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South Downs National Park Authority Local Plan/Lewes Joint Core Strategy Habitats Regulations Assessment Addendum

Traffic-Related Effects on Ashdown Forest SAC

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1 Executive Summary

1.1.1 In March 2017 a High Court judgment against the adopted Lewes/South Downs Joint Core Strategy (JCS)[1] concluded that the method that had been used in the JCS Habitat Regulations Assessment to rule out the potential for 'in combination' air quality effects from their plan on Ashdown Forest SAC was legally flawed, whether or not it complied with advice the Council had been given by Natural England, because it relied entirely on examining the flows arising from the JCS in isolation and took no account of the potential accumulation of growth from multiple authorities all affecting vehicle flows through the SAC, and the role (or not) of the JCS in any cumulative effect. In layman's terms, because the JCS used a shorthand assessment method agreed with Natural England, the HRA of the JCS *asserted* that its contribution was too small to contribute meaningfully to any 'in combination' effect but did not *demonstrate* that conclusion since it did not attempt to quantify the 'in combination' effect or demonstrate what the contribution of the JCS would actually mean in terms of changes in air quality.

1.1.2 AECOM was appointed to address the matter raised by the High Court judgment. That is the purpose of this HRA Addendum. Forecast vehicle flows on roads through Ashdown Forest in 2033 are compared with baseline flows on the same roads in order to ascertain the air quality effect. The relative contribution of growth in South Downs Local Plan/Lewes Joint Core Strategy (JCS) is then separated out from growth in other authorities in order to establish the relative contribution of the South Downs Local Plan/Lewes JCS to any change in air quality by 2033.

1.1.3 Nitrogen oxides (NOx) are the main pollutant emitted by traffic of relevance to vegetation, because they are a source of nitrogen, which is a fertiliser. The analysis shows that for all modelled links NOx concentrations within 200m of the roadside are forecast to be below the critical level (the concentration above which adverse effects may arise) by 2033 due to expected improvements in vehicle emissions and background, notwithstanding the projected increase in traffic on the road. The Lewes JCS/South Downs Local Plan is predicted to retard this improvement slightly (by up to 0.2 μgm^{-3}) within 20m of the A26 and A275. This is the worst-case retardation expected. Since the ecologically significant role of NOx is as a source of nitrogen the next step is to consider what effect this may have on nitrogen deposition rates.

1.1.4 Ashdown Forest SAC is designated for its heathland. The lowest part of the nitrogen Critical Load range for this habitat (the most stringent deposition rate above which adverse effects may occur) is 10 kg/N/ha/yr and as such baseline nitrogen deposition within 200m of the A26, A22 and A275 is above the Critical Load. However, notwithstanding the expected growth in traffic flows, nitrogen deposition is forecast to reduce by up to c. 1.9 kgN/ha/yr by 2033, although it is expected to remain above the critical load. In other words, the improvement in vehicle emission factors and in background nitrogen deposition rates expected over the period to 2033 are forecast to more than offset the increase in nitrogen deposition from an increase in the volume of vehicle movements.

1.1.5 On the A26 and A275 the South Downs Local Plan/Lewes JCS retards this improvement slightly, but only within 5m of the roadside and only by 0.01 kgN/ha/yr. This is so small that it is almost too small to appear in the model and is well within the probable limits of annual variation in background nitrogen deposition. It equates to 0.1% of the critical load or 0.08% of the deposition rate that would otherwise be expected by 2033. It is a sufficiently small amount (a total of 1 milligram of nitrogen[2] deposited per square metre over the course of a year) that it is ecologically insignificant and no retardation of any expected improvement in vegetation would occur. For example, data on lowland heathland[3] indicate that at deposition rates of c. 10-15kgN/ha/yr, an increase of 0.8 - 1.3 kgN/ha/yr would be required to lose one species from the sward. At higher background deposition rates (such as may apply at some parts of Ashdown Forest SAC) even greater additional nitrogen is required to remove one species. Growth stimulation responses that

[1] Wealden District Council vs Secretary of State for Communities and Local Government. Lewes District Council and South Downs National Park Authority and Natural England. [2017] EWHC 351 (Admin)

[2] For ease of comparison, a teaspoon of salt typically weighs 5000-6000 milligrams and a pinch of salt (c. $1/16^{th}$ of a teaspoon) weighs roughly 300 milligrams

[3] 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.

are not sufficiently severe to result in loss of species would occur before this scale of increase was achieved, but the very small magnitude of 0.01 kgN/ha/yr is evident[4]. Since the overall trend to 2033 is expected to be a positive one and will not be retarded to an ecologically significant extent by the South Downs Local Plan and JCS, there is thus not considered to be an adverse effect on the integrity of Ashdown Forest SAC in combination with growth arising from surrounding authorities.

1.1.6 Moreover, the Local Plan and Joint Core Strategy both contain sustainability policies (notably Local Plan policy SD19 (Transport and Accessibility) and Joint Core Strategy policy 13 (Sustainable Travel)) which are not factored into these traffic/air quality calculations and aspects of which have some potential to reduce the need for journeys to work by private vehicle towards Ashdown Forest; thus further reducing the already small contribution to increased vehicle movements on the A26 that is forecast to arise from the Local Plan and JCS.

1.1.7 Although it does not constitute mitigation (and is not presented as such), as a further safeguard the South Downs National Park Authority has also convened an Ashdown Forest Working Group which first met in April 2017. The shared objective of the working group is to ensure that impacts on the Ashdown Forest are properly assessed through HRA and that, if required, a joint action plan is put in place should such a need arise. It should be noted that the absence of any need for 'mitigation' associated with the scale of future growth in a particular authority does not prevent the Ashdown Forest authorities cooperatively working together to do whatever they jointly consider appropriate in reducing traffic and improving nitrogen deposition etc. around the Forest as a matter of general good stewardship, at least until 2040 after which it is likely an improvement in road-related air quality will start to be realised due to the Government's announcement to ban the sale of new petrol and diesel vehicles at that point. The aforementioned working group would be a suitable forum.

[4] To further illustrate the relative magnitude, Section 6.1 of Caporn et al (2016) describes increases in nitrogen deposition of 1-2kg N/ha/yr as '*relatively small increases'*.

2 Introduction

2.1.1 In the HRA of their adopted Joint Core Strategy (JCS), Lewes District Council used a 'change in flow' metric of 1,000 Annual Average Daily Traffic (AADT) as a basis to conclude that likely significant effects on the Ashdown Forest SAC due to changes in air quality would not arise either from their plan alone or their plan in combination with other projects and plans. This was because the expected change in flows due to the JCS on any road within 200m of Ashdown Forest SAC fell well below this metric. However, because this metric was used, no actual air quality calculations were undertaken and therefore no form of quantitative assessment examined the overall 'in combination' air quality effect from housing and employment growth in multiple authorities around the SAC.

2.1.2 In March 2017 a High Court judgment against the adopted Lewes/South Downs Joint Core Strategy[5] concluded that the simple application of the 1,000 AADT threshold as a basis to rule out the potential for 'in combination' effects from a plan in isolation was legally flawed (whether or not it complied with advice the Council had been given by Natural England) because the application of such a threshold to a single Local Plan in isolation explicitly took no account of the potential accumulation of growth. The judge did accept in paragraph 95 of the judgment that in principle there must be a change in flows (and thus air quality) which would make a *de minimis* contribution to an 'in combination' effect[6]. However, he determined that 1,000 AADT was an insufficiently precautionary threshold to be applied to a plan in isolation in the absence of further evidence to support its use in that way and in the absence of any attempt to put the contribution of Lewes JCS within the context of an 'in combination' analysis. In layman's terms, because the JCS used a shorthand assessment method agreed with Natural England, the HRA of the JCS *asserted* that that its contribution was too small to contribute meaningfully to any 'in combination' effect but did not *demonstrate* that conclusion since it did not attempt to quantify the 'in combination' effect or demonstrate what the contribution of the JCS would actually mean in terms of changes in air quality.

2.1.3 AECOM was appointed to address the matter raised by the High Court judgment. That is the purpose of this HRA Addendum. Transport modelling and air quality calculations have been undertaken for the adopted Lewes Joint Core Strategy and the emerging South Downs Local Plan (taken collectively). Due to the way in which such modelling and calculations are undertaken they calculate the expected 'future year' air quality adjacent to a road link as a result of the total cumulative growth in traffic expected from local authorities around Ashdown Forest SAC and further afield. The calculations are therefore inherently 'in combination' by virtue of the fact that they consider traffic growth by 2033 irrespective of point of origin. This therefore addresses the High Court judgement, which was based on the fact that there was no evidence of consideration of the effects of growth from the JCS area cumulatively with growth elsewhere over the same period[7]. The methodology used in this analysis is therefore compliant with the requirement of the Conservation of Habitats and Species Regulations 2010 (as amended) 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.

2.1.4 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 the Lewes JCS and South Downs 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. This is relevant to determining whether the contribution of the Lewes JCS and South Downs Local Plan to any 'in combination' effect is (to use the words of Justice Jay in paragraph 95 of the High Court judgment) '*very low indeed*'.

[5] Wealden District Council vs Secretary of State for Communities and Local Government. Lewes District Council and South Downs National Park Authority and Natural England. [2017] EWHC 351 (Admin)

[6] *'… I can well see that distinctions may be capable of being drawn in practice because if it is known that specific impacts are very low indeed, or are likely to be such, these can properly be ignored…'*

[7] The HRA of the Lewes Joint Core Strategy also included an analysis of air quality effects on the Lewes Downs SAC. However, the assessment relating to that SAC was not challenged because air quality calculations were undertaken, 'in combination' with growth arising from all sources and the HRA for that European site was therefore legally compliant.

3 Methodology

3.1.1 Vehicle exhaust emissions 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.

3.1.2 There are two measures of relevance regarding air quality impacts from vehicle exhausts. The first is the concentration of oxides of nitrogen (known as NOx) in the atmosphere. In extreme cases NOx 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 (μgm^{-3}), known as the Critical Level, as this concentration relates to the growth effects of nitrogen derived from NOx on vegetation.

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

3.1.4 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.

3.2 Traffic modelling

3.2.1 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. Traffic data were generated for each of these links for three scenarios:

- Base Case
- Do Nothing (DN)
- Do Something (DS)

3.2.2 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 undertaken in 2014. For the purposes of consistency with the other 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 South Downs Local Plan is backdated 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.

3.2.3 The Do Nothing scenario shows future flows on the same roads at the end of the South Downs Local Plan period (2033), without consideration of the role of the South Downs Local Plan or of the Lewes Joint Core Strategy. This therefore presents the expected contribution of other plans and projects to flows by 2033. 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 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.

3.2.4 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.

3.2.5 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 Area[8]) 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.

3.2.6 The 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, Tunbridge Wells, Sevenoaks 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)[9]. The OAN figure was 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:

- **Tunbridge Wells** – The adopted Core Strategy plans for 6,000 additional homes from 2006 to 2026 (300 dwellings per annum) with the majority (70%) in Royal Tunbridge Wells. The new Local Plan is currently in the early stages of development. The most recent Objectively Assessed Need for Tunbridge Wells is 648 dwellings per annum. Since this is a substantial difference from that in the adopted Core Strategy the higher rate was used in the model.

- **Sevenoaks** – The adopted Core Strategy allows for 3,000 dwellings from 2006 to 2026 or 165 dwellings per annum. Distribution is almost 40% in Sevenoaks itself, with 18% in Swanley and 11% in Edenbridge. The new Local Plan is in the early stages of development. The most recent Objectively Assessed Need for Sevenoaks is 620 dwellings per annum. Since this is a substantial difference from that in the adopted Core Strategy the higher rate was used in the model.

[8] 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.
[9] Note that the Objectively Assessed Need figures are as of June 2017

- **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'*.[10] 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.'*[11] 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.

3.2.7 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.

3.2.8 The Do Something scenario reflects the combined role of the 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

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

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

authorities. To build the Local Plan model, housing and employment sites in 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 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.

3.2.9 The 'in combination' growth scenario is therefore the Do Something flows, as these include existing traffic, all future journeys arising from within the South Downs National Park 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 Local Plan/Joint Core Strategy (and Neighbourhood Plans) in changing future flows compared to what would be expected without the Local Plan/Joint Core Strategy proposals. Some links see increases compared to Do Nothing (where trips are concentrated due to the scale and location of development in the Local Plan/Joint Core Strategy) and some see slight decreases[12].

3.3 Air quality calculations

3.3.1 Using these scenarios and information on average vehicle speeds and percentage Heavy Duty Vehicles (both of which influence the emissions profile), AECOM air quality specialists calculated expected NOx concentrations, nitrogen deposition rates and acid deposition rates for all modelled road links. The predictions 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)[13] for the assessment of impacts on sensitive designated ecosystems due to highways works. Background data were sourced from the Department of Environment, Food and Rural Affairs (Defra) background maps[14] [15].

3.3.2 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) position[16] as well as that of central government. Background nitrogen deposition rates were sourced from the Air Pollution Information System (APIS) website[17]. Although in recent years improvements have not kept pace with predictions, the general long-term trend for NOx has been one of improvement (particularly since 1990) despite an increase in vehicles on the roads[18]. 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 Defra will occur. 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). This approach is accepted within the professional air quality community and accounts for known recent improvements in vehicle technologies (new standard Euro 6/VI vehicles), whilst excluding the more distant and therefore more uncertain projections on the 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

[12] Note that these 'decreases' simply indicate lower flows than the Do Nothing forecasts and are essentially a modelling artefact due to the slightly different ways that TEMPRO and the AECOM model assign journeys to the network; compared to measured base flows there is always a net increase

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

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

[15] It is understood that measured data exists for Ashdown Forest but they were not available at the time this analysis was undertaken. The use of any measurement data for Ashdown Forest would likely change the absolute concentrations and deposition rates presented in this analysis but not the overall trends or conclusions with regard to the South Downs Local Plan/Lewes Joint Core Strategy

[16] http://www.iaqm.co.uk/text/position_statements/vehicle_NOx_emission_factors.pdf

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

[18] 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_statisticalrelease_2016_final.pdf [accessed 08/06/17]

would not affect the time period under consideration, but that announcement illustrates the general long-term direction of travel for 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.

3.3.3 Annual mean concentrations of NOx were calculated at varied intervals back from each road link, 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 6.0.2) which utilises traffic data in the form of 24-hour Annual Average Daily Traffic (AADT), detailed vehicle fleet composition and average speed. The tables in Appendix A present the calculated changes in NOx 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).

4 Results

4.1 Traffic modelling

4.1.1 The flows forecast by 2033, and how these differ between Do Nothing (without the Local Plan/JCS) and Do Something (including the Local Plan and JCS) are presented below.

A	B	C	D	E	F	G	H	I
Link ID	**Link Description**	**Wealden Model Base 2014 AADT**	**2017 Base AADT**	**2033 DN AADT**	**2033 DS AADT**	**Difference between 2017 Base and DS (all traffic growth)**	**Difference between 2017 DN and DS (contribution of South Downs Local Plan/JCS)[19]**	**Percentage growth from 2017-2033 attributable to South Downs Local Plan/JCS**
6	A22 Royal Ashdown Forest Golf Course	11,480	11,509	13,474	13,581	2,072	107	5%
33	A22 Wych Cross	12,340	12,371	14,483	14,460	2,089	-23	0%
34	A22 Nutley	11,360	11,389	13,333	13,317	1,928	-16	0%
37	A275 Wych Cross	4,530	4,542	5,317	5,515	973	198	20%
38	A26 Poundgate	16,150	16,191	18,955	19,215	3,024	260	9%

4.1.2 All links are forecast to experience an increase in traffic flows between 2017 and 2033 when all expected traffic growth sources (including the South Downs Local Plan/Lewes JCS) are taken into account (columns E and F). The increase including the South Downs Local Plan/Lewes JCS (column G) varies from c. 1,000 AADT on the A275 to c. 3,000 AADT on the A26. Although the busiest link is the A26, 'busy' is a relative term. The total measured 2014 flows on this part of the A26 (column C) are not particularly high in themselves. For comparison, traffic counts in 2017 have identified that the A3 in the west of the South Downs National Park has base flows of 47,000 AADT.

4.1.3 The contribution of the Local Plan/Joint Core Strategy growth to this change (column H) is small, ranging from effectively zero (links 33 and 34) to a further 260 journeys per day on the A26 by 2033. The greatest change in flows is forecast to occur on the A26, while the A275 is the link on which the Lewes JCS/South Downs Local Plan is forecast to make their greatest proportional contribution to the expected change in flows (20%). However, this is also the modelled link with the lowest overall traffic flows, having total flows in 2014 of just 4,530 AADT. The small contribution of growth in the South Downs and Lewes District is most likely to be a function of the distance between the population centres in Lewes District/South Downs National Park and the modelled links, and thus the small role these links play in daily journeys to work for residents of these areas.

4.2 Air quality calculations

4.2.1 Based on background mapping, adjusted for the effect of the road, the air quality calculations provided in Appendix A show that the baseline NOx concentrations are above the 30 μgm^{-3} general Critical Level for vegetation up to 20m from the roadside along the A26 at Poundgate (link 38) and the A275 at Wych Cross (link 37) and on one of the modelled transects along the A22 within the vicinity of Royal Ashdown Forest Golf Course (link 6). For all other links, NOx

[19] NB. For reasons already explained, a slight negative result essentially denotes no expected effect on the modelled road from the DS scenario compared to the DN scenario.

concentrations are currently identified as being below the critical level even at the roadside. Such a result would be unsurprising given the modest measured traffic flows on even the busiest road (the A26) and the essentially rural location of Ashdown Forest.

4.2.2 Under the DN scenario (without the Local Plan/Joint Core Strategy), concentrations are forecast to reduce to below the critical level on all three of these links by 2033 due to changes in vehicle emissions, notwithstanding the projected increase in traffic on the road. On the A26 and A275, this improvement in NOx concentrations is forecast to be retarded slightly by up to 0.2 μgm^{-3} within 20m of the roadside when Local Plan/JCS growth is taken into account, while a nominal retardation of 0.1 μgm^{-3} at the roadside is forecast from some of the transects along the A22 at Royal Ashdown Forest Golf Course (link 6). However, concentrations are forecast to remain below the critical level in all cases. Since the ecologically significant role of NOx is as a source of nitrogen the next step is to consider what effect the slight retardation of improvement may have on nitrogen deposition rates[20].

4.2.3 Ashdown Forest SAC is designated for its heathland. It has been assumed for the purposes of this analysis that functional heathland is present (or could be present with suitable management) throughout any or all of the 200m transects modelled in this analysis. In practice this is unlikely to be the case due to other factors associated with the presence of the road e.g. presence/retention of dense tree planting as a screen from the road, effects of salt deposition, or changes to local geology and hydrology when the road was constructed or re-surfaced, or where roadside services or drainage have been installed. However those potential factors have not been included in this analysis, which assumes pristine heathland. It is therefore an inherently precautionary assessment. Critical loads are always presented as a range, which for heathland is 10 kgN/ha/yr to 20 kgN/ha/yr[21]. The lowest part of the nitrogen Critical Load range has been used in this assessment as that is the most precautionary stance to take, although it is possible that the actual critical load could be a higher figure. That also makes the analysis reported in this document a precautionary assessment (as does the assumption of higher housing growth rates than contained in adopted Local Plans as reported earlier). The baseline for nitrogen deposition within 200m of the A26, A22 and A275 is above the Critical Load at c.14-15 kgN/ha/yr. Under both the DN and DS scenarios nitrogen deposition is expected to remain above the critical load, but is forecast to reduce by up to c. 1.9 kgN/ha/yr to 2033 notwithstanding overall growth in flows on the road. In other words, the improvement in vehicle emission factors and in background nitrogen deposition rates expected over the period to 2033 are forecast to more than offset the increase in nitrogen deposition from an increase in the volume of vehicle movements.

4.2.4 For the A26 and A275 the DS scenario (factoring in the Local Plan/JCS) retards this improvement slightly but only within 5m of the roadside and only by 0.01kgN/ha/yr[22]. If the contribution were only slightly smaller it would not appear in the model at all. It equates to 0.1% of the critical load or 0.08% of the forecast 2033 DN deposition rate and is likely to be well within the normal limits of annual variation in deposition rates. It is a sufficiently small amount (a total of 1 milligram of nitrogen[23] deposited per square metre over the course of a year) that it is ecologically insignificant and no retardation of any expected improvement in vegetation would occur, given that no habitats that have been studied to date are responsive to such very small incremental changes in nitrogen deposition. For example, data on dose response relationships in lowland heathland[24] indicate that at deposition rates of c. 10-15kgN/ha/yr (representative of current and forecast future deposition rates in this area using background mapping of deposition

[20] Acid deposition rates for all transects on all modelled links are expected to improve over the plan period and the contribution of the South Downs Local Plan/JCS to any retardation of that improvement is 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.

[21] 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.

[22] There is always an element of uncertainty in the modelling of future traffic flows, as with any form of forecasting. However, the assessment is based on the best available data, with traffic projections based on current methodologies. The worst-case predicted impact of the change in traffic flows on nitrogen deposition due to growth to 2033 in Lewes District and the South Downs National Park is so low (0.01 KgN/ha/yr) that variations in future predicted traffic flows would not materially affect the conclusions of this assessment. For example, even if the 2033 nitrogen deposition due to the Lewes JCS/South Downs Local Plan proved to be double that forecast in this analysis (0.02 KgN/ha/yr) it would remain a very small contribution and would not affect the interpretation and conclusions presented in this report.

[23] For ease of comparison, a teaspoon of salt typically weighs 5000-6000 milligrams and a pinch of salt (c. $1/16^{th}$ of a teaspoon) weighs roughly 300 milligrams

[24] 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.

rates) an increase of 0.8 - 1.3 kgN/ha/yr would be required to lose one species from the sward (Appendix B). An even greater increase would be required if actual measured deposition rates are shown to be substantially higher than those extrapolated from Defra mapping; 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 by one species. Growth stimulation responses that are not sufficiently severe to result in loss of species would occur at some point before this scale of increase was achieved, but the very small magnitude of 0.01 kgN/ha/yr is evident.

4.2.5 Even in the very unlikely event that there was no improvement in either background nitrogen deposition rates or vehicle emission factors by 2033 (and was thus a net deterioration in deposition rates once total traffic growth over the same period was included) the relative contribution of the additional traffic on the network due to the Lewes Joint Core Strategy and South Downs Local Plan taken together would be essentially identical to that discussed above[25] and thus the conclusion regarding the ecological importance of the contribution to any overall effect 'in combination' would remain the same.

4.2.6 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 (defined in available metrics as whether or not it will result in the loss of at least one species from the sward). This in turn makes it possible to gauge whether a given plan is not just of small magnitude (in which event it could still contribute meaningfully to an effect 'in combination') but of such small magnitude that its contribution would exist in theory (in the second decimal place of the air quality model), but not in practice (on the ground). Such a plan would be one in which one could say with confidence that a) there would not be a measurable difference in the vegetation whether or not that plan proceeded and b) there would not be a measureable 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 Lewes Joint Core Strategy and South Downs Local Plan falls well within those parameters.

4.2.7 Since the overall trend to 2033 is expected to be a positive one and will not be retarded to an ecologically significant extent by the South Downs Local Plan and JCS, there is thus not considered to be an adverse effect on the integrity of Ashdown Forest SAC in combination with growth arising from surrounding authorities. Moreover, the Local Plan and Joint Core Strategy both contain sustainability policies (notably Local Plan policy SD19 (Transport and Accessibility) and Joint Core Strategy policy 13 (Sustainable Travel)) which are not factored into these traffic/air quality calculations and aspects of which have some potential to reduce the need for journeys to work by private vehicle towards Ashdown Forest; thus further reducing the already small contribution to increased vehicle movements on the A26 that is forecast to arise from the Local Plan and JCS. For information, these policies are presented in Appendix C.

4.2.8 Although it does not constitute mitigation (and is not presented as such), as a further safeguard the SDNPA has also led on convening an Ashdown Forest working group which first met in April 2017. The shared objective of the working group is to ensure that impacts on the Ashdown Forest are properly assessed through HRA and that, if required, a joint action plan is put in place should such a need arise. It should be noted that the absence of any need for 'mitigation' associated with future growth in a particular authority does not prevent the various Ashdown Forest authorities cooperatively working together to do whatever they jointly consider appropriate in reducing traffic and improving nitrogen deposition etc. around the Forest as a matter of general good stewardship, at least until 2040 after which it is likely an improvement in road-related air quality will start to be realised due to the Government's announcement to ban the sale of new petrol and diesel vehicles at that point. This would also enable future trends in air quality to be tracked and the modelling (and responses to that modelling) to be updated as necessary. The aforementioned working group would be a suitable forum for this cooperative working.

[25] Modelling of a 'no improvement' scenario indicates that the worst-case contribution of the JCS/Lewes Local Plan to nitrogen deposition on the A26 by 2033 would rise slightly (due to the assumption of no improvement in emission factors) from 0.01 KgN/ha/yr to 0.02 KgN/ha/yr at the same location.

5 Conclusion

5.1.1 It can therefore be concluded 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. This is due to a combination of a) an expected net improvement in air quality over the Local Plan period and b) the fact that, whether or not that improvement occurs to the extent forecast, the contribution of the South Downs Local Plan and Lewes Joint Core Strategy to changes in roadside air quality is demonstrably ecologically negligible due to the very small magnitude. In the words of Mr. Justice Jay in his judgement regarding the Joint Core Strategy Judicial Review when discussing when a *de minimis* conclusion would be appropriate: '*…if it is known that specific impacts are very low indeed, or are likely to be such, these can properly be ignored…'*[26]. This therefore supports the original conclusion of the HRA of the Lewes JCS.

[26] Wealden District Council vs Secretary of State for Communities and Local Government. Lewes District Council and South Downs National Park Authority and Natural England. [2017] EWHC 351 (Admin). Paragraph 95 of the judgment

Appendix A. Detailed Modelling Results

Receptor 38: the A26 at Poundgate

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
			BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
1	38_0m	0	35.7	25.5	25.7	0.2	-9.9	14.23	12.34	12.35	0.01	-1.87	1.12	1.07	1.07	0.00	-0.04
2	38_5m	5	25.8	18.9	19.0	0.1	-6.8	13.72	12.00	12.00	0.01	-1.72	1.06	1.04	1.04	0.00	-0.03
3	38_10m	10	21.5	15.9	16.0	0.1	-5.5	13.50	11.84	11.85	0.00	-1.65	1.04	1.02	1.02	0.00	-0.02
4	38_15m	15	19.2	14.4	14.4	0.1	-4.7	13.37	11.76	11.76	0.00	-1.62	1.03	1.01	1.01	0.00	-0.01
5	38_20m	20	17.7	13.3	13.4	0.1	-4.3	13.29	11.70	11.70	0.00	-1.59	1.02	1.01	1.01	0.00	-0.01
6	38_30m	30	15.8	12.1	12.1	0.0	-3.7	13.20	11.63	11.64	0.00	-1.56	1.01	1.00	1.00	0.00	-0.01
7	38_40m	40	14.8	11.4	11.4	0.0	-3.4	13.14	11.59	11.60	0.00	-1.54	1.00	1.00	1.00	0.00	-0.01
8	38_50m	50	14.1	10.9	10.9	0.0	-3.2	13.10	11.57	11.57	0.00	-1.53	1.00	0.99	0.99	0.00	-0.01
9	38_60m	60	13.6	10.5	10.6	0.0	-3.0	13.07	11.55	11.55	0.00	-1.52	1.00	0.99	0.99	0.00	0.00
10	38_70m	70	13.2	10.3	10.3	0.0	-2.9	13.05	11.53	11.54	0.00	-1.52	0.99	0.99	0.99	0.00	0.00
11	38_80m	80	12.9	10.1	10.1	0.0	-2.8	13.03	11.52	11.52	0.00	-1.51	0.99	0.99	0.99	0.00	0.00
12	38_90m	90	12.7	9.9	9.9	0.0	-2.7	13.02	11.51	11.52	0.00	-1.51	0.99	0.99	0.99	0.00	0.00
13	38_100m	100	12.5	9.8	9.8	0.0	-2.7	13.01	11.51	11.51	0.00	-1.50	0.99	0.99	0.99	0.00	0.00
14	38_125m	125	12.1	9.5	9.5	0.0	-2.6	12.99	11.49	11.49	0.00	-1.50	0.99	0.99	0.99	0.00	0.00
15	38_150m	150	11.9	9.4	9.4	0.0	-2.5	12.98	11.48	11.48	0.00	-1.49	0.99	0.98	0.98	0.00	0.00
16	38_175m	175	11.7	9.2	9.2	0.0	-2.4	12.97	11.48	11.48	0.00	-1.49	0.99	0.98	0.98	0.00	0.00
17	38_200m	200	11.5	9.1	9.1	0.0	-2.4	12.96	11.47	11.47	0.00	-1.49	0.98	0.98	0.98	0.00	0.00

Receptor 37W – A275 at Wych Cross

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
			BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
18	37W_0m	0	18.7	14.3	14.5	0.2	-4.2	14.21	12.52	12.53	0.01	-1.68	1.09	1.08	1.08	0.00	-0.01
19	37W_5m	5	15.6	12.2	12.3	0.1	-3.4	14.04	12.40	12.41	0.01	-1.64	1.07	1.07	1.07	0.00	-0.01
20	37W_10m	10	14.5	11.4	11.4	0.1	-3.1	13.98	12.36	12.36	0.00	-1.62	1.07	1.06	1.06	0.00	0.00
21	37W_15m	15	13.9	10.9	11.0	0.1	-2.9	13.95	12.34	12.34	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
22	37W_20m	20	13.5	10.7	10.7	0.0	-2.8	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
23	37W_30m	30	13.1	10.4	10.4	0.0	-2.7	13.91	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
24	37W_40m	40	12.8	10.2	10.2	0.0	-2.6	13.89	12.30	12.30	0.00	-1.59	1.06	1.05	1.05	0.00	0.00
25	37W_50m	50	12.7	10.1	10.1	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
26	37W_60m	60	12.6	10.0	10.0	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
27	37W_70m	70	12.5	9.9	10.0	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
28	37W_80m	80	12.4	9.9	9.9	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
29	37W_90m	90	12.4	9.9	9.9	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
30	37W_100m	100	12.3	9.8	9.8	0.0	-2.5	13.86	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
31	37W_125m	125	12.3	9.8	9.8	0.0	-2.5	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
32	37W_150m	150	12.2	9.7	9.7	0.0	-2.5	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
33	37W_175m	175	12.2	9.7	9.7	0.0	-2.4	13.85	12.27	12.27	0.00	-1.58	1.05	1.05	1.05	0.00	0.00
34	37W_200m	200	12.1	9.7	9.7	0.0	-2.4	13.85	12.27	12.27	0.00	-1.58	1.05	1.05	1.05	0.00	0.00

Receptor 37E – A275 at Wych Cross

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
			BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
35	37E_0m	0	18.1	13.9	14.1	0.2	-4.0	14.18	12.50	12.51	0.01	-1.67	1.09	1.07	1.08	0.00	-0.01
36	37E_5m	5	15.4	12.0	12.1	0.1	-3.3	14.03	12.39	12.40	0.01	-1.63	1.07	1.06	1.06	0.00	-0.01
37	37E_10m	10	14.3	11.2	11.3	0.1	-3.0	13.97	12.35	12.36	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
38	37E_15m	15	13.8	10.9	10.9	0.1	-2.9	13.94	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
39	37E_20m	20	13.4	10.6	10.7	0.0	-2.8	13.92	12.32	12.32	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
40	37E_30m	30	13.0	10.3	10.4	0.0	-2.7	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
41	37E_40m	40	12.8	10.2	10.2	0.0	-2.6	13.89	12.29	12.30	0.00	-1.59	1.06	1.05	1.05	0.00	0.00
42	37E_50m	50	12.7	10.1	10.1	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
43	37E_60m	60	12.6	10.0	10.0	0.0	-2.5	13.88	12.28	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
44	37E_70m	70	12.5	9.9	9.9	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
45	37E_80m	80	12.4	9.9	9.9	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
46	37E_90m	90	12.4	9.9	9.9	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
47	37E_100m	100	12.3	9.8	9.8	0.0	-2.5	13.86	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
48	37E_125m	125	12.3	9.8	9.8	0.0	-2.5	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
49	37E_150m	150	12.2	9.8	9.8	0.0	-2.5	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
50	37E_175m	175	12.2	9.7	9.7	0.0	-2.5	13.85	12.27	12.27	0.00	-1.58	1.05	1.05	1.05	0.00	0.00
51	37E_200m	200	12.2	9.7	9.7	0.0	-2.4	13.85	12.27	12.27	0.00	-1.58	1.05	1.05	1.05	0.00	0.00

Receptor 34 – A22 at Nutley

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
			BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
52	34_0m	0	29.0	20.7	20.7	0.0	-8.3	15.04	13.11	13.11	0.00	-1.92	1.17	1.13	1.13	0.00	-0.03
53	34_5m	5	22.0	16.1	16.1	0.0	-6.0	14.67	12.87	12.87	0.00	-1.80	1.13	1.11	1.11	0.00	-0.02
54	34_10m	10	18.9	14.0	14.0	0.0	-4.9	14.51	12.76	12.76	0.00	-1.75	1.11	1.10	1.10	0.00	-0.01
55	34_15m	15	17.2	12.9	12.9	0.0	-4.3	14.42	12.70	12.70	0.00	-1.72	1.10	1.09	1.09	0.00	-0.01
56	34_20m	20	16.2	12.2	12.2	0.0	-3.9	14.36	12.66	12.66	0.00	-1.70	1.10	1.09	1.09	0.00	-0.01
57	34_30m	30	14.9	11.4	11.4	0.0	-3.5	14.29	12.62	12.62	0.00	-1.67	1.09	1.08	1.08	0.00	-0.01
58	34_40m	40	14.2	10.9	10.9	0.0	-3.3	14.25	12.59	12.59	0.00	-1.66	1.09	1.08	1.08	0.00	-0.01
59	34_50m	50	13.7	10.6	10.6	0.0	-3.1	14.22	12.57	12.57	0.00	-1.65	1.08	1.08	1.08	0.00	0.00
60	34_60m	60	13.4	10.4	10.4	0.0	-3.0	14.21	12.56	12.56	0.00	-1.65	1.08	1.08	1.08	0.00	0.00
61	34_70m	70	13.1	10.2	10.2	0.0	-2.9	14.19	12.55	12.55	0.00	-1.64	1.08	1.08	1.08	0.00	0.00
62	34_80m	80	12.9	10.1	10.1	0.0	-2.8	14.18	12.54	12.54	0.00	-1.64	1.08	1.08	1.08	0.00	0.00
63	34_90m	90	12.8	10.0	10.0	0.0	-2.8	14.17	12.54	12.54	0.00	-1.63	1.08	1.07	1.07	0.00	0.00
64	34_100m	100	12.6	9.9	9.9	0.0	-2.7	14.17	12.53	12.53	0.00	-1.63	1.08	1.07	1.07	0.00	0.00
65	34_125m	125	12.4	9.7	9.7	0.0	-2.7	14.15	12.52	12.52	0.00	-1.63	1.08	1.07	1.07	0.00	0.00
66	34_150m	150	12.2	9.6	9.6	0.0	-2.6	14.14	12.52	12.52	0.00	-1.62	1.07	1.07	1.07	0.00	0.00
67	34_175m	175	12.1	9.6	9.6	0.0	-2.6	14.14	12.51	12.51	0.00	-1.62	1.07	1.07	1.07	0.00	0.00
68	34_200m	200	12.0	9.5	9.5	0.0	-2.5	14.13	12.51	12.51	0.00	-1.62	1.07	1.07	1.07	0.00	0.00

Receptor 33 – A22 at Wych Cross

Lookup ID	Road Link	Distance From Road	Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
			BL Base	DM (Base	DS (Scn1	Change (DS-	Change (DS-	BL Base	DM (Base	DS (Scn1	Change (DS-	Change (DS-	BL Base	DM (Base	DS (Scn1	Change (DS-	Change (DS-

		(m)		2033)	2033)	DM)	BL)		2033)	2033)	DM)	BL)		2033)	2033)	DM)	BL)
69	33_0m	0	23.9	17.7	17.7	0.0	-6.2	14.49	12.71	12.71	0.00	-1.78	1.12	1.10	1.10	0.00	-0.02
70	33_5m	5	18.9	14.3	14.3	0.0	-4.7	14.23	12.53	12.53	0.00	-1.70	1.09	1.08	1.08	0.00	-0.01
71	33_10m	10	16.9	12.9	12.9	0.0	-4.0	14.12	12.45	12.45	0.00	-1.67	1.08	1.07	1.07	0.00	-0.01
72	33_15m	15	15.8	12.1	12.1	0.0	-3.7	14.06	12.41	12.41	0.00	-1.65	1.07	1.07	1.07	0.00	-0.01
73	33_20m	20	15.1	11.6	11.6	0.0	-3.4	14.02	12.38	12.38	0.00	-1.64	1.07	1.06	1.06	0.00	-0.01
74	33_30m	30	14.2	11.0	11.0	0.0	-3.2	13.97	12.35	12.35	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
75	33_40m	40	13.7	10.7	10.7	0.0	-3.0	13.95	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
76	33_50m	50	13.4	10.5	10.5	0.0	-2.9	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
77	33_60m	60	13.2	10.3	10.3	0.0	-2.9	13.92	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
78	33_70m	70	13.0	10.2	10.2	0.0	-2.8	13.91	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
79	33_80m	80	12.9	10.1	10.1	0.0	-2.8	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
80	33_90m	90	12.8	10.0	10.0	0.0	-2.7	13.89	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
81	33_100m	100	12.7	10.0	10.0	0.0	-2.7	13.89	12.29	12.29	0.00	-1.59	1.06	1.05	1.05	0.00	0.00
82	33_125m	125	12.5	9.9	9.9	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
83	33_150m	150	12.4	9.8	9.8	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
84	33_175m	175	12.3	9.7	9.7	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
85	33_200m	200	12.3	9.7	9.7	0.0	-2.6	13.86	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00

Receptor 6b_37_33 – Junction of A22 and A275

			Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
Lookup		Distance	BL	DM (Base	DS (Scn1	Change (DS-	(DS-	BL	DM (Base	DS (Scn1	Change (DS-	(DS-	BL	DM (Base	DS (Scn1	Change (DS-	(DS-
ID	Road Link	From Road (m)	Base	2033)	2033)	DM)	BL)	Base	2033)	2033)	DM)	BL)	Base	2033)	2033)	DM)	BL)
86	6b_37_33_0m	0	25.2	18.7	18.8	0.1	-6.4	14.55	12.75	12.76	0.01	-1.79	1.12	1.10	1.10	0.00	-0.02
87	6b_37_33_5m	5	22.5	16.8	16.9	0.1	-5.6	14.41	12.66	12.66	0.01	-1.75	1.11	1.09	1.09	0.00	-0.02
88	6b_37_33_10m	10	21.0	15.8	15.9	0.1	-5.1	14.34	12.60	12.61	0.00	-1.73	1.10	1.09	1.09	0.00	-0.02
89	6b_37_33_15m	15	20.1	15.2	15.2	0.1	-4.9	14.28	12.57	12.57	0.00	-1.71	1.10	1.08	1.08	0.00	-0.01
90	6b_37_33_20m	20	19.4	14.7	14.7	0.1	-4.6	14.25	12.54	12.54	0.00	-1.70	1.09	1.08	1.08	0.00	-0.01
91	6b_37_33_30m	30	18.2	13.9	13.9	0.0	-4.3	14.18	12.50	12.50	0.00	-1.68	1.09	1.07	1.08	0.00	-0.01
92	6b_37_33_40m	40	17.3	13.3	13.3	0.0	-4.0	14.14	12.46	12.47	0.00	-1.67	1.08	1.07	1.07	0.00	-0.01
93	6b_37_33_50m	50	16.6	12.8	12.9	0.0	-3.8	14.10	12.44	12.44	0.00	-1.66	1.08	1.07	1.07	0.00	-0.01
94	6b_37_33_60m	60	16.1	12.5	12.5	0.0	-3.6	14.07	12.42	12.42	0.00	-1.65	1.07	1.07	1.07	0.00	-0.01
95	6b_37_33_70m	70	15.7	12.2	12.2	0.0	-3.5	14.05	12.40	12.40	0.00	-1.64	1.07	1.07	1.07	0.00	-0.01
96	6b_37_33_80m	80	15.3	11.9	11.9	0.0	-3.4	14.03	12.39	12.39	0.00	-1.64	1.07	1.06	1.06	0.00	-0.01
97	6b_37_33_90m	90	15.0	11.7	11.7	0.0	-3.3	14.01	12.38	12.38	0.00	-1.63	1.07	1.06	1.06	0.00	-0.01
98	6b_37_33_100m	100	14.8	11.5	11.6	0.0	-3.2	14.00	12.37	12.37	0.00	-1.63	1.07	1.06	1.06	0.00	-0.01
99	6b_37_33_125m	125	14.2	11.2	11.2	0.0	-3.1	13.97	12.35	12.35	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
100	6b_37_33_150m	150	13.8	10.9	10.9	0.0	-2.9	13.95	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
101	6b_37_33_175m	175	13.5	10.7	10.7	0.0	-2.9	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
102	6b_37_33_200m	200	13.3	10.5	10.5	0.0	-2.8	13.92	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00

Receptor 6b - A22 at Royal Ashdown Forest Golf Course

			Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
Lookup		Distance From Road	BL	DM (Base	DS (Scn1	Change (DS-	(DS-	BL	DM (Base	DS (Scn1	Change (DS-	(DS-	BL	DM (Base	DS (Scn1	Change (DS-	(DS-
ID	Road Link	(m)	Base	2033)	2033)	DM)	BL)	Base	2033)	2033)	DM)	BL)	Base	2033)	2033)	DM)	BL)
103	6b_3m	3	21.7	16.2	16.2	0.0	-5.5	14.35	12.61	12.61	0.00	-1.74	1.10	1.09	1.09	0.00	-0.02
104	6b_8m	8	18.6	14.0	14.1	0.0	-4.5	14.18	12.49	12.49	0.00	-1.69	1.09	1.07	1.07	0.00	-0.01

105	6b_13m	13	17.0	13.0	13.0	0.0	-4.0	14.10	12.43	12.43	0.00	-1.66	1.08	1.07	1.07	0.00	-0.01
106	6b_18m	18	16.1	12.3	12.4	0.0	-3.7	14.05	12.40	12.40	0.00	-1.65	1.07	1.06	1.06	0.00	-0.01
107	6b_23m	23	15.4	11.9	11.9	0.0	-3.5	14.01	12.38	12.38	0.00	-1.64	1.07	1.06	1.06	0.00	-0.01
108	6b_33m	33	14.6	11.4	11.4	0.0	-3.2	13.97	12.35	12.35	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
109	6b_43m	43	14.2	11.1	11.1	0.0	-3.1	13.94	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
110	6b_53m	53	13.8	10.8	10.9	0.0	-3.0	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
111	6b_63m	63	13.6	10.7	10.7	0.0	-2.9	13.91	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
112	6b_73m	73	13.4	10.6	10.6	0.0	-2.9	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
113	6b_83m	83	13.3	10.5	10.5	0.0	-2.8	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
114	6b_93m	93	13.2	10.4	10.4	0.0	-2.8	13.89	12.29	12.29	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
115	6b_103m	103	13.1	10.4	10.4	0.0	-2.8	13.89	12.29	12.29	0.00	-1.59	1.06	1.05	1.05	0.00	0.00
116	6b_128m	128	12.9	10.2	10.2	0.0	-2.7	13.88	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
117	6b_153m	153	12.8	10.2	10.2	0.0	-2.7	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
118	6b_178m	178	12.8	10.1	10.1	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
119	6b_203m	203	12.7	10.1	10.1	0.0	-2.6	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00

Receptor 6aSW – A22 at Royal Ashdown Forest Golf Course

			Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
Lookup		Distance	BL	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
ID	Road Link	From Road (m)	Base					Base					Base				
120	6aSW_0m	0	29.0	21.3	21.3	0.0	-7.7	14.73	12.87	12.88	0.00	-1.85	1.14	1.11	1.11	0.00	-0.03
121	6aSW_5m	5	21.6	16.2	16.2	0.0	-5.3	14.34	12.60	12.61	0.00	-1.73	1.10	1.09	1.09	0.00	-0.02
122	6aSW_10m	10	18.7	14.3	14.3	0.0	-4.4	14.19	12.50	12.50	0.00	-1.69	1.09	1.07	1.08	0.00	-0.01
123	6aSW_15m	15	17.2	13.2	13.2	0.0	-4.0	14.11	12.44	12.44	0.00	-1.66	1.08	1.07	1.07	0.00	-0.01
124	6aSW_20m	20	16.3	12.6	12.6	0.0	-3.7	14.05	12.41	12.41	0.00	-1.65	1.07	1.07	1.07	0.00	-0.01
125	6aSW_30m	30	15.1	11.8	11.8	0.0	-3.3	13.99	12.36	12.37	0.00	-1.63	1.07	1.06	1.06	0.00	0.00
126	6aSW_40m	40	14.5	11.4	11.4	0.0	-3.1	13.96	12.34	12.34	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
127	6aSW_50m	50	14.1	11.1	11.1	0.0	-3.0	13.94	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
128	6aSW_60m	60	13.8	10.9	10.9	0.0	-2.9	13.92	12.31	12.31	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
129	6aSW_70m	70	13.6	10.7	10.7	0.0	-2.9	13.91	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
130	6aSW_80m	80	13.4	10.6	10.6	0.0	-2.8	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
131	6aSW_90m	90	13.3	10.5	10.5	0.0	-2.8	13.89	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
132	6aSW_100m	100	13.2	10.5	10.5	0.0	-2.7	13.89	12.29	12.29	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
133	6aSW_125m	125	13.0	10.3	10.3	0.0	-2.7	13.88	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
134	6aSW_150m	150	12.9	10.2	10.2	0.0	-2.7	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
135	6aSW_175m	175	12.8	10.2	10.2	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
136	6aSW_200m	200	12.7	10.1	10.1	0.0	-2.6	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00

Receptor 6aSE – A22 at Royal Ashdown Forest Golf Course

			Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
Lookup		Distance	BL	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
ID	Road Link	From Road (m)	Base					Base					Base				
137	6aSE_0m	0	32.7	23.7	23.8	0.1	-8.8	14.91	13.00	13.00	0.01	-1.91	1.16	1.13	1.13	0.00	-0.03
138	6aSE_5m	5	23.8	17.7	17.8	0.1	-6.0	14.46	12.68	12.69	0.00	-1.77	1.11	1.09	1.09	0.00	-0.02
139	6aSE_10m	10	20.4	15.4	15.4	0.0	-5.0	14.28	12.56	12.56	0.00	-1.72	1.10	1.08	1.08	0.00	-0.01
140	6aSE_15m	15	18.6	14.2	14.2	0.0	-4.4	14.18	12.49	12.50	0.00	-1.69	1.09	1.07	1.07	0.00	-0.01
141	6aSE_20m	20	17.5	13.4	13.4	0.0	-4.1	14.12	12.45	12.45	0.00	-1.67	1.08	1.07	1.07	0.00	-0.01
142	6aSE_30m	30	16.2	12.5	12.5	0.0	-3.7	14.05	12.40	12.40	0.00	-1.65	1.07	1.07	1.07	0.00	-0.01
143	6aSE_40m	40	15.4	12.0	12.0	0.0	-3.4	14.01	12.38	12.38	0.00	-1.63	1.07	1.06	1.06	0.00	-0.01

144	6aSE_50m	50	15.0	11.7	11.7	0.0	-3.3	13.98	12.36	12.36	0.00	-1.62	1.07	1.06	1.06	0.00	0.00
145	6aSE_60m	60	14.6	11.4	11.4	0.0	-3.2	13.97	12.35	12.35	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
146	6aSE_70m	70	14.4	11.3	11.3	0.0	-3.1	13.95	12.34	12.34	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
147	6aSE_80m	80	14.2	11.1	11.1	0.0	-3.0	13.94	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
148	6aSE_90m	90	14.0	11.0	11.0	0.0	-3.0	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
149	6aSE_100m	100	13.9	10.9	10.9	0.0	-3.0	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
150	6aSE_125m	125	13.7	10.8	10.8	0.0	-2.9	13.91	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
151	6aSE_150m	150	13.5	10.7	10.7	0.0	-2.8	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
152	6aSE_175m	175	13.4	10.6	10.6	0.0	-2.8	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
153	6aSE_200m	200	13.3	10.5	10.5	0.0	-2.8	13.89	12.29	12.29	0.00	-1.60	1.06	1.05	1.05	0.00	0.00

Receptor 6aNE – A22 at Royal Ashdown Forest Golf Course

			Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
Lookup ID	Road Link	Distance From Road (m)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Base	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
154	6aNE_0m	0	28.2	20.7	20.8	0.1	-7.4	14.70	12.85	12.85	0.00	-1.84	1.14	1.11	1.11	0.00	-0.03
155	6aNE_5m	5	21.7	16.3	16.3	0.0	-5.3	14.36	12.62	12.62	0.00	-1.74	1.10	1.09	1.09	0.00	-0.02
156	6aNE_10m	10	18.9	14.4	14.4	0.0	-4.5	14.21	12.52	12.52	0.00	-1.69	1.09	1.08	1.08	0.00	-0.01
157	6aNE_15m	15	17.5	13.4	13.4	0.0	-4.0	14.13	12.46	12.46	0.00	-1.67	1.08	1.07	1.07	0.00	-0.01
158	6aNE_20m	20	16.5	12.7	12.8	0.0	-3.7	14.08	12.42	12.43	0.00	-1.65	1.08	1.07	1.07	0.00	-0.01
159	6aNE_30m	30	15.4	12.0	12.0	0.0	-3.4	14.02	12.38	12.38	0.00	-1.63	1.07	1.06	1.06	0.00	-0.01
160	6aNE_40m	40	14.7	11.5	11.5	0.0	-3.2	13.98	12.36	12.36	0.00	-1.62	1.07	1.06	1.06	0.00	0.00
161	6aNE_50m	50	14.3	11.2	11.2	0.0	-3.1	13.96	12.34	12.34	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
162	6aNE_60m	60	13.9	11.0	11.0	0.0	-3.0	13.94	12.33	12.33	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
163	6aNE_70m	70	13.7	10.8	10.8	0.0	-2.9	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
164	6aNE_80m	80	13.5	10.7	10.7	0.0	-2.8	13.92	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
165	6aNE_90m	90	13.4	10.6	10.6	0.0	-2.8	13.91	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
166	6aNE_100m	100	13.2	10.5	10.5	0.0	-2.7	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
167	6aNE_125m	125	13.0	10.3	10.3	0.0	-2.7	13.89	12.29	12.29	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
168	6aNE_150m	150	12.9	10.2	10.2	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
169	6aNE_175m	175	12.7	10.1	10.1	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
170	6aNE_200m	200	12.7	10.1	10.1	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00

Receptor 33N – A22 at Wych Cross

			Annual Mean Nox Conc. (ug/m3)					Annual Mean N Dep (k N/ha/yr)					Annual Mean A Dep (keq/ha/yr)				
Lookup ID	Road Link	Distance From Road (m)	BL Baseline	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Baseline	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)	BL Baseline	DM (Base 2033)	DS (Scn1 2033)	Change (DS-DM)	Change (DS-BL)
171	33N_0m	0	22.9	17.1	17.0	0.0	-5.9	14.44	12.67	12.67	0.00	-1.77	1.11	1.09	1.09	0.00	-0.02
172	33N_5m	5	18.3	13.9	13.9	0.0	-4.4	14.19	12.50	12.50	0.00	-1.69	1.09	1.07	1.07	0.00	-0.01
173	33N_10m	10	16.4	12.6	12.6	0.0	-3.8	14.09	12.43	12.43	0.00	-1.66	1.08	1.07	1.07	0.00	-0.01
174	33N_15m	15	15.4	11.9	11.9	0.0	-3.5	14.03	12.39	12.39	0.00	-1.64	1.07	1.06	1.06	0.00	-0.01
175	33N_20m	20	14.7	11.4	11.4	0.0	-3.3	14.00	12.37	12.37	0.00	-1.63	1.07	1.06	1.06	0.00	-0.01
176	33N_30m	30	14.0	10.9	10.9	0.0	-3.0	13.95	12.34	12.34	0.00	-1.62	1.06	1.06	1.06	0.00	0.00
177	33N_40m	40	13.5	10.6	10.6	0.0	-2.9	13.93	12.32	12.32	0.00	-1.61	1.06	1.06	1.06	0.00	0.00
178	33N_50m	50	13.2	10.4	10.4	0.0	-2.8	13.91	12.31	12.31	0.00	-1.60	1.06	1.06	1.06	0.00	0.00
179	33N_60m	60	13.0	10.3	10.3	0.0	-2.8	13.90	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
180	33N_70m	70	12.9	10.2	10.2	0.0	-2.7	13.89	12.30	12.30	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
181	33N_80m	80	12.8	10.1	10.1	0.0	-2.7	13.89	12.29	12.29	0.00	-1.60	1.06	1.05	1.05	0.00	0.00
182	33N_90m	90	12.7	10.0	10.0	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00

183	33N_100m	100	12.6	10.0	10.0	0.0	-2.6	13.88	12.29	12.29	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
184	33N_125m	125	12.5	9.9	9.9	0.0	-2.6	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
185	33N_150m	150	12.4	9.8	9.8	0.0	-2.5	13.87	12.28	12.28	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
186	33N_175m	175	12.3	9.8	9.8	0.0	-2.5	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00
187	33N_200m	200	12.2	9.7	9.7	0.0	-2.5	13.86	12.27	12.27	0.00	-1.59	1.05	1.05	1.05	0.00	0.00

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. Existing or Proposed Sustainable Transport Policies

Core Policy 13 – Sustainable Travel

The local planning authority will promote and support development that encourages travel by walking, cycling and public transport, and reduces the proportion of journeys made by car, in order to help achieve a rebalancing of transport in favour of sustainable modes by:

1. **Ensuring that new development is located in sustainable locations with good access to schools, shops, jobs and other key services by walking, cycling and public transport in order to reduce the need to travel by car (unless there is an overriding need for the development in a less accessible location).**

2. **Ensuring that the design and layout of new development prioritises the needs of pedestrians, cyclists and users of public transport over ease of access by the motorist.**

3. **Ensuring that new residential developments are designed to achieve speeds of 20 mph or less.**

4. **Ensuring that new development minimises the need to travel and incorporates appropriate measures to mitigate for any transport impacts which may arise from that development.**

5. **Requiring new development to provide for an appropriate level of cycle and car parking in accordance with parking guidance approved by the local planning authority.**

6. **Requiring development which generates a significant demand for travel, and/or is likely to have other transport implications to:**

   i. **Be supported by a Transport Assessment/Transport Statement and sustainable Travel Plan, where appropriate;**

ii. Contribute to improved sustainable transport infrastructure, including the provision of safe and reliable sustainable transport modes; and
iii. Provide facilities and measures to support sustainable travel modes.

The local planning authority will work with East Sussex County Council and other relevant agencies to encourage and support measures that promote improved accessibility, create safer roads, reduce the environmental impact of traffic movements, enhance the pedestrian environment, or facilitate highway improvements. In particular, the local planning authority will:

a. Support the expansion and improvement of public transport services, particularly those providing links between the rural and urban areas;
b. Encourage improvements to existing rail services, new or enhanced connections or interchanges between bus and rail services, and improvements to the quality and quantity of car and cycle parking at railway stations; and
c. Support the development of a network of high quality walking and cycling routes throughout the district.

South Downs Local Plan Policy SD19: Transport and Accessibility (not yet adopted)

1. Development proposals will be permitted provided that they are located and designed to minimise the need to travel or promote the use of sustainable modes of transport.

2. Development proposals that are likely to generate a significant number of journeys, especially of vehicles, must be located near existing town and village centres, public transport routes, the cycle network and main roads. Such developments will be required to provide a transport assessment or transport statement.

3. Development proposals must demonstrate the continued safe and efficient operation of the strategic and local road networks.

4. The following improvements to public transport infrastructure will be supported:

a) Public transport waiting facilities, particularly those with reliable and accessible information;

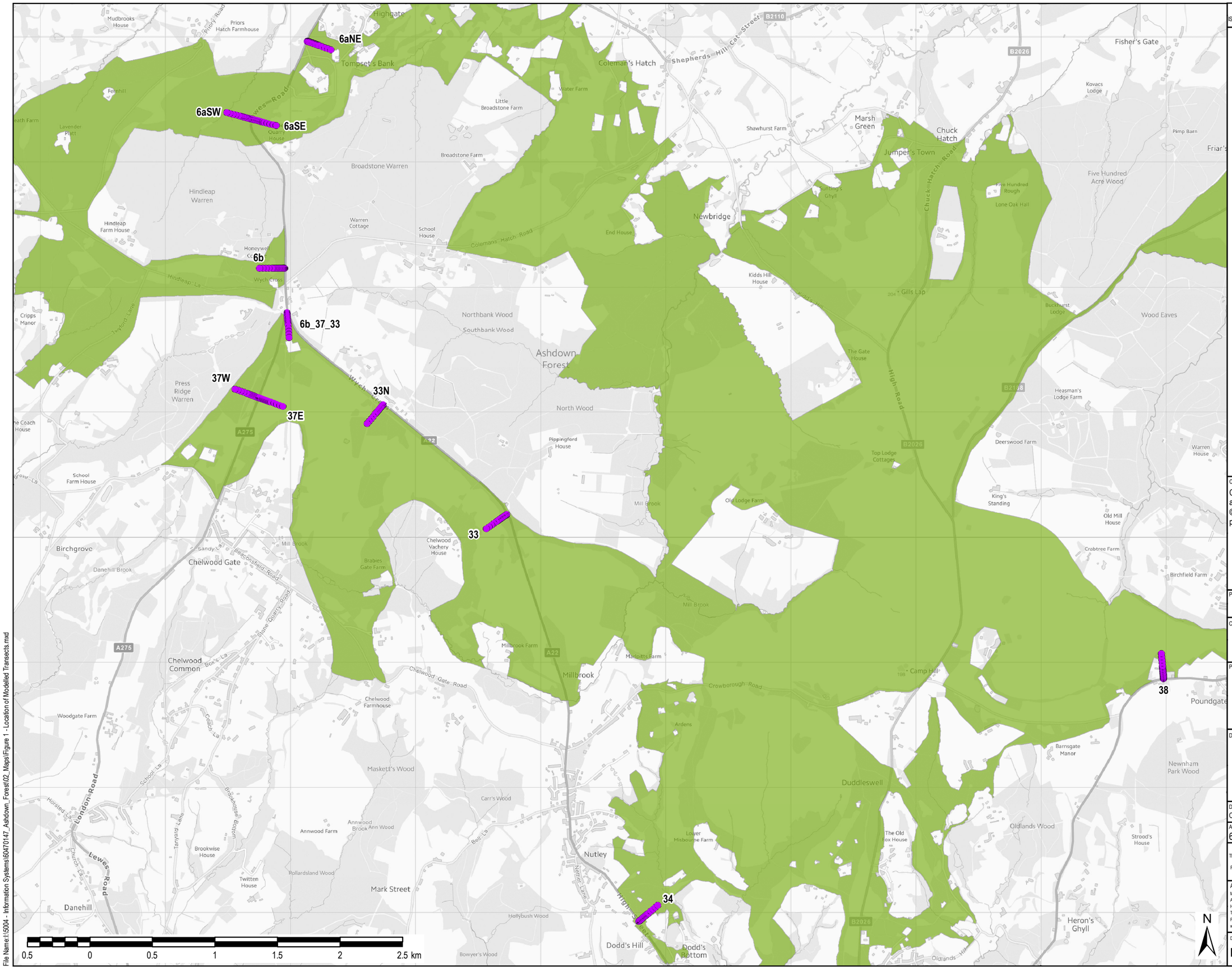
b) Infrastructure supporting the transfer of freight from road to rail and water;

c) Improvements to walking, cycling and bus connectivity at all transport interchanges;

d) Improvements to the quality and provision of cycle parking at railway stations and key bus stops.

5. In town and village centres, development will be permitted which appropriately provides for improved footways and cycle routes, cycle parking, and measures to restrict the impact of heavy goods vehicles and other traffic on historic streets.

6. Development proposals for powered aircraft landing or operation sites, or the expansion or intensification of such uses, will be refused. If exceptional circumstances exist which indicate that such development proposals are necessary, these will only be permitted where the impacts on both the special qualities, and on local amenity, can be fully mitigated.



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LEGEND

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

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	Checked	Approved	Date
CN	JW	JR	13/09/2017

AECOM Internal Project No.	Scale @ A3
60470147	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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