

# Lower Thames Crossing

## 9.199 Assessment of the air quality effects on European sites following Natural England advice

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# 1 Executive summary

- 1.1.1 National Highways (the Applicant) has submitted an application under section 37 of the Planning Act 2008 for an order to grant development consent for the A122 Lower Thames Crossing (the Project). The application is supported by the Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [[APP-487](#)] (the HRA).
- 1.1.2 Natural England has provided advice on the assessment of air quality impacts on European sites which is recorded in the Statement of Common Ground (SoCG) [[REP7-106](#)], the Relevant Representation [[RR-0784](#)] dated 24 February 2023, the note Summary of advice received on National Highways Air Quality assessment summarising the air quality advice received by email on 11 April 2023 and the Response to Applicant’s Air Quality Technical Note and Without Prejudice Assessment, etc. [[REP5-109](#)].
- 1.1.3 This document is an update of the without prejudice assessment of the air quality effects on European sites following Natural England advice [[REP2-068](#)] and reports the results in light of the representations from Natural England at Deadline 5 [[REP5-109](#)]. The Applicant has continued detailed engagement with Natural England’s technical team since Deadline 5 to ensure the assessment reporting was fully discussed and understood by both parties and recorded within the Statement of Common Ground [[REP7-106](#)].
- 1.1.4 This assessment is not presented on a without prejudice basis; it replaces all sections in the Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [[APP-487](#)] relating to the methodology and assessment of effects of changes in air quality as a result of vehicle emissions.
- 1.1.5 This assessment considers the results of the air quality modelling of the concentrations of nitrogen oxides (NO<sub>x</sub>) and ammonia (NH<sub>3</sub>), as individual pollutants against the relevant critical levels for each European site. The assessment also considered the results of the predicted nitrogen deposition, regardless of the changes in NO<sub>x</sub>, against the relevant lower critical loads for each European site.
- 1.1.6 This assessment concludes that there is sufficient evidence to demonstrate beyond reasonable scientific doubt that the Project, alone or in combination with any other plans and projects, would have no adverse effect on the integrity of any of the following European sites as a result of changes in vehicle emissions during construction and operation:
- a. Thames Estuary and Marshes Ramsar site
  - b. Epping Forest Special Area of Conservation (SAC)
  - c. North Downs Woodlands SAC
- 1.1.7 Within this assessment, the Applicant’s competent expert concludes there would be no adverse effects on the integrity of any European site, and accordingly there is no requirement for consideration of derogation at Stage 3.

## 2 Introduction

### 2.1 Purpose of this document

- 2.1.1 The Applicant has submitted an application under section 37 of the Planning Act 2008 for an order to grant development consent for the A122 Lower Thames Crossing (the Project). The application is supported by the Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [[APP-487](#)] (the HRA).
- 2.1.2 Natural England has made a number of representations on the assessment of air quality impacts on European sites in relation to nitrogen oxides (NOx) and ammonia (NH<sub>3</sub>).
- 2.1.3 The Applicant, in due regard to the representations from Natural England, completed a Without prejudice assessment of the air quality effects on European sites following Natural England advice [[REP2-068](#)]. This was done as a sensitivity test of the conclusions of the HRA and followed the methodological approaches advised by Natural England.
- 2.1.4 This document is based on the Without prejudice assessment of the air quality effects on European sites following Natural England advice [[REP2-068](#)] and reports the results in light of the representations from Natural England at Deadline 5 [[REP5-109](#)]. The Applicant has continued detailed engagement with Natural England's technical team since Deadline 5 to ensure the assessment reporting was fully discussed and understood by both parties and recorded within the Statement of Common Ground [[REP7-106](#)].
- 2.1.5 This assessment replaces all sections in the HRA [[APP-487](#)] relating to the methodology and assessment of effects of changes in air quality as a result of vehicle emissions.

### 2.2 Natural England representations

- 2.2.1 Natural England has provided the following advice on the assessment of air quality impacts on European sites, which is recorded in the Statement of Common Ground (SoCG) [[REP7-106](#)]:
- a. Relevant Representation [[RR-0784](#)] dated 24 February 2023.
  - b. 'Summary of advice received on National Highways Air Quality assessment' summarising the air quality advice received by email on 11 April 2023. Natural England's Written Representation [[REP1-262](#)] included the latter advice as Annex G.
  - c. Response to Applicant's Air Quality Technical Note and Without Prejudice Assessment, Response to Applicant's proposed Disapplication of the Wildlife & Countryside Act, Response to the responses to Examiner's Questions 1, Updated Statement of Common Ground, Updated Principal Areas of Disagreement, Comments on the Applicant's submissions at Deadline 4, Comments on any information requested by the ExA and

received by Deadline 4 and any further information requested by the  
Examining Authority under Rule 17 of the EPR [[REP5-109](#)].



## 3 Assessment methodologies and assumptions

### 3.1 Scope of the assessment

#### Data used

- 3.1.1 The change in air quality as a result of vehicle emissions (for both construction and operation of the Project), in particular concentrations of NO<sub>x</sub>, NH<sub>3</sub> and the resultant N deposition, has been assessed at all European sites within 200m of the relevant Affected Road Network (ARN). The air quality model predicts the N deposition as a result of both nitrogen oxides and ammonia emissions from road traffic up to 200m from the ARN.
- 3.1.2 The assessment has used the following sources of evidence when describing the likely changes to air quality as a result of the Project:
- The predicted changes in the concentrations of NO<sub>x</sub> and NH<sub>3</sub> as calculated by the Project team.
  - The predicted changes in N deposition as calculated by the Project team.

### 3.2 Assessing likely significant effects

#### Use of thresholds

##### Changes in air quality

- 3.2.1 The air quality model predicts the change in annual mean NO<sub>x</sub> concentrations which are then factored to determine the NH<sub>3</sub> concentrations for the Do Minimum (DM) and Do Something (DS) scenarios. These are assessed against the appropriate critical levels (CL) for the habitats within 200m of the ARN.
- 3.2.2 The 200m distance from the road network is used as standard in various guidelines and standards for air quality assessment. The real-world monitoring of pollutants from roads (vehicle emissions) has shown that pollutants tend to reduce to background (i.e. drop out) quickly, particularly within the first 50m from the source. As stated, models are conservative and will generate changes in concentrations to many decimal points at whatever distance the user selects from the road. This is why guidance<sup>1</sup> is in place which determines the area that the impacts are confined to as the modelled outputs, i.e. 200m from the road.
- 3.2.3 While it is acknowledged that there is less monitoring undertaken for NH<sub>3</sub>, compared to NO<sub>2</sub>, there is evidence from real-world monitoring which indicates a drop off of NH<sub>3</sub> with distance from the source. In particular, the Centre for Ecology and Hydrology (CEH) published a paper (Cape, et al., 2008) on concentration-dependent deposition velocities for ammonia: moving from lab to field, which provided results of monitoring along a transect. This paper showed that, even where concentrations of NH<sub>3</sub> close to the source were higher than

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<sup>1</sup> The documents that report 200m as a guide include DMRB LA105 (Highways England, 2019), Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001) (Natural England, 2018) and A guide to the assessment of air quality impacts on designated nature conservation sites (IAQM, 2019)



100µg/m<sup>3</sup> (over 10 times the concentrations modelled as a result of roads), concentrations were close to zero at just over 100m. Monitoring of NH<sub>3</sub> next to a road in Ashdown Forest by Air Quality Consultants (AQC) also illustrated the rapid drop off in NH<sub>3</sub> close to the road, especially within the first 30m. These studies provide further robust evidence that using a 200m distance to assess the impacts from road schemes is precautionary, and that modelling results beyond 200m would be unnecessary for a precautionary assessment.

3.2.4 The CLs are set out for each European site on the Site Relevant Critical Loads tab of the Air Pollution Information System<sup>2</sup>. Table 3.1 sets out the CLs that have been used to assess the likely significant effect (LSE) on each of the European sites identified.

**Table 3.1 The relevant critical levels used to determine LSE**

European site	Habitat within 200m of the ARN	Relevant NOx critical level µg m <sup>-3</sup>	Relevant NH <sub>3</sub> critical level µg m <sup>-3</sup>	Reasoning
Thames Estuary and Marshes Ramsar site	Coastal and floodplain grazing marsh	30	3	Bryophytes and lichens are not integral to this habitat
Epping Forest SAC	W1c5 Beech forests on acid soils (H9120)	30	1	Bryophytes and lichens are integral to this habitat
North Downs Woodlands SAC	W1f lowland deciduous woodland	30	1	Bryophytes and lichens are integral to this habitat

3.2.5 The air quality N deposition assessment is carried out with respect to the appropriate lower critical load (LCL) for the habitats within 200m of the ARN. The LCLs are set out for each European site on the Site Relevant Critical Loads tab of the Air Pollution Information System<sup>1</sup>. Table 3.2 sets out the LCLs that have been used to assess LSE on each of the European sites identified.

**Table 3.2 The relevant lower critical loads used to determine LSE**

European site	Habitat within 200m of the ARN	Relevant N critical load class	Lower critical load kg N ha <sup>-1</sup> yr <sup>-1</sup>
Thames Estuary and Marshes Ramsar site	Coastal and floodplain grazing marsh	Low and medium altitude hay meadows	10
Epping Forest SAC	W1c5 Beech forests on acid soils (H9120)	Fagus woodland	10
North Downs Woodlands SAC	W1f lowland deciduous woodland	Coniferous woodland	3

<sup>2</sup> [www.APIS.ac.uk](http://www.APIS.ac.uk)

- 3.2.6 The methodology used to determine the potential for the Project to have a LSE as a result of vehicle emissions, follows the advice provided by Natural England in their representations [REP5-109] (Section 2.2). Where the 1% CL/LCL is exceeded for any of the individual pollutants (NO<sub>x</sub>, NH<sub>3</sub> or Ndep), there is potentially an LSE on the European site as a result of the Project alone or in-combination with other plans and projects.

### 3.3 Assessment of effect on the integrity of the European site

#### Effects as a result of changes in air quality

- 3.3.1 The methodology used to determine the potential for the Project to result in an adverse effect on integrity is set out in the following paragraphs following advice provided by Natural England in their representations [REP5-109] (Section 2.2).

#### Information used to explore the magnitude/significance of the effect

- 3.3.2 For the European sites identified, the magnitude of the effect was explored using various factors described in the following paragraphs.
- 3.3.3 The extent of the habitat potentially affected was predicted using the change in nitrogen deposition model results in Esri Arcpro using the bounding tool to indicate the area within which the concentrations of NO<sub>x</sub> and NH<sub>3</sub>, and nitrogen deposition were predicted to exceed the 1% LCL thresholds.
- 3.3.4 A bespoke National Highways calculation tool has been used to compare the DM NO<sub>x</sub> total emissions (tonnes) at opening year (2030) with the future predicted changes in NO<sub>x</sub> emissions for the same ARN link for the DS scenario. The future predictions are calculated for the DS scenario annually from 2030 to 2045. The duration of effect is considered to occur from the opening year until the year the DS total emissions of NO<sub>x</sub> fall below the DM total emissions at opening year.
- 3.3.5 Where the air quality model predicted an increase in any of the individual pollutants (NO<sub>x</sub>, NH<sub>3</sub>, Ndep) of greater than 1% CL/LCL then a detailed site investigation was carried out and identified if there were nitrogen sensitive species located in the area potentially affected.
- 3.3.6 Ellenberg indicator values for fertility (Ellenberg N) published for the British vascular plant and bryophyte flora were used to analyse the nitrogen sensitivity of the species recorded during the detailed site investigations. The purpose of assigning Ellenberg values is to provide an indication of existing nutrient status and to identify species that are potentially sensitive to nitrogen deposition and therefore could be at risk of loss due to a Project-related increase in nitrogen deposition. Ellenberg values of less than three are indicative of species associated with more-or-less infertile sites and are therefore likely to be sensitive to small changes in nitrogen availability. Ellenberg values above three were therefore used to indicate species that were not sensitive to nitrogen deposition and therefore unlikely to be lost from additional nitrogen deposition. Further details on the approach to using Ellenberg values to determine the sensitivity of habitats to nitrogen deposition is set out in Environmental Statement (ES) Appendix 8.14 [APP-403 to APP-406].

- 3.3.7 In considering the results of the detailed site investigation, the Applicant has used the following factors to explore the magnitude of the effect on the integrity of the European site:
- What conditions is the affected habitat currently exposed to (e.g. existing exceedance of critical level/critical load)?<sup>3</sup>
  - What is the area and quality of the habitat affected, as a proportion of the qualifying habitat within the European site?
  - Will there be any direct loss of habitat or change to the distribution of such habitats?
  - Are NO<sub>x</sub>/NH<sub>3</sub>/N deposition operational changes predicted below the current baseline deposition levels (e.g. due to technological improvements in vehicle emissions between now and the time the Project is operational)?
- 3.3.8 Using professional judgement and taking into account the above factors (points a. to d.), will there be a reduction in habitat area that significantly impedes achievement of the conservation objectives of the European site? As there are no published or accepted thresholds for any of the factors considered alone, or combinations of thresholds of different factors, as to whether the effects could be considered to be significant, it is necessary for the competent expert (see the HRA [APP-487], Section 2.8) to make a judgement. That judgement is based on considering all of the factors, what is known about them and assessing the likely outcomes for the habitats from those factors.

#### Assessment of effect on integrity

- 3.3.9 The attributes and targets contained within Natural England's supplementary advice (listed in Table 4.2) were used as a basis for the assessment of the Project's impacts on the integrity of the European sites by identifying whether the magnitude of the effect would be likely to undermine achievement of the target for each attribute.

### 3.4 Assessing effects in-combination

- 3.4.1 An assessment of the Project in-combination with other plans or projects has been completed at Stage 1 screening and Stage 2 appropriate assessment.
- 3.4.2 At Stage 1 screening the assessment is limited to the European sites and effect pathways where no LSE has been found as a result of the Project alone.
- 3.4.3 Any interactions between the European sites and the Project where a conclusion of potential LSE alone has been reached, have been considered in combination with other plans and projects at Stage 2 appropriate assessment.

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<sup>3</sup> 'Small contributions of nitrogen deposition from the air have the potential to lead to more significant changes in vegetation composition where a site is below but near to the Critical Load, compared to a site which significantly exceeds a critical load.' NECR210, Natural England 2016 as referenced in NEA001. 'Habitats that have already been subject to high background nitrogen deposition can develop an effective tolerance to the effects of further deposition.' NECR210, Natural England 2016 as referenced in NEA001.

- 3.4.4 The contribution of changes in traffic from other plans or projects is included in the data used within the traffic model for the DM and DS scenarios. It includes the predicted changes in traffic from other plans and projects, described as traffic growth in the Traffic Forecasts Non-Technical Summary [[APP-528](#)]. Other plans and projects included within the traffic model, are as listed in Table A.1 and Table A.2 of Annex A: Uncertainty Log (Combined Modelling and Appraisal Report Appendix C: Transport Forecasting Package Annexes [[APP-523](#)]) and shown on Plate 4.1 of the Traffic Forecasts Non-Technical Summary [[APP-528](#)].
- 3.4.5 Therefore, the scope of the in-combination assessment for this effect pathway considers the contribution of the Project and all other traffic sources within the DS scenario and other potential sources of NO<sub>x</sub>, NH<sub>3</sub> and N deposition. Other plans and projects that potentially contribute to the concentration of NO<sub>x</sub>, NH<sub>3</sub> and N deposition in ways other than traffic (and could be identified via the planning system) would be broadly limited to power generation, industrial processes and intensive agricultural units.

### Precautionary nature of the assessment

- 3.4.6 The in-combination assessment of air quality effects has had due regard to the advice provided by Natural England in their representations (Section 2.2). Natural England has expressed concerns that the Applicant's traffic modelling may not be sufficiently precautionary for the assessment of effects in-combination, i.e. the results of the model may not identify the change in traffic with sufficient precision to rely on in the HRA, due for example, to all local development plan allocations not being specifically included in the model.
- 3.4.7 The Applicant has followed government guidance, as published in the Department for Transport's Transport Analysis Guidance (TAG) in the development of the Project's transport model (the Lower Thames Area Model (LTAM)). The Applicant considers this to be the best available source of forecast traffic data for the Lower Thames area on which to base the HRA in-combination assessment. More information on how the Applicant has built the LTAM is set out in the Combined Modelling and Appraisal Report [[APP-518](#)]. However, in due regard to the concerns of Natural England, the Applicant has set out below an explanation of why, despite any concerns over the precautionary nature of the LTAM, the HRA in-combination assessment overall is sufficiently precautionary for the purposes of complying with the regulations and case law.

### Precautionary nature of the LTAM

- 3.4.8 As the LTAM has been built in line with TAG, the Applicant considers that the outputs from the model are the best available information on forecast changes to traffic flows in the area as a result of the Project (and therefore the best available scientific information). The application of changes to the LTAM that diverge from TAG would in itself create uncertainty in the model outputs. The use of TAG in this context is endorsed and required by paragraph 4.6 of the National Policy Statement for National Networks (Department for Transport, 2014), and using a contrary standard or methodology would be contrary to government policy and precedent.

- 3.4.9 Growth within the LTAM has been derived in line with TAG, specifically Unit M4 as set out in Chapter 4 of Combined Modelling and Appraisal Report Appendix C: Transport Forecasting Package [APP-522]. Growth within the model is capped on a regional basis in line with Department for Transport (DfT) traffic forecasts, which are ultimately based upon Office for National Statistics population projections. This growth is then adjusted on a spatial basis to account for developments in the Uncertainty Log; these are developments that in the period between 2016 and 30 September 2021 (within the local authority areas through which the Project would pass, plus those adjacent) are under construction, have a submitted planning application or a planning permission, and thus (in accordance with TAG) carry sufficient certainty to be included within the core scenario (upon which the environmental assessment is based). Regardless of the development included within the Uncertainty Log, the level of growth within the LTAM remains in line with the national methodology and forecasts.
- 3.4.10 As such, the LTAM includes developments of sufficient certainty, but to the extent there are developments which do not meet that requirement, growth is generally accounted for in the LTAM. As the growth is nonetheless accounted for, the assessments are robust for the purposes of HRA.
- 3.4.11 It should be noted that the Applicant has, in line with TAG, undertaken both low and high growth sensitivity tests, and these are reported within the Transport Forecasting Package. The high growth sensitivity test reflects a scenario where the level of growth within the model exceeds that forecast by DfT in the traffic forecasts used by the Applicant. At Deadline 3, the Applicant submitted NTEM 8 and Common Analytical Scenarios [REP3-145] which sets out a series of different model run outputs that have been prepared using the LTAM incorporating updates and reflecting different scenarios published by DfT in November 2022.
- 3.4.12 The Applicant considers that if the LTAM was to be amended, in a departure from TAG, by the inclusion of additional development, such as that included in local plans, it is likely that the changes in the outputs of the model overall would not be significant as the overall level of growth within the model would remain capped in line with DfT traffic forecasts. If, contrary to TAG, the cap on growth was to be adjusted or removed entirely then of course the model outputs would then differ, but the changes to the model would also not be in accordance with TAG. If a higher growth factor were to be used, the forecast traffic flows would not simply be an increase in traffic. Perhaps counterintuitively, modelling with higher growth can lead to some areas having a lower level of traffic increase due to capacity constraints on the network. As such, it cannot be assumed that higher growth factors would lead to higher traffic in any particular location.
- 3.4.13 The Applicant is therefore of the view that any changes in traffic levels that might be generated from non-TAG compliant approaches would likely be insignificant (either positively or negatively) and that a sufficient degree of certainty has been achieved to be appropriate for the purposes of HRA (noting that it is not necessary to provide evidence to a standard of absolute certainty but, instead, sufficient evidence to demonstrate there is no reasonable scientific doubt remaining as to the absence of adverse effects).



### Precautionary nature of the air quality assessment

- 3.4.14 Whether or not there is a perceived residual uncertainty in the precautionary nature of the LTAM, the air quality assessment is strongly precautionary to a degree that would outweigh any concerns on the input from the traffic model.
- 3.4.15 Air quality modelling in the UK is undertaken in accordance with the Department for Environment Food and Rural Affairs' (Defra's) Local Air Quality Management Technical Guidance (LAQM.TG(22)) (Defra, 2023a), and is informed by outputs from Defra's LAQM tools such as the Emission Factor Toolkit (to derive road traffic vehicle emission factors) and Background Pollution Maps (to derive background pollution concentrations). The air quality modelling has been based on the most recent Defra LAQM tools and assumptions available at the time the assessments were undertaken.
- 3.4.16 Following the advice of the Design Manual for Roads and Bridges (DMRB) LA 105 (Highways England, 2019), National Highways long-term trend gap analysis factors have been used to account for uncertainty in the vehicle emission factors, and consequently the rate at which nitrogen dioxide (NO<sub>2</sub>) concentrations would decrease between the 2016 base year and the 2030 opening year scenarios (as described in paragraphs 5.3.93 to 5.3.97 of ES Chapter 5: Air Quality [APP-143]). This has led to the uplift of modelled NO<sub>2</sub> concentrations (which also form the basis of the N deposition calculation for the NO<sub>2</sub> component) in the opening year scenario compared to the Defra LAQM tools used on non-National Highways projects. As a result of this approach, the modelled NO<sub>2</sub> outputs at Epping Forest SAC and North Downs Woodlands SAC have been uplifted by a factor of 2.5 to 2.8, in the opening year scenarios, prior to the calculation of the NO<sub>2</sub> contribution to N deposition. This illustrates the level of precaution that is already included in the assessment, particularly as recent air quality monitoring data for the study area shows that NO<sub>2</sub> concentrations are declining at a faster rate than assumed in the modelling.
- 3.4.17 The air quality modelling has also used a conservative estimate when predicting the future changes in background N deposition as it assumes no change between the base year (2016) and opening year (2030). N deposition with the Project is likely to be lower than calculated in the assessment as there are likely to be future national reductions in NO<sub>x</sub> and ammonia emissions in response to improvements in technology (e.g. uptake of electric vehicles), and local and national government actions such as those outlined in the Defra (2023) Air Quality Strategy (Defra, 2023b). The Joint Nature Conservation Committee (2020) 'Nitrogen Futures' Report (Joint Nature Conservation Committee, 2020) predicted that UK nitrogen deposition would decrease by approximately 14% between 2017 and 2030 under a business-as-usual scenario, whereby only currently adopted policy was accounted for; this scenario is therefore likely to be pessimistic as it expected that further policy and mitigations would be adopted between 2017 and 2030. Under the most likely scenario, UK nitrogen deposition was predicted to reduce by approximately 21% by 2030.
- 3.4.18 The Project air quality modelling uses an ADMS dispersion model which assumes that nitrogen oxides (NO<sub>x</sub>) emitted (from vehicle exhausts) into the atmosphere are not lost through deposition or chemistry (i.e. the model is conservative as it uses the same emission factors for 0m to 200m from the road) and so NO<sub>x</sub> concentrations are likely to be overpredicted further from

roads. This is important as the N deposition associated with NO<sub>2</sub> and particularly ammonia (NH<sub>3</sub>) (which has a much higher deposition velocity than NO<sub>2</sub>) has been calculated based on the NO<sub>x</sub> concentrations modelled, and so rates of N deposition are likely to be overpredicted as there would be less NO<sub>2</sub> and NH<sub>3</sub> present (as distance increases from the road) than assumed in the model. This will particularly apply to nitrogen deposition associated with NH<sub>3</sub> due to its high deposition velocity (approximately 10 times higher than NO<sub>2</sub>). This means that the pollutant levels shown in the model (of which the ecological consequences are assessed in the consideration of likely significant effects and adverse effects on integrity) are inherently precautionary.

### Identifying other plans and projects

- 3.4.19 The in-combination assessment includes consideration of the reasonably foreseeable plans and projects considered in ES Chapter 16: Cumulative Effects Assessment (CEA) [APP-154] undertaken for the Environmental Impact Assessment, amended to ensure compliance for the HRA, for example through refining potential pathways and receptors. The in-combination assessment for air quality effects uses the shortlist of plans and projects derived for the CEA as well as bespoke searches of the planning portals, as described in paragraphs 3.4.23 to 3.4.26.
- 3.4.20 This list of reasonably foreseeable plans and projects is based on Advice Note 17 (The Planning Inspectorate, 2019), with the following types of development considered:
- a. Projects that were permitted (and therefore assumed operational) between 2018 and 2023 as these were not part of the background included within the air quality model
  - b. Projects that are under construction
  - c. Permitted application(s) not yet implemented
  - d. Submitted application(s) not yet determined
  - e. All refusals subject to appeal procedures not yet determined
  - f. Projects on the National Infrastructure Commission's programme of projects
  - g. Projects identified in the relevant development plans and emerging development plans
- 3.4.21 Rejected and withdrawn planning applications were not included in the in-combination assessment as they are not considered to be reasonably foreseeable developments.
- 3.4.22 Effects were considered to be potentially acting in combination where there are spatial and temporal overlaps of Project effects with similar effects from other projects on relevant receptors. The air quality model uses a base year of 2018 and Air Pollution Information System background data from 2017–2019, therefore in-combination effects of projects that had planning permission from



2018 will also be included. The searches of planning applications focus on those applications submitted from January 2018 to October 2023.

### Spatial extent used to identify other plans or projects

3.4.23 The search area for other plans or projects that may also contribute to N deposition at these European sites has been defined as follows and is illustrated on Plate 6.2, Plate 6.5 and Plate 6.7. The size of search area has been determined based on the advice given by the Environment Agency on Environmental Permits (Environment Agency, 2018; Environment Agency, 2023) and includes project types within the following distances from where each European site is affected by changes in nitrogen deposition:

- a. 15km – coal, gas or oil-fired power stations or >50 megawatt emitters
- b. 10km – industrial emissions, e.g. energy generation plants <50 megawatt
- c. 5km – intensive livestock units including slurry lagoons/manure stores
- d. 0.5km – agricultural biomass boilers (includes domestic/residential installations)

### Assessment method

3.4.24 Table 3.3 lists the planning portals searched and the terms used to identify other projects that could contribute to a change in air quality and therefore act in combination with the Project. The searches were for applications between 2018 and 2023. The location of any identified project was then confirmed in relation to the spatial zones listed above and the Site of Special Scientific Interest (SSSI) Impact Risk Zones that relate to each of the European sites being assessed.

**Table 3.3 Planning portals searched for other (non traffic) plans or projects that result in an in-combination effect**

Relevant planning portal	Search terms used to identify projects on relevant planning portal (distance from impacted area)			
	Within 0.5km	Within 5km	Within 10km	Within 15km
	Biomass	Livestock Cattle Poultry Pig Slurry Manure	Power Energy Generation Incinerator Biomass	Power Energy Generation
<b>All European sites</b>				
National Infrastructure Planning Register of Applications South East & London			x	x
<b>Thames Estuary and Marshes Ramsar</b>				
Kent	x	x	x	x

Relevant planning portal	Search terms used to identify projects on relevant planning portal (distance from impacted area)			
	Within 0.5km	Within 5km	Within 10km	Within 15km
	Biomass	Livestock Cattle Poultry Pig Slurry Manure	Power Energy Generation Incinerator Biomass	Power Energy Generation
Essex	x	x	x	x
Thurrock	x	x	x	x
Gravesham	x	x	x	x
Medway		x	x	x
Dartford			x	x
Sevenoaks District			x	x
Tonbridge and Malling District			x	x
London Borough: Havering				x
Basildon				x
Castle Point District				x
<b>Epping Forest SAC</b>				
Essex	x	x	x	x
Epping Forest District	x	x	x	x
Harlow District			x	x
Brentwood District			x	x
Broxbourne District			x	x
London Borough: Havering			x	x
London Borough: Redbridge			x	x
London Borough: Waltham Forest			x	x
London Borough: Enfield			x	x
Welwyn Hatfield District				x
East Hertfordshire District				x
Uttlesford District				x
London Borough: Barking and Dagenham				x
London Borough: Harringay				x
<b>North Downs Woodlands SAC</b>				
Kent	x	x	x	x

Relevant planning portal	Search terms used to identify projects on relevant planning portal (distance from impacted area)			
	Within 0.5km	Within 5km	Within 10km	Within 15km
	Biomass	Livestock Cattle Poultry Pig Slurry Manure	Power Energy Generation Incinerator Biomass	Power Energy Generation
Tonbridge and Malling District	x	x	x	x
Maidstone District	x	x	x	x
Medway		x	x	x
Swale District			x	x
Gravesham				x

3.4.25 Appendix A provides a list of all the other plans and projects identified and the rationale for inclusion within the in-combination assessment reported in Section 6.

3.4.26 The predicted contribution of NO<sub>x</sub>, NH<sub>3</sub> and N deposition has been identified where available for the other plans and projects located within the search area. The combined contribution to N deposition was calculated by summing together the predicted N deposition (kg N ha<sup>-1</sup>yr<sup>-1</sup>) for each of the projects within the search area and determining the percentage of the critical load for the habitats of each site. The likelihood of an effect of all the projects in combination was determined based on the combined figure with consideration given to the likely sensitivity of the habitats present and in view of the conservation objectives of the European sites.

## 4 European sites potentially affected by the proposals

### 4.1 Sites identified

4.1.1 Table 4.1 sets out the European sites identified within 200m of the ARN as well as information on the key features, vulnerability and the conservation objectives.

**Table 4.1 European sites identified**

European site name and code	Location and distance	Size (ha)	Key features including the primary reasons for designation and any other qualifying interests	Vulnerability	Conservation objectives
Thames Estuary and Marshes Ramsar site UK11069	Adjacent to the Project	5,588.59	<p>Ramsar site criterion 2 – The site supports more than 20 British Red Data Book invertebrates and populations of the GB Red Book endangered least lettuce <i>Lactuca saligna</i>, as well as the vulnerable slender hare's-ear <i>Bupleurum tenuissimum</i>, divided sedge <i>Carex divisa</i>, sea barley <i>Hordeum marinum</i>, Borrer's saltmarsh-grass <i>Puccinellia fasciculata</i>, and dwarf eelgrass <i>Zostera noltei</i>.</p> <p>Ramsar site criterion 5 – Assemblages of international importance: Species with peak counts in winter: 45,118 waterfowl (five-year peak mean 1998/99–2002/2003)</p> <p>Ramsar site criterion 6 – Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: Ringed plover <i>Charadrius hiaticula</i>, Europe/Northwest Africa 595 individuals, representing an average of 1.8% of the GB population (five-year peak mean 1998/9–2002/3) Black-tailed godwit <i>Limosa islandica</i>, Iceland/W Europe 1,640 individuals, representing an average of 4.6% of the population (five-year peak mean 1998/9–2002/3)</p> <p>Species with peak counts in winter: Grey plover <i>Pluvialis squatarola</i>, E Atlantic/W Africa -wintering 1,643 individuals, representing an average of 3.1% of the GB population (five-year peak mean 1998/9–2002/3) Red knot <i>Calidris canutus islandica</i>, W &amp; Southern Africa (wintering) 7,279 individuals, representing an average of 1.6% of the population (five-year peak mean 1998/9–2002/3) Dunlin <i>Calidris alpina</i>, W Siberia/W Europe 15,171 individuals, representing an average of 1.1% of the population (five-year peak mean 1998/9–2002/3) Common redshank <i>Tringa totanus</i>, 1,178 individuals, representing an average of 1% of the GB population (five-year peak mean 1998/9–2002/3)</p>	Dredging Erosion Eutrophication General disturbance from human activities	<p>The Applicant considers that the following Special Protection Area (SPA) conservation objectives are sufficient to support the management of the Ramsar site<sup>4</sup> interests.</p> <p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:</p> <ul style="list-style-type: none"> <li>• The extent and distribution of the habitats of the qualifying features</li> <li>• The structure and function of the habitats of the qualifying features</li> <li>• The supporting processes on which the habitats of the qualifying features rely</li> <li>• The population of each of the qualifying features</li> <li>• The distribution of the qualifying features within the site</li> </ul>

<sup>4</sup> For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focusing on the production of high-level conservation objectives. As the provisions on the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar site interests. If there are Ramsar site qualifying features not covered by overlapping European Marine Sites, Natural England will consider the best approach on addressing these (e.g. to produce advice on a feature basis) if there is an operational risk.

European site name and code	Location and distance	Size (ha)	Key features including the primary reasons for designation and any other qualifying interests	Vulnerability	Conservation objectives
Epping Forest SAC UK0012720	Approximately 19km west of the Project	1,630.74	Annex I habitats that are a primary reason for selection of this site: 9120 Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrublayer ( <i>Quercion robori-petraeae</i> or <i>Ilici-Fagenion</i> ) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> 4030 European dry heaths Annex II species that are a primary reason for selection of this site: 1083 Stag beetle <i>Lucanus cervus</i> Other features present: 1166 Great crested newt <i>Triturus cristatus</i>	M02 Changes in biotic conditions H04 Air pollution, air-borne pollutants G01 Outdoor sports and leisure activities, recreational activities J02 Human-induced changes in hydraulic conditions A04 Grazing	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: <ul style="list-style-type: none"> <li>The extent and distribution of qualifying natural habitats and habitats of qualifying species</li> <li>The structure and function (including typical species) of qualifying natural habitats</li> <li>The structure and function of the habitats of qualifying species</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>The populations of qualifying species</li> <li>The distribution of qualifying species within the site</li> </ul> Natural England also provides supplementary advice on conservation objectives for this site (Natural England, 2019a).
North Downs Woodlands SAC UK0030225	Adjacent to the Project	288.58	Annex I habitats that are a primary reason for selection of this site: 9130 <i>Asperulo-Fagetum</i> beech forests 91J0 <i>Taxus baccata</i> woods of the British Isles *Priority feature Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) (*important orchid sites)	I01 Invasive Non-Native Species H04 Air pollution, air-borne pollutants G01 Outdoor sports and leisure activities, recreational activities B02 Forest and Plantation management & use	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: <ul style="list-style-type: none"> <li>The extent and distribution of the qualifying natural habitats</li> <li>The structure and function (including typical species) of the qualifying natural habitats</li> <li>The supporting processes on which the qualifying natural habitats rely</li> </ul> Natural England also provides supplementary advice on conservation objectives for this site (Natural England, 2019b).

## 4.2 Conservation objectives and site integrity

### Ramsar site

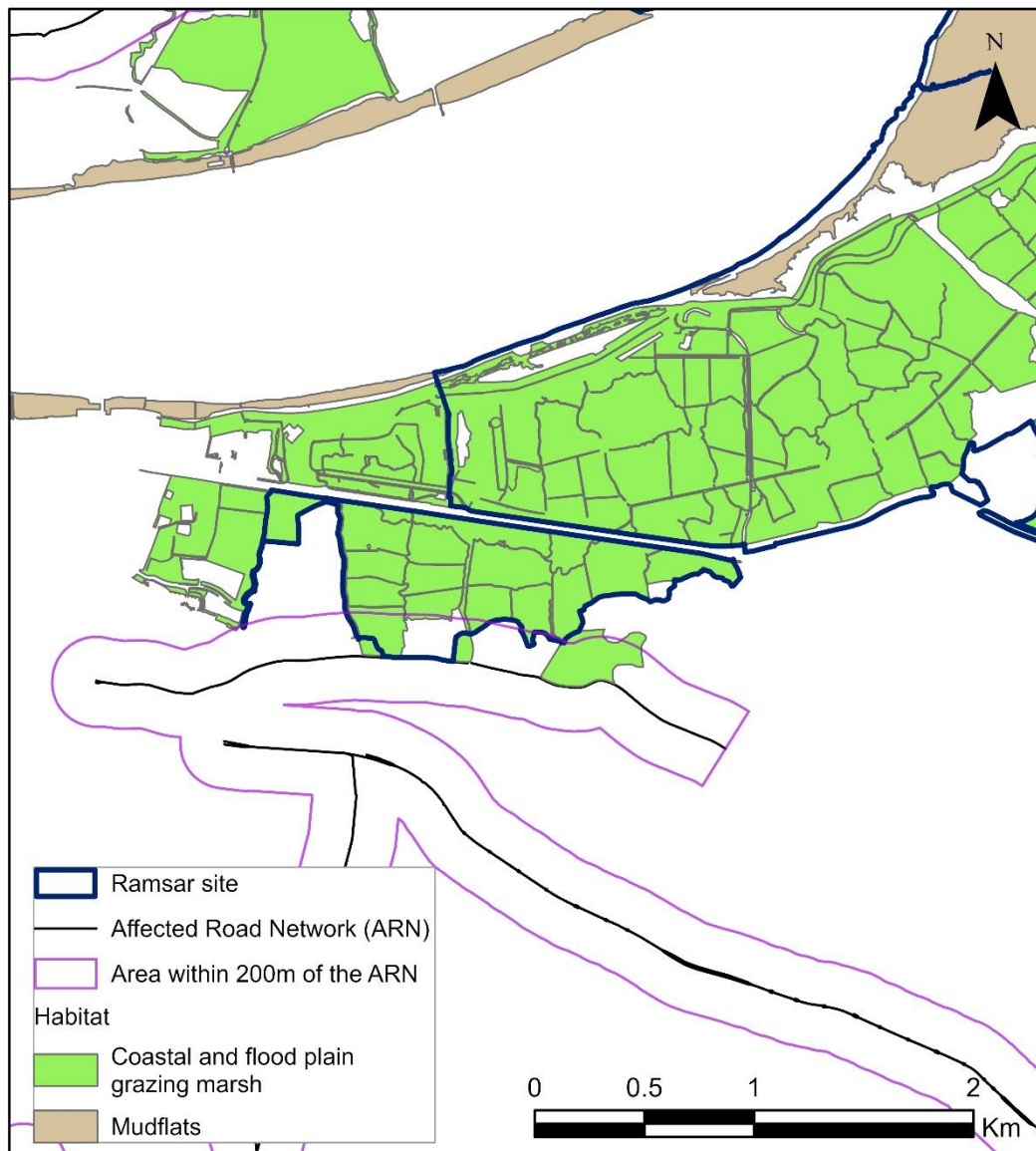
- 4.2.1 The conservation objectives used to inform the assessment for each of the European sites are set out within Table 4.1. Natural England has produced supplementary advice on conserving and restoring the site features of each of the SPAs and the attributes that are of relevance to this assessment are summarised in the following paragraphs. Where conservation objectives or targets are not available for the qualifying feature subject to assessment, proxy information has been used from the Standard Data Form for sites within the 'UK national site network of European sites', formerly the Natura 2000 standard form (in the case of the population size targets).

### Supplementary advice relating to air quality

- 4.2.2 The potential LSEs identified in Section 5.1 relate to the effects of changes in air quality as a result of construction vehicle emissions on the Thames Estuary and Marshes Ramsar site. Plate 4.1 illustrates the location of the area of the Thames Estuary and Marshes Ramsar site that is within 200m of the ARN and the habitats used by the qualifying features. The supplementary advice provided by Natural England (Natural England, 2018) relating to the air quality attribute was the same for all three European sites identified and had the following target for all qualifying features:
- a. Maintain concentrations and deposition of air pollutants at below the site-relevant critical load or level values given for this feature of the site on the Air Pollution Information System



**Plate 4.1 Area of the Thames Estuary and Marshes Ramsar site within 200m of the construction ARN**



### SAC sites

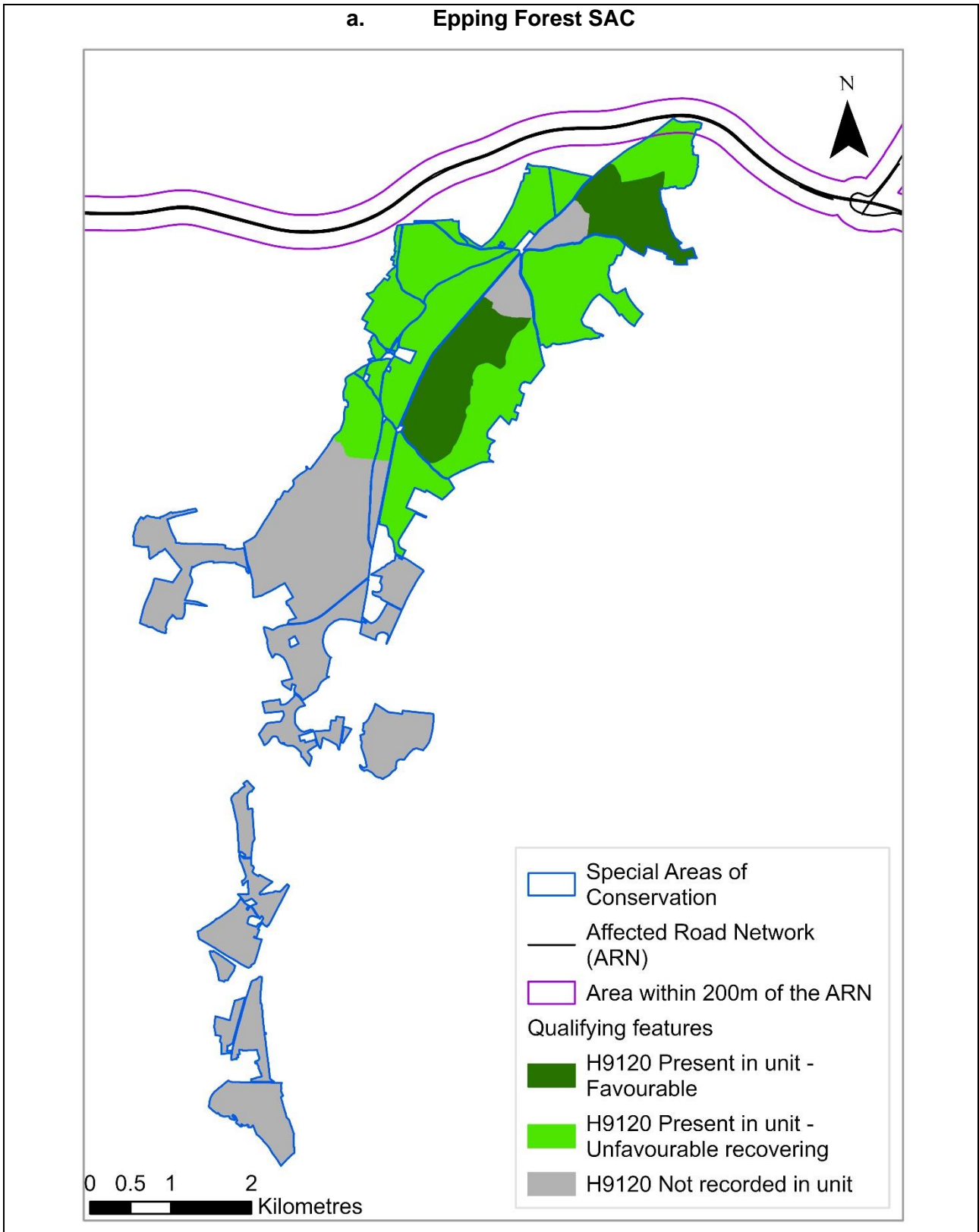
4.2.3 The conservation objectives for the Epping Forest and North Downs Woodlands SACs are set out within Table 4.1.

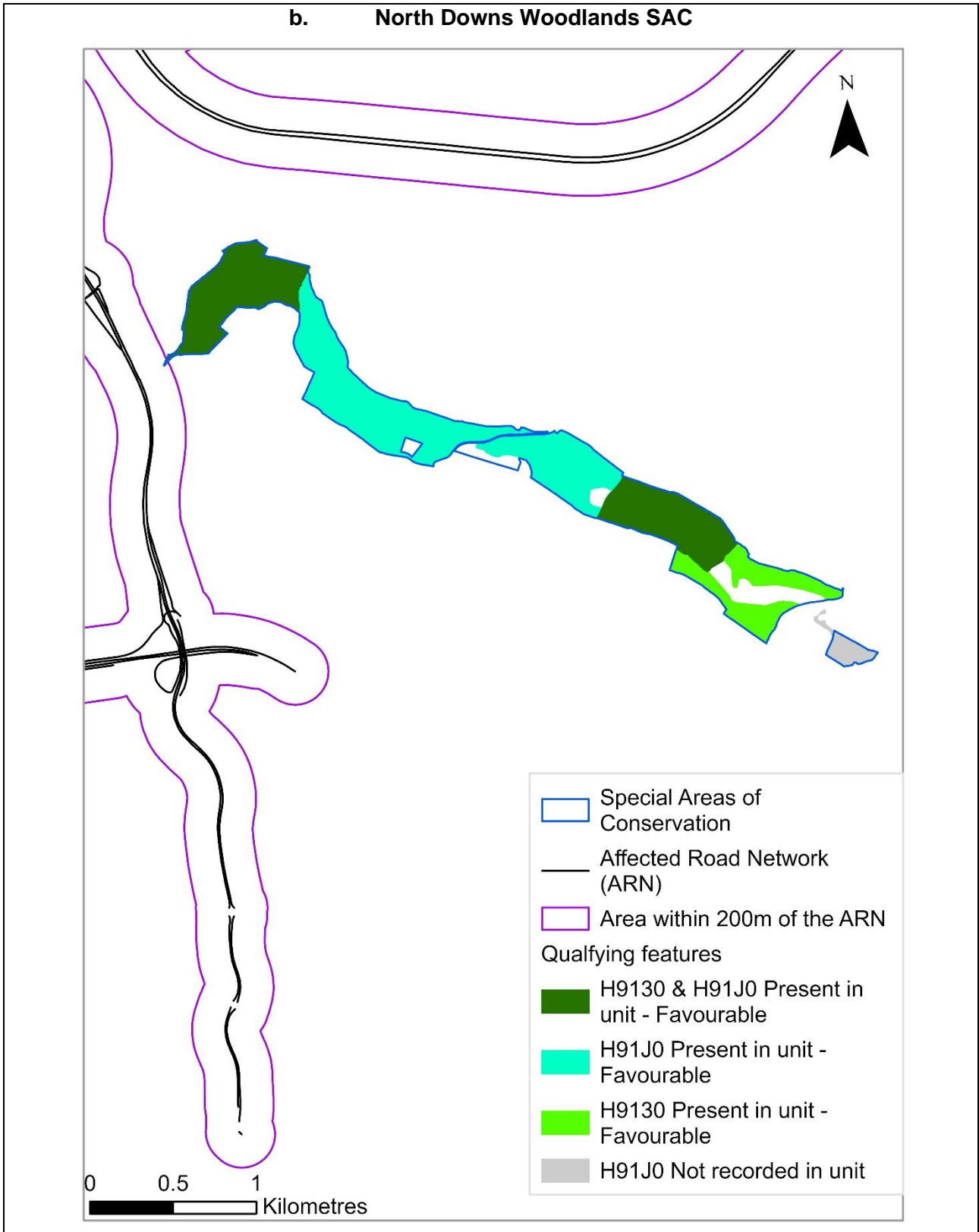
### Supplementary advice relating to air quality

4.2.4 The distribution of the qualifying habitats potentially affected (those within 200m of the ARN) within the European sites is shown in Plate 4.2. This is displayed using the information (at November 2022) provided by the Natural England Designated Sites View (Natural England, n.d.) and relates to the SSSI units where the qualifying features have been recorded.



**Plate 4.2 Extent of qualifying features within the European sites**





- 4.2.5 The preliminary survey work completed within the areas potentially affected (see paragraphs 4.3.6 to 4.3.11) found that the qualifying features likely to be present were:
- a. Epping Forest SAC: H9120. Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercion robori-petraeae* or *Illici-Fagenion*); Beech forests on acid soils and therefore S1083 Stag beetle *Lucanus cervus*
  - b. North Downs Woodlands SAC: H9130 *Asperulo-Fagetum* beech forests and H91J0 *Taxus baccata* woods of the British Isles
- 4.2.6 Natural England has produced supplementary advice (Natural England, 2019a; Natural England, 2019b) on conserving and restoring the site features of each of the SACs, and the attributes that are of relevance to this assessment are set out within Table 4.2.
- 4.2.7 The potential LSEs identified in Section 5.1 relate to effects of changes in concentrations of NO<sub>x</sub> and NH<sub>3</sub> and N deposition resulting in habitat loss/degradation. Therefore, the attributes summarised are those that relate to air quality and the targets associated with these attributes are used as part of the assessment of effects on the integrity of the European sites.

**Table 4.2 The attributes and targets that apply to this assessment (extracted from Natural England’s supplementary advice)**

Qualifying feature	Attribute and target	Reason for target
<b>Epping Forest SAC</b>		
H9120. Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrub layer ( <i>Quercion robori-petraeae</i> or <i>Illici-Fagenion</i> ); Beech forests on acid soils	Attribute: Air quality – Supporting processes (on which the feature relies)  Target: Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant critical load or level values given for this H9120 woodland feature of the site on the Air Pollution Information System (www.apis.ac.uk).	The annual mean critical levels for NH <sub>3</sub> and critical loads for N deposition are being exceeded for the H9120 woodland feature (and the defined mosaic). In addition to this, site-based evidence indicates that the annual mean critical level for NO <sub>x</sub> is also being exceeded, notably for areas close to main roads.
S1083 Stag beetle <i>Lucanus cervus</i>	Attribute: Air quality – Supporting processes (on which the feature relies)  Target: Maintain or, where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant critical load or level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	The relevant critical levels and critical loads for the S1083 stag beetle feature at Epping Forest broadly align with the thresholds for the H9120 woodland feature.

Qualifying feature	Attribute and target	Reason for target
<b>North Downs Woodlands SAC</b>		
H9130 <i>Asperulo-Fagetum</i> Beech forests on neutral to rich soils	Attribute: Air quality – Supporting processes (on which the feature relies) Target: Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant critical load or level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. N deposition (kg ha <sup>-1</sup> yr <sup>-1</sup> ): 25.9 which is above critical loads (kg ha <sup>-1</sup> yr <sup>-1</sup> ): 10–20.
H91J0 <i>Taxus baccata</i> woods of the British Isles *Priority feature	Attribute: Air quality – Supporting processes (on which the feature relies) Target: Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant critical load or level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. N deposition (kg ha <sup>-1</sup> yr <sup>-1</sup> ): 25.9 which is above critical loads (kg ha <sup>-1</sup> yr <sup>-1</sup> ): 5–15.

## 4.3 Baseline conditions

### Background

- 4.3.1 A preliminary site walkover was completed at the end of February 2020 within the areas of the European sites potentially affected by changes in air quality, i.e. the areas within 200m of the ARN. The aim of the surveys was to confirm the habitat types and inform the deposition velocity and lower critical load values applicable to the site for input to the air quality model. The walkover was carried out from the road network or Public Rights of Way and for some areas it was not possible to clearly see all of the area potentially affected; however, the findings of the site walkover are considered a robust basis for assessment. The habitat types have been described in accordance with the UKHab classification system (The UKHab Working Group, 2018) where it was possible to do so.
- 4.3.2 Detailed site investigations were completed for the European sites where the change in nitrogen deposition was predicted to change by greater than 1% of the lower critical load.
- 4.3.3 A detailed site investigation for Epping Forest SAC was carried out in May 2020 and the survey report is included in Appendix D of the HRA [APP-487]. The survey was carried out on three 500m transects with plots spaced at 100m intervals along each transect. The locations of the transects and quadrats are

shown in Figure A.1 of Annex D.1 in Appendix D of the HRA [APP-487]. The transects were aligned along gradients of modelled N deposition, with origins at the point in the north of the SAC where changes in N deposition were highest. Along each transect, 50m x 50m plots for sampling vegetation were spaced at 100m intervals. Plots along transects one and three were truncated at 400m and 300m, respectively, as plots at these locations would have been, respectively, over a wide track and outside of the SAC.

- 4.3.4 A detailed site investigation for North Downs Woodlands SAC was carried out in May 2022 and 2023 and the survey methodology and results are included in Appendix B. The surveys were carried out within the SAC, up to 200m from the ARN and up to approximately 500m from the ARN as shown within the location plans in Appendix B. At each location surveyors walked a zig-zag transect through the habitat survey area to ground-truth the UKHab classification. Vegetation composition and species abundance were recorded using the DAFOR scale ('dominant', 'abundant', 'frequent', 'occasional' or 'rare'). Evidence of any obvious vegetation gradients was noted as well as evidence of site management, pressures and threats (e.g. recreation, fly-tipping, encroaching development). Site condition in the habitat survey area was recorded using Defra's Biodiversity Metric 3.1 (Panks *et al.*, 2022). Note was made on whether habitats are degraded versions of habitats the site is important for (as detailed in the citation), or if they have been replaced by a different habitat type.

### Thames Estuary and Marshes Ramsar site habitats

- 4.3.5 The area within 200m of the construction ARN intersects the Ramsar site as shown on Plate 4.1. The Project Phase 1 habitat surveys indicate that the area within 200m of the construction ARN is poor semi-improved grassland with a network of ditches. The ditches have a variety of emergent, submerged and floating vegetation. The combination of pasture and ditch habitats would constitute coastal and floodplain grazing marsh.

### Epping Forest SAC

- 4.3.6 The SAC is approximately 10 metres south-east of the M25 as shown on Plate 4.2a. All of the plots supported mature broadleaved semi-natural woodland, with two woodland habitat and vegetation types recorded. The woodland nearest the M25 was generally more heavily disturbed by public use with a sparse understory and younger trees and heavily disturbed ground. The boundary between the two was very marked, following the route of a footpath, with younger oak woodland lying to the north and mature mixed woodland in the interior of the site to the south. The majority of plots comprised the UK Habitat Classification type 'w1c5 Beech forests on acid soils (H9120)', an Annex I habitat and qualifying feature of Epping Forest SAC.
- 4.3.7 The Ellenberg values of species recorded during the field survey (see Table D.5 in the HRA Appendix D [APP-487]) did not identify any species likely to be sensitive to N deposition. The qualifying features being assessed are habitat features which are listed as nitrogen-sensitive habitats in the Air Pollution Information System, but no species with an Ellenberg value of less than three (indicative of more-or-less infertile sites) were recorded in the affected area. The lack of nitrogen-sensitive species recorded in the survey therefore shows



the habitat in this area is not nitrogen sensitive but does not imply the qualifying feature as a whole is not nitrogen sensitive. The survey extent was greater than the 200m as set out in Appendix D of the HRA [APP-487]. A comparison with areas further away was discussed in the main survey report in Appendix D of the HRA [APP-487] and no discernible difference along the transects was recorded.

- 4.3.8 The distribution of the stag beetle feature (S1083) at Epping Forest is considered to broadly align with the distribution of the H9120 woodland feature.

### North Downs Woodlands SAC

- 4.3.9 The SAC is approximately 160 metres east of the A229 as shown on Plate 4.2b. Within the area 200m from the ARN (A229), the woodland block is narrow (approximately 20m wide) and bisected by a sunken lane (The North Downs Way Public Right of Way) comprising bare ground and vegetated banks. The woodland in this area is classified as UKHab w1f Lowland mixed deciduous woodland and recorded a habitat condition score of 29 (moderate). It comprises a narrow strip of ash woodland around a public footpath, with abundant ash *Fraxinus excelsior*, and frequent field maple *Acer campestre*, wild cherry *Prunus avium* and sycamore *Acer pseudoplatanus* in the canopy over an understorey of frequent hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, yew *Taxus baccata* and wild privet *Ligustrum vulgare*. The ground layer is heavily shaded where yew occurs. Ivy *Hedera helix* is abundant, with frequent dog's mercury *Mercurialis perennis*, wood melick *Melica uniflora* and wild arum *Arum maculatum*. The area was relatively heavily disturbed due to the presence of the public footpath and ash die back observed as widespread throughout the habitat survey area. The survey found that ash was the most abundant canopy species in the survey area, and it does not meet the criteria for the habitats that are the primary reason for selection of the site as a SAC.
- 4.3.10 Further away (approximately 500m) from the A229, where the SAC boundary widens, the composition of the woodland is classified as UKHab w1c7 Yew-dominated woodland (H91J0) and recorded a habitat condition score of 33 (good). The habitat survey area is characterised by a closed yew tree canopy, with an almost bare field layer and very few Ancient Woodland Indicator (AWI) species. The area was disturbed due to presence of the public footpath and use by bikes. A burnt-out vehicle was recorded which had scorched and damaged nearby trees. The survey found that most of the area surveyed was made up of W13 *Taxus baccata* (Annex I, 91J0), one of the primary reasons for selection of the site as a SAC.
- 4.3.11 The Ellenberg values for the species, noted within the habitat survey area within 200m of the ARN, ranged from four to eight and did not include any species likely to be sensitive to N deposition. The qualifying features being assessed are habitat features which are listed as nitrogen-sensitive habitats in the Air Pollution Information System, but no species with an Ellenberg value of less than three (indicative of more-or-less infertile sites) were recorded in the affected area. The lack of nitrogen-sensitive species recorded in the survey therefore shows the habitat in this area is not nitrogen sensitive but does not imply the qualifying feature as a whole is not nitrogen sensitive.

## 4.4 Future changes in baseline conditions

- 4.4.1 Defra indicates that the trend in emissions of nitrogen oxides (NO<sub>x</sub>) has been decreasing since the 1990s with the introduction of catalytic converters in vehicles and increasingly stringent emission standards, with emission estimates for 2020 indicating a 51% reduction on the 2005 UK emissions total (Dore, et al., 2009). To some extent the reduction in emissions is being matched by a similar trend in nutrient N deposition. Rowe *et al.* (2020) showed that, for SACs in England, the percentage of sites with nutrient N exceedance decreased from 98.5% in 1996 to 94.4% in 2017.
- 4.4.2 The Thames Estuary and Marshes Ramsar site is large (5,588.59ha), and the areas within 200m of the operational ARN comprise coastal floodplain grazing marsh habitat. The trends in N deposition at this site are published on the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2023) and are generally exceeding the lower critical loads (10–20kgNha<sup>-1</sup>yr<sup>-1</sup>) for the habitat type with the parts of the site closest to Gravesend receiving the highest loads.
- 4.4.3 Both of the SAC sites identified (Epping Forest and North Downs Woodlands) have been exposed to atmospheric N deposition in excess of the critical loads, for the features within 200m of the operational ARN, for many decades as shown in the deposition trends published on the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2023). The information recorded during the detailed habitat survey for Epping Forest (Appendix D of the HRA [[APP-487](#)]) appears to support this trend as no nitrogen-sensitive species were recorded within any of the transects surveyed, suggesting that the habitat within that area could have been adversely affected by long-term excess N deposition. Pristine or high-quality examples of the qualifying habitat might be expected to support nitrogen-sensitive species, but the surveys (Appendix D of the HRA [[APP-487](#)]) have shown that the area affected does not.
- 4.4.4 Both Epping Forest and the North Downs Woodlands SAC citations highlight air quality as a key attribute underpinning the conservation objectives of the sites. The Epping Forest Site Improvement Plan (Natural England, 2016) lists ‘air pollution: impact of atmospheric nitrogen deposition’ as the highest priority issue for the site. While air pollution is listed as an issue in the North Downs Woodlands Site Improvement Plan (Natural England, 2014) it was not the highest priority.
- 4.4.5 Both Epping Forest and North Downs Woodlands SAC have ‘restore’ targets for the air quality attribute of the conservation objectives which relate to the concentrations and deposition of air pollutants to at or below the site-relevant critical load or level values. The current trends in NO<sub>x</sub> and N deposition indicate that progress is being made; however, Rowe *et al.* (2020) state that ‘*Reducing deposition to below the critical load does not mean that ecosystems immediately recover. There are time lags before chemical recovery takes place, and further delays before biological recovery. The timescales for both chemical and biological recovery, could be very long, particularly for the most sensitive ecosystems*’. Stevens *et al.* (2016) state that ‘*The available experimental evidence suggests that this is a simplification; some recovery in vegetation does occur but total recovery is likely to take an extremely long time, if this is indeed possible. Recovery speed is also likely to vary between habitats depending on*



*the ability of the soils to accumulate N and the vegetation composition. For example, in boreal forests Strengbom et al. (2001) showed no detectable recovery after nine years of N treatment cessation and impacts on vegetation composition were still marked after 47 years of recovery.'*

- 4.4.6 Therefore, the qualifying features at these SACs are unlikely to change significantly in composition based on predicted improvements in air quality alone and this is recognised within the pressures and issues listed and measures proposed in the Site Improvement Plans for both European sites.

## 5 Stage 1 screening

### 5.1 Assessment of LSE

#### Changes in air quality from vehicle emissions

- 5.1.1 Changes in air quality as a result of vehicle emissions occur during construction and operation of the Project. The changes in air quality relevant to this assessment are in NO<sub>x</sub> and NH<sub>3</sub> as individual pollutants and their contribution to the deposition of nitrogen (N deposition).
- 5.1.2 Increases in the concentrations of NO<sub>x</sub> have the potential to: affect growth, photosynthesis and nitrogen assimilation/metabolism with few species showing visible injury; and result in direct damage to mosses, liverworts and lichens with a reduction in species diversity.
- 5.1.3 Increases in the concentrations of NH<sub>3</sub> have the potential to: cause direct damage to foliage, increased sensitivity to drought and frost resulting in pest/pathogen attack and water stress; and cause changes in ground flora, bryophyte and lichen composition coupled with changes to understorey with an increase in grass and ruderal species.
- 5.1.4 Increases in N deposition have the potential to change habitat composition, depending on the sensitivity of the habitat type. These changes could affect the habitats for which a European site is designated as well as the qualifying species if supporting habitat within the site is affected.
- 5.1.5 The European sites identified as potentially affected by vehicle emissions during construction and operation are:
- Thames Estuary and Marshes Ramsar – construction
  - Epping Forest SAC – operation
  - North Downs Woodlands SAC – operation
- 5.1.6 The contribution of changes in traffic from other plans or projects are considered with this ‘alone’ assessment as the data used within the traffic model includes the predicted changes in traffic from other plans and projects, as represented by the growth factor. The in-combination is assessed as the alone plus any contributions from other sources as described in paragraph 3.4.4.

#### Thames Estuary and Marshes Ramsar

##### Construction

###### *Effect alone*

- 5.1.7 Changes in air quality as a result of vehicle emissions could occur during construction of the Project. The changes in traffic that were predicted for the ARN within 200m of the Thames Estuary and Marshes Ramsar site are summarised in Table 5.1. Figure 22a in the HRA [APP-487] and Plate 6.1 illustrate where the construction ARN is within 200m of the Thames Estuary and Marshes Ramsar site and where the air quality model transect was located. Table 5.2 to Table 5.4 provide a summary of the air quality (AQ) model results

for the predicted concentrations of NO<sub>x</sub> and NH<sub>3</sub> as well as the predicted nitrogen deposition as a result of the vehicle emissions during each year of construction.

**Table 5.1 Summary of the traffic changes predicted during construction, within 200m of the Thames Estuary and Marshes Ramsar site (N/A indicates criteria not met)**

Road (Traffic model link ID)	Construction year	AADT <sup>5</sup> change	HDV <sup>6</sup> change	Speed band change	Carriageway alignment change
Lower Higham Road (20161_86027)	2025	1708	N/A	Yes	N/A
	2026	1636	N/A	Yes	N/A
	2027	1721	N/A	Yes	N/A
	2028	2126	N/A	Yes	N/A
	2029	N/A	N/A	Yes	N/A
	2030	N/A	N/A	N/A	N/A

**Table 5.2 Summary of the maximum predicted changes in NO<sub>x</sub> concentrations as a result of construction traffic for the ‘Base Year’<sup>7</sup> (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Construction year	Relevant CL µg/m <sup>3</sup>	BY µg/m <sup>3</sup>	DM µg/m <sup>3</sup>	DS µg/m <sup>3</sup>	DS-DM change µg/m <sup>3</sup>	DS-DM change as a % of CL
2025	30	42.57	29.48	31.35	1.87	6.2%
2026	30	42.57	28.65	30.51	1.86	6.2%
2027	30	42.57	27.82	29.63	1.81	6.0%
2028	30	42.57	27.12	29.10	1.98	6.6%
2029	30	42.57	26.50	26.94	0.44	1.5%
2030	Criteria not met for inclusion within the ARN.					

<sup>5</sup> AADT – Annual Average Daily Traffic: An estimate of the average daily traffic along a defined segment of roadway. This value is calculated from short-term counts taken along the same section, which are then factored to produce the estimate of AADT. Because of this process, the most recent AADT for any given roadway will always be for the previous year.

<sup>6</sup> HDV – Heavy Duty Vehicle: Freight vehicles of more than 3.5 tonnes (e.g. lorries) or passenger transport vehicles of more than eight seats (e.g. buses).

<sup>7</sup> The Base Year in the air quality model is 2016.

**Table 5.3 Summary of the predicted changes in NH<sub>3</sub> concentrations as a result of construction traffic for the ‘Base Year’ (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Construction year	Relevant CL µg/m <sup>3</sup>	BY µg/m <sup>3</sup>	DM µg/m <sup>3</sup>	DS µg/m <sup>3</sup>	DS-DM change µg/m <sup>3</sup>	DS-DM change as a % of CL
2025	3	1.54	1.56	1.71	0.15	5.0%
2026	3	1.54	1.56	1.72	0.16	5.3%
2027	3	1.54	1.55	1.73	0.18	6.0%
2028	3	1.54	1.54	1.75	0.21	7.0%
2029	3	1.54	1.54	1.59	0.05	1.7%
2030	Criteria not met for inclusion within the ARN.					

**Table 5.4 Summary of the maximum predicted changes in nitrogen deposition as a result of construction traffic for the ‘Base Year’ (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Construction year	Total N deposition (kg N ha <sup>-1</sup> yr <sup>-1</sup> )					
	Relevant LCL	BY	DM	DS	DS-DM change	DS-DM change as a % of LCL
2025	10	16.88	16.99	17.93	0.93	9.3%
2026	10	16.88	16.95	17.95	1.00	10.0%
2027	10	16.88	16.91	17.96	1.05	10.5%
2028	10	16.88	16.81	18.10	1.24	12.4%
2029	10	16.88	16.83	17.12	0.30	3.0%
2030	Criteria not met for inclusion within the ARN.					

5.1.8 The changes in traffic result in variations of both NO<sub>x</sub> and NH<sub>3</sub> concentrations and resultant nitrogen deposition over a period of five of the construction years where the ARN criteria were met. The change in NO<sub>x</sub> and NH<sub>3</sub> concentrations and resultant nitrogen deposition are predicted to exceed 1% of the CL in five of the construction years. Therefore, a LSE on the Thames Estuary and Marshes Ramsar site cannot be discounted as a result of the Project alone.

*Effect in-combination*

5.1.9 Where uncertainty of LSE remains for the Project alone the possibility of LSE is also uncertain in-combination with other plans and projects for the Thames Estuary and Marshes Ramsar site. The in-combination assessment is completed as part of the assessment of effect on integrity of European sites in Section 6.2.

## Epping Forest SAC

### Operation

#### Effect alone

- 5.1.10 The traffic scoping criteria that were used to determine the ARN are defined by DMRB LA 105 (Highways England, 2019). Table 5.5 summarises the changes predicted by the traffic model for the ARN within 200m of Epping Forest SAC.

**Table 5.5 Summary of the traffic scoping criteria met at the ARN link identified within 200m of the Epping Forest SAC**

Road (Traffic model link ID)	AADT change	HDV change	Speed band change	Carriageway alignment change
M25 (82844_8267 & 184854_82810)	4784	877	N/A	N/A

- 5.1.11 The predicted concentrations of NO<sub>x</sub> and NH<sub>3</sub> and the total N deposition were calculated as a matrix of modelled points for Epping Forest SAC to reflect the potential effect of the plume from the tunnel portals. Figure 22b of the HRA [APP-487] and Plate 6.3 show the relationship between the modelled points and the boundary of the European sites.
- 5.1.12 Table 5.6 to Table 5.8 summarise the results of the modelling and illustrate the minimum and maximum changes recorded at Epping Forest SAC. The values for the CL and LCL are taken from the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2023) for most sensitive habitat types present within 200m of the ARN.

**Table 5.6 Summary of the maximum predicted changes in NO<sub>x</sub> concentrations as a result of operational traffic for the 'Base Year' (BY), 'Do Minimum' (DM) and 'Do Something' (DS) scenarios**

Minimum/maximum changes	Relevant CL µg/m <sup>3</sup>	BY µg/m <sup>3</sup>	DM µg/m <sup>3</sup>	DS µg/m <sup>3</sup>	DS-DM change µg/m <sup>3</sup>	DS-DM change as a % of CL
Minimum	30	30.55	18.49	18.56	0.07	0.2%
Maximum	30	106.36	69.10	70.84	1.74	5.8%

**Table 5.7 Summary of the predicted changes in NH<sub>3</sub> concentrations as a result of operational traffic for the 'Base Year' (BY), 'Do Minimum' (DM) and 'Do Something' (DS) scenarios**

Minimum/maximum changes	Relevant CL µg/m <sup>3</sup>	BY µg/m <sup>3</sup>	DM µg/m <sup>3</sup>	DS µg/m <sup>3</sup>	DS-DM change µg/m <sup>3</sup>	DS-DM change as a % of CL
Minimum	1	1.20	1.59	1.60	0.01	1.0%
Maximum	1	3.64	3.94	4.03	0.09	9.0%

**Table 5.8 Minimum and maximum changes in total nitrogen (N) deposition at Epping Forest SAC for the ‘Base Year’ (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Minimum/ maximum changes	Total N deposition (kg N ha <sup>-1</sup> yr <sup>-1</sup> )					
	Relevant LCL	BY	DM	DS	DS-DM change	DS-DM change as a % of LCL
Minimum	10	32.75	32.44	32.50	0.06	0.6%
Maximum	10	61.50	58.53	59.53	1.00	10.0%

5.1.13 The maximum changes in NO<sub>x</sub> and NH<sub>3</sub> concentrations, and the resultant nitrogen deposition predicted at Epping Forest SAC are greater than 1% of the CL/LCL. The qualifying habitats are listed as vulnerable to changes in N deposition within Natural England’s supplementary advice for Epping Forest (Natural England, 2019a). Therefore, a LSE cannot be discounted at Epping Forest SAC as a result of the Project.

*Effect in-combination*

5.1.14 Where uncertainty of LSE remains for the Project alone, the possibility of LSE is also uncertain in-combination with other plans and projects for Epping Forest SAC. The in-combination assessment is completed as part of the assessment of effect on integrity of European sites in Section 6.2.

**North Downs Woodlands SAC**

**Operation**

*Effect alone*

5.1.15 The traffic scoping criteria that were used to determine the ARN are defined by DMRB LA 105 (Highways England, 2019). Table 5.9 summarises the changes predicted by the traffic model for ARN within 200m of North Downs Woodlands SAC.

**Table 5.9 Summary of the traffic scoping criteria met at the ARN link identified within 200m of the North Downs Woodlands SAC**

Road (Traffic model link ID)	AADT change	HDV change	Speed band change	Carriageway alignment change
A229 (83301_83306 & 83310_88842)	10180	1063	N/A	NA

5.1.16 Table 5.10 to Table 5.12 summarise the results of the AQ modelling and illustrate the minimum and maximum changes recorded at North Downs Woodlands SAC. The values for the CL and LCL are taken from the Air Pollution Information System (Centre for Ecology & Hydrology (CEH), 2023) for most sensitive habitat types present within 200m of the ARN. Figure 22c of the HRA [APP-487] and Plate 6.6 shows the relationship between the modelled points and the boundary of the European site.

**Table 5.10 Summary of the maximum predicted changes in NO<sub>x</sub> concentrations as a result of operational traffic for the ‘Base Year’ (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Minimum/ maximum changes	Relevant CL µg/m <sup>3</sup>	BY µg/m <sup>3</sup>	DM µg/m <sup>3</sup>	DS µg/m <sup>3</sup>	DS-DM change µg/m <sup>3</sup>	DS-DM change as a % of CL
Minimum	30	34.76	21.02	21.25	0.23	0.8%
Maximum	30	35.48	21.47	21.74	0.27	0.9%

**Table 5.11 Summary of the predicted changes in NH<sub>3</sub> concentrations as a result of operational traffic for the ‘Base Year’ (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Minimum/ maximum changes	Relevant CL µg/m <sup>3</sup>	BY µg/m <sup>3</sup>	DM µg/m <sup>3</sup>	DS µg/m <sup>3</sup>	DS-DM change µg/m <sup>3</sup>	DS-DM change as a % of CL
Minimum	1	3.31	1.56	1.58	0.02	2.0%
Maximum	1	3.28	1.58	1.60	0.02	2.0%

**Table 5.12 Minimum and maximum changes in total nitrogen (N) deposition at North Downs Woodlands SAC for the ‘Base Year’ (BY), ‘Do Minimum’ (DM) and ‘Do Something’ (DS) scenarios**

Minimum/ maximum changes	Relevant LCL kg N ha <sup>-1</sup> yr <sup>-1</sup>	BY kg N ha <sup>-1</sup> yr <sup>-1</sup>	DM kg N ha <sup>-1</sup> yr <sup>-1</sup>	DS kg N ha <sup>-1</sup> yr <sup>-1</sup>	DS-DM change kg N ha <sup>-1</sup> yr <sup>-1</sup>	DS-DM change as a % of LCL
Minimum	3	34.92	34.16	34.36	0.20	6.7%
Maximum	3	35.23	34.40	34.62	0.22	7.3%

5.1.17 The maximum change in NO<sub>x</sub> concentration at opening year will not exceed 1% of the CL. The maximum change in NH<sub>3</sub> concentration at opening year will exceed 1% of the CL and the changes in nitrogen deposition predicted at North Downs Woodlands SAC are also greater than 1% of the LCL. The qualifying habitats are listed as vulnerable to changes in N deposition within Natural England’s supplementary advice for North Downs Woodlands SAC (Natural England, 2019b). Therefore, a LSE cannot be discounted at North Downs Woodlands SAC as a result of the Project.

*Effect in-combination*

5.1.18 Where uncertainty of LSE remains for the Project alone (paragraph 5.1.17), the possibility of LSE is also uncertain in-combination with other plans and projects for North Downs Woodlands SAC. The in-combination assessment of all pollutants is completed as part of the assessment of effect on integrity of European sites in Section 6.2.



## 5.2 Conclusion of Stage 1 screening

- 5.2.1 The European sites identified were:
- a. Thames Estuary and Marshes Ramsar site
  - b. Epping Forest SAC
  - c. North Downs Woodlands SAC
- 5.2.2 The potential effects of the Project were assessed alone and in-combination with other plans and projects, and this identified three categories that reflect whether LSEs would occur at the European sites identified (or if uncertainty remains):
- a. Project effects where no pathway to effect was found
  - b. Project effects that would be ecologically inconsequential and therefore where no LSE would occur
  - c. Project effects where LSE could not be discounted
- 5.2.3 All LSEs considered were wholly within England and no effects were considered to be likely in respect of European sites in devolved administrations.
- 5.2.4 Table 5.13 to Table 5.15 summarise the results of the assessment.

**Table 5.13 Summary of the conclusion of the assessment of LSE on Thames Estuary and Marshes Ramsar site**

Potential LSE	No LSE		LSE not discounted
	Project effects with no pathway to effect	Inconsequential Project effects resulting in no LSE	Project effects where LSE cannot be discounted
Reduction in habitat area	None	None	Change in air quality – vehicle emissions – construction (within the site itself) relating to changes in NO <sub>x</sub> , NH <sub>3</sub> and N deposition

**Table 5.14 Summary of the conclusion of the assessment of LSE on Epping Forest SAC**

Potential LSE	No LSE		LSE not discounted
	Project effects with no pathway to effect	Inconsequential Project effects resulting in no LSE	Project effects where LSE cannot be discounted
Reduction in habitat area	None	None	Change in air quality – vehicle emissions – operation (within the site itself) relating to changes in NO <sub>x</sub> , NH <sub>3</sub> and N deposition

**Table 5.15 Summary of the conclusion of the assessment of LSE on North Downs Woodlands SAC**

Potential LSE	No LSE		LSE not discounted
	Project effects with no pathway to effect	Inconsequential Project effects resulting in no LSE	Project effects where LSE cannot be discounted
Reduction in habitat area	None	None	Change in air quality – vehicle emissions – operation (within the site itself) relating to changes in NO <sub>x</sub> , NH <sub>3</sub> and N deposition

## 6 Stage 2 appropriate assessment

### 6.1 Mitigation

- 6.1.1 The mitigation measures that have been put in place to avoid or reduce the effect pathways identified at Stage 1 screening are set out in the following paragraphs and have been included within the Stage 2 appropriate assessment reported in Section 6.2.

#### Measures to reduce the effects of nitrogen deposition

##### Operation

- 6.1.2 The conclusion of the assessment is that adverse effects on the integrity of Thames Estuary and Marshes Ramsar site, Epping Forest SAC and North Downs Woodlands SAC can be excluded beyond reasonable scientific doubt on the basis that the predicted scale of the impact of N deposition would cause no consequential risk of a measurable change in the habitats. Consequently, no mitigation measures are required or proposed by the Applicant.
- 6.1.3 However, during consultation for the HRA [APP-487], Natural England advised that they did not agree that adverse effects on Epping Forest SAC could be discounted without mitigation. The SoCG [REP7-106] between the Applicant and Natural England reports the positions of the two parties in relation to this matter; see Table 2.1 item 2.1.94 of that document.
- 6.1.4 In order to show due regard to the representations of Natural England, on a without prejudice basis potential mitigation measures were investigated as to the feasibility of avoiding or reducing the predictions of the impact (N deposition) to below screening thresholds, as opposed to avoiding or reducing the adverse effect potentially caused by that impact (which is considered to be inconsequential, and which cannot be mitigated). The results of the Applicant's without prejudice assessment of a potential speed limit reduction are presented in the Natural England SoCG Annex C.7: Without prejudice consideration of mitigation for air quality effects on Epping Forest SAC [REP7-106]. As noted at paragraph 6.1.2 above the Applicant's position is that no mitigation measures are required or proposed.

## 6.2 Assessment of effect on integrity of European sites

### Thames Estuary and Marshes Ramsar site

#### Changes in air quality as a result of vehicle emissions in construction

- 6.2.1 There is a risk that LSE cannot be discounted on the Thames Estuary and Marshes Ramsar site as a result of the Project for the following effect pathways:
- a. Changes in air quality within the Thames Estuary and Marshes Ramsar site (affecting all features) as a result of vehicle emissions, specifically the changes in concentration of nitrogen oxides and ammonia, and resulting nitrogen deposition, in construction

#### Magnitude/significance of the effects

##### *Effect alone*

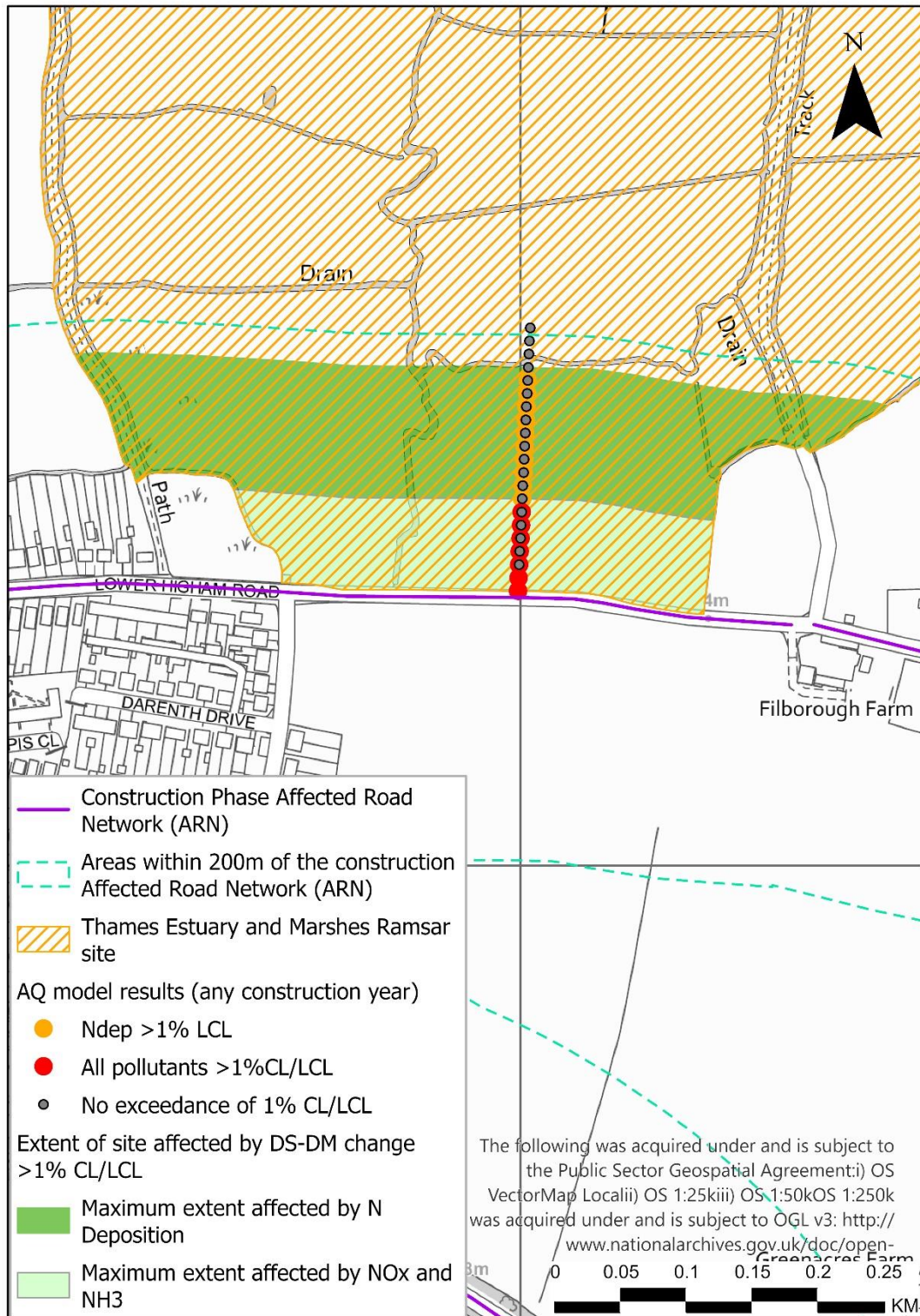
- 6.2.2 This section describes the effects of the Project alone, to distinguish it from the in-combination assessment presented in paragraphs 6.2.7 to 6.2.11.
- 6.2.3 The DS-DM changes in predicted concentrations of NO<sub>x</sub> and NH<sub>3</sub> and resultant nitrogen deposition exceeded the 1% CL/LCL threshold at a number of sample points and construction years. Plate 6.1 illustrates the changes predicted and the extent of habitat potentially affected. Table 6.1 shows the variation, during construction, in extent of the Ramsar site affected by changes in the concentrations of NO<sub>x</sub> and NH<sub>3</sub> as well as the resultant N deposition. The N deposition affects the greatest extent of habitat for up to one year (2028).

**Table 6.1 The maximum distance (m) into the Ramsar site (perpendicular to the ARN) where model predicts DS-DM change >1% CL/LCL in each construction year**

Construction year	NO <sub>x</sub>	NH <sub>3</sub>	Ndep
2025	50	40	70
2026	40	40	80
2027	60	60	130
2028	70	70	170
2029	10	10	20
2030	No effect predicted. Criteria not met for inclusion within the ARN.		

- 6.2.4 The other factors that influence this assessment are set out in Table 6.2.

**Plate 6.1 Extent of the changes >1% CL/LCL within the Thames Estuary and Marshes Ramsar site**





**Table 6.2 Consideration of other factors for Thames Estuary and Marshes Ramsar site**

Other factors considered	Thames Estuary and Marshes Ramsar site
What conditions is the habitat affected currently exposed to (e.g. existing exceedance of critical load)?	Air Pollution Information System (APIS) (2019–2021) three year average concentrations <ul style="list-style-type: none"> <li>• NO<sub>x</sub>: 22.4µgm<sup>-3</sup> critical level (30µgm<sup>-3</sup>) not exceeded</li> <li>• NH<sub>3</sub>: 1.3µgm<sup>-3</sup> critical level (3µgm<sup>-3</sup>) not exceeded</li> <li>• N deposition: 13.4kgNha<sup>-1</sup>yr<sup>-1</sup> lower critical load (10kgNha<sup>-1</sup>yr<sup>-1</sup>) exceeded</li> </ul>
What is the area and quality of the habitat affected as a proportion of the qualifying habitat within the European site?	Site is 5,588.59ha. Extent of coastal and floodplain grazing marsh within the site is 1,126.11ha. <ul style="list-style-type: none"> <li>• A maximum extent of 2.41ha affected by changes in concentration of NO<sub>x</sub> and NH<sub>3</sub> &gt;1% CL</li> <li>• A maximum extent of 7.45ha affected by changes in nitrogen deposition &gt;1% LCL</li> </ul> The survey work indicated that the habitat within this part of the Ramsar site is poor semi-improved grassland with a network of ditches. The ditches have a variety of emergent, submerged and floating vegetation.
Will there be any direct loss of habitat or change to the distribution of such habitats?	No direct loss or change in distribution is predicted to occur.
What is the predicted duration of the impact?	Timescale of the impact was predicted to be a maximum of four years within the extent affected by all pollutants (2.41ha). The wider extent (7.45ha) affected by changes in N deposition of >1% LCL would only be affected in up to two years of construction: 2027 (up to 130m from the ARN) and 2028 (up to 170m from the ARN).
Are changes predicted below the current baseline concentrations levels (e.g. due to technological improvements in vehicle emissions between now and the time the Project is in construction)?	The maximum predicted (DS) concentrations of NO <sub>x</sub> in all construction years are higher than the APIS background but lower than the modelled base year (see Table 5.2). The critical level (30µgm <sup>-3</sup> ) is exceeded in the first two years (2025 and 2026) of construction only. The maximum predicted (DS) concentrations of NH <sub>3</sub> in all construction years are higher than the APIS background and the modelled base year (see Table 5.3) but lower than the critical level. The maximum predicted (DS) N deposition in all construction years is higher than the APIS background, the modelled base year (see Table 5.4) and the lower critical load (10kgNha <sup>-1</sup> yr <sup>-1</sup> ).



Other factors considered	Thames Estuary and Marshes Ramsar site
<p>Using professional judgement, taking into account the above factors, will there be a reduction in habitat area that significantly contributes to the favourable conservation status of the European site?</p>	<p>Although up to 7.45ha of habitat would be impacted no reduction in habitat area or habitat degradation is predicted to occur. The concentrations of NO<sub>x</sub> and NH<sub>3</sub> are generally below the critical levels, therefore no direct toxic effects are predicted particularly as the grazing marsh is subject to water inundation during the winter months which generally flushes nutrients out and older marshes are considered less sensitive due to mineralisation (APIS, 2016).</p> <p>The changes in N deposition exceed the LCL assigned to this habitat type by APIS. However, the increases are only predicted during the first five years of construction and any effect on the receiving vegetation is unlikely to be perceivable within this time frame. For example, Basto <i>et al.</i> (2015) recorded reductions in the size and richness of an acid grassland seed bank after 13 years of simulated N deposition at 140kg Nha<sup>-1</sup>yr<sup>-1</sup>, and van den Berg <i>et al.</i> (2011) found species composition changes in calcareous grassland after 15 years. The habitat in the area affected is in agricultural use for grazing livestock and any changes as a result of the Project construction (between 0.3kgNha<sup>-1</sup>yr<sup>-1</sup> and 1.24kgNha<sup>-1</sup>yr<sup>-1</sup> predicted to be deposited) are small when compared to the amount of nitrogen a single sheep produces in a year (13kg (Carty, 2021), 7.6kg–11.9kg (Welsh Lamb and Beef Producers Ltd, 2018)). APIS (2016) states that ‘<i>Grazing represents an important management tool and grazing intensity will modify any N response, such that more grazing offsets the likelihood of graminoid dominance at the expense of forbs.</i>’</p> <p>The area affected within the Ramsar site comprises coastal grazing marsh and is used by the criterion 5 and 6 features (birds). The changes in nitrogen deposition have the potential to shift the vegetation to a sward less suitable to the birds; however, given the existing agricultural grazing in place this is considered highly unlikely within such a short time frame (maximum of five years). Therefore, use of the habitat by the bird features would not be compromised. Criterion 2 features (invertebrates and plants) may be present within the ditches in this area; however, the ditches are heavily shaded by trees which in turn are likely to absorb the additional nitrogen before it reaches the ditch and that in conjunction with the high winter water levels flushing the system would result in no material nutrient changes within the ditches and the use of the ditches by criterion 2 features would not be affected.</p> <p>Therefore, it is considered that there will be no reduction (or degradation) of habitat area that would contribute to the favourable conservation status of the Thames Estuary and Marshes Ramsar site.</p>

6.2.5 The predicted changes in nitrogen (NO<sub>x</sub>, NH<sub>3</sub> and N deposition) are over a short period (a maximum of five years). The maximum extent of habitat potentially affected by changes in N deposition within Thames Estuary and Marshes Ramsar site is 7.45ha which equates to 0.7% of the coastal and floodplain grazing marsh within the site.

6.2.6 It is considered that the changes in concentrations, over a small area of habitat, for a limited period of time would not result in any consequential changes in the habitat composition and therefore not significantly affect the favourable conservation status of the criterion 2, 5 and 6 features that the Ramsar site is designated for.

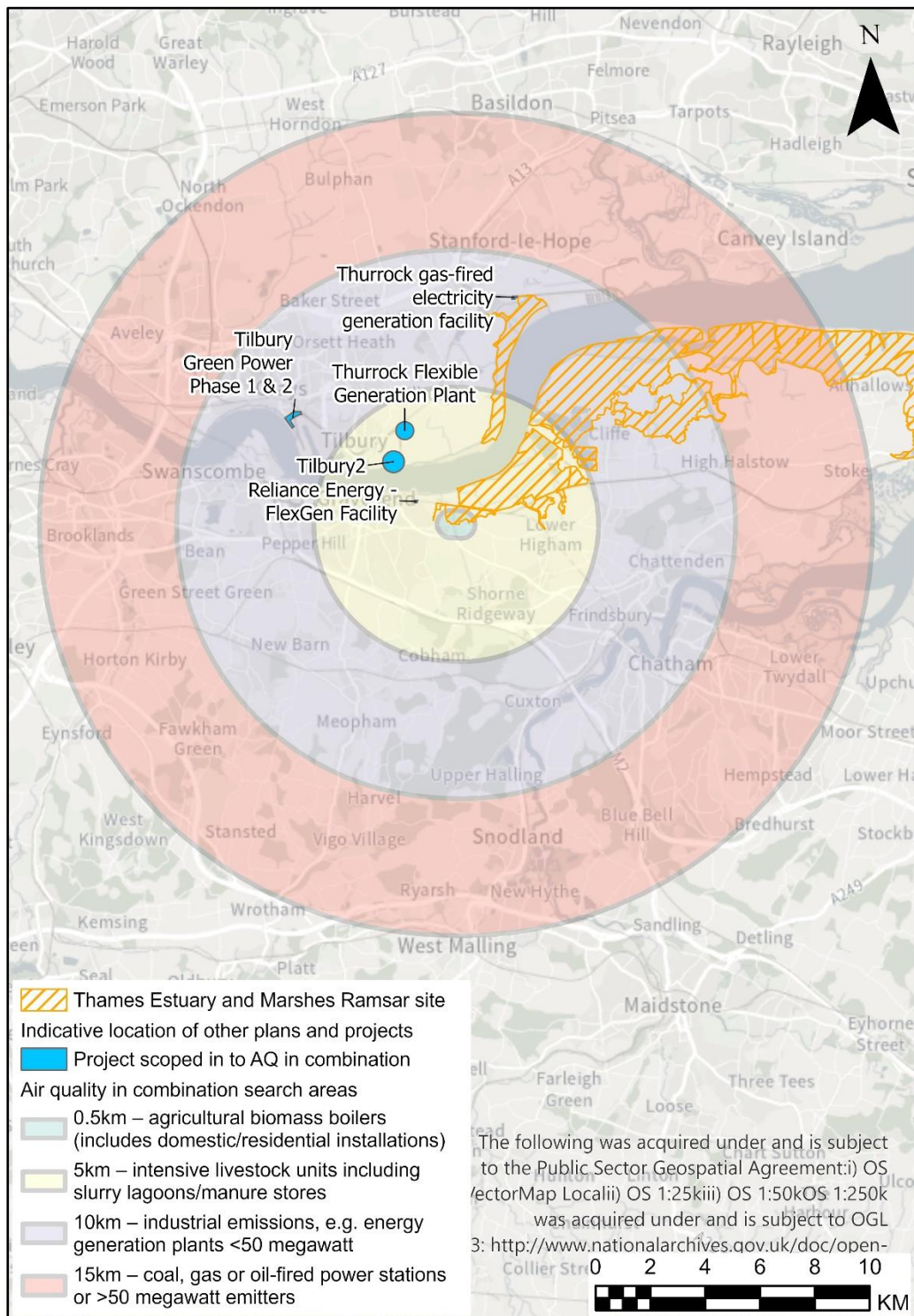
*Effect in-combination*

6.2.7 The projects identified within the search areas were then reviewed to determine whether the predicted emissions from them coincided with the construction years from the Project. The projects identified (see Plate 6.2 for locations) as potentially overlapping with the Project construction phase air quality changes are set out below.

- a. Tilbury2, Thurrock. A new port terminal on the site of the demolished Tilbury Power Station. Construction was completed in 2020 and it is now operational. The background emissions for the Project model are 2017–2019 so Tilbury2 was not included and therefore is assessed as part of the in-combination assessment as it will generate emissions from shipping which were considered as part of the Tilbury2 DCO application.
- b. Thurrock Flexible Generation Plant, Thurrock. These works comprise a Nationally Significant Infrastructure Project (NSIP) and the DCO application was granted in February 2022 with the operation predicted to overlap the Project construction phase. The development comprises a gas-fired electricity generating station and a battery storage facility on land to the north of Tilbury substation, Thurrock.
- c. Thurrock gas-fired electricity generation facility, Stanford-le-Hope, Thurrock (19/01534/FUL). A planning application was submitted to Thurrock Council in October 2019 and is awaiting decision, for installation of 25 gas engine generators, a gas house, distribution network operator building for transformers and associated vehicular access roads for a gas-fired electricity generation facility at Wharf Road, Stanford-le-Hope, Essex. For the purposes of this assessment the Applicant has assumed there is potential for the operation of this facility to overlap with the Project construction phase.
- d. Tilbury Green Power Phase 1 (08/00175/ELEC) and Phase 2 (22/00048/ELEC), Port of Tilbury, Thurrock. Applications for both phases via s36 (Electricity Act) consent to generate up to 88MW from a waste biomass facility (phase 1) and energy from waste facility (phase 2). The site is located within the Port of Tilbury.

- e. FlexGen Facility (20180768), Gravesend. The FlexGen Facility comprises nine (9) MTU 16V4000 GS natural gas-fired engine power generation units, with one on permanent standby, with a combined output of ~16MWe. The facility will operate for up to ~3,000 hours per year, to supply electricity to the national grid during periods of peak demand.

**Plate 6.2 Location of other plans and projects identified for in-combination assessment – Thames Estuary and Marshes Ramsar**



6.2.8 Other plans or projects within the search area around Thames Estuary and Marshes Ramsar site and the respective contributions to nitrogen emissions/deposition are shown in Table 6.3. The list of plans and projects is limited to where data on the pollutant was available or where a reasonable proxy could be used.

**Table 6.3 Contribution to individual pollutants from other plans and projects – Thames Estuary and Marshes Ramsar site**

	NOx µgm <sup>-3</sup>	NH <sub>3</sub> µgm <sup>-3</sup>	Nitrogen deposition kg N ha <sup>-1</sup> yr <sup>-1</sup>
CL/LCL of habitat affected by the Project alone	30	3	10
<b>DS scenario</b> – With the Project in combination with other plans and projects that contribute to traffic emissions	31.35	1.75	18.1
<b>DM scenario</b> – Without the Project in combination with other plans and projects that contribute to traffic emissions	29.48	1.56	16.99
<b>Other plans and projects</b>			
Tilbury2	0.00048	No effect identified	0.00005
Thurrock Flexible Generation Plant	2.1	0.1	0.7
Thurrock gas-fired electricity generation facility (19/01534/ FUL)	3.14	No effect identified	0.02
Tilbury Green Power Phase 1 (08/00175/ELEC)	0.16	0.008	0.063
Tilbury Green Power Phase 2 (22/00048/ELEC)	0.2	0.01	0.081
FlexGen Facility (20180768)	<0.2	No effect identified	No effect identified
<b>Concentration/deposition attributable to other in-combination projects</b>	<b>5.80</b>	<b>0.12</b>	<b>0.86</b>
<b>Total predicted concentration/deposition (DM scenario and other plans/projects contributions)</b>	<b>35.28</b>	<b>1.68</b>	<b>17.85</b>
<b>Total predicted concentration/deposition (DS scenario and other plans/projects contributions)</b>	<b>37.15</b>	<b>1.87</b>	<b>18.96</b>
<b>Change DS-DM in-combination (% of CL/LCL)</b>	<b>1.87 (6.23%)</b>	<b>0.19 (6.33%)</b>	<b>1.11 (11.10%)</b>

6.2.9 The background deposition, as set out in Table 6.2, to the Thames Estuary and Marshes Ramsar site does not exceed the CL for NOx or NH<sub>3</sub> but does exceed the LCL for N deposition for the habitat type potentially affected by the Project alone. The combined concentration and deposition from the DS and DM in combination with other plans and projects exceeds the CL and LCL for NOx and N deposition respectively. The in-combination concentration for NH<sub>3</sub> remains below the CL.



- 6.2.10 The other plans and projects identified are north of the River Thames and the figures provided in the relevant application assessments are for predicted concentrations/deposition on the parts of the Ramsar site closest to each project, so are not necessarily the same as the parts affected by the Project alone. Therefore, the exceedances presented in Table 6.3 are highly precautionary.
- 6.2.11 The discussion of the likely effects on the habitat type present as a result of the changes in the individual pollutants predicted for the Project alone also apply to the assessment in-combination with other plans or projects. The habitat would not reduce in area or degrade in the five-year construction time frame where the impacts are predicted to act in-combination, even if the maximum exceedance predicted occurred for the whole construction period. As discussed in Table 6.2 the qualifying features of the Ramsar site would therefore not be affected as their use of the habitat would not be compromised.

#### Assessment of effect on integrity

- 6.2.12 The Project alone and in-combination could potentially affect the achievement of the following conservation objectives for the Thames Estuary and Marshes SPA and by proxy the Thames Estuary and Marshes Ramsar site:
- a. The extent and distribution of the habitats of the qualifying features
  - b. The population of each of the qualifying features
  - c. The distribution of the qualifying features within the site
- 6.2.13 The Natural England supplementary advice (Natural England, 2018) to the conservation objectives for the Thames Estuary and Marshes SPA/Ramsar site includes supporting attributes and targets, as set out in paragraph 4.2.2, that could be affected by the Project.
- 6.2.14 The AQ attribute has been reviewed against the effects of the Project (as set out earlier in this section) and based on the targets presented in the supplementary advice have been refined to those considered when determining the effect of the Project on the integrity of each of the European sites. Table 6.4 provides a summary of that review.

**Table 6.4 Summary of the review of attributes against the Project effects**

Attribute	Consideration in assessment of adverse effects
Supporting habitat: air quality	The effect of the Project increasing the concentrations of NO <sub>x</sub> and N deposition over the CL/LCL is limited to the construction period and would not alter the suitability/availability of the habitat (freshwater and coastal grazing marsh) for the qualifying features. Although the target to maintain air quality would not be achieved during the construction period, the effect is over a short finite period and the target of maintain is not compromised in the long term as a result of the Project.

### The extent and distribution of the habitats of the qualifying features

- 6.2.15 The Natural England supplementary advice for the Thames Estuary and Marshes SPA provides the following targets associated with this conservation objective.
- a. Thames Estuary and Marshes SPA. Supporting habitat: extent and distribution of supporting habitat for the non-breeding season. Maintain the extent, distribution and availability of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding) at the following:
- |                                         |            |
|-----------------------------------------|------------|
| i. Intertidal sand and muddy sand       | 1.16ha     |
| ii. Intertidal mixed sediment           | 0.61ha     |
| iii. Coastal reedbeds                   | 30.83ha    |
| iv. Coastal lagoons                     | 136.64ha   |
| v. Freshwater and coastal grazing marsh | 1,126.11ha |
| vi. Saltmarsh                           | 108.14ha   |
- 6.2.16 The Project changes in the NO<sub>x</sub>, NH<sub>3</sub> and N deposition, alone and in combination, would not result in any loss or degradation of freshwater and coastal grazing marsh, and therefore would not compromise the objective to maintain the extent, distribution and availability of suitable habitat.

### Conclusion

- 6.2.17 The conservation objectives of the Thames Estuary and Marshes SPA, and by proxy the Thames Estuary and Marshes Ramsar site, would not be undermined by the effects of vehicle emissions during construction of the Project alone or in-combination with other plans and projects. Consequently, it is concluded that the Project alone and in-combination with other plans and projects would not have an adverse effect on the integrity of the Thames Estuary and Marshes Ramsar site.

## Epping Forest SAC

### Changes in air quality as a result of vehicle emissions in operation

- 6.2.18 There is a risk of LSE on the Epping Forest SAC as a result of the Project due to the changes in air quality (NO<sub>x</sub> and NH<sub>3</sub> concentrations and nitrogen deposition) as a result of vehicle emissions in operation.

### Magnitude/significance of effect

#### *Effect alone*

- 6.2.19 This section describes the effects of the Project alone, to distinguish it from the in-combination assessment presented in paragraphs 6.2.25 to 6.2.27.
- 6.2.20 The predicted concentrations of NO<sub>x</sub> and NH<sub>3</sub> at a number of the model points within the Epping Forest SAC exceeded the 1% CL threshold (see Plate 6.3).



The change in N deposition exceeds 1% of the LCL at a number of the modelled points within the Epping Forest SAC, as shown on Plate 6.4.

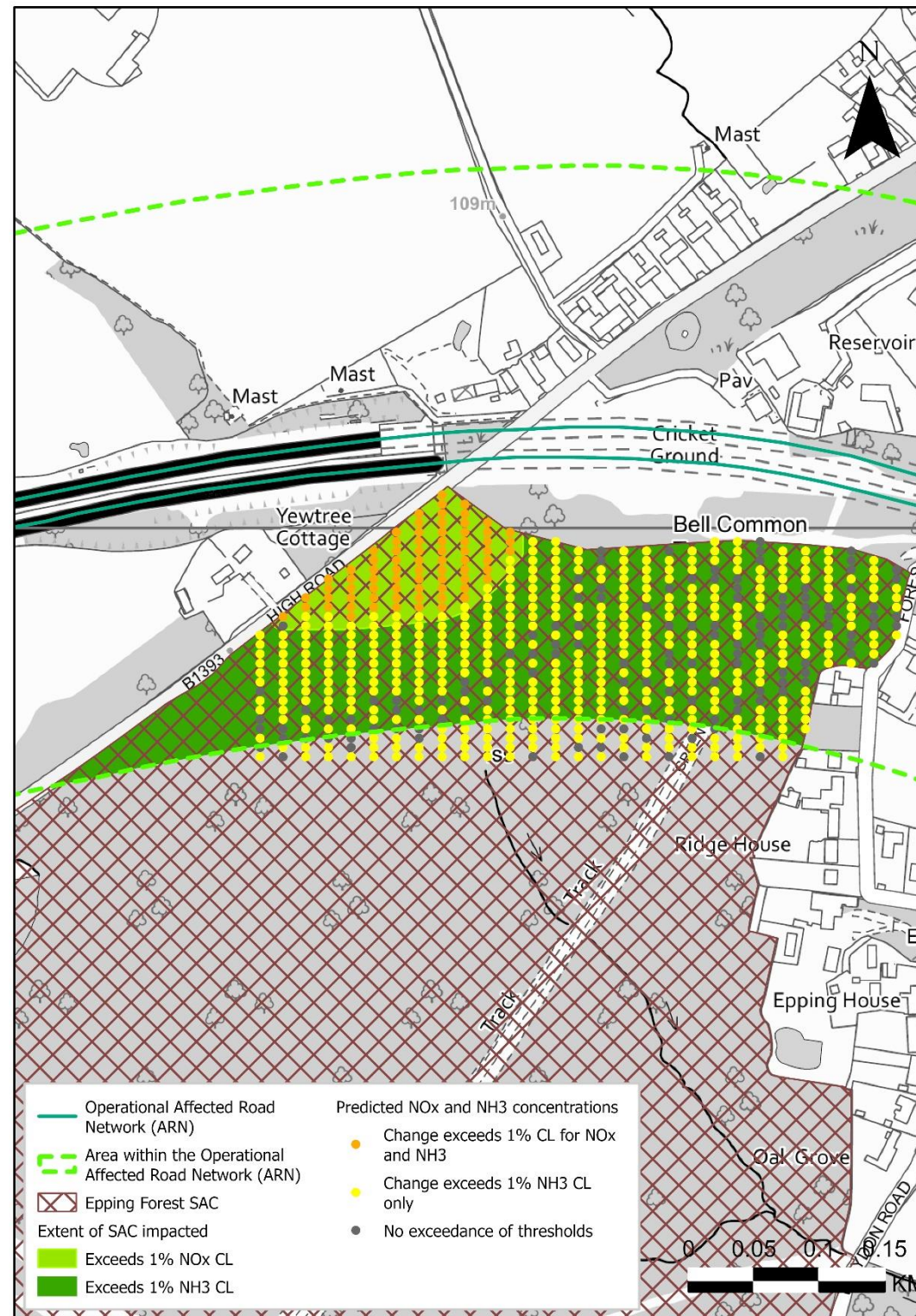
- 6.2.21 The current background data for NO<sub>x</sub> and NH<sub>3</sub> concentration and N deposition provided by APIS (2019–2021) are a grid square average and not necessarily reflective of the higher concentrations of both pollutants in the areas closer to the M25. The base year in the air quality model (see Table 5.6 and Table 5.7) therefore provides a better reflection of the baseline conditions in this location rather than the APIS background<sup>8</sup> and it is considered likely that these parts of the SAC are already exposed to concentrations/deposition exceeding the relevant critical levels/loads. The survey did not note any indications that the habitat was affected by the high NO<sub>x</sub> and NH<sub>3</sub> concentrations, such as leaf discolouration, premature senescence and loss (APIS, 2016a; APIS, 2016b). The species recorded during the survey in the area, did not include any that were sensitive to N deposition (as described in paragraphs 4.3.6 to 4.3.8 and Appendix D of the HRA [[APP-487](#)]) or any vegetation trends with distance from the road. Therefore, this habitat is considered likely to have already lost the nitrogen sensitive species due to the historically high concentrations of NO<sub>x</sub> and NH<sub>3</sub>/N deposition and is therefore resilient to further degradation. No change in species composition is anticipated as a result of the predicted changes in NO<sub>x</sub> and NH<sub>3</sub> concentrations/N deposition from the Project. The other factors that influence this assessment have been considered as set out in Table 6.5.

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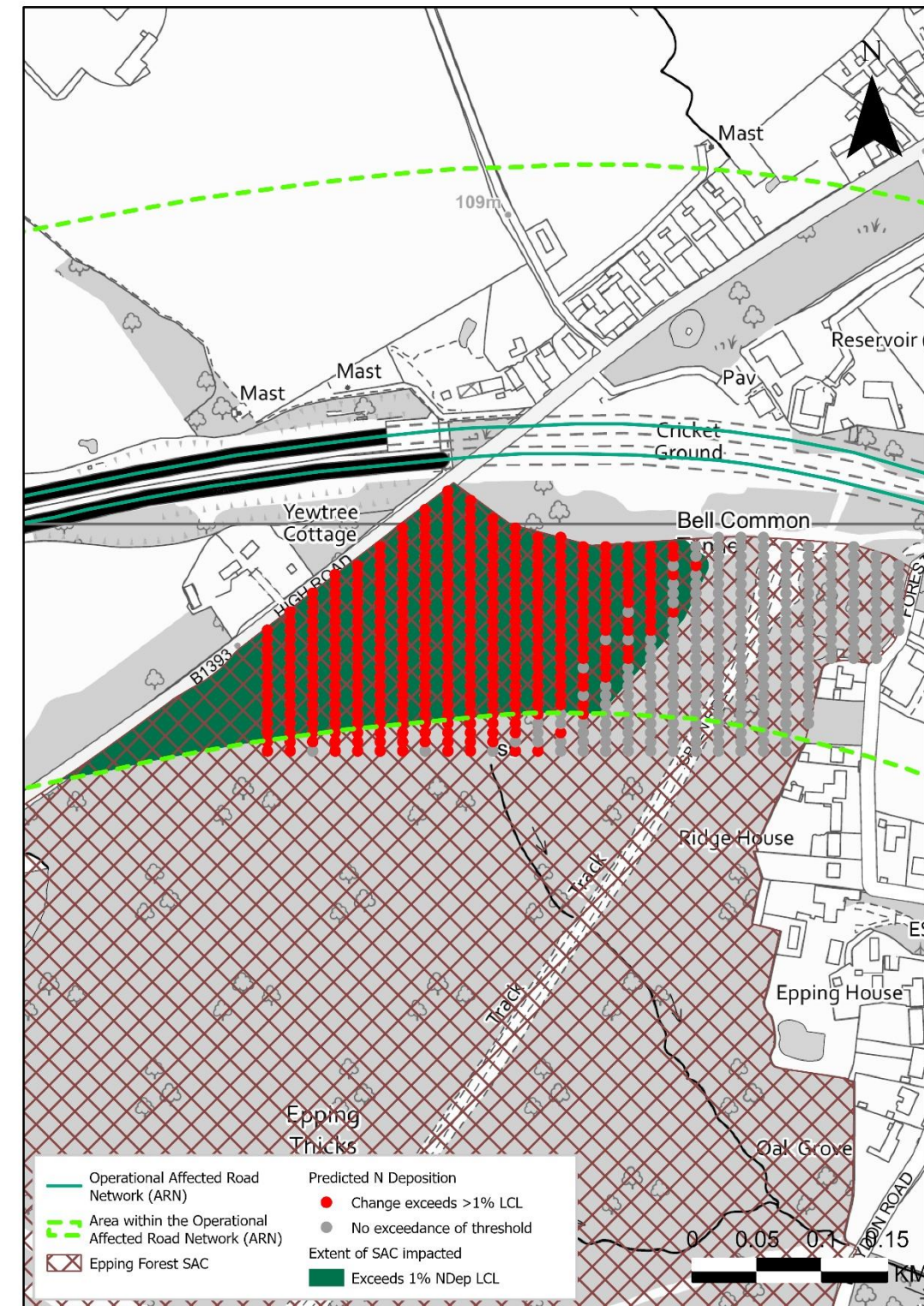
<sup>8</sup> The base year is 2016 and the APIS background for 2017–2019 recorded NO<sub>x</sub> concentration as 28.53µgm<sup>-3</sup> and NH<sub>3</sub> concentration as 1.63µgm<sup>-3</sup> for the relevant grid square.



**Plate 6.3** Extent of the predicted changes in NO<sub>x</sub> and NH<sub>3</sub> concentrations within the Epping Forest SAC



**Plate 6.4** Extent of the predicted changes in nitrogen deposition within the Epping Forest SAC





**Table 6.5 Consideration of other factors for Epping Forest SAC**

Other factors considered	Epping Forest
What conditions is the habitat affected currently exposed to (e.g. existing exceedance of critical load)?	<p>Air Pollution Information System (2019–2021) three year average concentrations. Noting the comments on grid square averages in paragraph 6.2.20 above.</p> <ul style="list-style-type: none"> <li>• NO<sub>x</sub>: 21.77µgm<sup>-3</sup> critical level (30µgm<sup>-3</sup>) not exceeded</li> <li>• NH<sub>3</sub>: 1.42µgm<sup>-3</sup> critical level (1µgm<sup>-3</sup>) exceeded</li> <li>• N deposition: 26.97kgNha<sup>-1</sup>yr<sup>-1</sup> lower critical load (10kgNha<sup>-1</sup>yr<sup>-1</sup>) exceeded</li> </ul>
What is the area and quality of the habitat affected as a proportion of the qualifying habitat within the European site?	<p>Site is 1,630.74ha. Extent of qualifying habitat (H9120) within the site is 652.3ha</p> <ul style="list-style-type: none"> <li>• Approximately 1.1ha affected by changes in NO<sub>x</sub> concentrations &gt;1% CL</li> <li>• Approximately 7.2ha affected by changes in NH<sub>3</sub> concentrations &gt;1% CL</li> <li>• Approximately 4.9ha affected by nitrogen deposition changes &gt;1% LCL</li> </ul> <p>The survey work (as reported in Appendix D of the HRA [APP-487] indicated that the habitat within this part of the SAC was representative of the qualifying habitat (H9120 Beech forests), however the quality was low, and no nitrogen-sensitive species were recorded.</p>
Will there be any direct loss of habitat or change to the distribution of such habitats?	No direct loss or change in distribution is predicted to occur.
What is the predicted duration of the impact?	Timescale of the impact was predicted to be four years.
Are NO <sub>x</sub> /NH <sub>3</sub> /N deposition operational changes predicted below the current baseline concentrations/deposition levels (e.g. due to technological improvements in vehicle emissions between now and the time the Project is operational)?	<p>The predicted (DS) concentrations of NO<sub>x</sub> are higher than the APIS background but lower than the modelled base year (see Table 5.6). The critical level (30µgm<sup>-3</sup>) is exceeded up to approximately 50–100m from the M25 tunnel portal.</p> <p>The minimum and maximum predicted (DS) concentrations of NH<sub>3</sub> are higher than the APIS background and the modelled base year (see Table 5.7). The critical level (1µgm<sup>-3</sup>) is exceeded for all of the site within 200m of the ARN.</p> <p>The minimum and maximum predicted (DS) N deposition are higher than the APIS background but lower than the modelled base year (see Table 5.8). The lower critical load (10kgNha<sup>-1</sup>yr<sup>-1</sup>) is exceeded for all of the site within 200m of the ARN.</p> <p>The AQ modelling used a conservative estimate when predicting the future changes in background N deposition and assumes no change between the base year (2016) and opening year (2030), i.e. does not consider improvements from technology. With the anticipated improvements in technology regarding vehicle emissions, the predicted concentrations of NO<sub>x</sub> and N deposition with the Project (DS scenario) are in reality likely to be lower than calculated. NH<sub>3</sub> concentrations are dependent on the uptake of electric vehicles, therefore there is likely to be some improvement on the currently predicted DS scenario; however, it is not possible to quantify whether this would result in a lower extent of the site being impacted.</p>
Using professional judgement, taking into account the above factors, will there be a reduction in habitat area that significantly contributes to the favourable conservation status of the European site?	<p>Although up to 7.2ha of habitat would be impacted no reduction in habitat area or habitat degradation is predicted to occur. The habitat composition of the area affected is not considered likely to change given the lack of nitrogen-sensitive species recorded, no gradient in vegetation composition with distance from the road and the small increases in both concentration and deposition predicted. The timescale of the impact is also short, four years, and this is unlikely to be sufficiently long for changes to be detected (or occur) in the receiving vegetation, particularly as the species considered most sensitive, bryophytes and lichens (Britton &amp; Ross, 2018), were not abundant in the area affected. Caporn <i>et al.</i> (2016) also found that the effects of increases in N deposition are not always detectable in terms of changes in vegetation composition and habitat structure and require long-term exposure to generate change.</p> <p>The H9120 qualifying habitat (SSSI unit 105) is recently recorded by Natural England (2022) as being in 'unfavourable recovering' condition. The previous assessment by Natural England in 2010 recorded the H9120 qualifying habitat in the unit as being in favourable condition. Nitrogen deposition has improved in this time frame with the grid square average decreasing from 30.72 kgNha<sup>-1</sup>yr<sup>-1</sup> in 2010 to 26.97 kgNha<sup>-1</sup>yr<sup>-1</sup> in 2020, therefore it is likely that the other environmental factors are influencing the change in habitat condition.</p> <p>The predicted changes in NO<sub>x</sub>, NH<sub>3</sub> and N deposition as a result of the Project alone are not considered to result in a reduction in habitat area that would significantly contribute to the favourable conservation status of the European site.</p>

6.2.22 The extent of qualifying habitat potentially affected by changes in NO<sub>x</sub> and NH<sub>3</sub> concentrations, and N deposition within Epping Forest SAC has been calculated and the proportions in relation to each of these sites shown in Table 6.6.

**Table 6.6 Proportions of habitat affected in Epping Forest SAC**

<b>Extent of the SAC</b>	Total area of SAC (ha)	1,630.74
	Proportion of site affected by changes in concentration of NO <sub>x</sub> >1% CL	0.07%
	Proportion of site affected by changes in concentration of NH <sub>3</sub> >1% CL	0.44%
	Proportion of site affected by changes in N deposition of >1% LCL (%)	0.3%
<b>Extent of the qualifying habitat</b>	Total area of qualifying habitat within SAC (ha)	652.3
	Proportion of habitat affected by changes in concentration of NO <sub>x</sub> >1% CL	0.17%
	Proportion of habitat affected by changes in concentration of NH <sub>3</sub> >1% CL	1.10%
	Proportion of habitat affected by changes in N deposition of >1% LCL (%)	0.76%

6.2.23 The background concentrations of NO<sub>x</sub>, NH<sub>3</sub> and nitrogen deposition reported on APIS are provided as a three-year average for a 1km grid square that includes the location within Epping Forest SAC that is closest to the ARN. The limitation of relying on the background from APIS to judge how far the critical levels and loads are exceeded for this part of the site is that the average grid square does not provide an accurate representation of the influence of the M25 (the ARN) on the concentrations of NO<sub>x</sub>, NH<sub>3</sub> and nitrogen deposition. The base year (2016) calculated in the AQ model provides a better representation of the baseline conditions being experienced by the habitats in this part of the SAC.

6.2.24 Table 6.7 provides a summary of the extent of the exceedances of critical levels/loads in the baseline conditions in comparison to the changes predicted as a result of the Project.

**Table 6.7 Comparison of the exceedances of critical loads for Epping Forest SAC with the predicted change as a result of the Project**

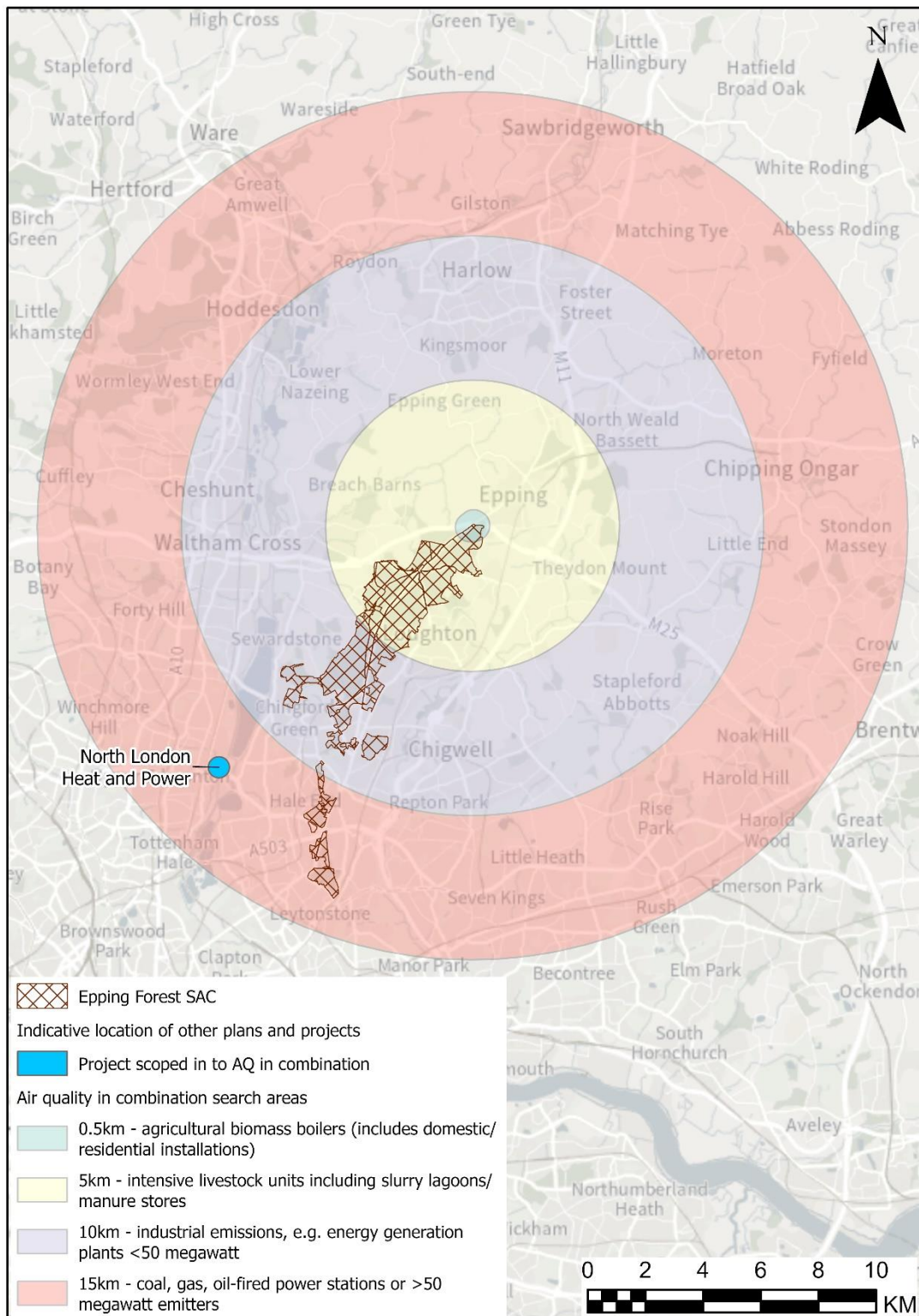
		<b>N deposition kg N ha<sup>-1</sup>yr<sup>-1</sup></b>	<b>NOx µgm<sup>-3</sup></b>	<b>NH<sub>3</sub> µgm<sup>-3</sup></b>
<b>Baseline conditions (Current APIS background)</b>	Relevant LCL/CL	10	30	1
	Three-year (2019–2021) average concentration/ deposition (current APIS background)	26.97	21.77	1.42
	Maximum range of exceedance of critical levels/critical loads	16.97	-8.23	0.42
	Maximum range of exceedance of critical levels/loads as a percentage of the LCL/CL	169%	-27%	42%
<b>Baseline conditions (Base Year)</b>	Maximum total concentration/deposition calculated for the Base Year (2016)	61.50	106.36	3.64
	Maximum range of exceedance of critical levels/loads as a percentage of the CL/LCL	515%	254%	264%
<b>Do Minimum scenario at opening year</b>	Maximum total concentration/deposition at opening year (Do Minimum scenario)	58.53	69.10	3.94
	Maximum range of exceedance of critical loads as a percentage of the CL/LCL	485%	130%	294%
<b>Do Something scenario at opening year</b>	Maximum total concentration/ deposition at opening year (Do Something scenario)	59.53	70.84	4.03
	Maximum change in concentration/deposition as a result of the Project	1.00	1.74	0.09
	Change in concentration/deposition as a result of the Project (Do Something scenario) as a percentage of the CL/LCL	10.0%	5.8%	9.0%

*Effect in-combination*

- 6.2.25 The projects identified within search areas were reviewed (see Appendix A) and those scoped in to the in-combination assessment for Epping Forest are shown on Plate 6.5 and are as follows:
- a. North London Heat and Power Project. An NSIP that was granted development consent in February 2017. It is an energy recovery facility located at the Edmonton EcoPark and will replace the existing Energy from Waste facility. The site is currently under construction and predicted to be operational from 2025. It is approximately 12km south-west of the area of the Epping Forest SAC affected by the Applicant's Project.



**Plate 6.5 Location of other plans and projects identified for in-combination assessment – Epping Forest SAC**



6.2.26 Other plans or projects within the search area around Epping Forest SAC and the respective contributions to nitrogen emissions/deposition are shown in Table 6.8. The list of plans and projects is limited to where data on N deposition was available or where a reasonable proxy could be used.

**Table 6.8 Contribution to N deposition on Epping Forest SAC from the Project in-combination with other plans and projects**

	NOx $\mu\text{gm}^{-3}$	NH <sub>3</sub> $\mu\text{gm}^{-3}$	Nitrogen deposition kg N ha <sup>-1</sup> yr <sup>-1</sup>
CL/LCL of habitat affected by the Project alone	30	1	10
<b>DS scenario</b> – With the Project in combination with other plans and projects that contribute to traffic emissions	70.84	4.03	59.53
<b>DM scenario</b> – Without the Project in combination with other plans and projects that contribute to traffic emissions	69.1	3.94	58.53
<b>Other plans and projects</b>			
North London Heat and Power	No effect identified	No effect identified	0.076
<b>Concentration/deposition attributable to other in-combination projects</b>	-	-	<b>0.076</b>
<b>Total predicted concentration/deposition (DS scenario and other plans/projects contributions)</b>	<b>70.84</b>	<b>4.03</b>	<b>59.606</b>
<b>Total predicted concentration/deposition (DM scenario and other plans/projects contributions)</b>	<b>69.1</b>	<b>3.94</b>	<b>58.606</b>
<b>Change DS-DM in-combination (% of CL/LCL)</b>	<b>1.74 (5.80%)</b>	<b>0.09 (9.00%)</b>	<b>1.00 (0.0%)</b>

6.2.27 Table 6.8 shows that the other plans and projects did not identify any changes in NOx or NH<sub>3</sub>, therefore the effect of these pollutants in combination is the same as the Project alone. The combined change in N deposition of all the projects identified (see Table 6.8) is 1.0kgNha<sup>-1</sup>yr<sup>-1</sup>, 10.0% of the LCL. The duration of effect from the Project alone is considered short term (four years). Therefore, the length of time the Project could act in-combination with other plans and projects is also limited to four years and unlikely to be sufficiently long for changes to be detected (or occur) in the receiving vegetation, particularly as the species considered most sensitive, bryophytes and lichens (Britton & Ross, 2018), were not abundant in the area affected. Therefore, as discussed in Table 6.5 the favourable conservation status of the qualifying habitat would not be significantly affected by the Project alone or in-combination with other plans and projects.

### Assessment of effect on integrity

- 6.2.28 The conservation objectives for the Epping Forest include attributes and targets relating to air quality and the assessment of effect on the integrity of the sites is judged on the basis of whether the Project would undermine these targets being achieved. The Project has the potential to result in a reduction in habitat area which could affect the following conservation objectives:
- The supporting processes on which the qualifying natural habitats rely
  - The extent and distribution of the qualifying natural habitats
  - The structure and function (including typical species) of the qualifying natural habitats
- 6.2.29 The supplementary advice for Epping Forest SAC (Natural England, 2019a) included an air quality attribute and related target and has a restore target for the concentrations and deposition of air pollutants, to below or equal to the site-relevant critical load.
- 6.2.30 The maximum predicted NO<sub>x</sub> concentration with the Project in place is slightly higher than the Do Minimum scenario and both exceed the critical level and are greater than background (noting discussion in paragraph 6.2.23) but equal to or less than the Base Year, due to the predicted improvements in vehicle emissions. The maximum predicted NH<sub>3</sub> concentration with the Project in place is slightly higher than the Do Minimum scenario and both exceed the critical level as well as the background and the Base Year. The future predicted concentrations of NH<sub>3</sub> from vehicle emissions, unlike NO<sub>x</sub>, are uncertain. However, the accelerated uptake of electric vehicles will result in a reduction of NH<sub>3</sub> from road transport. The maximum predicted N deposition with the Project in place is slightly higher than the Do Minimum scenario, but both scenarios predict N deposition greater than background (noting discussion in paragraph 6.2.23) but equal to or less than the Base Year, due to predicted improvements in vehicle emissions.
- 6.2.31 The site-relevant critical levels for NO<sub>x</sub> are currently (APIS 2019–2021) not exceeded; however, as set out in paragraph 6.2.23 these are unlikely to reflect the conditions in the areas close to the M25, hence the use of the Base Year as providing a better measure of the current baseline. The Base Year concentrations exceed the site relevant critical levels by over 350% and the contribution of the Project, alone and in combination, would be small (5.8%). The site-relevant critical levels for NH<sub>3</sub> are currently (APIS 2019–2021) exceeded; however, as set out in paragraph 6.2.23 these are unlikely to reflect the conditions in the areas close to the M25, hence the use of the Base Year as providing a better measure of the current baseline. The Base Year concentrations exceed the site relevant critical levels by over 264% and the contribution of the Project, alone and in-combination, would be small (9%), noting the discussion in paragraph 6.2.30 regarding the likely conservative nature of the ammonia emissions, i.e. these are likely to see the greatest improvements with electric vehicle take up. The proportions of the site affected by the increased concentrations of NO<sub>x</sub> and NH<sub>3</sub> in the Do Something scenario are very small (<0.5%).

- 6.2.32 The site-relevant critical loads are currently (APIS 2019–2021) exceeded by over 150% and the contribution of the Project to the N deposition on the site, alone and in combination, would be small (10%). Although the Project would result in a slightly higher N deposition than would occur in the Do Minimum scenario, this would occur only within a very small proportion of the site (0.3%) and there would be no slowing of progress towards the target by any material degree. Progress to achieving this target is affected by a variety of factors and vehicle emissions, 10.8%<sup>9</sup>, are only part of the source of the site-relevant pollutants. The Project would contribute a very small proportion in the context of the very substantial decreases in N deposition that would be required to meet this target and would affect only a very small proportion of the site. Achievement of the restore target would require many years of sustained significant reductions in pollution that would likely require new national policy and wholesale behavioural changes.
- 6.2.33 The improvement in vehicle emissions and the potential for habitats to improve in quality are discussed in paragraphs 4.4.1 to 4.4.5. It is considered that the effect the Project would have on air quality at this location is not material compared to the very substantial reductions (see Table 6.7) that would have to be achieved through changes such as improvements in vehicle emissions to bring the NO<sub>x</sub> and NH<sub>3</sub> concentrations below site-relevant critical levels and N deposition below site-relevant critical loads.
- 6.2.34 There are no pathways to an effect identified in terms of the extent or distribution of the qualifying habitats, the vegetation structure within them, or their function as woodland. Any air quality effect would not degrade the habitat to the extent that it would no longer be classified as that qualifying habitat. The qualifying habitat within the area affected by the changes in N deposition would not change in extent and distribution, or structure and function as a result of the Project.
- 6.2.35 The assessment has considered the effects of the Project alone and in combination resulting in a reduction/degradation of the qualifying habitat and concluded that there would be no adverse effect on the integrity of the Epping Forest SAC in view of its conservation objectives.

## North Downs Woodlands SAC

### Changes in air quality as a result of vehicle emissions in operation

- 6.2.69 There is a risk of LSE on the North Downs Woodlands SAC as a result of the Project due to the changes in air quality (NO<sub>x</sub> and NH<sub>3</sub> concentrations and nitrogen deposition) as a result of vehicle emissions in operation.

### Magnitude/significance of effect

#### *Effect alone*

- 6.2.70 This section describes the effects of the Project alone, to distinguish it from the in-combination assessment presented in paragraphs 6.2.76 to 6.2.77.

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<sup>9</sup> APIS Site Relevant Critical Loads and Source Attribution – Source Attribution for nitrogen deposited onto Epping Forest (UK0012720) Local contribution to Nitrogen deposition from sources (UK)

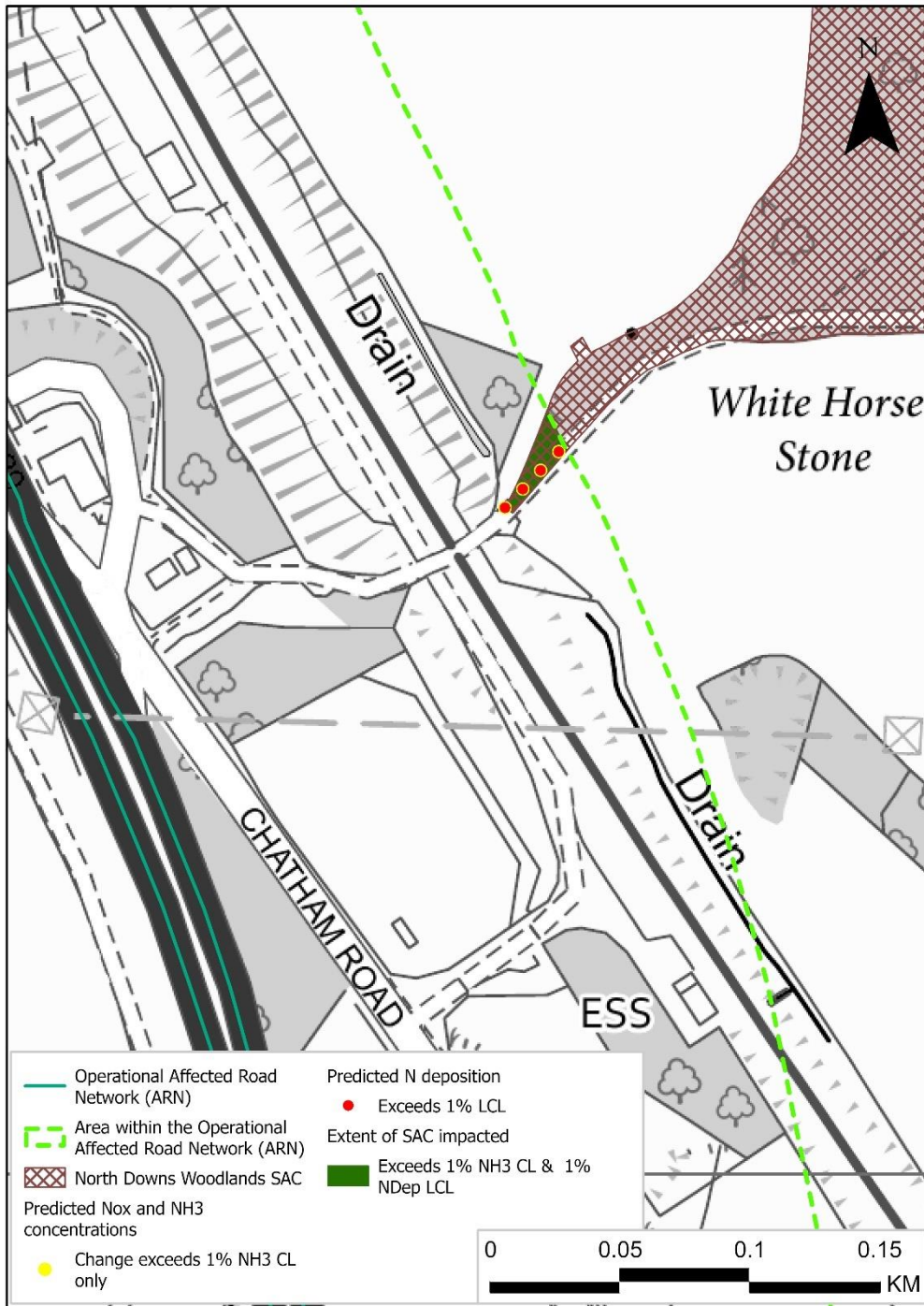
- 6.2.71 The extent of the SAC impacted by the predicted changes is shown in Plate 6.6. The changes in NO<sub>x</sub> concentrations did not exceed 1% of the CL at any of the sample points. The change in NH<sub>3</sub> concentrations and N deposition exceeded 1% of the CL/LCL at all of the sample points. The predicted changes in N deposition although greater than 1% of the LCL are extremely small and when considered in conjunction with the predicted changes in NO<sub>x</sub>, which are less than 1% of the critical level, are considered imperceptible.
- 6.2.72 The background concentrations of NH<sub>3</sub> (1.28µgm<sup>-3</sup>) and N deposition (25.38kgNha<sup>-1</sup>yr<sup>-1</sup>) exceed the CL and LCL for this site as reported by APIS for the current mid year 2020<sup>10</sup>.
- 6.2.73 The species recorded during the survey in the area, where the NH<sub>3</sub> and N deposition changes are predicted to be greater than 1%, did not include any that were sensitive to N deposition (as described in paragraphs 4.3.9 to 4.3.11). The survey results indicate that the affected area does not represent any of the qualifying feature habitats of the SAC, and was ash woodland (see Appendix B). The lower critical load of 3kgNha<sup>-1</sup>yr<sup>-1</sup> for coniferous woodland is not applicable in this location and the LCL for broadleaved deciduous woodland 10kgNha<sup>-1</sup>yr<sup>-1</sup> is more appropriate. However, although the predicted changes in N deposition still exceed 1% of the 10kgNha<sup>-1</sup>yr<sup>-1</sup> LCL for this woodland type, no impacts on the qualifying habitats are predicted to occur, as these are more than 250m from the ARN (see paragraphs 3.2.2 to 3.2.3). The other factors that influence this assessment have been considered as set out in Table 6.9.

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<sup>10</sup> APIS Site Relevant Critical Loads and Source Attribution – North Downs Woodlands (UK0030225) site information, Site Detailed Information Location TQ75307 60256



**Plate 6.6 Extent of the changes >1% CL/LCL within the North Downs Woodlands SAC**





**Table 6.9 Consideration of other factors for North Downs Woodlands SAC**

Other factors considered	North Downs Woodland
What conditions is the habitat affected currently exposed to (e.g. existing exceedance of critical load)?	<p>Air Pollution Information System (2019–2021) three year average concentrations.</p> <ul style="list-style-type: none"> <li>• NO<sub>x</sub>: 18.97µgm<sup>-3</sup> critical level (30µgm<sup>-3</sup>) not exceeded</li> <li>• NH<sub>3</sub>: 1.28µgm<sup>-3</sup> critical level (1µgm<sup>-3</sup>) exceeded</li> <li>• N deposition: 25.38kgNha<sup>-1</sup>yr<sup>-1</sup> lower critical load (10kgNha<sup>-1</sup>yr<sup>-1</sup>) exceeded</li> </ul>
What is the area and quality of the habitat affected as a proportion of the qualifying habitat within the European site?	<p>Site is 288.58ha.</p> <p>Extent of qualifying habitat H9130 within the site is 53.1ha and H91J0 is 66.08ha.</p> <p>Approximately 0.03ha within SAC boundary affected by changes &gt;1% (but the area does not represent any of the qualifying features).</p> <p>The survey work indicated that the habitat within the affected area of the SAC was not representative of any of the qualifying features of the SAC.</p> <p>The surveys also showed that areas of habitat in the SAC further away from the road (outside the 200m zone where significant effect are possible, see paragraphs 3.2.2 and 3.2.3) were representative of the qualifying habitats H9130 <i>Asperulo-Fagetum</i> beech forests and H91J0 <i>Taxus baccata</i> woods of the British Isles, but the habitat quality was low, and no nitrogen-sensitive species were recorded.</p>
Will there be any direct loss of habitat or change to the distribution of such habitats?	<p>No direct loss or change in distribution is predicted to occur.</p>
What is the predicted duration of the impact?	<p>Timescale of the impact was predicted to be less than one year.</p>
Are N deposition/NO <sub>x</sub> operational changes predicted below the current baseline deposition levels (e.g. due to technological improvements in vehicle emissions between now and the time the Project is operational)?	<p>The change in NO<sub>x</sub> concentrations did not exceed 1% of the CL; however, the maximum DS and DM predictions do exceed the APIS background but are lower than the modelled base year (see Table 5.10).</p> <p>The minimum and maximum predicted (DS) concentrations of NH<sub>3</sub> are higher than the APIS background but are lower than the modelled base year (see Table 5.11). The critical level (1µgm<sup>-3</sup>) is exceeded for all of the site within 200m of the ARN.</p> <p>The minimum and maximum predicted (DS) N deposition is higher than the APIS background but lower than the modelled base year (see Table 5.12). The lower critical load (10kgNha<sup>-1</sup>yr<sup>-1</sup>) is exceeded for all of the site within 200m of the ARN.</p> <p>The AQ modelling used a conservative estimate when predicting the future changes in background N deposition and assumes no change between the base year (2016) and opening year (2030), i.e. does not consider improvements from technology. With the anticipated improvements in technology regarding vehicle emissions, the predicted concentrations of NO<sub>x</sub> and N deposition with the Project (DS</p>

Other factors considered	North Downs Woodland
	scenario) are in reality likely to be lower than calculated. NH <sub>3</sub> concentrations are dependent on the uptake of electric vehicles, therefore there is likely to be some improvement on the currently predicted DS scenario; however, it is not possible to quantify whether this would result in a lower extent of the site being impacted.
Using professional judgement, taking into account the above factors, will there be a reduction in habitat area that significantly contributes to the favourable conservation status of the European site?	<p>The area of habitat impacted (0.03ha) is extremely small and not representative of the SAC qualifying woodland habitat types. The scale of the changes in N pollutants are small and no habitat reduction or degradation are predicted to occur.</p> <p>The habitat composition of the area affected is not considered likely to change given the lack of nitrogen-sensitive species recorded, no gradient in vegetation composition with distance from the road and the small increases in both concentration and deposition predicted. The timescale of the impact is also very short, less than one year, and this is unlikely to be sufficiently long for changes to be detected (or occur) in the receiving vegetation, particularly as the species considered most sensitive, bryophytes and lichens (Britton &amp; Ross, 2018), were not abundant in the area affected. Caporn <i>et al.</i> (2016) also found that the effects of increases in N deposition are not always detectable in terms of changes in vegetation composition and habitat structure and require long-term exposure to generate change.</p> <p>The predicted changes in NO<sub>x</sub>, NH<sub>3</sub> and N deposition as a result of the Project alone are not considered to result in a reduction in habitat area that would significantly contribute to the favourable conservation status of the European site.</p>

6.2.74 The extent of qualifying habitat potentially affected by changes in NH<sub>3</sub> concentration and N deposition within North Downs Woodlands SAC has been calculated and the proportions in relation to each of these sites shown in Table 6.10.

**Table 6.10 Proportions of qualifying habitat affected in North Downs Woodlands SAC**

<b>Extent of the SAC</b>	Total area of SAC (ha)	288.58
	Proportion of site affected by changes in NH <sub>3</sub> and N deposition of >1% CL/LCL (%) Note: Habitat affected does not represent any qualifying habitat of the SAC	0.01%
<b>Extent of the qualifying habitats</b>	Total area of qualifying habitat within SAC (ha) H9130	53.1
	Total area of qualifying habitat within SAC (ha) H91J0	66.08
	Note: Habitat affected does not represent any qualifying habitat of the SAC Proportion of qualifying habitats affected by changes in NH <sub>3</sub> and N deposition of >1% CL/LCL (%)	0.0%

6.2.75 As set out in Table 6.9 and Table 6.10 the habitat present in the area affected by changes in NH<sub>3</sub> concentration and N deposition is not representative of the qualifying habitats for which the North Downs Woodlands SAC is designated. Table 6.11 provides further analysis of the changes in nitrogen deposition predicted against the baseline conditions and Do Minimum scenarios in relation to the site-relevant lower critical load for the SAC.

**Table 6.11 Comparison of the exceedances of critical loads for North Downs Woodlands SAC with the predicted change as a result of the Project**

		<b>N deposition kg N ha<sup>-1</sup>yr<sup>-1</sup></b>	<b>NH<sub>3</sub> µgm<sup>-3</sup></b>
<b>Baseline conditions (Current APIS background)</b>	Relevant CL/LCL	10	1
	Three-year (2019–2021) average deposition (using location within APIS GIS map tool <sup>11</sup> ) (Current APIS background)	25.38	1.28
	Maximum range of exceedance of critical level/load	15.38	0.28
	Maximum range of exceedance as a percentage of the CL/LCL	154%	28%
<b>Baseline conditions (Base Year)</b>	Maximum total concentration/deposition calculated for the Base Year (2016) <sup>1</sup>	35.23	3.28
	Maximum range of exceedance as a percentage of the CL/LCL (Base Year)	252%	228%
<b>Do Minimum scenario at opening year</b>	Maximum total concentration/deposition at opening year (Do Minimum scenario)	34.40	1.58
	Maximum range of exceedance as a percentage of the CL/LCL (Do Minimum scenario)	244%	58%
<b>Do Something scenario at opening year</b>	Maximum total concentration/deposition at opening year (Do Something scenario)	34.62	1.60
	Maximum change concentration/deposition as a result of the Project (Do Something scenario)	0.22	0.02
	Change in concentration/deposition as a result of the Project (Do Something scenario) as a percentage of the CL/LCL	2.2%	2.0%

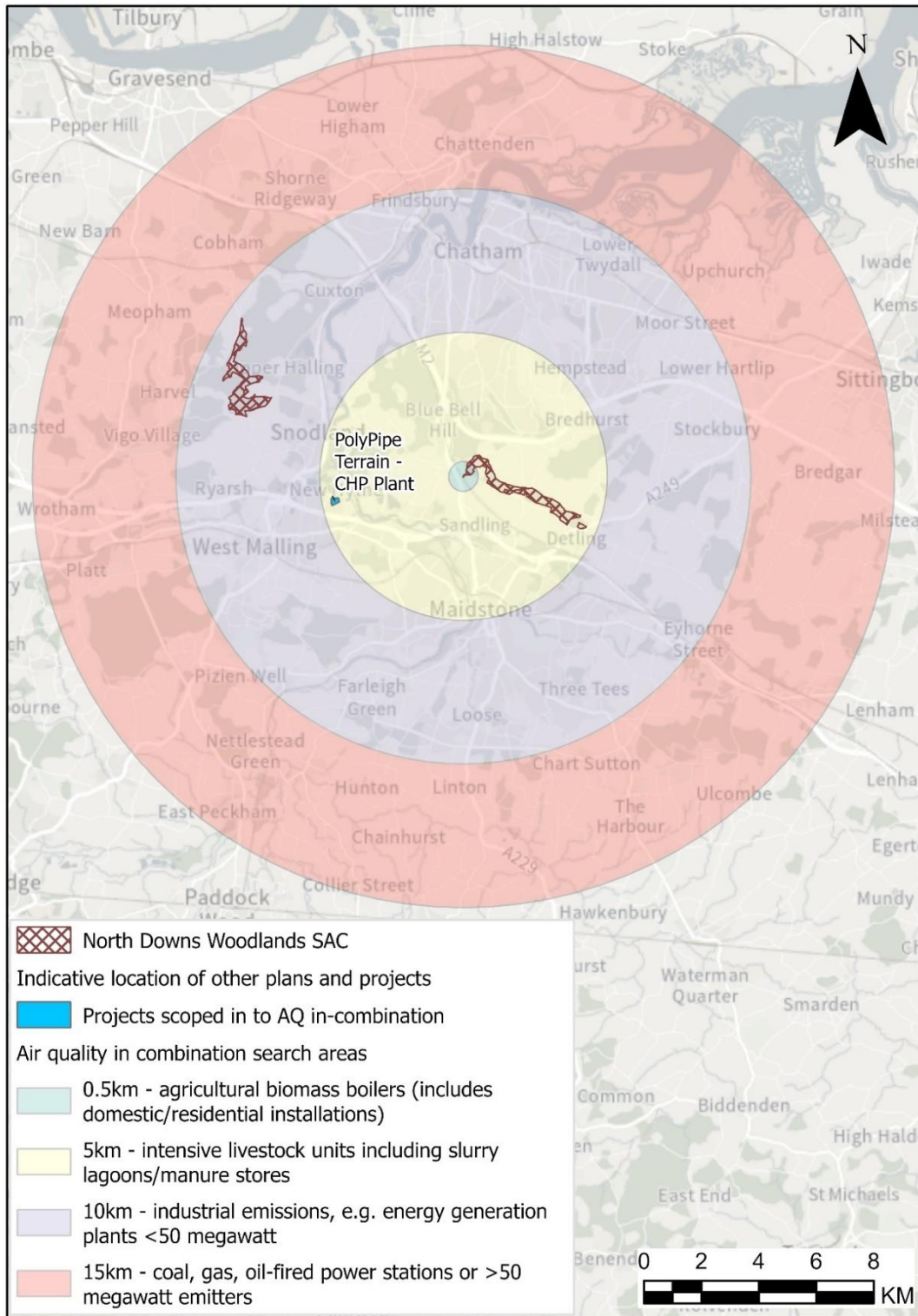
<sup>11</sup> APIS GIS map tool. Location TQ75307 60256. The baseline figures in Table 6.11 are from the ‘grid information tab’ within the ‘results’.

*Effect in-combination*

6.2.76 The projects identified within search areas were reviewed (see Appendix A) and those scoped in to the in-combination assessment for North Downs Woodlands are shown on Plate 6.7 and are as follows:

- a. Polypipe Terrain Combined heat and power (CHP) plant (18/03009/FL) – Located approximately 5km west of North Downs Woodlands SAC in Larkfield, Aylesford. Planning was approved in 2018 and it is assumed that the plant is now in operation but would not have been part of the background within the AQ model. The AQ assessment submitted as part of the planning application included the same part of the SAC (E2) and NO<sub>x</sub> and N deposition were screened out as insignificant. However, they are included as a precaution within this in-combination assessment as a modelled impact was reported. NH<sub>3</sub> was not included in the emissions assessment.

**Plate 6.7 Location of other plans and projects identified for in-combination assessment – North Downs Woodlands SAC**





**Table 6.12 Contribution to N deposition on North Downs Woodlands SAC from the Project in-combination with other plans and projects**

	NOx µgm <sup>-3</sup>	NH <sub>3</sub> µgm <sup>-3</sup>	Nitrogen deposition kg N ha <sup>-1</sup> yr <sup>-1</sup>
CL/LCL of habitat affected by the Project alone	30	1	10
<b>DS scenario</b> – With the Project in combination with other plans and projects that contribute to traffic emissions	21.74	1.6	34.62
<b>DM scenario</b> – Without the Project in combination with other plans and projects that contribute to traffic emissions	21.47	1.58	34.40
<b>Other plans and projects</b>			
Polypipe Terrain CHP Plant (18/03009/FL)	0.01	No effect identified	0.002
<b>Concentration/deposition attributable to other in-combination projects</b>	<b>0.01</b>	<b>-</b>	<b>0.002</b>
<b>Total predicted concentration/deposition (DS scenario and other plans/projects contributions)</b>	<b>21.75</b>	<b>1.6</b>	<b>34.622</b>
<b>Total predicted concentration/deposition (DM scenario and other plans/projects contributions)</b>	<b>21.48</b>	<b>1.58</b>	<b>34.402</b>
<b>Change DS-DM in-combination (% of CL/LCL)</b>	<b>0.27 (0.90%)</b>	<b>0.02 (2.0%)</b>	<b>0.22 (2.2%)</b>

6.2.77 Table 6.12 shows that the other plans and projects did not identify any changes in NH<sub>3</sub>, therefore the effect of these pollutants in combination is the same as the Project alone. Table 6.12 shows that the effect in combination is almost the same as the Project alone as the other project identified had an extremely small contribution to both the NOx and N deposition. The duration of effect from the Project alone is considered very short term at one year. Therefore, the length of time the Project could act in-combination with other plans and projects is also limited to one year and will not be sufficiently long for changes to be detected (or occur) in the receiving vegetation, particularly as the area affected was not representative of the SAC qualifying habitats. Therefore, as discussed in Table 6.9, the favourable conservation status of the qualifying habitat would not be significantly affected by the Project alone or in-combination with other plans and projects.

### Assessment of effect on integrity

6.2.78 The conservation objectives for the North Downs Woodlands include attributes and targets relating to air quality and the assessment of effect on the integrity of the sites is judged on the basis of whether the Project would undermine these targets being achieved. The Project has the potential to result in a reduction in habitat area which could affect the following conservation objectives:

- a. The supporting processes on which the qualifying natural habitats rely



- b. The extent and distribution of the qualifying natural habitats
  - c. The structure and function (including typical species) of the qualifying natural habitats
- 6.2.79 The supplementary advice for North Downs Woodlands SAC (Natural England, 2019b) included an air quality attribute and related targets for both qualifying habitats (H9130 and H91J0) and both have a restore target for the concentrations and deposition of air pollutants, to below or equal to the site-relevant critical load.
- 6.2.80 The predicted N deposition with the Project in place is slightly higher than the Do Minimum scenario, but both scenarios predict N deposition equal to or less than the baseline, due to predicted improvements in vehicle emissions.
- 6.2.81 The site-relevant critical loads are currently exceeded by over 150% and the contribution of the Project to the N deposition on the site, alone and in combination, would be small (<2.5%). Although the Project would result in a slightly higher N deposition than would occur in the Do Minimum scenario, this would occur only within a very small proportion of the site (0.03ha (0.01%)) and the affected habitats do not represent any of the qualifying habitats of the SAC. Progress to achieving the 'restore' target is affected by a variety of factors and vehicle emissions are only part of the source of the site-relevant pollutants. The Project would contribute a very small proportion in the context of the very substantial decreases in N deposition that would be required to meet this target and would affect the qualifying features of the SAC. Achievement of the restore target would require many years of sustained significant reductions in pollution that would likely require new national policy and wholesale behavioural changes.
- 6.2.82 The improvement in vehicle emissions and the potential for habitats to improve in quality are discussed in paragraphs 4.4.1 to 4.4.5 It is considered that the effect the Project would have on air quality at this location is not material compared to the very substantial reductions (see Table 6.11) that would have to be achieved through changes such as improvements in vehicle emissions to bring the N deposition below site-relevant critical loads.
- 6.2.83 There are no pathways to an effect identified in terms of the extent or distribution of the qualifying habitats, the vegetation structure within them, or their function as woodland. The qualifying habitats were not present within the area affected by the changes in N deposition, therefore would not change in extent and distribution, or structure and function as a result of the Project.
- 6.2.84 The assessment has considered the effects of the Project alone and in combination as a result of a reduction/degradation in habitat and concluded that there would be no adverse effect on the integrity of the North Downs Woodlands SAC in view of its conservation objectives.

## 6.3 Conclusion of Stage 2 appropriate assessment

- 6.3.1 This assessment has been completed using the methodological approaches advised by Natural England in their Deadline 5 submission [[REP5-109](#)].

- 6.3.2 The assessment concludes, beyond reasonable scientific doubt, that the Project will not adversely affect the integrity of the:
- a. Thames Estuary and Marshes Ramsar site during its construction phase, either alone or in combination with other plans or projects
  - b. North Downs Woodlands SAC during its operational phase, either alone or in combination with other plans or projects
  - c. Epping Forest SAC during its operational phase, either alone or in combination with other plans or projects

## 7 Stage 3 derogation

- 7.1.1 The Applicant has concluded there would be no adverse effects on the integrity of any European site as a result of changes in air quality, and accordingly there is no requirement for consideration of derogation at Stage 3. Natural England does not agree with the conclusion of the Stage 2 appropriate assessment in respect of Epping Forest SAC only.
- 7.1.2 In the event that the competent authority does not agree with the conclusions of this assessment, there would in any event be no need to employ Stage 3 derogation of the HRA process as a mitigation measure has been assessed on a 'without prejudice' basis, shown to be feasible and would reduce the impact to below screening thresholds (see Annex C.7 of the Natural England SoCG [[REP7-106](#)]). Further, Natural England has agreed that the mitigation measure would be appropriate and, if required to be implemented by the competent authority, would avoid any adverse effects on the integrity of Epping Forest SAC, thereby enabling the competent authority to complete the HRA process at Stage 2.

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## Appendix A Other (non traffic) Plans and Projects identified for the in-combination assessment

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
National Infrastructure Planning – London	Energy	Riverside Energy Park	Thamesmead, Bexley (LB)	DCO granted 14 Apr 2020 Non material change granted 28 Feb 2023	REP will have potential implications for local air quality principally from the flue gases emitted through the combustion processes from the Energy Recovery Facility (ERF) and Anaerobic Digestion facility.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone.	<a href="https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010093/EN010093-000247-6.3%20ES%20Technical%20Appendices%20C.2%20Stack%20Modelling.pdf">https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010093/EN010093-000247-6.3%20ES%20Technical%20Appendices%20C.2%20Stack%20Modelling.pdf</a>
National Infrastructure Planning – London	Power	North London Heat and Power Project	Edmonton, Enfield (LB)	DCO granted 24 Feb 2017 2023 – under construction	Development of an Energy Recovery Facility generating electricity using residual waste as a fuel and capable of an intended electrical output of around 70MW. The ERF will also be capable of producing low carbon heat.	Yes	Epping Forest SAC	Within 15km of Epping Forest SAC. Assume operation of project coincides with Lower Thames Crossing operation. Note that the application does not affect the same part of Epping Forest as the Project but has been included on a precautionary basis. NOx and NH <sub>3</sub> not included in the AQ model so assume not emitted therefore no impact predicted.	<a href="https://northlondonheatandpower.london/media/1kuo31/ad05-17_no_significant_effects_report-update.pdf">https://northlondonheatandpower.london/media/1kuo31/ad05-17_no_significant_effects_report-update.pdf</a>
National Infrastructure Planning – South East	Power	Kemsley Paper Mill (K4) CHP Plant	Kemsley, Sittingbourne, Swale District	DCO granted 05 Jul 2019 2023 – Operational	A Combined Heat and Power Plant comprising a gas turbine (52MW), Waste Heat Recovery Boilers (105MWth steam) and Steam Turbine (16MW).	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone.	<a href="https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010090/EN010090-000212-3.1%20-%20Appendix%205.4%20-%20Air%20Quality%20Assessment%20of%20Ecological%20Impacts.pdf">https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010090/EN010090-000212-3.1%20-%20Appendix%205.4%20-%20Air%20Quality%20Assessment%20of%20Ecological%20Impacts.pdf</a>
National Infrastructure Planning – South East	Energy Power	Wheelabrator Kemsley Generating Station (K3)	Kemsley, Sittingbourne, Swale District	DCO granted 19 Feb 2021	A Nationally Significant Infrastructure Project comprising a power upgrade and increase in tonnage throughput to the existing Kemsley Generating Station (K3) to allow for generation of up to 75MW.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone.	<a href="https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010083/EN010083-000400-EN010083%20-%20202019%20ES%20Appendix%2011.2%20-%20Habitats%20Regulations%20Assessment.pdf">https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010083/EN010083-000400-EN010083%20-%20202019%20ES%20Appendix%2011.2%20-%20Habitats%20Regulations%20Assessment.pdf</a>
National Infrastructure Planning – South East	Other AQ emissions – shipping	Tilbury2	Tilbury, Thurrock	Construction completed 2020	A new port terminal on the site of the demolished Tilbury Power Station. Construction was completed in 2020 and it is now operational. The background emissions for the Project model are 2017–2019 so Tilbury2 was not included and therefore is assessed	Yes	Thames Estuary and Marshes Ramsar	Within 15km of Thames Estuary and Marshes Ramsar. Operation not in baseline, therefore included as overlaps Lower Thames Crossing construction.	<a href="https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/TR030003/TR030003-000242-ES%20Appendix%2010.O">https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/TR030003/TR030003-000242-ES%20Appendix%2010.O</a>

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
					as part of the in-combination assessment as it will generate emissions from shipping which were considered as part of the Tilbury2 DCO application.			NH <sub>3</sub> not included in the model; assume not emitted therefore no impact predicted.	<a href="#">%20Habitat%20Regulations%20Assessment%20(HRA)%20Report.pdf</a>
National Infrastructure Planning – South East	Energy Power	Thurrock Flexible Generation Plant	Tilbury, Thurrock	DCO application was granted in February 2022	The development comprises a gas-fired electricity generating station and a battery storage facility on land to the north of Tilbury substation.	Yes	Thames Estuary and Marshes Ramsar	Within 15km of Thames Estuary and Marshes Ramsar. Assume operation could overlap Lower Thames Crossing construction.	
National Infrastructure Planning – South East	Other AQ emissions – Plane	Manston Airport	Ramsgate, Kent	DCO non material change granted 27 Sept 2023	Plans to reopen and develop Manston Airport into a dedicated air freight facility able to handle at least 10,000 air cargo movements per year whilst also offering passenger, executive travel, and aircraft engineering services.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone.	
National Infrastructure Planning – South East	Other AQ emissions	Cory Decarbonisation Project	Belvedere, Bexley (LB)	Application expected Q1 2024	Construction and operation of carbon capture plant, storage and marine export terminal.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone.	
Thurrock	Generation	19/01534/FUL Thurrock gas-fired electricity generation facility	Stanford-le-Hope, Essex	Planning approved Assume operational at same time as Project construction	The installation of gas engine generators, a gas house, DNO building for transformers and associated vehicular access roads for a gas-fired electricity generation facility with associated infrastructures and fencing around the compound.	Yes	Thames Estuary and Marshes Ramsar	Within 15km of Thames Estuary and Marshes Ramsar. Included in combination; however, NH <sub>3</sub> not included in the AQ model so assume not emitted therefore no impact predicted.	<a href="https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=PZ44BQQG GZB00">https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=PZ44BQQG GZB00</a>
Thurrock	Power	20/00360/FUL STOR 'Peaking' Power Plant	Purfleet, Essex	Application Approved May 2020 20–30 year operational lifespan Operation start not specified	Change of use of an existing building to house eight No. 2.5MWe engines and associated plant. A 20MW embedded Short Term Operating Reserve (STOR) generating facility (Sui Generis) together with internal and external alterations to the existing units with the erection of two 18m chimney stacks, auxiliary equipment including DNO, reactors, exhaust pipework, 8 coolers, gas kiosk, louvres, car parking, 3m high fencing and associated works (resubmission of 18/01231/FUL).	No	N/A	Within 15km of Thames Estuary and Marshes Ramsar but not within 10km. Operation potentially overlapping Project construction period. STOR application did not model AQ impact at Thames Estuary and Marshes Ramsar, modelled West Thurrock Lagoon and Marshes SSSI 10km north west of the Ramsar, therefore assume no impacts predicted to occur.	<a href="https://regs.thurrock.gov.uk/online-applications/files/70D64CE3E543E575A2394760B25CD216/pdf/20_00360_FUL-AIR_QUALITY_ASSESSMENT-571491.pdf">https://regs.thurrock.gov.uk/online-applications/files/70D64CE3E543E575A2394760B25CD216/pdf/20_00360_FUL-AIR_QUALITY_ASSESSMENT-571491.pdf</a>
Thurrock Section 36C Application	Power Energy Biomass	08/00175/ELE C (as varied) – Tilbury Green Power	Tilbury Docks	Permitted and Operational Jan 2019	A renewable biomass power plant 40MWe, fired on waste wood.	Yes	Thames Estuary and Marshes Ramsar	Within 15km of Thames Estuary and Marshes. Operational but not included in the background.	<a href="https://www.tilburyerf.com/documents/ApplicationDocuments/SEIR/TGP%20Phase%20%20S36%20Air%20QA_RevC%202018.pdf">https://www.tilburyerf.com/documents/ApplicationDocuments/SEIR/TGP%20Phase%20%20S36%20Air%20QA_RevC%202018.pdf</a> <a href="https://environment.data.gov.uk/public-register/api/search?name-number-search=Tilbury+Green+Power">https://environment.data.gov.uk/public-register/api/search?name-number-search=Tilbury+Green+Power</a>

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
Thurrock Section 36C Application	Power Energy Biomass	22/00048/ELE C Tilbury Green Power Phase 2	Tilbury Docks	Application for a variation of existing S36 consent to increase generating capacity – not yet registered with Thurrock	It is proposed that Phase 2 will be fired on Refuse Derived Fuel (RDF), Commercial and Industrial (C&I) waste and Municipal Solid Waste (MSW). The proposal for Phase 2 will increase the generating capacity of this unit from 20MWe to 40MWe, increasing the overall electrical capacity of the Plant to 88MW	Yes	Thames Estuary and Marshes Ramsar	Within 15km of Thames Estuary and Marshes Ramsar Phase 2 application in progress but potential to be operational and overlap the construction period Site planning history <a href="https://www.tilburyerf.com/documents/ApplicationDocuments/2022/Planning%20Ctee%20Report%2007.04.22.pdf">https://www.tilburyerf.com/documents/ApplicationDocuments/2022/Planning%20Ctee%20Report%2007.04.22.pdf</a>	<a href="https://www.tilburyerf.com/documents/SEIR/TGP%20Phase%20%20S36%20Air%20QA_RevC%202018.pdf">https://www.tilburyerf.com/documents/SEIR/TGP%20Phase%20%20S36%20Air%20QA_RevC%202018.pdf</a>
Thurrock	Power	20/01532/SCO – Thames Bio Power Thames Enterprise Park	Coryton Essex	20/01532/SCO – request for EIA scoping opinion	Proposed development of an Energy Recovery Facility for generating electricity for up to 29MW and exporting 25MW of electricity along with associated infrastructure including the erection of an 80m high chimney stack. The proposal would be sited on the northern half of Plot D from the Development Plots Parameter Plan to the outline planning application ref 18/01404/OUT for the Thames Enterprise Park.	No	N/A	Within 15km but not within 10km of Thames Estuary and Marshes Ramsar EIA Scoping Stage – No information yet available on emissions and Ramsar on north side of the River Thames is considered a receptor. There is a risk that the operation will coincide with construction impacts of Lower Thames Crossing, however it is not the same part of the Ramsar site and therefore not considered an in-combination risk.	<a href="https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=QJDPN3QG0TK00&amp;activeTab=summary">https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=QJDPN3QG0TK00&amp;activeTab=summary</a>
Thurrock	Energy	18/01404/OUT Thames Enterprise Park	Coryton Essex	Outline permission	Outline planning permission with all matters (except for access) reserved for the demolition, phased remediation and redevelopment of 167 hectares of former Coryton Oil Refinery to provide up to 345,500 sq. m of commercial development including Manufacturing; Storage, Distribution & Logistics (Use Class B2/B8); Energy & Waste related facilities (Use Class Sui Generis); A Central Hub incorporating a range of active uses (Research & Development, leisure, education, hotel and conferencing facilities) (Use Classes B1(b), D1, D2, C1) and ancillary retail/leisure/community facilities (Use Classes A3, D2 & Sui Generis), as well as additional land set aside for a Rail Freight Terminal; Up to 20 Hectares of Open Storage (Use Class B8); <b>Energy Centre</b> ; Lorry Parking Facilities; structural landscaping; car parking, new road and access facilities; vehicular, pedestrian and cycle crossing over Shellhaven Creek; pedestrian crossing facilities to existing and proposed estate roads; retention	Yes See 20/01532/SCO above	N/A	Within 15km of Thames Estuary and Marshes Ramsar See 20/01532/SCO above	See 20/01532/SCO above



Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
					of existing jetties; and associated infrastructure works.				
Thurrock	Generation	21/02122/FUL – 11MW gas fires stand-by electricity generation plant	Coryton Essex	Planning approved Assume operational after base year	Construction and operation of a 11MW gas-fired, stand-by electricity generation plant with battery storage and ancillary development (resubmission of 18/00513/OUT / 21/00128/REM)	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites at risk.	<a href="https://regs.thurrock.gov.uk/online-applications/files/37D134E0FDE9D00F6D1F8A01572B3ADF/pdf/21_02122_FUL-APPENDIX_C_AIR_QUALITY_ASSESSMENT-764997.pdf">https://regs.thurrock.gov.uk/online-applications/files/37D134E0FDE9D00F6D1F8A01572B3ADF/pdf/21_02122_FUL-APPENDIX_C_AIR_QUALITY_ASSESSMENT-764997.pdf</a>
Thurrock	Generation	18/01502/FUL – Flexible Energy Generator	Bulphan Essex	Planning approved Assume operational after base year	Installation of three gas fuelled generators (2.5MW each), a DNO building, HV building, transformers, gas kiosk, client building, CCTV cameras, waste oil tank, clean oil tank, access track and associated infrastructure for the generation of electricity. Adjacent to 18/00889/NMA.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites significantly affected.	<a href="https://regs.thurrock.gov.uk/online-applications/files/96572D80C65123A4C96FD77CF9845447/pdf/18_01502_FUL-ENVIRONMENTAL_REPORT_2-395760.pdf">https://regs.thurrock.gov.uk/online-applications/files/96572D80C65123A4C96FD77CF9845447/pdf/18_01502_FUL-ENVIRONMENTAL_REPORT_2-395760.pdf</a>
Thurrock	Generation	18/00889/NMA – 22MW STOR Facility	Bulphan Essex	Planning approved Assume operational after base year	Application for a proposed non-material amendment to amend the layout of planning permission ref. 17/01540/FUL (Provision of back-up standby electricity generation and balancing facility, comprising gas utilisation engines (total capacity of 22MW), 2MW battery-based electricity storage units, acoustic fencing and gates, substation, transformers, control cabinet, LV switch room, CCTV, welfare and storage containers, landscaping and ancillary infrastructure). Adjacent to 18/01502/FUL	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites significantly affected. However, the Thames Estuary and Marshes Ramsar site (north of the Thames) is assessed but it is not the same SSSI unit or habitat type therefore would not act in combination with the Project.	<a href="https://regs.thurrock.gov.uk/online-applications/files/17676CE86B8D20BFBBF419E520A3CFBF/pdf/17_01540_FUL-AIR_QUALITY_ASSESSMENT-332182.pdf">https://regs.thurrock.gov.uk/online-applications/files/17676CE86B8D20BFBBF419E520A3CFBF/pdf/17_01540_FUL-AIR_QUALITY_ASSESSMENT-332182.pdf</a>
Thurrock	Incinerator	21/01834/SCR Certas Energy UK	West Thurrock Essex	EIA screening application EIA not required	Proposed Tank Container Wash Facility to include Tank Wash, Steaming Pods, RDF Incinerator, Chemical Waste Transfer Station and Associated Development: Land off Watson Close, Oliver Road, West Thurrock, Essex, RM20 3EF	No	N/A	Within 15km of Thames Estuary and Marshes Ramsar No EIA required in application therefore assume emissions to air not significant	<a href="https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=R1IZXVQG0RJ00">https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=R1IZXVQG0RJ00</a>
Thurrock	Biomass	20/00569/FUL CHEP UK	Stifford Road South Ockendon	Planning application	Installation of a heat treatment kiln and biomass boiler	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone	<a href="https://regs.thurrock.gov.uk/online-applications/files/03121C56BBE1CA70D975FEC8E79508E1/pdf/20_00569_FUL-AIR_QUALITY_ASSESSMENT-622865.pdf">https://regs.thurrock.gov.uk/online-applications/files/03121C56BBE1CA70D975FEC8E79508E1/pdf/20_00569_FUL-AIR_QUALITY_ASSESSMENT-622865.pdf</a>
Thurrock	Livestock	20/00455/FUL – Livestock shed	Horndon On The Hill Stanford Le Hope	Planning approved Assume operational after base year	Construction of agricultural building for livestock (2)	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone No AQ or odour assessment required by EHO therefore assume no risk of significant effects	<a href="https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q8VQDBQG0UF00">https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q8VQDBQG0UF00</a>



Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
Thurrock	Livestock	20/00390/FIUL Livestock shed	Horndon On The Hill Stanford Le Hope	Planning approved Assume operational after base year	Construction of agricultural building for livestock (1)	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone No AQ or odour assessment required by EHO therefore assume no risk of significant effects	<a href="https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=Q7SSDNQG0QN00&amp;activeTab=summary">https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=Q7SSDNQG0QN00&amp;activeTab=summary</a>
Thurrock	Cattle	19/01277/PNA F – Cattle shed	Corringham Essex	Planning approved Assume operational after base year	Open sided building for housing of cattle and storage of machinery	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=PWJ1JCQG0RJ00&amp;activeTab=summary">https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=PWJ1JCQG0RJ00&amp;activeTab=summary</a>
Thurrock	Poultry Pig Slurry Manure	No relevant results returned							
Gravesham	Livestock Cattle Poultry Pig Slurry	No relevant results returned							
Gravesham	Manure	20200255 – Shire Hore Breeding Facility	Meopham Gravesend	Planning approved Assume operational after base year	Erection of a new hay barn and erection of a barn (to include separate stallion box, 5 shire horse pens, classroom, museum area and toilets), continue the equestrian use of an existing barn (for 5 Shire Horse pens and wash down area) associated with the use of the site as a Shire Horse Breeding Facility.	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://plan.gravesham.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q6PKURHPJ6300">https://plan.gravesham.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q6PKURHPJ6300</a>
Gravesham	Power	20180768 – FlexGen Facility	Gravesend	Planning approved 2018 2023 – aerial imagery review indicates not constructed	The FlexGen Facility comprises nine (9) MTU 16V4000 GS natural gas-fired engine power generation units, with one on permanent standby, with a combined output of ~16MWe. The facility will operate for up to ~3,000 hours per year, to supply electricity to the national grid during periods of peak demand.	Yes	Thames Estuary and Marshes Ramsar	Within 5km of Thames Estuary and Marshes Operation unlikely to coincide with construction of Lower Thames Crossing (2025-2030), even with 2 year delay as facility still not constructed five years after planning granted. But included as a precautionary measure NH3 not included AQ assessment therefore assume not emitted therefore no impact predicted. AQ assessment for application did not include Ndep impacts or the Ramsar as a receptor.	<a href="https://docs.gravesham.gov.uk/PublicAccess_Live/Document/ViewDocument?id=B6DF7BE18E7911E88C20180373E3D8C8">https://docs.gravesham.gov.uk/PublicAccess_Live/Document/ViewDocument?id=B6DF7BE18E7911E88C20180373E3D8C8</a>
Gravesham	Energy Generation Incinerator Biomass	No relevant results							
Maidstone Swale	Livestock	23/501050/FULL – Livestock housing	Ash Tree Farm Woodcock Lane	Planning approved Assume operational after base year	Erection of 2no. mixed-agricultural buildings, for housing of livestock and	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDe">https://pa.midkent.gov.uk/online-applications/applicationDe</a>

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
			Boughton Malherbe Kent		storage of hay and machinery on a seasonal rotation (retrospective).				<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=RQSRYGTYIDT00">tails.do?activeTab=documents&amp;keyVal=RQSRYGTYIDT00</a>
Maidstone Swale	Livestock	22/501079/FULL – Livestock housing	Cripps Farm Plough Road Minster-on-sea Sheerness Kent	Planning approved Assume operational after base year	Part retrospective application for the erection of an agricultural barn for storage of machinery, hay and livestock	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?keyVal=R83YJRTYLIA00&amp;activeTab=summary">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?keyVal=R83YJRTYLIA00&amp;activeTab=summary</a>
Maidstone Swale	Livestock	20/500057/FULL – Livestock buildings	Wheatsheaf Farm Hazel Street Stockbury Sittingbourne Kent	Planning approved Assume operational after base year	Erection of 2no. livestock buildings with associated yard and creation of new access track with gates and alterations to field levels.	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?keyVal=Q3S338TYIQQ00&amp;activeTab=summary">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?keyVal=Q3S338TYIQQ00&amp;activeTab=summary</a>
Maidstone Swale	Livestock	19/506388/FULL – Livestock buildings	Land At Water Lane Thurnham Kent	Planning approved Assume operational after base year	Erection of a new livestock yard comprising 2no. new livestock buildings and 1no. hay/straw store, new vehicular access and alterations to ground levels	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q2TJ1ZTYJTN00">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q2TJ1ZTYJTN00</a>
Maidstone Swale	Livestock	18/502021/FULL – Livestock housing	Touchwood Farm Love Lane Maidstone Headcorn	Planning approved Assume operational after base year	Change of use of land for the keeping of animals (namely sheep, llamas and alpacas) and erection of agricultural building for housing of livestock and storage of associated machinery/equipment and hay.	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=P79TMFTYLOQ00">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=P79TMFTYLOQ00</a>
Maidstone Swale	Cattle	22/501792/FULL – Livestock yards	Old Rides Farm Leysdown Road Eastchurch Sheerness	Planning approved Assume operational after base year	Erection of 2 No. roofs over existing external cattle yards.	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?keyVal=R9VGOITYK8S00&amp;activeTab=summary">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?keyVal=R9VGOITYK8S00&amp;activeTab=summary</a>
Maidstone Swale	Poultry Pig Slurry Manure	No relevant results returned							
Maidstone Swale	Power	19/503777/FULL – CHP unit	Marley Plumbing And Drainage Ltd Dickley Lane Lenham Maidstone Kent	Planning approved Assume operational after base year	Installation of a containerised Combined Heat and Power (CHP) unit and associated equipment. CHP powered by natural gas.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=PV5D0MTYH9F00">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=PV5D0MTYH9F00</a>
Maidstone Swale	Power	18/500393/FULL – Sittingbourne Standing Reserve Power Plant	Plot N2c Castle Road Eurolink Sittingbourne Kent	Planning approved Assume operational after base year	Erection of a natural gas fuelled reserve power plant with a maximum export capacity of up to 12MW.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=P2T3WJTYGYH00">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=P2T3WJTYGYH00</a>
Maidstone Swale	Energy	18/501965/FULL – Energy Centre	Henry Blair Building Liphook Way 20/20 Business Park Allington Maidstone Kent ME16 0LQ	Planning approved Assume operational after base year	Installation of a new single storey energy centre building. Includes a combined heat and power plant.	No	N/A	Within 5km of North Downs Woodlands SAC. Energy centre application included no AQ assessment but short statement that no detailed AQ model required, emissions confined to CO and SO2. Therefore assume	<a href="https://pa.midkent.gov.uk/online-applications/files/D805C95C94D6FAC5381C485E4CF1AC3F/pdf/18_501965_FULL-Air_Quality_Impact_Assessment">https://pa.midkent.gov.uk/online-applications/files/D805C95C94D6FAC5381C485E4CF1AC3F/pdf/18_501965_FULL-Air_Quality_Impact_Assessment</a>

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
								that no contribution of NOx or NH3 emissions.	<a href="#">ssment_Output-4309568.pdf</a>
Maidstone Swale	Incinerator Generation	No relevant results							
Maidstone Swale	Biomass	19/506071/FULL – biomass boiler	Torry Hill Farm Torry Hill Frinted Sittingbourne Kent	Planning approved Assume operational after base year	Installation of a biomass boiler (240 kilowatt) and flue (retrospective).	No	N/A	Not within 500m or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=Q1Y4BMTYH2C00">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=Q1Y4BMTYH2C00</a>
Maidstone Swale	Biomass	19/505668/FULL – residential biomass boiler	2 Derbies Court Cottages Stalisfield Road Stalisfield Faversham Kent	Planning approved Assume operational after base year	Part retrospective change of use of land from agricultural to residential garden. Erection of new cart lodge style garage with biomass boiler.	No	N/A	Not within 500m or relevant IRZ of any European site affected by the Project alone	<a href="https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q0WPTITYLEI00">https://pa.midkent.gov.uk/online-applications/applicationDetails.do?activeTab=map&amp;keyVal=Q0WPTITYLEI00</a>
Medway	Livestock	MC/21/3233 – Livestock building	West Court Farm Salt Lane Cliffe Rochester Medway	Planning approved Assume operational after base year	Prior Notification under Schedule 2 Part 6 Class A of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended) for the construction of a livestock building	No	N/A	Within 5km of Thames Estuary and Marshes. No information provided in application regarding numbers/types of livestock. Therefore assume no significant AQ impacts predicted and no possible risk of contribution to in combination effect.	<a href="https://publicaccess1.medway.gov.uk/online-applications/applicationDetails.do?keyVal=R23VHZKNMMZ00&amp;activeTab=summary">https://publicaccess1.medway.gov.uk/online-applications/applicationDetails.do?keyVal=R23VHZKNMMZ00&amp;activeTab=summary</a>
Medway	Livestock	MC/21/1865 – Livestock buildings	Rye Street Farm Rye Street Cliffe Rochester Medway	Planning application EIA not required. Assume operational after base year	Town and Country Planning Act (Environmental Impact Assessment) (England and Wales) Regulations 2017 (as amended) – request for a screening opinion for the erection of two livestock buildings providing a cumulative floorspace of approximately 3,904m <sup>2</sup>	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone No information provided in application re numbers/types of livestock and EIA not required. Therefore assume no significant AQ impacts predicted and no possible risk of contribution to in combination effect.	<a href="https://publicaccess1.medway.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=QV5E74KN03700">https://publicaccess1.medway.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=QV5E74KN03700</a>
Medway	Cattle	MC/22/0755 – Cattle shed	Rye Street Farm Rye Street Cliffe Rochester Medway	Planning approved Assume operational after base year	Construction of an open-sided cattle shed on concrete base and 3m access	No	N/A	Not within 5km or relevant IRZ of any European site affected by the Project alone No information provided in application re numbers/types of livestock and EIA not required. Therefore assume no significant AQ impacts predicted and no possible risk of contribution to in combination effect	<a href="https://publicaccess1.medway.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=R97FDFKNMCE00">https://publicaccess1.medway.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=R97FDFKNMCE00</a>
Medway	Poultry Pig Slurry Manure	No relevant results returned							
Medway	Power	MC/22/0685 (MC/19/2870) – Gas fired electricity	National Grid Grain Lng Terminal Grain Road Isle Of Grain	Planning approved Assume operational after base year	Proposed gas fired electricity generating facility with the ability to generate up to 49.99 MW of electricity.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://publicaccess1.medway.gov.uk/online-applications/files/6DAF2A4824BFBECE54ABF174B0226EA8/pdf/MC_22_068">https://publicaccess1.medway.gov.uk/online-applications/files/6DAF2A4824BFBECE54ABF174B0226EA8/pdf/MC_22_068</a>

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
		generating facility							<a href="#">5-AIR QUALITY ASSESSMENT-5989286.pdf</a>
Medway	Power	MC/19/2441 – Isle of Grain, Medway (South) MC/19/2444 – Isle of Grain, Medway (North)	National Grid – Grain Road Isle Of Grain Rochester Kent	Planning application EIA not required. Assume operational after base year	Proposed gas fired electricity generating facility to generate electricity during peak periods of demand	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://publicaccess1.medway.gov.uk/online-applications/files/ED61E4FCEEA004B79D5ED45C044528B7/pdf/MC_19_2444-AIR_QUALITY_ASSESSMENT-5446458.pdf">https://publicaccess1.medway.gov.uk/online-applications/files/ED61E4FCEEA004B79D5ED45C044528B7/pdf/MC_19_2444-AIR_QUALITY_ASSESSMENT-5446458.pdf</a>
Medway	Power Generation	MC/20/3245 – STOR 'Peaking' Power Plant	Medway City Estate Rochester	Planning approved Assume operational after base year	Variation of conditions 2 and 3 on planning permission MC/17/2301 to allow a minor material amendment for the construction and operation of gas-powered generators inside existing building for the provision of flexible energy generation and reduce the maximum annual operating hours to 2000 from 3000. The facility will generate a combined total of 20 MWe of electricity to feed into the National Grid	No	N/A	Within 10km of Thames Estuary and Marshes Ramsar Within 10km of North Downs Woodlands SAC Application AQ assessment does not consider either European site as being affected and limits AQ assessment to within 2km of STOR facility. The contributions at that distance stated as negligible therefore assume that there is no possible risk of contribution to in combination effect with Lower Thames Crossing project.	<a href="https://publicaccess1.medway.gov.uk/online-applications/files/FB3ABDC1558CF3609951A4DE9E9B80A7/pdf/MC_20_3245-AIR_QUALITY_ASSESSMENT-5720649.pdf">https://publicaccess1.medway.gov.uk/online-applications/files/FB3ABDC1558CF3609951A4DE9E9B80A7/pdf/MC_20_3245-AIR_QUALITY_ASSESSMENT-5720649.pdf</a>
Medway	Energy	MC/21/0979 – includes EfW Plant	Hoo St Werburgh Rochester Medway	Planning approved Assume operational after base year	Outline planning application with all matters reserved except access (to be taken from Eschol Road) for the construction of flexible EG (iii)/B2/B8 use class buildings, sui generis uses for energy uses and a lorry park, together with servicing, parking, landscaping, drainage, remediation, demolition and earthworks AQ assessment includes modelling effects of a proposed Energy from Waste (EfW) Plant on European sites within 10km.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application documents include an assessment of AQ effects on a different part of the Thames Estuary and Marshes SPA/Ramsar site and concluded no effect pathways.	<a href="https://publicaccess1.medway.gov.uk/online-applications/files/3786914078345F2312E2CF86C026D7ED/pdf/MC_21_0979-AIR_QUALITY-5889119.pdf">https://publicaccess1.medway.gov.uk/online-applications/files/3786914078345F2312E2CF86C026D7ED/pdf/MC_21_0979-AIR_QUALITY-5889119.pdf</a>
Medway	Generation	MC/20/1047 – 5 gas fuelled flexible electricity generation	Isle Of Grain Medway	Planning approved Assume operational after base year	Installation of up to five gas fuelled generators with radiator arrays, a DNO building, HV building, transformers, gas kiosk, amenity/welfare cabins, CCTV cameras on 4m posts, access track and associated infrastructure for flexible fast response electricity generation to support the local and national electricity network.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application documents include an assessment of AQ effects on a different part of the Thames Estuary and Marshes SPA/Ramsar site and concluded no significant effects.	<a href="https://publicaccess1.medway.gov.uk/online-applications/files/854B926300260D96BC07819802C57FC7/pdf/MC_20_1047-APPENDIX_2_AIR_QUALITY_ASSESSMENT-5565571.pdf">https://publicaccess1.medway.gov.uk/online-applications/files/854B926300260D96BC07819802C57FC7/pdf/MC_20_1047-APPENDIX_2_AIR_QUALITY_ASSESSMENT-5565571.pdf</a>
Medway	Incinerator Biomass	No relevant results returned							



Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
Tonbridge and Malling District	Livestock Cattle Poultry Pig Slurry Manure	No relevant results returned							
Tonbridge and Malling District	Power	18/03009/FL – CHP Plant	PolyPipe Terrain College Road Larkfield Aylesford Kent	Planning approved Assume operational after base year	Install (CHP) combined heat and power plant	Yes	North Downs Woodlands SAC	Within 10km of North Downs Woodlands SAC AQ assessment includes same part of NDW SAC (E2) and NOx and Ndep were screened out as insignificant. However, included as a precaution within in combination assessment as a modelled impact was reported. NH3 was not included in emissions assessment.	<a href="https://planningapi.agileapplications.co.uk/api/application/document/TMBC/375822">https://planningapi.agileapplications.co.uk/api/application/document/TMBC/375822</a>
Tonbridge and Malling District	Energy Generation Incinerator Biomass	No relevant results returned							
Dartford (Kent)	Power	DA/19/1626 (KCC/DA/0253/2019) – St Margarets Farm CHP	St Margarets Farm, St Margarets Road, Darenth	Planning approved Assume operational after base year	Regularisation and extension of the existing Green Waste Composting (GWC) facility and construction and operation of a biomass combined heat and power (CHP) plant (two 980kW) for the processing of up to 5,200tpa of locally sourced green waste and timber and associated facilities and landscaping	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites at risk.	<a href="https://www.kentplanningapplications.co.uk/Planning/Display/KCC/DA/0253/2019">https://www.kentplanningapplications.co.uk/Planning/Display/KCC/DA/0253/2019</a>
Dartford (Ebbsfleet)	Power	EDC/20/0042 – Westgate Power	Westgate Power Land Northside Of Galley Hill Road Northfleet Kent DA11 9SW	Planning approved Assume operational after base year	Construction and operation of a 5MW Flexible Energy Facility and associated ancillary equipment within Ebbsfleet Development Corporation	No	N/A	Within 10km of Thames Estuary and Marshes Ramsar Application AQ assessment does not identify any European sites at risk.	<a href="http://applications.ebbsfleetc.org.uk/online-applications/files/A1712E4C71F582582400932CD0D8919/pdf/EDC_20_0042-AIR_QUALITY_ASSESSMENT-43282.pdf">http://applications.ebbsfleetc.org.uk/online-applications/files/A1712E4C71F582582400932CD0D8919/pdf/EDC_20_0042-AIR_QUALITY_ASSESSMENT-43282.pdf</a>
Dartford	Energy Generation Incinerator Biomass	No relevant results returned							
Sevenoaks District	Power Energy Generation Incinerator Biomass	No relevant results returned							
Kent County Council	Power Energy Generation Incinerator Biomass	No relevant results returned							



Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
Kent County Council	Livestock Cattle Poultry Pig Slurry Manure	No relevant results returned							
Basildon	Power	20/00929/FUL L – 250kW CHP unit	Unit 2 Genesis Endeavour Drive Basildon Essex SS14 3WF	Planning approved Assume operational after base year	Installation of one 250kW combined heat and power (CHP) unit, together with associated infrastructure.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone.	<a href="https://planning.basildon.gov.uk/online-applications/applicationDetails.do?activeTab=summary&amp;keyVal=QE9Q2QCQK1M00">https://planning.basildon.gov.uk/online-applications/applicationDetails.do?activeTab=summary&amp;keyVal=QE9Q2QCQK1M00</a>
Basildon	Power Generation	19/01443/FUL L – 5MW Power generation plant	Howard Power, Land On The North Side Of Howard Chase Basildon Essex	Planning approved Assume operational after base year	Construction & operation of an urban reserve 5MW power generation plant & associated equipment	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites at risk.	<a href="https://planning.basildon.gov.uk/online-applications/files/4A465D1498E9245B5FFC1468E6CF3D65/pdf/19_01443_FULL-AIR_QUALITY_ASSESSMENT-566734.pdf">https://planning.basildon.gov.uk/online-applications/files/4A465D1498E9245B5FFC1468E6CF3D65/pdf/19_01443_FULL-AIR_QUALITY_ASSESSMENT-566734.pdf</a>
Basildon	Energy	21/00562/FUL L – 5MW Flexible energy facility	Aspect House 2 Honywood Road Basildon Essex SS14 3DS	Planning approved Assume operational after base year	Construction and operation of a 5MW (2x2.5MW) urban reserve flexible energy facility and associated equipment (revised submission following approval)	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites at risk.	<a href="https://planning.basildon.gov.uk/online-applications/files/D71D8DBF60C6584E4366256EAD0BF7B6/pdf/21_00562_FULL-PLANNING STATEMENT-666999.pdf">https://planning.basildon.gov.uk/online-applications/files/D71D8DBF60C6584E4366256EAD0BF7B6/pdf/21_00562_FULL-PLANNING STATEMENT-666999.pdf</a>
Castle Point District	Power Generation	18/0910/FUL – 2MW gas fired power station	Units 1-11, 16 And 17 Sandhurst Kings Road Canvey Island Essex SS8 0SA	Planning approved Assume operational after base year	Construction and operation of an urban reserve 2MW gas fired power plant	No		Not within 10km or relevant IRZ of any European site affected by the Project alone. Application AQ assessment does not identify any European sites at risk.	<a href="https://publicaccess.castlepoint.gov.uk/online-applications/files/E0F1A757B03B72A0B24DE6A5B5A939F9/pdf/18_0910_FULL-PLANNING STATEMENT-476255.pdf">https://publicaccess.castlepoint.gov.uk/online-applications/files/E0F1A757B03B72A0B24DE6A5B5A939F9/pdf/18_0910_FULL-PLANNING STATEMENT-476255.pdf</a>
Castle Point District	Energy	No relevant results returned							
Essex County Council	Power Energy Generation Incinerator Biomass	No relevant results returned							
Essex County Council	Livestock Cattle Poultry Pig Slurry Manure	No relevant results returned							
Epping Forest District	Power Energy Generation Incinerator Biomass	No relevant results returned							

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
Epping Forest District	Livestock Cattle Poultry Pig Slurry Manure	No relevant results returned							
Harlow District	Power Energy Generation Incinerator	No relevant results returned							
Harlow District	Biomass	HW/FUL/21/00322 – Installation biomass boiler	Harlow Essex	Planning approved Assume operational after base year	Installation of a biomass boiler, filters, storage silo, chipper and associated duct work to provide space heating to the premises.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone.	<a href="https://planningonline.harlow.gov.uk/online-applications/files/D766657EF6DFC14FDC6F3CCB3E8A1ECE/pdf/HW_FUL_21_00322-ENV_APP_SUPPLEMENTARY_INFORMATION-632843.pdf">https://planningonline.harlow.gov.uk/online-applications/files/D766657EF6DFC14FDC6F3CCB3E8A1ECE/pdf/HW_FUL_21_00322-ENV_APP_SUPPLEMENTARY_INFORMATION-632843.pdf</a>
Brentwood	Power	22/01205/FUL – Includes a CHP plant	Little Warley Brentwood	Planning approved Assume operational after base year	Construction of meat processing building (Use Class B2), one HGV maintenance building (Use Class B2) and one food storage building (Use Class B8) with roof mounted solar PV panels, new access and staff parking, enhanced landscaping, sustainable drainage and a combined heat and power plant.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone.	<a href="https://publicaccess.brentwood.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=RH2PVFDJHV100">https://publicaccess.brentwood.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=RH2PVFDJHV100</a>
Brentwood	Generation	18/01721/FUL – Peak time electricity generation	Mountnessing Essex	Planning approved Assume operational after base year	The installation of five gas fuelled generators (2.5MW each) with radiator arrays, a DNO building, HV building, transformers, gas kiosk, client building, CCTV cameras on 4m posts, waste and clean oil tank and associated infrastructure for the generation of electricity during times of peak demand.	No	N/A	Not within 10km or relevant IRZ of any European site affected by the Project alone.	<a href="https://publicaccess.brentwood.gov.uk/online-applications/applicationDetails.do?activeTab=summary&amp;keyVal=PHI8YUDJM9900">https://publicaccess.brentwood.gov.uk/online-applications/applicationDetails.do?activeTab=summary&amp;keyVal=PHI8YUDJM9900</a>
Brentwood	Energy Incinerator	No relevant results returned							
Brentwood	Biomass	19/01231/S191 – Biomass boiler (residential)	Pilgrims Hatch Brentwood	Planning approved Assume operational after base year	Installation of a biomass boiler and stainless steel flue in an existing building at Calcott Hall Farm.	No	N/A	Not within 0.5km or relevant IRZ of any European site affected by the Project alone.	<a href="https://publicaccess.brentwood.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=PX95AXDJLCH00">https://publicaccess.brentwood.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=PX95AXDJLCH00</a>
Broxbourne	Power Energy Generation Incinerator Biomass	No relevant results returned							
Havering LB	Power Energy Generation Incinerator Biomass	No relevant results returned							

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
Redbridge LB	Power Energy Generation Incinerator Biomass	No relevant results returned							
Waltham Forest LB	Power Energy Generation Incinerator Biomass	No relevant results returned							
Enfield LB	Power	22/01735/FUL (18/03595/FUL) – Gas fuelled heat and power plant	Enfield	Planning approved Assume operational after base year	Installation of 1 x natural gas fuelled heat and power plant (~1000KW), 1 x steam waste heat boiler, 1 x transformer, 1 x gas booster and 2 x oil tanks. The installation will provide electricity, steam and low temperature hot water to displace consumption of mains electricity and gas, increase resilience of onsite energy supplies and reduce carbon emissions.	No	N/A	Within 10km of Epping Forest SAC Supporting application documents do not identify any European sites at risk. Therefore assume plant is of a size that no emissions would occur to the extent they would also affect the same area as the Project.	<a href="https://planningandbuildingcontrol.enfield.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=RC12HIJNG5100">https://planningandbuildingcontrol.enfield.gov.uk/online-applications/applicationDetails.do?activeTab=documents&amp;keyVal=RC12HIJNG5100</a>
Enfield LB	Energy Generation Incinerator Biomass	No relevant results returned							
Welwyn Hatfield District	Power Energy Generation	No relevant results returned							
East Hertfordshire District	Power Energy Generation	No relevant results returned							
Uttlesford District	Power Energy Generation	No relevant results returned							
Barking and Dagenham LB	Power	21/02125/FUL – Energy centre	Barking, Barking And Dagenham	Planning approved Assume operational after base year	Construction of a new above ground decentralised energy centre and visitor centre and associated buried heat network piping within the site, landscaping, parking, new site access, boundary treatments and illuminated external display. The Energy Centre building and site compound shall house mechanical and electrical services equipment for the production of heat and power.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=29308">https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=29308</a>
Barking and Dagenham LB	Energy	22/02130/REM – Development incl. energy centre	Dagenham Barking And Dagenham	Planning approved Assume operational after base year	Application for approval of details (Access, Appearance, Landscaping, Layout, and Scale) relating to the Energy Centre and Primary Substation (within the Development Plot for Employment Uses) of Outline Planning Permission ref: 21/01808/OUTALL which relates to the erection of buildings to deliver residential dwellings (Class C3), and ancillary residential floorspace and/or non-residential floorspace, delivery of new	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=31488">https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=31488</a>

Planning Portal	Search Term	Project	Location	Status	AQ information	Include in-combination	Site	Rationale	Link to docs
					public open space and communal open space; including children's play space, new public realm, landscaping works and new lighting; car and cycle parking spaces together with associated highways and utilities works incidental to the proposed development, including temporary highways works. The proposals for the Energy Centre and 2 Primary Substation include the erection of an energy centre building and adjacent primary substation compound, together with associated highways, landscaping and utilities works. The existing defunct sub-station on-site will also be demolished.				
Barking and Dagenham LB	Energy	19/00310/FUL – Redevelopment incl. energy centre	Gascoigne Estate East Barking	Planning approved Assume operational after base year	Application for variation of condition 49 (approved parameter plans) in respect of permission 15/01084/FUL which granted permission the development to include an Energy Centre. Full planning permission sought on Phase 1A included an Energy Centre.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=15743">https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=15743</a>
Barking and Dagenham LB	Generation	21/02199/NON MAT – EfW facility	North Clove Street, Dagenham	Planning approved Assume operational after base year	Non material amendment to planning permission 13/01134/FUL dated 05/11/2014 comprising of change to the description of the approved development from: 'Erection of a building (8,925 m2 internal area) incorporating 55 metre high stack and associated plant to be used as an energy generation facility to generate electricity from residual waste along with car parking, boundary treatment and landscaping.' To be replaced by: 'Construction of a building and associated plant and infrastructure to generate energy from residual waste along with car parking, boundary treatment and landscaping.'	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=29325">https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=29325</a>
Barking and Dagenham LB	Generation	19/00116/FUL – gas fired electricity generating station	Ripple Road, Barking,	Planning approved Assume operational after base year	Gallions Power – Construction and operation of gas fired electricity generating plant.	No	N/A	Not within 15km or relevant IRZ of any European site affected by the Project alone	<a href="https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=17175">https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&amp;id=17175</a>
Haringey LB	Power	No relevant results returned							

## Appendix B North Downs Woodlands SAC detailed botanical survey results

### B.1 Survey methodology

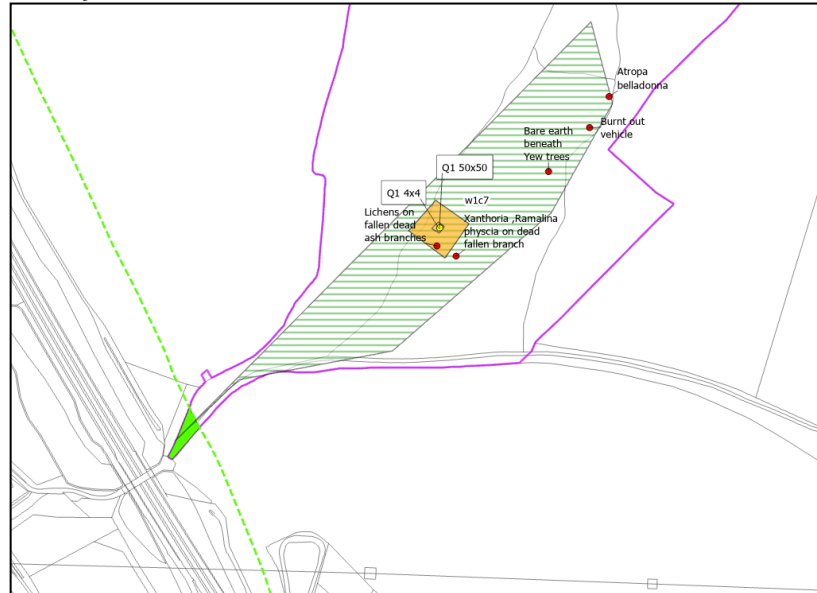
- B.1.1 Two habitat survey areas were surveyed: one, the area within 200m of the ARN and the other further into the SAC, up to approximately 500m from the ARN to inform whether or not a vegetation gradient from the ARN existed.
- B.1.2 At each location surveyors walked a zig-zag transect through the habitat survey area to ground-truth the UKHab classification and amend it if necessary. Vegetation composition and species abundance were recorded using the DAFOR scale ('dominant', 'abundant', 'frequent', 'occasional' or 'rare') to provide a relatively rapid characterisation of the vegetation in the habitat survey area. Particular note was made of invasive non-native species, ancient woodland indicator species, species that are reasons for designation and species that are known to be sensitive to nitrogen. One quadrat was then sampled in each UKHab Level 4 habitat type using the Domin scale, as described in Rodwell (2006). This provides a quantitative measure of cover/abundance of every higher plant in the sampled area. The quadrat size sampled depended on the structural variation in the plant community, with 50m x 50m quadrats for woodland canopy and shrub layers and 2m x 2m for short herbaceous vegetation. The combination of DAFOR and quantitative sampling of quadrats was considered sufficient to provide a comprehensive list of the higher plants present in the habitat survey area and their relative abundances.
- B.1.3 Evidence of any obvious vegetation gradients was noted, indicated by changes in vegetation structure and composition with distance from the woodland edge with an existing road which may indicate whether any existing factors such as site management or nitrification/pollution from external sources have influenced or are influencing the habitat. Evidence of site management and pressures and threats were recorded (e.g. recreation, fly-tipping, encroaching development). Surveyors also made notes of the potential for beneficial management.
- B.1.4 Site condition in the habitat survey area was recorded using Defra's Biodiversity Metric 3.1 (Panks, et al., 2022), with additional notes on justification of the score and on features of interest. Note was made on whether habitats are degraded versions of habitats the site is important for (as detailed in the citation), or if they have been replaced by a different habitat type.
- B.1.5 Representative photographs were collected to illustrate the features recorded.



## B.2 Survey results

### Field survey results 2022

#### Survey Location



Purple line – SAC boundary  
 Green hatch – Habitat survey area.  
 Green dotted line – 200m distance from Affected Road Network (ARN)  
 Orange box – Quadrat location  
 Target notes are shown.

#### Survey Summary

Survey date: 19/05/2022  
 UK Hab classification: w1c7 Yew-dominated woodland (H91J0)  
 Habitat description: Closed yew tree canopy, with almost bare field layer with very few Ancient Woodland Indicator (AWI) species.  
 Presence of SAC qualifying habitats: The survey found that most of the area surveyed was made up of W13 *Taxus baccata* (Annex I, 91J0).  
 Vegetation gradient: No species gradients observed.  
 Pressures and threats: Human disturbance due to bike jumps and a burnt-out vehicle which had scorched and damaged nearby trees. A fence had been knocked down, possibly for access.

**Table 1 Summary of condition score of Habitat Parcel**

Criteria	Score
1 Age distribution of trees	3
2 Wild, domestic and feral herbivore damage	3
3 Invasive plant species	2
4 Number of native tree species	3
5 Cover of native tree and shrub species	2
6 Open space within woodland	3
7 Woodland regeneration	2
8 Tree health	2
9 Vegetation and ground flora	3
10 Woodland vertical structure	2
11 Veteran trees	3
12 Amount of dead wood	3
13 Woodland disturbance	2
Total:	33 (Good)

**Table 3 Species recorded in Quadrat 1, with DOMIN and Ellenberg values**

Latin Name	DOMIN	EV
<b>Canopy</b>		
<i>Acer pseudoplatanus</i>	5	6
<i>Fagus sylvatica</i>	4	5
<i>Fraxinus excelsior</i>	4	6
<i>Taxus baccata</i>	8	5
<b>Understorey</b>		
<i>Corylus avellana</i>	4	6
<i>Crataegus monogyna</i>	2	6
<i>Daphne laureola</i>	1	5
<i>Ligustrum vulgare</i>	5	5
<b>Field layer</b>		
<i>Arum maculatum</i>	1	7
<i>Hedera helix</i>	5	6
<i>Ligustrum vulgare</i>	4	5
<i>Mercurialis perennis</i>	4	7
<i>Bare ground</i>	8	N/A
<i>Leaf litter</i>	8	N/A

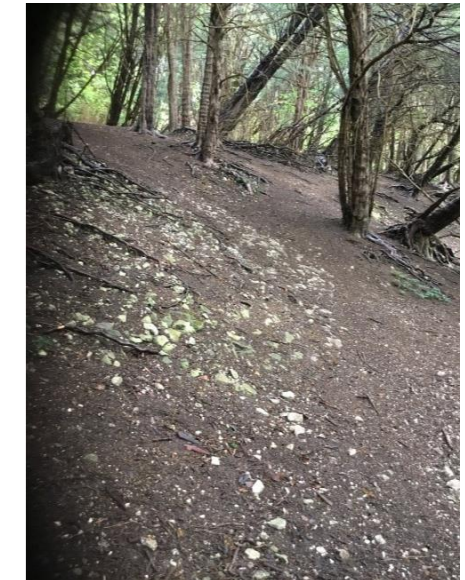
**Table 2 Species recorded in habitat survey area, with DAFOR and Ellenberg values**

Latin Name	DAFOR	EV
<b>Canopy</b>		
<i>Acer campestre</i>	O and LA	6
<i>Acer pseudoplatanus</i>	F	6
<i>Fraxinus excelsior</i>	F	6
<i>Quercus robur</i>	R	4
<i>Sorbus aria</i>	R	4
<i>Taxus baccata</i>	A	5
<b>Understorey</b>		
<i>Buddleja davidii</i>	R	5
<i>Cornus sanguinea</i>	R	6
<i>Corylus avellana</i>	O	6
<i>Crataegus monogyna</i>	O	6
<i>Ilex aquifolium</i>	R	5
<i>Ligustrum vulgare</i>	F	5
<i>Prunus avium</i>	R	6
<i>Prunus spinosa</i>	R	6
<i>Sambucus nigra</i>	R	7
<i>Viburnum lantana</i>	R	5

Latin Name	DAFOR	EV	Latin Name	DAFOR	EV
<b>Field layer</b>					
<i>Ajuga reptans</i>	R	5	<i>Iris foetidissima</i>	O	5
<i>Alliaria petiolata</i>	R	8	<i>Melica uniflora</i>	R	5
<i>Arctium minus</i>	R	5	<i>Mercurialis perennis</i>	F/LA	7
<i>Arum maculatum</i>	O	7	<i>Poa trivialis</i>	R	6
<i>Atropa belladonna</i>	R	6	<i>Potentilla reptans</i>	R	5
<i>Ballota nigra</i>	R	6	<i>Prunella vulgaris</i>	R	4
<i>Brachypodium sylvaticum</i>	O	5	<i>Ranunculus repens</i>	R	7
<i>Bryonia dioica</i>	R	7	<i>Rosa sp.</i>	R	N/A
<i>Carex sylvatica</i>	R	5	<i>Rubus fruticosus</i>	O	6
<i>Cirsium vulgare</i>	R	6	<i>Sanicula europaea</i>	R	5
<i>Clematis vitalba</i>	O	5	<i>Scrophularia auriculata</i>	R	7
<i>Daphne laureola</i>	O	5	<i>Scrophularia nodosa</i>	R	6
<i>Digitalis purpurea</i>	R	5	<i>Tamus communis</i>	R	6
<i>Fragaria vesca</i>	R	4	<i>Taraxacum officinale agg.</i>	R	6
<i>Fraxinus excelsior</i>	O	6	<i>Veronica serpyllifolia</i>	R	5
<i>Geranium robertianum</i>	R	6	<i>Viola hirta</i>	R	2
<i>Geum urbanum</i>	R	7			
<i>Glechoma hederacea</i>	R	7			
<i>Hedera helix</i>	A	6			
<i>Hypericum hirsutum</i>	O	5			
<i>Hypericum perforatum</i>	R	5			

**Table 4: Summary of Ellenberg Values for all recorded species**

Minimum	2
Mean	5.58
Maximum	8



**Photograph 1** Densely shaded bare ground beneath canopy of yew coppice



**Photograph 2** Deadwood showing presence of some nitrogen tolerant lichens including *Xanthoria* species



### Field survey results 2023

#### Survey Location



Purple line – SAC boundary  
 Green hatch – Habitat parcel survey area.  
 Green dotted line: 200m distance from Affected Road Network (ARN)  
 Red line – Transect location  
 Target notes are shown  
 Quadrat – The surveyed woodland had an area of approximately 480m<sup>2</sup>, i.e. approximately 20% of a standard 50mx50mm woodland quadrat.

#### Survey Summary

Survey date: 15/05/2023  
 UK Hab classification: w1f: lowland mixed deciduous woodland  
 Habitat description: A narrow strip of ash woodland around a public footpath, with abundant ash, and frequent field maple, wild cherry and sycamore in the canopy over an understorey of frequent hazel, hawthorn, yew and wild privet. The ground layer is heavily shaded where yew occurs. Ivy is abundant, with frequent dog's mercury, wood melick and wild arum. The path is well used by dog walkers. Ash dieback is widespread. There is no sign of recent management. Presence of SAC qualifying habitats: Ash was the most abundant canopy species in the survey area, which does not meet the criteria for the habitats that are the primary reason for selection of the site as a SAC. Vegetation gradient: No species gradients observed. Nettle is slightly more frequent at southern end along with cleavers and barren brome but this seems more related to the open nature of the southern end and possibly run off of fertilisers from the arable land above Pressures and threats: Ash dieback is widespread. Footpath well used by public.

Table 1 Summary of condition score of Habitat Parcel

Criteria	Score
1 Age distribution of trees	2
2 Wild, domestic and feral herbivore damage	3
3 Invasive plant species	3
4 Number of native tree species	3
5 Cover of native tree and shrub species	3
6 Open space within woodland	1
7 Woodland regeneration	2
8 Tree health	1
9 Vegetation and ground flora	3
10 Woodland vertical structure	2
11 Veteran trees	1
12 Amount of dead wood	2
13 Woodland disturbance	3
<b>Total:</b>	<b>29 (Moderate)</b>

Table 3 Species in Quadrat, with DOMIN and Ellenberg values

Latin Name	DAFOR	EV
<b>Canopy</b>		
<i>Acer campestre</i>	4	6
<i>Acer pseudoplatanus</i>	5	6
<i>Fraxinus excelsior</i>	7	6
<i>Prunus avium</i>	4	6
<b>Understorey</b>		
<i>Cornus sanguinea</i>	1	6
<i>Corylus avellana</i>	4	6
<i>Crataegus monogyna</i>	4	6
<i>Euonymus europaeus</i>	3	5
<i>Hedera helix</i>	5	6
<i>Ilex aquifolium</i>	1	5
<i>Ligustrum vulgare</i>	4	5
<i>Prunus spinosa</i>	1	6
<i>Rosa canina</i>	1	6
<i>Sambucus nigra</i>	2	7
<i>Taxus baccata</i>	4	5
<b>Field layer</b>		
<i>Acer campestre</i>	1	6
<i>Acer pseudoplatanus</i>	1	6
<i>Arum maculatum</i>	4	7
<i>Galium aparine</i>	1	8
<i>Hedera helix</i>	3	6
<i>Iris foetidissima</i>	2	5
<i>Mercurialis perennis</i>	4	7
<i>Prunus avium</i>	1	6

Table 2 Species recorded in Transect, with DAFOR and Ellenberg values

Latin Name	DAFOR	EV
<b>Canopy</b>		
<i>Acer campestre</i>	F	6
<i>Acer pseudoplatanus</i>	F	6
<i>Fraxinus excelsior</i>	A	6
<i>Prunus avium</i>	F	6
<b>Understorey</b>		
<i>Cornus sanguinea</i>	O	6
<i>Corylus avellana</i>	F	6
<i>Crataegus monogyna</i>	F	6
<i>Euonymus europaeus</i>	F	5
<i>Hedera helix</i>	A	6
<i>Ilex aquifolium</i>	R	5
<i>Ligustrum vulgare</i>	F	5
<i>Prunus spinosa</i>	O	6
<i>Rosa canina</i>	O	6
<i>Sambucus nigra</i>	R	7
<i>Taxus baccata</i>	F	5
<b>Field layer</b>		
<i>Anisantha sterilis</i>	O	7
<i>Anthriscus sylvestris</i>	R	7
<i>Arum maculatum</i>	F	7
<i>Ballota nigra</i>	O	6
<i>Brachypodium sylvaticum</i>	O	5
<i>Clematis vitalba</i>	O	5
<i>Galium mollugo</i>	O	4
<i>Galium aparine</i>	F	8
<i>Geranium pusillum</i>	R	7
<i>Geranium robertianum</i>	R	6
<i>Hedera helix</i>	A	6
<i>Iris foetidissima</i>	F	5
<i>Lactuca virosa</i>	R	7
<i>Lamium album</i>	R	8
<i>Melica uniflora</i>	F	5
<i>Mercurialis perennis</i>	F	7
<i>Origanum vulgare</i>	R	4
<i>Plantago major</i>	R	7
<i>Poa trivialis</i>	O	6
<i>Rubus fruticosus</i>	O	6
<i>Tamus communis</i>	O	6
<i>Taraxacum officinale agg.</i>	O	6
<i>Urtica dioica</i>	O	8
<i>Vicia sativa</i>	R	4
<i>Viola sp. (EV for Viola riviniana used)</i>	O	4

Table 4 Summary of Ellenberg Values for all recorded species

Minimum	4
Mean	5.95
Maximum	8



Photograph 1 Sparse field layer over predominantly bare ground



Photograph 2 Woodland in survey area

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