

6.0 NATURAL HERITAGE AND ECOLOGY

6.1 Introduction

- 6.1.1 The scoping responses received with respect to the proposals identified the potential for two sites of ecological interest to be affected by nitrogen deposition as a result of increased traffic flows due to the development of the IPM. This chapter presents the results of the assessment of likely impacts on these features.
- 6.1.2 Since the submission of the original LDO application and ES in June 2019 further iterations of the Medway Council Strategic Transport Assessment (STA) model have been undertaken during 2020 in consultation with Kent County Council (as Highway Authority) and Highways England. As the levels of future development growth assessed within the STA have an influence on the cumulative and in-combination effect of traffic from IPM with other development, update of the assessment of air quality on sites of ecological interest is necessary.
- 6.1.3 The whole of this chapter has been updated and all amended or new sections are presented in blue font for ease of identification. This chapter completely replaces the original chapter submitted as part of the ES.

6.2 Scope of the Assessment

- 6.2.1 Guidance from Natural England and the Highways Agency (English Nature, 2004; Highways Agency, 2009) indicates that Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), which are collectively referred to as designated sites, are likely to be at risk from local airborne emissions within 200 metres of a major road (motorway or A road). Within this 200-metre zone, Natural England guidance (<http://publications.naturalengland.org.uk/publication/6331846246793216>) notes that impacts are greatest within the first 50 to 100 metres from roads. The 200-metre zone of influence from the strategic road network is also referenced within the Design Manual for Roads and Bridges (DMRB), which requires a quantitative air quality assessment if a European Site (SPA or SAC) is within this distance from a strategic road.
- 6.2.2 A source-pathway-receptor conceptual model, which highlights whether there is any potential pathway that connects development to any ecological sites has been implemented in the assessment. In this case the spatial scope of the assessment has been informed and refined by identifying the impacts that could potentially arise as a result of the development, assessing the spatial and temporal scope of these impacts and understanding the effects on sensitive receptors that might arise.
- 6.2.3 The assessment has been based on outputs from the Medway Council STA model, which has provided predicted future traffic movements at the end of the Local Plan period (2037) with and without the development of IPM in order to demonstrate the predicted impact of the Proposed Development on relevant designated sites. An air quality dispersion model has been used to project emissions associated with the predicted future road traffic flows and the way that concentrations of nitrogen dioxide within the designated areas would be likely to change, taking account of meteorological data. The predicted concentrations of nitrogen dioxide have been

compared with 'critical loads' for the designated site to determine the likely impact associated with the development of IPM.

- 6.2.4 In addition to assessing the likely impact of road traffic associated with IPM, the assessment must also include consideration of cumulative and in-combination effects on the designated sites. The STA model includes projected traffic growth associated with allocated development in the Medway Local Plan and it has also included projected future road traffic associated with development growth in the neighbouring local authority areas (Maidstone, Tonbridge and Malling, Gravesham and Swale). Natural England has confirmed that use of the STA model as the basis for the assessment of cumulative and in-combination road traffic impacts (in conjunction with the predicted traffic flows associated with IPM) will be appropriate.

6.3 Baseline conditions

Identification of relevant designated sites

- 6.3.1 Identification of relevant designated ecological sites for this assessment requires consideration of the proximity of relevant sites to the strategic road network that will be used by traffic associated with IPM.
- 6.3.2 In the context of the surrounding highway infrastructure, the Site lies off the M2 motorway and access to the development will primarily be from the motorway and the adjoining A229. As such these roads have been identified for further consideration within this assessment as they provide the principal arterial routes to and from IPM in southerly, easterly and westerly directions. To the north is the urban centre of Rochester and there are no designated sites within the urban area.
- 6.3.3 The A228 also links the M2 and M20 but it has been discounted from this assessment as it does not pass within 200 metres of a designated site. Other roads including the A249 and the A228 have been considered for inclusion within this assessment. The A249 links the A229 and the M2, providing a corridor between Swale and Maidstone.
- 6.3.4 The only European Site within 200 metres of the A229 is the North Downs Woodland SAC, which is approximately 3.5 kilometres south-west of IPM. The section of the SAC close to the A229 is mostly at greater distance than 200 metres, but 0.04 hectares falls between 165 and 200 metres of the road.
- 6.3.5 Whilst the A249 is not likely to be a primary route to and from IPM, because vehicles travelling east would be expected to use the M2 and those travelling south onto the M20 would use the A229, it passes within 200 metres of the North Downs Woodland SAC and the section between the A229 and M2 is therefore considered to be relevant for inclusion as part of the cumulative and in-combination assessment.
- 6.3.6 With regard to SSSIs the only SSSI within 200 metres of the A229 or the applicable section of the A249 is the Wouldham to Detling Escarpment SSSI, specifically units 7, 10, 11, 12, 13, 15, 25 and 26 listed below.
- Unit 7 – Bluebell Hill: 8.46 hectares of lowland calcareous grassland, which is in unfavourable declining in condition due to lack of grazing management;
 - Unit 10 – Bluebell Hill: 2.17 hectares of lowland broadleaved mixed and yew woodland in favourable condition;

- Unit 11 – Warren Road Bank: 7.01 hectares of lowland broadleaved mixed and yew woodland in favourable condition;
- Unit 12 – Kit's Coty Pasture: 2.47 hectares of lowland calcareous grassland in favourable condition;
- Unit 13 – Kit's Coty Woodland: 1.8 hectares of lowland broadleaved mixed and yew woodland in favourable condition;
- Unit 15 - White Horse Stone Woodland: 26.9 hectares of lowland broadleaved mixed and yew woodland in favourable condition;
- Unit 25 – The Lynch: 3.93 hectares of lowland calcareous grassland in unfavourable recovering condition;
- Unit 26 – Lynch Bank: 4.08 hectares of lowland broadleaved mixed and yew woodland in favourable condition.

North Downs Woodland SAC (UK0030225)

- 6.3.7 North Downs Woodland SAC contains semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). The mature *Asperulo-Fagetum* beech forests and Yew *Taxus baccata* woods on steep slopes are considered one of the best areas in the UK. The stands lie within a mosaic of scrub and other woodland types and are the most easterly of the beech woodland sites selected. Parts of the woods were affected by the Great Storm of 1987.
- 6.3.8 Yew woodland at this site is associated with beech forests, scrub and small areas of unimproved grassland on thin chalk soils. Where the shade is not too dense dog's mercury *Mercurialis perennis* predominates in the ground flora. The site is the most easterly of those selected.
- 6.3.9 The Natura 2000 Standard Data Form available at: <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030225.pdf> (reviewed for updates on 26 September 2020) states the qualifying interest of the SAC as summarised above. The form was first published in January 2001 and was updated in December 2015
- 6.3.10 North Downs Woodland SAC is legally underpinned by Wouldham to Detling Escarpment SSSI and Halling to Trottiscliffe Escarpment SSSI. Halling to Trottiscliffe Escarpment SSSI is over 4 kilometres south of IPM. Wouldham to Detling Escarpment SSSI is 1.7 kilometres west of IPM at its closest point and overlaps the North Downs Woodlands SAC 3.5 kilometres south of IPM.
- 6.3.11 By reference to the condition of the underlying SSSI management units comprising the SAC (<https://designatedsites.naturalengland.org.uk>, accessed 15 January 2018, based on an assessment carried out by Natural England between 2007-2018) it is apparent that:
- 3.5 hectares of the 26.9 hectares of the White Horse Stone Woodland Unit (Unit 15) of the Wouldham to Detling SSSI is within 200 metres of A229. This Unit is in a favourable condition.
 - All of the Lynch Bank Unit (Unit 26) of the Wouldham to Detling SSSI is within 200 metres of A249.
- 6.3.12 The SSSI units of relevance within the SAC contain lowland broadleaved and mixed yew woodland. Air Pollution Information System (APIS, 2016-18) determines that this habitat type is sensitive to air pollution such as nitrogen produced by vehicles, and therefore this particular part of the SAC

may be affected by nitrogen deposition from increased numbers of vehicles using the A229 and A249. Predicted nitrogen deposition and critical loads from APIS for the woodland habitat types within the SAC are provided in **Table 6.1** below.

Table 6.1: Baseline Nitrogen deposition and critical loads for the SAC woodlands

Woodland type	Deposition (N/ha/y r)			Critical Load (N/ha/y r)
	Min	Average	Max	
A sperulo-Fagetum beech woodland	24.9 kg	26.4 kg	28.8 kg	10-20 kg
Taxus baccata yew woodland	24.9 kg	26.4 kg	28.8 kg	5-15 kg

6.3.13 APIS data indicates that predicted nitrogen deposition in the SAC is above the critical loads for both woodland types. Of this load the APIS website indicates that only 16% is attributable to road traffic, with 31% attributable to pollution from continental Europe and 12% from international shipping.

Conservation objectives

6.3.14 The North Downs Woodland SAC conservation objectives are, subject to natural change, as follows:

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

6.3.15 Natural England has not yet produced Supplementary Advice to support these objectives.

Description of Wouldham to Detling Escarpment SSSI

6.3.16 The Wouldham to Detling Escarpment contains broadleaved woodland, containing mixed and Yew Woodlands. The Wouldham to Detling Escarpment includes representative examples of woodland scrub and grassland habitats on chalk.

6.3.17 Much of the site was traditionally open grazing. Lack of grazing has resulted in the development of scrub and woodland, leaving little open grassland. The tree canopy is dominated by varying amounts of beech *Fagus sylvatica*, ash *Fraxinus excelsior*, whitebeam *Sorbus aria*, wild cherry *Prunus avium*, silver birch *Betula pendula* and yew *Taxus baccata*.

6.3.18 Understorey shrubs include hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, midland hawthorn *C. laevigata*, elder *Sambucus nigra* and privet *Ligustrum vulgare*, while the ground flora includes dog’s mercury *Mercurialis perennis*, ivy *Hedera helix*, lords-and-ladies *Arum maculatum* and spurge laurel *Daphne laureola*.

Site condition

- 6.3.19 Previous surveys (1998-2008) show that the Wouldham to Detling Escarpment SSSI is being adequately conserved and the results from monitoring demonstrate that the feature(s) in the unit are meeting all the mandatory site specific monitoring targets, therefore the site has been designated favourable in condition.
- 6.3.20 The Wouldham to Detling Escarpment (SSSI) contains lowland broadleaved and mixed yew woodland. Air Pollution Information System (APIS, 2016-18) determines that this habitat type is sensitive to air pollution such as nitrogen produced by vehicles, and therefore has the potential to be affected by nitrogen deposition.
- 6.3.21 Deposition and critical loads for the woodland types within applicable SSSI units are envisaged to be as set out in **Table 6-1** above. For the calcareous grasslands within Units 7, 12 and 25 information within APIS suggests the nitrogen deposition rates and critical loads set out in **Table 6.2**.

Table 6.2: Baseline Nitrogen deposition and critical loads for calcareous grassland units

Woodland type	Deposition (N/ha/yr)			Critical Load (N/ha/yr)
	Min	Average	Max	
Calcareous grassland	15.8 kg	16.5 kg	16.8 kg	15-25 kg

Vulnerabilities (JNCC 2015)

- 6.3.22 The Natura 2000 Standard Data Form for North Downs Woodland SAC reports the following vulnerabilities:
 - Invasive non-native species.
 - Air pollution and air-borne pollutants.
 - Outdoor sports and leisure activities and recreational activities.
 - Forest and Plantation management and use.
- 6.3.23 A portion of North Downs Woodlands SAC (0.04 ha) lies within 165 to 200 metres of the A229, and there is 3.4 hectares within 10 to 200 metres of the A249.
- 6.3.24 Case law has further defined how air quality assessments in relation to SAC habitats should be scoped. In the case of Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351, Natural England had advised that the following threshold could be applied at the screening stage: *an expected increase in traffic (Annual Average Daily Traffic ("AADT") flows) of less than 1,000 cars per day or 200 HGVs per day, or if the Joint Core Strategy would give rise to less than a 1% increase in traffic compared to that predicted at the end of the Core Strategy period, then it would have no likely significant effect on the SAC and no appropriate assessment would be required. In this case the judgement concluded that the traffic movements needed to include an assessment of predicted change in combination with the plans of neighbouring authorities.*

6.4 Assessment of Likely Significant Effects

- 6.4.1 This section is primarily (initially) concerned with the potential for nitrogen deposition from the increase in traffic on the A229 and the section of the A249 between the M2 and A229 to affect the interest features of North Downs Woodland SAC. These features are Yew woodland, beech forests and semi-natural dry grasslands & scrubland facies on calcareous substrates.
- 6.4.2 The North Downs Woodland SAC is a significant distance from IPM and hence there will be no direct effects. Indirect impacts from traffic associated with IPM on the A229 are likely due to increase in traffic and therefore an increase in deposition of nitrogen.

Likely Significant Effects

Construction Phase Impacts

- 6.4.3 No significant impacts on the North Downs SAC or Wouldham to Detling Escarpment SSSI are anticipated during the construction phase. Construction traffic movements associated with IPM will be substantially below the HGV guidance threshold of 200 AADT and these are likely to use a range of routes, as opposed to just the A229.

Operational Phase Impacts

- 6.4.4 Traffic modelling undertaken by for IPM was based upon traffic data provided by Medway Council and includes committed developments up to 2037 that will be delivered in the existing local plan period. Table 6.3 provides updated AADT flows for the A229 and A249 for three scenarios:
- 2037 Do-minimum – background traffic and committed development in the absence of IPM
 - 2037 Do-something – background traffic, committed development and IPM traffic
 - 2037 Do-something plus mitigation – background traffic, committed development, IPM traffic and the effect of altered traffic distribution resulting from proposed highways mitigation measures associated with IPM (Bridgewood Roundabout, Lord Lees Roundabout, Taddington Roundabout and Junction 4 of the M2).

Table 6.3: Predicted AADT flows along the A229 and A249 past the relevant designated sites

Link	Car	LDV	HGV	Total
<i>2037 Do Minimum – future baseline without IPM traffic</i>				
A229 SB (North of Shell Garage)	37,196	4,127	1,819	43,142
A229 NB (South of Old Chatham Road Slip)	38,025	7,762	3,798	49,585
A249 EB (East of Pilgrims Way)	24,353	8,278	1,565	34,196
A249 WB (East of Pilgrims Way)	11,869	1,241	1,588	14,698
<i>2037 Do Something – future baseline plus IPM traffic</i>				
A229 SB (North of Shell Garage)	37,263	4,308	1,828	43,399
A229 NB (South of Old Chatham Road Slip)	38,121	7,869	3,835	49,826
A249 EB (East of Pilgrims Way)	24,359	8,276	1,567	34,202
A249 WB (East of Pilgrims Way)	11,941	1,212	1,567	14,720

Link	Car	LDV	HGV	Total
2037 Do Something – future baseline plus IPM traffic and proposed mitigation				
A 229 SB (North of Shell Garage)	36,625	4,167	1,816	42,608
A 229 NB (South of Old Chatham Road Slip)	38,368	7,878	3,820	50,065
A 249 EB (East of Pilgrims Way)	24,337	8,311	1,572	34,220
A 249 WB (East of Pilgrims Way)	12,217	1,267	1,591	15,075

- 6.4.5 Department for Transport traffic counts from 2019 for the relevant links on the A229 and A249 provide total two-way AADT flows of 69,336 movements for the A229 and 46,101 movements for the A249.
- 6.4.6 The data in Table 6.3 indicate that for the A229, the predicted change in two-way AADT car movements associated with IPM would be an increase of 169 without mitigation and a reduction of 227 compared to the future baseline with the implementation of the proposed mitigation. For HGV movements on the A229, the predicted AADT change associated with IPM would be an increase of 45 without mitigation and an increase of 18 with mitigation.
- 6.4.7 For the A249, the predicted change in two-way AADT car movements associated with IPM would be an increase of 79 without mitigation and an increase of 331 compared to the future baseline with the implementation of the proposed mitigation. For HGV movements on the A249, the predicted AADT change associated with IPM would be a reduction of 19 movements without mitigation and an increase of 10 with mitigation.
- 6.4.8 The results of the modelling therefore show predicted AADT movements for both roads (with or without mitigation) to be below the Natural England thresholds (1,000 total/200 HGV), indicating that changes in nitrogen deposition on the North Downs Woodlands SAC and Wouldham to Detling Escarpment SSSI from IPM alone would be unlikely to make a significant contribution to nitrogen deposition on the SAC or the SSSI.

Cumulative and in-combination effects

- 6.4.9 APIS data has shown that current critical loads of nitrogen are exceeded within the SAC. Modelled traffic flows including committed development from Medway and adjacent local authority areas suggest that the baseline nitrogen deposition rates across the SAC (Wouldham to Detling Escarpment) will continue to exceed the applicable minimum critical load values, although background nitrogen deposition is envisaged to reduce over the plan period due to improvements in vehicle emissions over time as a higher proportion of newer vehicles will be meeting more stringent emission standards and an increased uptake of electric or hybrid vehicles.
- 6.4.10 The worst case in-combination impacts (assuming no improvements in background nitrogen concentrations over time) are predicted to be along the closest points of the SAC to the A249 (approximately 10 metres from the kerb edge) where the increase in nitrogen emissions between baseline 2019 traffic flows and in-combination traffic flows plus mitigation would be 2.9%. For emissions from the A229, the extent of the SAC potentially affected by nitrogen deposition from traffic (0.04ha), is located at least 165 metres from the verge of the A229 and because concentrations of nitrogen deposition fall rapidly the further away from the road the receptor is

located, the change in predicted nitrogen emissions associated with in-combination traffic flows compared to the 2019 baseline flows would be negligible.

- 6.4.11 In addition, as described in paragraph 6.3.13 above, it is noted that the total road contribution to nitrogen deposition at the designated sites is approximately 16% of the total nitrogen deposition. Whilst the additional nitrogen deposition associated with cumulative and in-combination effects will marginally suppress the envisaged background improvements from the base year to the future year, the resultant total nitrogen deposition across the SAC is still predicted to be significantly below the current baseline values.
- 6.4.12 Considering the above, it is not considered that the predicted levels of cumulative and in-combination nitrogen deposition (given they only marginally counter the envisaged background improvements) will have a perceptible impact upon the habitats within the affected areas of North Downs Woodland SAC. When reviewed against the conservation objectives of the SAC, it is considered that the structure / function of habitats or the supporting processes of North Downs Woodlands SAC will not be subject to a perceptible impact; despite the marginal suppression of envisaged improvements in nitrogen deposition attributed to the cumulative and in combination effects.
- 6.4.13 Therefore, it is considered that the integrity of North Downs Woodlands SAC will be maintained.

6.5 Conclusion

- 6.5.1 Given the distance of North Downs Woodland SAC from the A229 (165 metres) and the small area potentially at risk of increased nitrogen deposition, and the predicted increase traffic flow of less than 1,000 AADT over the core strategy plan period it is unlikely that the IPM development alone or in combination would have a likely significant adverse effect on the integrity of North Downs SAC or Wouldham to Detling Escarpment SSSI through increased nitrogen deposition.