



Habitats Regulations Assessment of  
the Ipswich Borough Local Plan  
Review at Final Draft Plan stage:  
Air Quality & Flood Risk  
Addendum.

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## Summary

This report is an addendum to the Habitats Regulations Assessment (HRA) of the Ipswich Local Plan Review at Final Draft stage. Following the production of the HRA, two further pieces of evidence have been made available:

- WSP (2020). The aligned local plans for Suffolk Districts Air Quality Assessment, report for Suffolk County Council & Ipswich Borough Council.
- AECOM (2020) Strategic Flood Risk Assessment

The purpose of this addendum is to review these additional pieces of evidence and to check whether these affect the conclusions of the HRA.

The air quality assessment involves modelling that provides further clarity on future air quality and demonstrates the effect of the Ipswich Local Plan Review (and development in the wider Ipswich Strategic Planning Area) on oxides of nitrogen (NO<sub>x</sub>) and nitrogen deposition for the Stour & Orwell Estuaries SPA/Ramsar. The assessment considers impacts on the Stour and Orwell Estuaries SPA/Ramsar not to be significant. The modelling shows a trajectory of steady improvement in NO<sub>x</sub> and nitrogen deposition, and the Ipswich Local Plan Review is not predicted to influence that trajectory. With the inclusion of transport mitigation, the results indicate that adverse effects on integrity of the Stour and Orwell Estuaries SPA/Ramsar can be ruled out, alone and in-combination with the other local plans in the Ipswich Strategic Planning Area. This confirms the conclusions of the previous HRA work. The air quality assessment does however highlight that levels of NO<sub>x</sub> are currently above critical levels and will continue to be so through to 2036 (regardless of whether the Ipswich Local Plan Review is implemented or not). As such long-term monitoring should be established and measures sought to reduce NO<sub>x</sub> levels.

The Strategic Flood Risk Assessment has been checked for any information that might affect the original HRA conclusions. There are no further changes to the HRA required and the conclusion of no adverse effects on the integrity of the Stour and Orwell Estuaries SPA/Ramsar remains.

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## 1. Introduction

- 1.1 This report is an addendum to the Habitats Regulations Assessment (HRA), in accordance with the Conservation of Habitats and Species Regulations 2017, as amended, of the Ipswich Local Plan Review at Final Draft stage.
- 1.2 The HRA was finalised in January 2020 and concluded that at a plan level, the Local Plan Review will not result in adverse effects on European site integrity. Subsequently, two further pieces of evidence have been made available, relating to air quality and flood risk:
- WSP (2020). The aligned local plans for Suffolk Districts Air Quality Assessment, report for Suffolk County Council & Ipswich Borough Council.
  - AECOM (2020) Strategic Flood Risk Assessment
- 1.3 The purpose of this addendum is to review these additional pieces of evidence that were finalised after the HRA was published and to check whether these affect the conclusions of the HRA.

## 2. Air Quality

### HRA conclusions

- 2.1 The HRA drew on case law, best practice guidance, discussion with Natural England and reference to traffic modelling to conclude, for air quality, that there were potential risks that warranted a co-ordinated approach to more comprehensive evidence gathering, but that this should be planned in time for the next plan review. Overall, the HRA came to a conclusion of no adverse effect on site integrity.
- 2.2 The HRA advised that the plan include text at an appropriate point to highlight the potential risk of traffic emissions to designated sites with features sensitive to air pollution, and that each Council commits to working with neighbouring authorities to gather more data.
- 2.3 The HRA highlighted one location<sup>1</sup>, where the A14 crosses over the Orwell Estuary in the southern part of Ipswich, via the Orwell Bridge. The potential risks to the Orwell Estuary SPA/Ramsar were considered to be low due to the nature of habitats present, with estuarine habitats being less sensitive than other habitat types within the Suffolk European sites.
- 2.4 It was highlighted that any development in very close proximity to the Orwell Estuary should check for any air borne pollutant risks, over and above general traffic generation and Policy DM3 in the Final Draft Plan provides for this.

### New Evidence

- 2.5 The new evidence is a report by WSP, who were commissioned by Suffolk County Council (SCC) on behalf of Ipswich Borough Council (IBC) to provide an assessment of the potential local air quality impacts of the proposed aligned local plans for the administrative areas of Ipswich Borough Council, Babergh District Council, Mid Suffolk District Council and the former Suffolk Coastal District Council element, of the administrative area that is now East Suffolk. These together form the Ipswich Strategic Planning Area. The WSP report focuses on the impacts of air pollutant levels due to changes in road

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<sup>1</sup> See Map 5 of the HRA

traffic emissions within the IBC administrative area associated with the Ipswich Local Plan Review.

- 2.6 This is new evidence as it provides predictions of the scale of change in air quality – associated with the traffic increases linked to the Local Plan – for the Orwell Estuary SPA/Ramsar.

## WSP approach

- 2.7 The assessment considers the potential impacts on nutrient nitrogen levels of the Ipswich Local Plan Review without and with Transport Mitigation Measures.

- 2.8 Modelled scenarios included:

- 2017 base year;
- 2026 without the Ipswich Local Plan Review, without transport mitigation;
- 2026 with the Ipswich Local Plan Review, without transport mitigation;
- 2026 without the Ipswich Local Plan Review, with transport mitigation;
- 2026 with the Ipswich Local Plan Review, with transport mitigation;
- 2036 without the Ipswich Local Plan Review, without transport mitigation;
- 2036 with the Ipswich Local Plan Review, without transport mitigation;
- 2036 without the Ipswich Local Plan Review, with transport mitigation;
- 2036 with the Ipswich Local Plan Review, with transport mitigation.

- 2.9 In the scenarios without the Ipswich Local Plan Review, the models account for the implementation of the Babergh District Council, Mid Suffolk District Council and Suffolk Coastal District Council (now part of East Suffolk) local plans. The with Ipswich Local Plan Review scenarios are the same (i.e. include the other local authority areas), with the addition of the Ipswich Local Plan Review.

- 2.10 Transport models were used to determine changes in traffic levels and these were used to make predictions of changes in air quality, using Defra's Emissions Factors Toolkit that takes into account anticipated advances in vehicle technology and changes in vehicle fleet composition. Potential impacts on ambient annual mean NO<sub>x</sub> concentrations and nutrient nitrogen deposition were determined at ground level receptor points. Receptor points

were aligned in transects within each site, up to 200m from the centreline of the nearest road.

## Modelling results

- 2.11 Modelled baseline (2017) annual mean NO<sub>x</sub> concentrations were predicted to exceed the critical level of 30µg/m<sup>3</sup> and the base modelled Nitrogen deposition were predicted to exceed the critical load at 0m (i.e. directly alongside the road) only.
- 2.12 The predictions for 2026, in the absence of any traffic mitigation measures, show a marked improvement in air quality, which as WSP suggest is likely to be the result of improved vehicle emissions standards and a shift towards low emissions vehicles. The improvements continue through to 2036, with a further decrease in NO<sub>x</sub> and Nitrogen deposition. With transport mitigation applied, the predictions show a slight further improvement.
- 2.13 Following guidance in the previous edition of the Design Manual for Roads and Bridges 'DMRB' (prior to the LA105, which is the current air quality section), exceedance of a critical level for NO<sub>x</sub> by greater than 1% of that critical level triggers the need to consider the potential for negative impacts arising from nitrogen deposition. The more recent guidance, LA105, states that if levels do not exceed the lower critical load of the most sensitive feature, then it is considered that the impact will not give rise to a significant effect. The same is true if the change in nitrogen deposition is less than 1% of the lower critical load. For the Stour and Orwell Estuaries SPA and Ramsar the modelled levels of Nitrogen deposition for 2026 or 2036 are no longer exceeding the critical load. This led WSP to conclude that the changes in nitrogen deposition are unlikely to lead to adverse changes in the vegetation present in the SPA/Ramsar.
- 2.14 In Figure 1 we summarise the NO<sub>x</sub> annual mean concentrations under different scenarios. The plot highlights the current high baseline and then similar results for different scenarios in 2026. NO<sub>x</sub> concentrations are predicted to reduce further in 2026 and again all scenarios are very similar. The blue shading indicates scenarios without transport modelling and the orange/brown shading indicates scenarios with transport modelling. The darker shading (dark blue and dark orange/brown) indicate predictions with the inclusion of the Ipswich Local Plan Review. The plots highlight that – with transport mitigation – there is no predicted material difference with the

Ipswich Local Plan Review. The plots for Nitrogen deposition (see Figure 2) show a similar pattern.

2.15 The modelling results show that the distance at which impacts occur decreases with time too. Baseline modelled annual mean NO<sub>x</sub> concentrations were predicted to be above the critical level of 30µg/m<sup>3</sup> out to 200m. This falls to 70m (to the north of the road) and 40m (to the south) by 2026 and then to 40m (to the north) and 20m (to the south) by 2036. These distance figures (i.e. the distance from the road beyond which the concentration is below the critical level of NO<sub>x</sub>) are summarised in the bullets below under the different scenarios. Distance figures are to the north/to the south of the road:

- 200m/200m 2017 baseline
- 70m/40m 2026 without the Ipswich Local Plan Review, without transport mitigation;
- 70m/40m 2026 with the Ipswich Local Plan Review, without transport mitigation;
- 70m/40m 2026 without the Ipswich Local Plan Review, with transport mitigation;
- 70m/40m 2026 with the Ipswich Local Plan Review, with transport mitigation;
- 40m/20m 2036 without the Ipswich Local Plan Review, without transport mitigation;
- 40m/20m 2036 with the Ipswich Local Plan Review, without transport mitigation;
- 40m/20m 2036 without the Ipswich Local Plan Review, with transport mitigation;
- 40m/20m 2036 with the Ipswich Local Plan Review, with transport mitigation.

2.16 It can be seen that the different scenarios make no impact on the distances at which the critical level is exceeded, the key point being simply that with improved vehicle emissions there is a positive change over time.

2.17 These results all indicate an improvement in air quality with time. Although the modelling does not explicitly predict the effect of no development at all, it is clear that there is no real difference in impact when the Ipswich Local Plan Review is considered in combination with other local authorities.

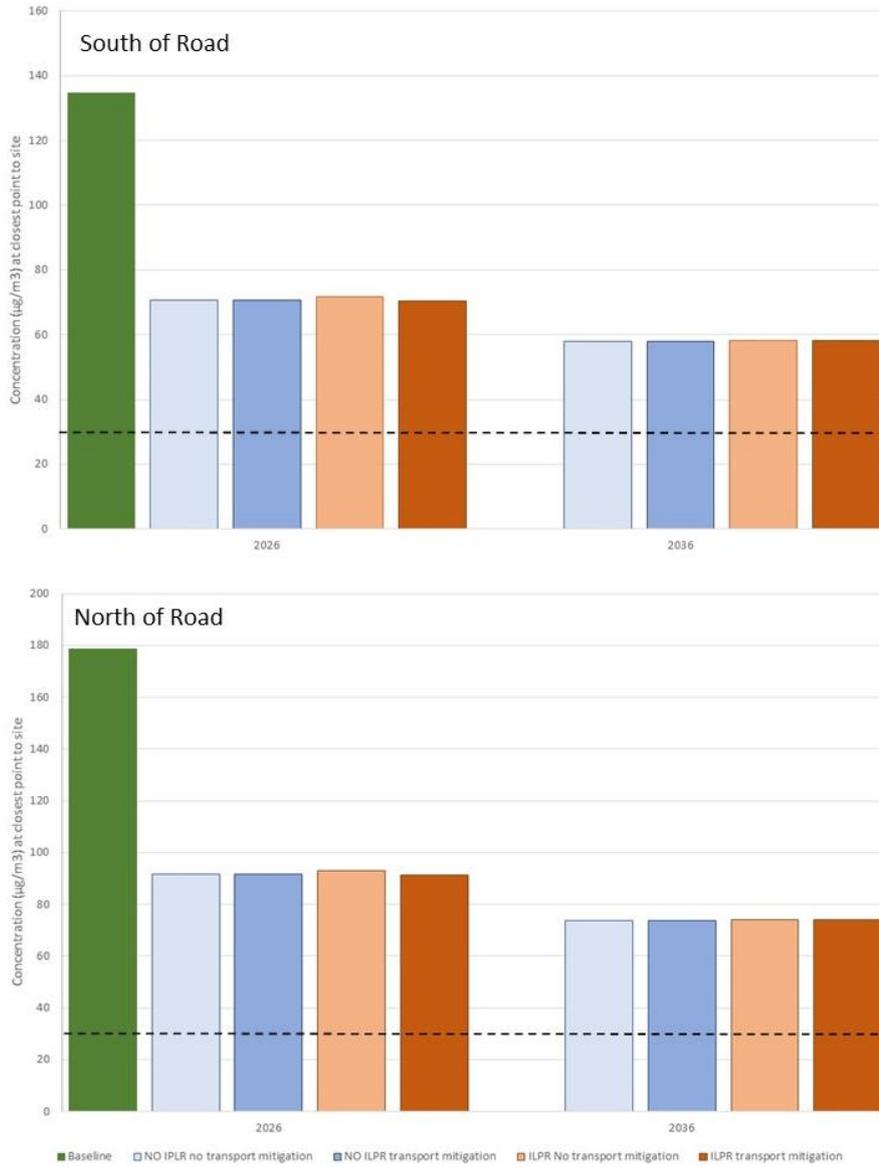


Figure 1: Summary of NO<sub>x</sub> levels under different scenarios for the Stour & Orwell Estuaries SPA/Ramsar. Dotted line reflects the critical level (30µg/m<sup>3</sup>). Data from WSP modelling.

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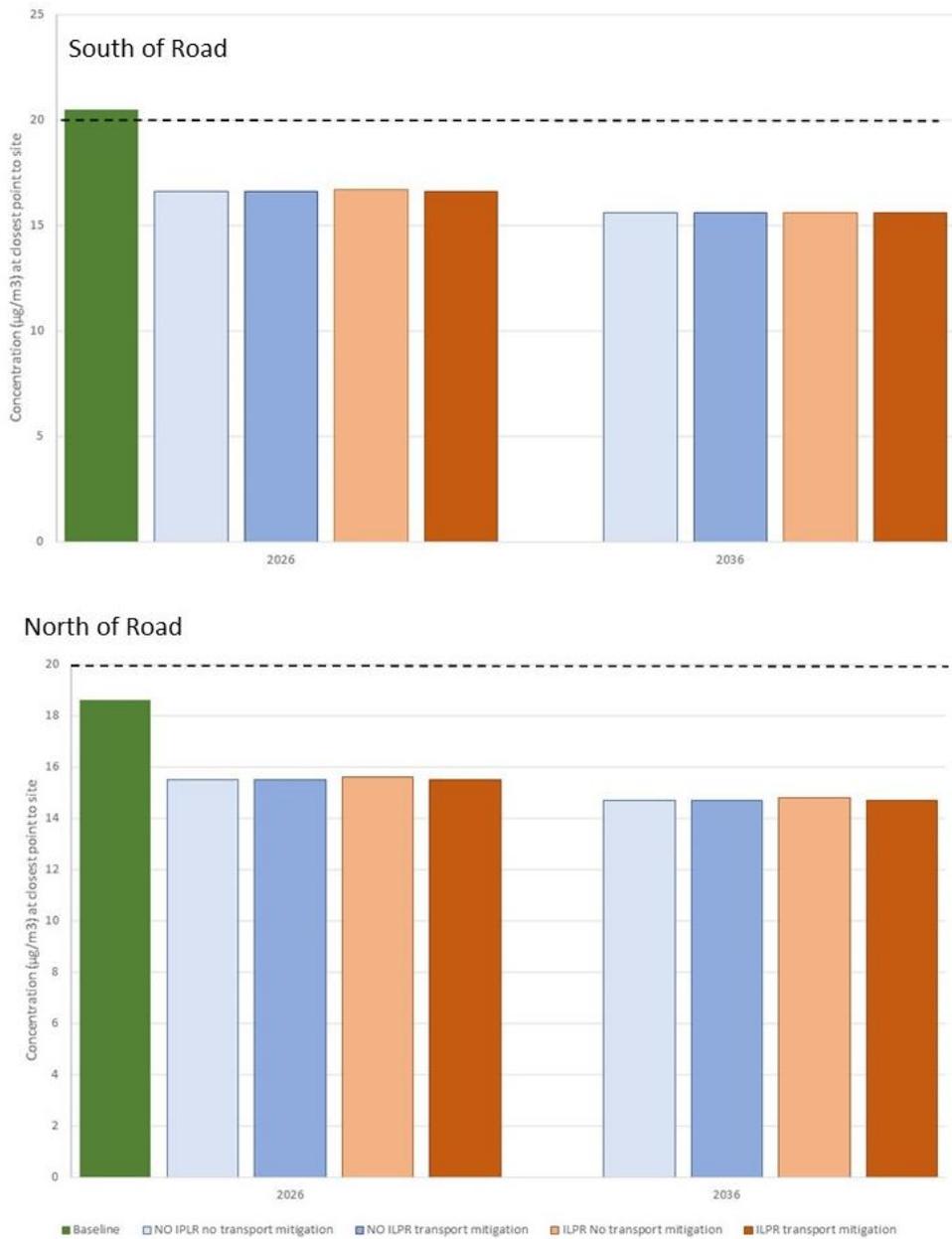


Figure 2: Summary of Nitrogen deposition levels for the Stour & Orwell Estuaries SPA/Ramsar at the closest point to the road under different scenarios. Dotted line reflects the critical load (20kg N/ha/yr). Data from WSP modelling.

## Implications

### *Orwell SPA/Ramsar and sensitivity to air quality impacts*

- 2.18 Natural England's site improvement plan from 2014<sup>2</sup> states that Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site. The site improvement plan states that this requires further investigation.
- 2.19 As a result, the plan sets out the following actions (with relevant delivery leads/partners):
- Establish regular monitoring of atmospheric nitrogen and possibly phosphorus concentrations in the Stour & Orwell estuary (Environment Agency, Natural England);
  - Develop a site nutrient plan to investigate levels of atmospheric nitrogen and possibly phosphorus deposition across the SPA, and impacts on site features (Environment Agency, Natural England);
  - Further investigate potential atmospheric nitrogen impacts on the site based on application of guidance from Chief Scientist Group Nitrogen Task and Finish Group (Natural England);
  - Informed by investigation and monitoring and nutrient plan, reduce atmospheric nutrient inputs where monitoring identifies concentrations of nutrients exceeding thresholds for Natura 2000 sites, by working with local landowners/managers, through drainage strategy framework/diffuse water pollution etc. (Environment Agency, Natural England).
- 2.20 The European marine site conservation package<sup>3</sup> for all the interest features of the Stour and Orwell Estuaries SPA, sets the following target in relation to air quality:
- 2.21 *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](#).*
- 2.22 Supporting notes indicate:
- This target has been included because the structure and function of habitats which support this SPA feature may be sensitive to changes in air quality.*

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<sup>2</sup> Available to download from the [Natural England website](#)

<sup>3</sup> See relevant page on the [Natural England website](#).

*Exceeding critical values for air pollutants may result in changes to the chemical status of its habitat substrate, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of feeding or roosting habitats.*

*Critical Loads and Levels are thresholds below which such harmful effects on sensitive UK habitats will not occur to a noteworthy level, according to current levels of scientific understanding. There are critical levels for ammonia (NH<sub>3</sub>), oxides of nitrogen (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development.*

2.23 In addition, the notes clarify timescales:

*It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.*

### *Site specific considerations*

2.24 The Stour & Orwell Estuaries is classified for the following:

- Dark-bellied Brent Goose *Branta bernicla bernicla* (Non-breeding);
- Northern Pintail *Anas acuta* (Non-breeding);
- Avocet *Recurvirostra avosetta* (Breeding);
- Grey Plover *Pluvialis squatarola*; (Non-breeding);
- Red Knot *Calidris canutus*; (Non-breeding);
- Dunlin *Calidris alpina alpina*; (Non-breeding);
- Black-tailed Godwit *Limosa limosa islandica*; (Non-breeding);
- Common Redshank *Tringa totanus*; (Non-breeding).

2.25 The wintering waterbirds include waders and wildfowl that feed on intertidal sediments and saltmarsh (the extensive areas of soft mud exposed at low tide are the main feeding areas) and roost primarily on higher areas of saltmarsh at high tide or the adjacent marshes and arable fields.

2.26 The main nesting sites for Avocet are the grazing marshes which flank the estuary with Trimley Marshes, at the Felixstowe end of the estuary being the key location. They may also use the saltmarsh edges to roost during high tide.

- 2.27 The site qualifies as a Ramsar site as it provides wintering habitats for important assemblages of wetland birds and supports internationally and nationally important numbers of wintering wildfowl and waders, and holds several nationally scarce plants and British Red Data Book invertebrates.
- 2.28 Drawing from recent reports by Natural England (Trigg, 2020) we can summarise the main Ramsar interest that does not overlap with the SPA as:
- Invertebrate assemblage: Muscid fly *Phaonia fusca*; horsefly *Haematopota grandis*; spider *Arctosas fulvolineata*; spider *Baryphma duffeyi* and the swollen spire snail *Mercuria confuse*. The natural habitat for these British Red Data Book species is saltmarsh and upper tidal litter;
  - Wetland plant assemblage Eelgrasses; Stiff saltmarsh-grass; Small cord-grass; Perennial glasswort; Lax-flowered sea lavender. These saltmarsh plant species are mainly found in the intertidal habitat, grazing marshes and ditches. In addition to providing important bird feeding areas the plants also help to stabilise the sediment
- 2.29 Checks of the area adjacent to the Orwell Bridge using aerial imagery indicate minimal areas of saltmarsh. As such the Ramsar interest that do not overlap with the SPA are believed unlikely to occur adjacent to the bridge (within the distances whereby the critical load is predicted to be exceeded from 2026). As such the Ramsar interest are not relevant to consideration of the impacts. Furthermore, Avocet do not breed in the area adjacent to the bridge and therefore the key focus – in HRA terms – is the wintering waterbirds.
- 2.30 The Site Improvement Plan states that (in 2014) the site interest features of the SPA that are sensitive to Nitrogen deposition were in favourable condition. More recent data from the British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) provides an indication of the current status of the qualifying features for the intertidal and wetland sites. [WeBS 'alerts'](#) highlight species with notable declines, and by comparing trends across sites and regions it is possible to identify where there are site-specific issues – i.e. where a decline is not mirrored at nearby sites. Alerts on the Stour & Orwell Estuaries SPA (see Woodward, Frost, Hammond, & Austin, 2019 for full details) have been triggered for five of the eight species assessed for this site and also for the waterbird assemblage as a whole. For two of these species, Black-tailed Godwit and Redshank, comparison of site trend with broadscale trends suggests that the declines underpinning Alerts status may be driven by site-specific pressures. This would suggest some of the wintering

waterbirds are under particular pressure within the Stour and Orwell Estuaries SPA. This could be for a range of reasons.

- 2.31 The area of intertidal feeding habitat within 70m (the distance within which critical levels of NO<sub>x</sub> are predicted to be exceeded in 2026) are very small as a proportion of the SPA. By 2036 the relevant distance of 40m (north of the road) and 20m (to the south) likely to be impacted by the elevated NO<sub>x</sub> levels is very limited. Furthermore, it should be noted that these distances are estimated on the assumption of the road being at ground level. The bridge is actually elevated well above the European site. Checks with WSP have indicated that this is likely to mean that any predictions of pollutant levels and relevant distances for the Stour and Orwell Estuaries SPA/Ramsar will be overestimated. This is because any pollutants from traffic will be dispersed due to elevation.

### *Implications*

- 2.32 The WSP modelling provides further clarity on future air quality and demonstrates the effect of the Ipswich Local Plan Review (and development in the wider Ipswich Strategic Planning Area) on NO<sub>x</sub> and Nitrogen deposition for the Stour & Orwell Estuaries SPA/Ramsar. WSP conclude that impacts on the Stour and Orwell Estuaries SPA and Ramsar were determined to be not significant according to DMRB LA105 criteria.
- 2.33 The modelling shows a trajectory of steady improvement in NO<sub>x</sub> and Nitrogen deposition, and the Ipswich Local Plan Review is not predicted to influence that trajectory. With the inclusion of transport mitigation, the results indicate that adverse effects on integrity of the Stour and Orwell Estuaries SPA/Ramsar can be ruled out, alone and in-combination with the other local plans in the Ipswich Strategic Planning Area. This confirms the conclusions of the previous HRA work.
- 2.34 Nonetheless, the predictions do also indicate that currently the Stour and Orwell Estuaries SPA/Ramsar is exceeding critical levels for NO<sub>x</sub> and that even by 2036 those levels will be exceeded (regardless of the implementation of the Ipswich Local Plan Review). The distance at which the critical levels are exceeded shrink with time to a maximum of 70m of the road by 2036 (as opposed to 200m at the baseline year of 2017). This would indicate that long-term monitoring is necessary and relevant organisations, including the local planning authorities, should be working together to ensure the levels of NO<sub>x</sub> are reduced.

## 3. Flood Risk

### HRA conclusions

- 3.1 The HRA states that flood risk is of relevance where flooding may occur and draw pollutants and sewage overflow into designated waterbodies, such as the Orwell Estuary. The HRA however ruled out adverse effects on integrity from flood risk. It highlighted the Development and Flood Risk SPD (most recently updated in 2016) and Core Strategy policy CS18, which commits to the implementation of the Borough's Flood Defence Management Strategy, along with policy DM4 that requires adherence to this strategy and sets out clear requirements for flood risk prevention in development proposals.

### New Evidence

- 3.2 The updated Strategic Flood Risk Assessment collates relevant and up to date information on the risk of flooding to the Borough from all sources, including the impact of climate change in the future. It therefore provides Ipswich Borough Council with the information necessary to guide planning decisions and incorporate flood risk avoidance and mitigation measures where required.
- 3.3 The Strategic Flood Risk Assessment identifies that the town is at risk of flooding from surface water runoff and exceedance of the local drainage network. In some localised areas (along spring lines and in some tributary valleys) this is exacerbated by the underlying ground conditions which are susceptible to groundwater emergence.
- 3.4 The updated Strategic Flood Risk Assessment is a positive step to reducing the risks identified in the HRA as it provides the best available evidence to ensure impacts from run-off can be avoided. For example, it enables development to be steered into the locations with the least flood risk and identifies allocations where there is a risk of flooding and measures will be necessary at project level to resolve the risks.
- 3.5 The updated Strategic Flood Risk Assessment sets out guidance for SUDS in order to reduce and manage surface water run-off from developments and also sets out strategic flood risk management measures.

## HRA implications

- 3.6 The Strategic Flood Risk Assessment has been checked for any information that might affect the original HRA conclusions. There are no further changes to the HRA required and the conclusion of no adverse effects on the integrity of the Stour and Orwell Estuaries SPA/Ramsar remains.

## References

- AECOM. (2020). *Strategic Flood Risk Assessment*. Report for Ipswich Borough Council.
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