

Report to Inform Habitats Regulations Assessment

Cherwell Local Plan Review 2040

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Cherwell District Council

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1. Introduction

Background to the Project

- 1.1 AECOM was appointed by Cherwell District Council to produce a report to inform the Council's Habitats Regulations Assessment (HRA) of the potential effects of the Cherwell Local Plan Review on the National Site Network of Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites. For simplicity these sites are referred to as Habitats Sites throughout this report. The objectives of the assessment are to:
- Identify any aspects of the Local Plan Review that would cause an adverse effect on the integrity of Habitats Sites either alone or in combination with other plans and projects; and
 - To advise on appropriate policy mechanisms for delivering mitigation where such effects were identified.
- 1.2 The HRA of the Cherwell Local Plan Review is required to determine if there are any realistic linking pathways present between a Habitats Site and the Local Plan Review and where Likely Significant Effects cannot be screened out, an analysis to inform Appropriate Assessment is undertaken to determine if adverse effects on the integrity of the Habitats Sites will occur as a result of the Local Plan Review alone or in combination.

Legislation

- 1.3 The need for HRA is set out within the Conservation of Habitats & Species Regulations 2017 (**Box 1**). Habitats Sites (also called the National Site Network) can be defined as actual or proposed/candidate Special Areas of Conservation (SAC) or Special Protection Areas (SPA). It is also Government policy for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to Habitats Sites.

Box 1: The legislative basis for Habitats Regulations Assessment

Conservation of Habitats and Species Regulations 2017 (as amended)

The Regulations state that:

"A competent authority, before deciding to ...give any consent, permission or other authorisation for, a plan or project which- (a) is likely to have a significant effect on a European site ... (either alone or in combination with other plans or projects)... must make an appropriate assessment of the implications of the plan or projects in view of the sites conservation objectives... The competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site".

- 1.4 The Habitats Regulations applies the precautionary principle to Habitats Sites. Plans and projects can therefore only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.
- 1.5 In 2018, the 'People Over Wind' European Court of Justice (ECJ) ruling¹ determined that 'mitigation' (i.e., measures that are specifically introduced to avoid or reduce the harmful effects of a plan or project on Habitats Sites) should not be taken into account when forming a view on likely significant effects. Mitigation should instead only be considered at the appropriate assessment stage. Appropriate assessment is not a technical term: it simply means 'an assessment that is appropriate' for the plan or project in question. As such, the law purposely does not prescribe what it should consist of or how it should be presented; these are decisions to be made on a case by case basis by the competent authority.

¹ Case C-323/17

- 1.6 Over the years the phrase 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations from screening through to Imperative Reasons of Overriding Public Interest (IROPI). This has arisen in order to distinguish the process from the individual stage described in the law as an 'Appropriate Assessment'. Throughout this report we use the term Habitats Regulations Assessment for the overall process.

Report Layout

- 1.7 **Chapter 2** of this report explains the process by which the HRA has been carried out. **Chapter 3** explores the relevant pathways of impact. **Chapter 4** summarises the Test of Likely Significant Effects of the policies and site allocations of the Plan considered 'alone' and 'in-combination'. **Chapter 5** contains the conclusion and a summary of recommendations

2. Methodology

Introduction

- 2.1 This section sets out the approach and methodology for undertaking the Habitats Regulations Assessment (HRA).

A Proportionate Assessment

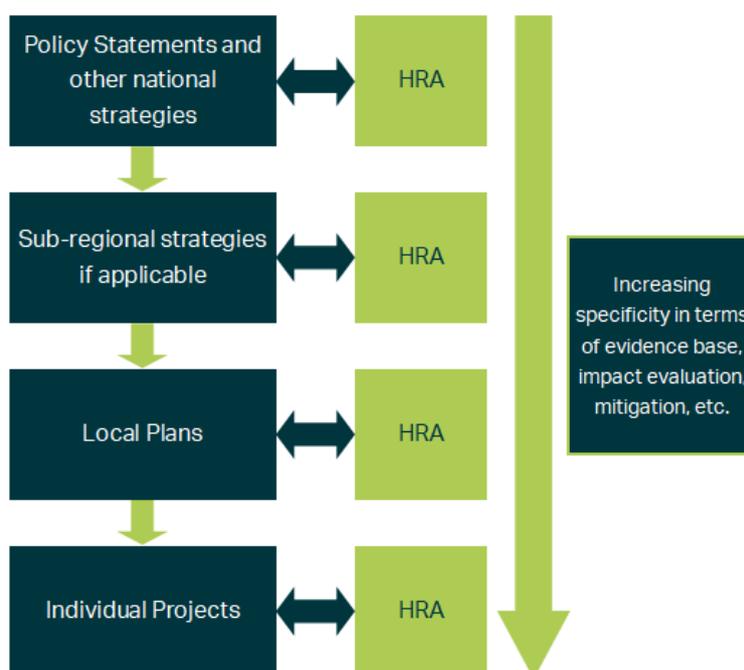
- 2.2 Project-related HRA often requires bespoke survey work and novel data generation in order to accurately determine the significance of effects. In other words, to look beyond the risk of an effect to a justified prediction of the actual likely effect and to the development of avoidance or mitigation measures.
- 2.3 However, the draft MHCLG guidance² (described in greater detail later in this chapter) makes it clear that when implementing HRA of land-use plans, the Appropriate Assessment (AA) should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself:
- 2.4 *“The comprehensiveness of the [Appropriate] assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would be inappropriate and impracticable to assess the effects [of a strategic land use plan] in the degree of detail that would normally be required for the Environmental Impact Assessment (EIA) of a project.”*
- 2.5 More recently, the Court of Appeal³ ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be *“achieved in practice”* then this would suffice to meet the requirements of the Habitat Regulations. This ruling has since been applied to a planning permission (rather than a Plan document)⁴. In this case the High Court ruled that for *“a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of reg 61 of the Habitats Regulations”*.
- 2.6 In other words, there is a tacit acceptance that AA can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers as illustrated in **Box 2**.

² MHCLG (2006) Planning for the Protection of European Sites, Consultation Paper

³ No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015

⁴ High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

Box 2: Tiering in HRA of Land Use Plans



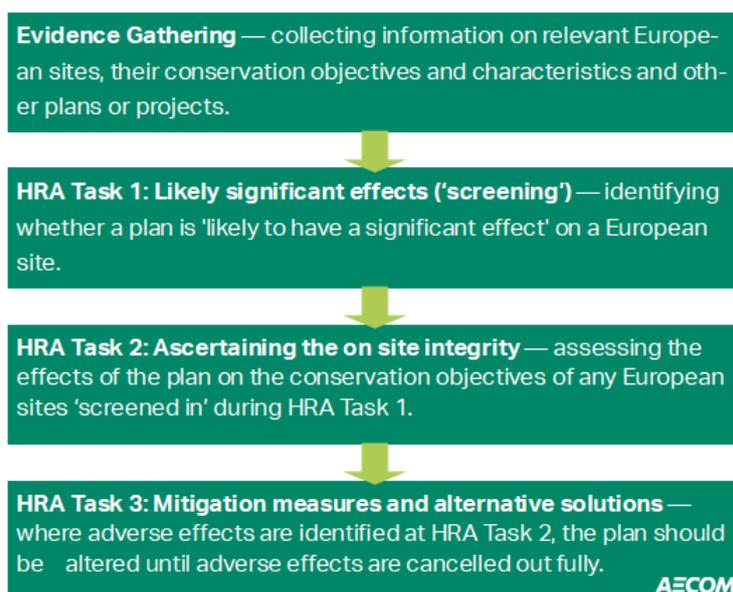
- 2.7 At the same time, it is necessary to have confidence that sites allocated in a Local Plan have a reasonable prospect of being deliverable without fundamental Habitats Regulations Assessment issues.
- 2.8 The most robust and defensible approach to the absence of fine grain detail at this level is to make use of the precautionary principle. In other words, the plan is never given the benefit of the doubt (within the limits of reasonableness); it must be assumed that a policy/measure is likely to have an impact leading to a significant adverse effect upon an internationally designated site unless it can be clearly established otherwise.

The Process of HRA

- 2.9 Central government have released general guidance on appropriate assessment.⁵ **Box 3** outlines the stages of HRA according to guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations, and any relevant changes to the plan until no likely significant effects remain.

⁵ <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site>

Box 3: Four-Stage Approach to Habitats Regulations Assessment



2.10 The following process has been adopted for carrying out the subsequent stages of the HRA.

Task One: Test of Likely Significant Effects

2.11 The first stage of any Habitats Regulations Assessment is a test of Likely Significant Effects - essentially a high-level assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

"Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

2.12 In evaluating significance, AECOM have relied on professional judgment and experience of working with the other local authorities on similar issues. The level of detail concerning developments that will be permitted under land use plans is rarely sufficient to make a detailed quantification of effects. Therefore, a precautionary approach has been taken (in the absence of more precise data) assuming as the default position that if a likely significant effect (LSE) cannot be confidently ruled out, then the assessment must be taken to the next level of assessment Task Two: Appropriate Assessment. This is in line with the April 2018 court ruling relating to 'People Over Wind' where mitigation and avoidance measures are to be included at the next stage of assessment.

Task Two: Appropriate Assessment

2.13 Habitats Site(s) which have been 'screened in' during the previous Task have a detailed assessment undertaken on the effect of the policies on the Habitats Site(s) site integrity. Avoidance and mitigation measures to avoid adverse significant effects are taken into account or recommended where necessary.

2.14 As established by case law, 'appropriate assessment' is not a technical term; it simply means whatever further assessment is necessary to confirm whether there would be adverse effects on the integrity of any Habitats Sites that have not been dismissed at screening. Since it is not a technical term it has no firmly established methodology except that it essentially involves repeating the analysis for the likely significant effects stage, but to a greater level of detail on a smaller number of policies and sites, this time with a view to determining if there would be adverse effects on integrity.

2.15 One of the key considerations during Appropriate Assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the Appropriate Assessment takes any policies or allocations that could not be dismissed following the high-level Screening analysis and analyse the potential

for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the Habitats Site(s)).

The Geographic Scope

2.16 There is no single guidance document that dictates the physical scope of an HRA of a plan in all circumstances. Therefore, in considering the physical scope of the assessment AECOM was guided primarily by the identified impact pathways rather than by arbitrary “zones”, i.e. a source-pathway-receptor approach. Current guidance suggests that the following Habitats Sites be included in the scope of assessment:

- All sites within the District; and
- Other sites shown to be linked to development within Cherwell through a known “pathway” (discussed below).

2.17 Briefly defined, impact pathways are routes by which a change in activity within the plan area can lead to an effect upon a Habitats Site. In terms of the second category of Habitats Site listed above, DLUHC guidance states that the AA should be “*proportionate to the geographical scope of the [plan policy]*” and that “*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*” (MHCLG, 2006, p.6).

2.18 Locations of European designated sites are illustrated in **Appendix A, Figure 1**, and full details of all European designated sites discussed in this document can be found in **Appendix B**, specifying their qualifying features, conservation objectives and pressures and threats to integrity taken from the Site Improvement Plan for each site, although it is noted that the Conservation Objectives and Supplementary Advice on Conservation Objectives take precedence over Site Improvement Plans as they are generally more recent. Table 1 below lists all those European designated sites included in this HRA.

2.19 The Physical scope of this exercise includes all Habitats Sites within Table 1 below. Part of Oxford Meadows SAC sits within the Cherwell District and Cothill Fen lies approximately 8km south of the District boundary. All other Habitats Sites are relatively remote from Cherwell, the next closest being 17km from the District boundary.

Table 1. Physical scope of the HRA - Habitats Sites of interest

Habitats Site	Description	Qualifying Features	Potential Pathways to the Plan	Impact relating to the Plan	Distance from Cherwell District
Oxford Meadows SAC	Oxford Meadows is one of two SACs that represent lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) in the Thames Valley. It includes vegetation communities that are perhaps unique in the world in reflecting the influence of long-term grazing and hay-cutting on lowland hay meadows. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function. The site is selected because Port Meadow is the larger of only two known sites in the UK for creeping marshwort <i>Apium repens</i>	– Lowland hay meadows – Creeping marshwort	– Hydrological change – Invasive species		Partially within District boundary
Cothill Fen SAC	Cothill Fen is an exceptionally important site with an outstanding range of nationally rare habitats which support a large number of rare invertebrates and plants. The habitats consist of calcareous fen, calcareous grassland, woodland and scrub of varying degrees of wetness. The habitat supports over 330 species of vascular plant and over 120 nationally scarce or rare	– Calcium-rich springwater-fed fens – Alder woodland on floodplains	– Water pollution – Hydrological changes – Air pollution		8km south of District boundary

Habitats Site	Description	Qualifying Features	Potential Pathways to the Plan	Impact relating to the Plan	Distance from Cherwell District
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invertebrates, including the nationally rare Southern Damselfly *Coenagrion mercuriale*.

The 'in Combination' Scope

- 2.20 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the European designated site(s) in question.
- 2.21 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e. to ensure that those projects or plans which in themselves have minor impacts are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in combination assessment is therefore of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. The overall approach is to exclude the risk of there being unassessed likely significant effects in accordance with the precautionary principle. This was first established in the seminal Waddenzee⁶ case.
- 2.22 For the purposes of this HRA, we have determined that the key other documents with a potential for in-combination effects are:
- Cherwell's Air Quality Action Plan⁷
 - Oxfordshire's Local Transport and Connectivity Plan⁸
 - West Oxfordshire Local Plan (2018)⁹
 - Vale of the White Horse Local Plan (2016)¹⁰
 - Oxford Local Plan (2020)¹¹ and the emerging Oxford Local Plan Review
 - South Oxfordshire Local Plan (2020)¹²
 - West Northamptonshire Joint Core Strategy (2014)¹³
 - Vale of Aylesbury Local Plan (2021)¹⁴
- 2.23 South Oxfordshire and Vale of White Horse are currently working on a new Joint Local Plan but they are at an early stage (Issues) with an Preferred Options consultation expected in October 2023. It should be noted that, while the broad potential impacts of these plans will be considered, this document does not carry out HRA of these Plans and projects. Instead, it draws upon existing HRAs that have been carried out on the Plans and projects.

⁶ Waddenzee case (Case C-127/02, [2004] ECR-I 7405)

⁷ <https://www.cherwell.gov.uk/download/downloads/id/7702/air-quality-action-plan-2017.pdf> Accessed 02/08/2023

⁸ <https://www.oxfordshire.gov.uk/sites/default/files/file/roads-and-transport-connecting-oxfordshire/LocalTransportandConnectivityPlan.pdf> Accessed 02/08/2023

⁹ <https://westoxon.gov.uk/media/fevjmpen/local-plan.pdf> Accessed 02/08/2023

¹⁰ [Local Plan 2031 - Part One - Vale of White Horse District Council \(whitehorsedc.gov.uk\)](https://www.oxford.gov.uk/downloads/download/1176/oxford_local_plan_2016-2036) Accessed 02/08/2023

¹¹ https://www.oxford.gov.uk/downloads/download/1176/oxford_local_plan_2016-2036 Accessed 02/08/2023

¹² [SODC-LP2035-Publication-Feb-2021.pdf \(southoxon.gov.uk\)](https://www.sodc.gov.uk/media/2021/02/SODC-LP2035-Publication-Feb-2021.pdf) Accessed 02/08/2023

¹³ <https://www.westnorthants.gov.uk/west-northamptonshire-joint-planning-unit-jpu> Accessed 02/08/2023

¹⁴ [Vale of Aylesbury Local Plan \(VALP\) \(buckinghamshire-gov-uk.s3.amazonaws.com\)](https://www.valeofaylesbury.gov.uk/media/2021/02/Vale-of-Aylesbury-Local-Plan-(VALP)-(buckinghamshire-gov-uk.s3.amazonaws.com)) Accessed 02/11/2022

3. Test of Likely Significant Effects

- 3.1 This section of the report sets out the Test of Likely Significant Effects, determining whether there is any potential for a significant effect on Habitats Sites either alone or 'in combination' with other plans and projects. The potential impact pathways explored, and discussed in detail later in the report, are air quality, recreational pressure, water quality and water levels/flows (water resources) with regard to Oxford Meadows SAC in particular but also considering Cothill Fen SAC.

Policies and Allocations in the Local Plan Review

- 3.2 Tables 2 and 3 overleaf set out each policy and proposed site allocation in the Cherwell Local Plan Review. For each policy a judgment is made in the last column of the table as to whether it could present any conceivable impact pathway to Habitats Sites. Since impact pathways arising from policies depends primarily on the proximity of allocated sites to Habitats Sites, Table 3 then identifies each allocation and its proximity to the nearest Habitats Site.

Likely Significant Effects of Cherwell Local Plan Review policies and allocations

Table 2. Likely Significant Effects of Cherwell Local Plan Review policies and allocations

Policy Reference	Brief Description	Potential Impact	Likely	Significant
Core Meeting Educational Needs Policy 52:	<p>This policy relates to the provision of educational facilities within the Local Plan (LP) area. The policy states “the council, in partnership, will ensure the provision of pre-school, school, community learning and other facilities”. However, the policy does not specifically allocate locations for educational facilities within the policy, merely a commitment to provide facilities within the LP area within the LP period.</p> <p>The rest of the policy is development management which provides criteria for which the development of educational facilities should be designed based on.</p>	<p>No likely significant effect, but down the line HRA</p> <p>Although the policy states that the council will ensure the provision of educational facilities the policy does not make commitment to locations for these sites. Therefore, impact pathways cannot be assessed for this policy.</p> <p>Developments proposals providing educational facilities will be required to undergo HRA at the project level where it is determined proposals present a linking impact pathway.</p> <p>The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.</p>		
Core Health Facilities Policy 49:	<p>This policy related to the provision of health facilities. The policy states “the council will support the provision, extension and co-location of health facilities in sustainable locations”.</p> <p>The rest of the policy is development management which provides criteria for which the development of health facilities should be designed based on.</p>	<p>No likely significant effect</p> <p>Although the policy states that the council will support provision of healthcare facilities, the policy is merely committing to support</p>		

Policy Reference Brief Description

**Potential Likely Significant
Impact**

	<p>proposals for development where they can adhere to certain criteria.</p> <p>The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 57: Historic Environment and Archaeology</p> <p>The policy aims to conserve and/or enhance the special character, appearance, and distinctiveness of Cherwell District’s historic environment by protecting both designated and non-designated heritage assets.</p> <p>This policy is a development management policy.</p>	<p>No likely significant effect</p> <p>Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 58: Conservation Areas</p> <p>The policy aims to conserve and/or enhance the special character, appearance and setting of Cherwell District’s Conservations Areas through development management criteria for all development proposals within Conservation Areas.</p> <p>The policy is a development management policy.</p>	<p>No likely significant effect</p> <p>Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 59: Listed Buildings</p> <p>This is a development management policy setting out criteria that proposals on listed building have to adhere to when adding to, altering, and/or changing the use of the listed building.</p>	<p>No likely significant effect</p> <p>Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 60: Oxford Canal</p> <p>The policy seeks to protect and enhance the Oxford Canal.</p> <p>The policy also states “[the council] will support proposals to promote transport, recreation, leisure and tourism related uses of the canal, as well as supporting enhancement of the canals active role in mixed use development in an urban setting.”</p> <p>The rest of the policy is a development management policy.</p>	<p>No likely significant effect</p> <p>Although the policy states that the council will support provision of recreation, leisure, tourism and mixed use development along the canal, the policy does not allocate development it is merely</p>

Policy Reference Brief Description

Potential Likely Significant Impact

	<p>committing to support proposals for development where they can adhere to certain criteria.</p> <p>The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 61: This is a development management policy setting out criteria that proposals for permanent residential moorings on the Oxford Canal have to adhere to.</p> <p>Residential Canal Moorings</p>	<p>No likely significant effect</p> <p>Although the policy states that the council will support permanent residential moorings on the canal, the policy does not allocate development it is merely committing to support proposals for development where they can adhere to certain criteria.</p> <p>The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 31: Tourism This is a development management policy setting out criteria that proposals for new tourist and visitor facilities, including hotels have to adhere to.</p>	<p>No likely significant effect</p> <p>Although the policy states that the council will support new tourist and visitor facilities including hotels, the policy does not allocate development it is merely committing to support proposals</p>

Policy Reference Brief Description

Potential Impact Likely Significant

	<p>for development where they can adhere to certain criteria.</p> <p>The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 32: Town Centre Hierarchy and Retail Uses</p> <p>The policy is a development management policy which focuses on the promotion of the continued role and functions of town/urban centres to positively contribute towards their viability, vitality, character and public realm.</p> <p>The policy does also mention that it will support the provision of new local centres containing retail development within allocated strategic housing sites and any leisure and retail outside of town centres which requires planning permission will be subject to an impact assessment appropriate to its use.</p>	<p>No likely significant effect</p> <p>Although the policy states that the council will support new local centres with retail development within and leisure and retail development outside of town centre, the policy does not allocate development it is merely committing to support proposals for development where they can adhere to certain criteria.</p> <p>The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.</p>
<p>Policy 33: Primary Shopping Areas</p> <p>This policy is a development management policy which focuses on proposals resulting in the loss of an E Class use, setting out criteria where this will be supported by the council.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

		provide linking impact pathways to Habitats Sites.
Development Policy 5: Hot Food Takeaways	This is a development management policy which sets out criteria that proposals for fast food takeaways must adhere to, to be supported by the council.	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Development Policy 2: Outdoor Markets	This is a development management policy which sets out criteria that proposals for permanent and temporary street markets and car boot sales must adhere to, to be supported by the council.	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Development Policy 3: Shopfronts and Signage	This is a development management policy which sets out criteria that proposals including new or altered shopfronts and advertisement must adhere to, to be supported by the council.	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Development Existing Employment Sites	Policy 26: This is a development management policy which aims to protect existing employment sites to ensure an appropriate level of employment provision is provided for over the LP period.	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core New Employment	Policy 27: The policy states that "new employment development... will be supported on unallocated sites..."	No likely significant effect, but down the line HRA.

Policy Reference Brief Description

**Potential Likely Significant
Impact**

Development on Unallocated Sites The policy does not allocate sites for development in the LP area merely states it will support development where the proposals adhere to the criteria set in the Policy.

Although the policy states the council will support new employment development on unallocated sites, the policy does not make commitment to locations for these sites. Therefore, impact pathways cannot be assessed for this policy. **Developments proposals providing new employment development on unallocated sites will be required to undergo HRA at the project level where it is determined proposals present a linking impact pathway.**

The rest of the policy is development management. Development management policies do not provide linking impact pathways to Habitats Sites.

Core Policy 28: This is a development management policy which provides criteria which the proposal must adhere to be supported with regards to Ancillary Uses on Designated Employment Sites uses other than E(g), B2 and B8 business uses on designated employment sites.

No likely significant effect

This is a development management policy. Development management policies do not provide linking impact pathways.

Core Policy 29: This is development management policy which seeks to ensure opportunities for local employment apprenticeships and training Community Employment Plans can be created through proposals for employment/business development.

No likely significant effect

This is a development management policy. Development

Policy Reference Brief Description

**Potential Likely Significant
Impact**

	management policies do not provide linking impact pathways.
Core Policy 30: This is a development management policy which provides criteria which proposals must adhere to to be supported with regards to Rural Diversification proposals for economic activities through diversification of farms.	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 53: This is a development management policy which aims to improve the public services/utilities within the district through planning Public Services and Utilities proposals and working with Oxfordshire County Council.	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 21: This policy is a development management policy which aims to ensure that transport improvements contribute positively to Sustainable Transport and Connectivity attractiveness, safety of place, and quality of life in Cherwell and respond sensitively to the natural and historic environment Improvements	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 47: This is a development management policy which aims to ensure that public realm improvements and infrastructure are designed to Active Travel – create attractive places that make walking and cycling a safer, healthier and more attractive travel choice. Walking and Cycling	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 48: This is a development management policy which aims to ensure that public rights of way including bridleways and byways are Public Rights of Way of protected and enhanced to maintain connectivity of these networks.	No likely significant effect This is a development management policy. Development

Policy Reference Brief Description

**Potential Likely Significant
Impact**

	management policies do not provide linking impact pathways.
<p>Core Policy 22: This is a development management policy which aims to help the delivery of public transportation and active travel improvements to manage the districts road network in a manner that reduces traffic and congestion.</p> <p>Assessing Transport Impact/Decide and Provide</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways</p>
<p>Core Policy 23: This is a development management policy which aims to manage number and intensity of transport movements relating to freight</p> <p>Freight</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 1: This is a development management policy which aims to ensure that all buildings (new, conversions and refurbishments) are resilient and to the impacts of climate change and that the impact of the development on climate change is mitigated.</p> <p>Mitigating and Adapting to Climate Change</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 3: This is a development management policy which aims to ensure all new developments are achieving zero carbon by reducing greenhouse gas emissions and minimising peak energy demands.</p> <p>The Energy Hierarchy and Energy Efficiency</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 4: This is a development management policy which aims to ensure that all new dwellings and new non-residential development of Net 1,000sqm or more are achieving net zero operational regulated carbon emissions</p> <p>Achieving Net</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

<p>Zero Carbon Development</p>	<p>management policies do not provide linking impact pathways.</p>
<p>Core Policy 2: This is a development management policy which aims to ensure new dwellings and new non-residential development of 1,000sqm Zero or Low are delivering zero and low carbon energy technologies on site Carbon Energy Sources</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 5: This is a development management policy which requires developments to address any residual carbon emissions forecast by Carbon Offsetting financial contributions to the Council's carbon offsetting fund.</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 6: This is a development management policy which sets out criteria by which renewable energy development must adhere to be supported by the council Renewable Energy</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 7: This is a development management policy to manage and reduce the risk of flooding in the district. Sustainable Flood Risk Management</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 8: This is a development management policy which ensures the use of sustainable drainage systems in all major development Sustainable</p>	<p>No likely significant effect This is a development management policy. Development</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

<p>Drainage Systems</p>	<p>management policies do not provide linking impact pathways.</p>
<p>Core Policy 9: This is a development management policy which seeks to protect and enhance water quality including surface water and groundwater; ensure adequate water resources, foul drainage and sewerage treatment capacity; and, promote sustainable water use.</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 16: This is a development management policy which aims to address the impact of poor air quality, to improve air quality and mitigate its impacts.</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 43: This is a development management policy which aims to preserve the character and appearance of the landscape through Protection and restoration, management and enhancement of existing areas, features or habitats and where appropriate the creation of new ones including the planting of woodlands, trees and hedgerows.</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 45: This is a development management policy that aims to ensure that the settlements character is retained and physical and visual separation is maintained between settlements.</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 18: This is a development management policy which aims to avoid unnecessary light pollution.</p>	<p>No likely significant effect This is a development management policy. Development</p>

Policy Reference Brief Description

Potential Impact Likely Significant

	management policies do not provide linking impact pathways.
<p>Core Policy 54: This is a development management policy to ensure protection of local green spaces from inappropriate development.</p> <p>Local Green Space</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 10: This is a development management policy to prevent any obstruction of ground water flows and preserve water quality, to maintain the stability of the hydrological regime within the SAC and therefore its integrity as a site of international importance.</p> <p>Oxford Meadows SAC</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 11: This is a development management policy to ensure the restoration, protection and enhancement of biodiversity assets and facilitation of their adaptation to climate change wherever possible. It also protects internationally important sites by ensuring that any development which has the potential to impact an SAC, SPA and/or Ramsar would be subject to an HRA and not permitted unless it could be demonstrated that there will be no likely significant effect or that the effects can be mitigated.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p> <p>This policy also provides specific protection to internationally important sites.</p>
<p>Core Policy 12: This is a development management policy which ensures the requirement to demonstrate 10% net gain in biodiversity is achieved. Additionally 20% biodiversity net gain will be sought in the Nature Recovery Network Core and Recovery zone and new urban extensions will also be required to achieve 20% biodiversity net gain.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

<p>Core Policy 13: This is a development management policy which aims to protect and provide biodiversity enhancement to Conservation Target Areas</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 14: This is a development management policy which ensures that a natural capital assessment is undertaken for each development to demonstrate the impact of the development on the environment and any environmental net gain to be secured.</p> <p>Natural Capital and Ecosystem Services</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 15: This is a development management policy which promotes the protection and enhancement of sites that form part of the existing Green and Blue infrastructure network.</p> <p>Green and Blue Infrastructure</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 36: This is a development management policy which details the requirements of developments to provide affordable housing.</p> <p>Affordable Housing</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 37: This is a development management policy which details the mix of housing required for developments</p> <p>Housing Mix</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

<p>Core Policy 38: This is a development management policy which defines where and when specialist housing should be included within development proposals.</p> <p>Specialist Housing</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 39: This is a development management policy which relates to the required internal and external space for all new dwellings</p> <p>Residential Space Standards</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Policy 40: Self-build and Custom-build Housing</p> <p>This is a development management policy which encourages the development of self-build and custom-build housing in appropriate locations.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Development Policy 8: New Dwellings in the Countryside</p> <p>This is a development management policy which details criteria for which development will be accepted outside of the limits of New settlements</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Development Policy 9: Conversion of a Rural Building to a Dwelling</p> <p>This is a development management policy which details criteria for which conversion of a rural building to a dwelling will be accepted.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

<p>Core Policy 41: This is a development management policy which details criteria for which converting dwellings into multiple self-contained units or Sub-division of HMOs will be accepted. Dwellings and Homes in Multiple Ownership</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Development Policy 4: This is a development management policy which details the criteria for which a residential caravan will be granted temporary consent to reside within the curtilage of a house or land. Residential Caravans</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 42: This is a development management policy which details the criteria for which placement of travelling community sites will be considered against. Travelling Communities</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways. The policy does not allocate any sites for travelling communities.</p>
<p>Core Policy 46: This is a development management policy which details criteria by which development will be accepted in terms of complementing Achieving Well and enhancing its surroundings Designed Places</p>	<p>No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 50: This is a development management policy which details the criteria by which developments must adhere with regards to promoting Creating Healthy healthier communities. Communities</p>	<p>No likely significant effect This is a development management policy. Development</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

	management policies do not provide linking impact pathways.
Core Policy 54: This is a development management policy which relates to the criteria by which the addition or removal of a community facility would be accepted Local Services and Community Facilities	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 55: This is a development management policy which relates to the criteria by which the addition or removal of open space, sport and recreational facilities would be accepted Open Space, Sport and Recreation	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 20: This is a development management policy which relates to the criteria by which the use, movement or storage of hazardous substances will be accepted. Hazardous Substances	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 17: A development management policy relating to pollution and noise Pollution and Noise	No likely significant effect This is a development management policy. Development management policies do not provide linking impact pathways.
Core Policy 19: A development management policy relating to soils, contaminated land and stability Soils,	No likely significant effect This is a development management policy. Development

Policy Reference Brief Description

Potential Likely Significant Impact

Contaminated Land and Stability

management policies do not provide linking impact pathways.

Development Policy 1: Waste Collection and Recycling
A development management policy relating to waste collection and recycling

No likely significant effect
This is a development management policy. Development management policies do not provide linking impact pathways.

Core Policy 62: This policy allocates development within the Banbury area both in the form of strategic and non-strategic development. A total of 5,950 dwellings will be delivered in Banbury between 2020 and 2040 including the following strategic site allocations:

Potential likely significant effects in combination

Site	2020-2040	
North of Wykham Lane	600	New Site Allocation
Withycombe Farm	230	New Site Allocation
Canalside	-168	Replacing Policy Banbury 1 of the Local Plan 2011-2031 with a new allocation including 500 homes
Higham Way	-150	Replacing Policy Banbury 19 of the Local Plan 2011-2031 to allow for employment use

This policy allocates net new dwellings and net new employment area within the Cherwell District.

This policy may have linkage to the following impact pathways:

- Recreational pressure
- Water resources, quality and hydrological change
- Air quality

The following existing strategic site policies are retained and will not be replaced.

- Policy Banbury 2: Land to the West of Southam Road
- Policy Banbury 3: West of Bretch Hill
- Policy Banbury 4: Bankside Phase 2
- Banbury 5: North of Hanwell Fields
- Banbury 16: South of Salt Way West
- Banbury 17: South of Salt Way East

Policy Reference Brief Description

Potential Impact Likely Significant

- Banbury 18: Land at Drayton Lodge Farm

A further allowance will be made for ‘windfalls’ of less than 10 dwellings on previously developed sites within the built-up area.

Employment

8 hectares of employment land will be provided for business and employment growth in accordance with Core Policy 3 in the following locations:

Settlement/ Parish	Site Name	Hectares
Banbury	Higham Way	3.0
Banbury	Canalside – Regeneration	7.5

Core Policy 63: This policy identifies highway infrastructure which is needed to mitigate the impact of planned growth within the Banbury area.

Delivery of Strategic Transport Schemes within the Banbury Area

- new M40 junction/ enlarged slip roads at Southam Road in Banbury
- rejuvenating or relocating Banbury Bus Station
- re-designing Banbury Station forecourt to improve multi-modal interchange
- improving capacity of north south routes: Cherwell Street/ Bridge Street/A4620 Windsor Street corridor
- east-west strategic movements: Hennef Way corridor A422 Improvements
- east-west strategic movements: Warwick Road Corridor Improvements
- review of Banbury Town Centre traffic circulation
- car parking routing and guidance system
- potential link road crossing from Tramway to Higham Way or a South East Link Road Promotion of Bankside to include bus services
- new spine road and increased level of bus service – east of Bloxham Road

Potential likely significant effects in combination

This policy identifies new highway infrastructure development within the Cherwell District.

This policy may have linkage to the following impact pathways:

- Recreational pressure
- Water resources, quality and hydrological change
- Air quality

Core Policy 64: Safeguards land for a range of transport scheme:

Safeguarding of Land for Strategic Transport

- Enlarged M40 slip roads at Southam Road in Banbury

No likely significant effect

This is a development management policy. Development

Policy Reference Brief Description

Potential Likely Significant Impact

<p>Schemes in the Banbury Area</p>	<p>management policies do not provide linking impact pathways. The policy safeguards land for several road schemes but safeguarding land will not affect Habitats Sites as it does not prejudge grant of consent but prevents the land from being sterilised through conflicting development incompatible with its safeguarded purpose.</p>
<p>Development Policy 6: Banbury Inner Relief Road and Hennef Way</p> <p>The policy aims to protect the function and safety of Banbury inner relief road and Hennef Way. New access to the road will not be permitted unless essential.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 65: Development in the vicinity of Banbury Railway Station</p> <p>The policy aims to protect the function and access of Banbury railway station and surrounding area from development which would inhibit improvement to the station and negatively impact public transport access and active travel routes.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
<p>Core Policy 66: Green and Blue Infrastructure in the Banbury Area</p> <p>Sets out a list of green and blue infrastructure priorities, including:</p> <ul style="list-style-type: none"> i. the need for an improved interface between Spiceball Park and the canal/river green corridor linking with the town centre. This should be delivered as part of the town centre enhancements and form a fundamental part of any development proposals ii. the continued development of the country park extending the green corridor to the north of the town connecting the urban area with the rural hinterland beyond iii. the greening of the town centre, improving east – west connectivity from People’s Park to an enhanced green corridor along the river/canal corridor 	<p>This is a policy that promotes delivery and safeguarding of green and blue infrastructure. Banbury is remote from Habitats Sites with the Oxford Meadows SAC being over 26km to the south.</p>

Policy Reference Brief Description

Potential Impact Likely Significant

<p>iv. the greening of the primary north – south vehicular route along the South Bar Street/ Horsefair corridor in conjunction with improved traffic solutions to ease congestion in these areas</p> <p>v. the development of a new green, accessible link along the southern edge of the development to the south of Salt Way connecting new development and associated open space adjacent to the Bloxham Road in the west and Longford Park in the east, and</p> <p>vi. the connection of Salt Way to the improved north – south green corridor along the canal/ river corridor.</p>	
<p>Core Policy 67: The policy outlines appropriate uses of the Horton Hospital site and development management detail Horton Hospital Site The policy does not allocate a quantity of development.</p>	<p>Potential likely significant effects in combination</p> <p>This policy allows for the development of new health care facilities within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality
<p>Core Policy 68: This policy is a site allocation for Banbury Canalside. Banbury Canalside The allocation is for a mixed use redevelopment of land to provide housing, employment, commercial, recreational and community uses adjacent to Banbury Town Centre.</p> <p>The policy sets out key delivery requirements, key constraints and additional requirements for large complex sites.</p> <p>Banbury Strategy Area Policy sets out an allocation of 500 dwellings and 5ha of employment for this site.</p>	<p>Potential likely significant effects in combination</p> <p>This policy allocates net new dwellings and net new employment area within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p>

Policy Reference Brief Description

Potential Likely Significant Impact

	<ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality 						
<p>Core Policy 69: Banbury Areas of Change</p> <p>This policy identifies sites within or close to Banbury Centre which are supported as locations for change and/or redevelopment:</p> <ul style="list-style-type: none"> • Site 2 – Bolton Road/Castle Street • Site 3 – Calthorpe Street/ Marlborough Road • Site 4 – Bridge Street/ Concorde Avenue • Site 5 – George Street/ Cherwell Street/ Bridge Street <p>The policy lists criteria by which proposals within these sites will be supported.</p>	<p>Potential likely significant effects in combination</p> <p>Although this policy does not allocate a quantum of development this policy does allow for new residential development to be</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality 						
<p>Core Policy 82: Heyford Area Strategy</p> <p>This policy allocates development within the Heyford area both in the form of strategic and non-strategic development. A total of 1,235 dwellings is to be delivered through new strategic allocations between 2020 and 2040.</p> <p>Development will be supported on the newly allocated site after 2030 in the interests of:</p> <ul style="list-style-type: none"> - first ensuring the delivery of the approved (2022) masterplan under Saved Policy Villages 5; - securing further sustainable transport infrastructure investment necessary to support the additional homes. <table border="1" data-bbox="318 1281 1525 1380"> <thead> <tr> <th><u>Site</u></th> <th><u>2020-2040</u></th> <th></th> </tr> </thead> <tbody> <tr> <td><u>South of Heyford Park</u></td> <td><u>1,235</u></td> <td><u>New Site Allocation</u></td> </tr> </tbody> </table>	<u>Site</u>	<u>2020-2040</u>		<u>South of Heyford Park</u>	<u>1,235</u>	<u>New Site Allocation</u>	<p>Potential likely significant effects in combination</p> <p>This policy allocates net new dwellings and net new employment area within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p>
<u>Site</u>	<u>2020-2040</u>						
<u>South of Heyford Park</u>	<u>1,235</u>	<u>New Site Allocation</u>					

Policy Reference Brief Description

Potential Likely Significant Impact

<p>The following existing strategic site policy is retained and will not be replaced:</p> <ul style="list-style-type: none"> • Policy Villages 5: Former RAF Upper Heyford 	<ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality
<p>Core Policy 83: This policy identifies highway infrastructure which is needed to mitigate the impact of planned growth within the Heyford area. Delivery of Strategic Transport Schemes within the Heyford Area</p> <p>Highway infrastructure identified for development include:</p> <ul style="list-style-type: none"> • extended walking / cycling provision including eastwards along Camp Road and westwards connecting to Lower Heyford station through public rights of way improvement utilising the canal towpath • a new spine road within the new proposed allocation to accommodate buses and to provide for active travel • walking / cycling connections through the new development linking Lower Heyford Road to Camp Road via Tait Drive • a commuter cycle route to Bicester linking to an improved bridleway to Bicester to the east of Heyford Park • mobility hubs with cycling provision and electric car charging points • appropriate contributions necessary to capacity upgrades to M40 Junction 10 along with wider highway capacity improvements, and • upgrading of the access road to the B430 to the east of Heyford Park. 	<p>Potential likely significant effects in combination</p> <p>This policy identifies new highway infrastructure development within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality
<p>Core Policy 84: The policy safeguards lands for the delivery of identified transport schemes which are identified in Policy 83: Delivery of Strategic Safeguarding of Land for Strategic Transport Schemes in the Heyford Area.</p> <p>This is a development management policy which sets criteria to ensure the delivery of the transport schemes. Land is safeguarded to support the delivery of the following transport schemes as listed by Core Policy ADD.</p> <ul style="list-style-type: none"> • a new spine road within the new proposed allocation to accommodate buses and to provide for active travel • a commuter cycle route to Bicester linking to an improved bridleway to Bicester to the east of Heyford Park • capacity upgrades to M40 Junction 10 along with wider highway capacity improvements, and • upgrading of the access road to the B430 to the east of Heyford Park. 	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways. The policy safeguards land for several road schemes but safeguarding land will not affect Habitats Sites as it does not prejudice grant of consent but prevents the land from being</p>

Policy Reference Brief Description

Potential Impact Likely Significant

	sterilised through conflicting development incompatible with its safeguarded purpose.								
<p>Core Policy 85: This policy safeguards land for a new railway station at the site of the original Ardley station and supports the safeguarded Ardley Railway development at this site. Station</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways. The policy safeguards land for a new railway station but safeguarding land will not affect Habitats Sites as it does not prejudge grant of consent but prevents the land from being sterilised through conflicting development incompatible with its safeguarded purpose.</p>								
<p>Development Policy 7: Rural Exception Sites This is a development management proposal which sets out criteria for which affordable housing only will be supported as an exception in rural areas.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>								
<p>Core Policy 70: Development in the Bicester Area should be in accordance with the Settlement Hierarchy set out in Core Policy 3: Bicester Area Strategy Housing Delivery 9,100 homes will be delivered at Bicester between 2020 and 2040 including the following strategic site allocations:</p> <table border="1" data-bbox="318 1273 1561 1326"> <thead> <tr> <th data-bbox="318 1273 676 1326">Site</th> <th data-bbox="676 1273 884 1326">2020-2040</th> <th data-bbox="884 1273 1072 1326">Post 2040</th> <th data-bbox="1072 1273 1561 1326"></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Site	2020-2040	Post 2040						<p>Potential likely significant effects in combination</p> <p>This policy allocates net new dwellings and new employment area within the Cherwell District.</p>
Site	2020-2040	Post 2040							

Policy Reference Brief Description

**Potential Likely Significant
Impact**

South of Chesterton / North-West of A41	500	-	New Site Allocation
South-East of Wretchwick Green	800	-	New Site Allocation
North West Bicester	2,775*	4,000	Extended Site Allocation to provide an additional 1000 homes Replacing Policy Bicester 1 of the Local Plan 2011-2031
*225 completions recorded before 1/4/20			

This policy may have linkage to the following impact pathways:

- Recreational pressure
- Water resources, quality and hydrological change
- Air quality

The following existing strategic site policies are retained and will not be replaced:

- Policy Bicester 2: Graven Hill
- Policy Bicester 3: SW Bicester
- Policy Bicester 12: SE Bicester
- Policy Bicester 13: Gavray Drive

A further allowance will be made for 'windfalls' of less than 10 dwellings on previously developed sites within the built-up area.

Employment

49.6 hectares of employment land will be provided for business and employment growth in accordance with Core Policy 3 on the following strategic employment sites:

Settlement/ Parish	Site Name	Hectares
Bicester	Land East of M40 J9 and South of Green Lane	40
Bicester	Land Adjacent to Symmetry Park, North of A41, South East Bicester	6.3
Bicester	**Bicester 4 (Bicester Business Park)	3.3
Total		49.6

Policy Reference Brief Description

Potential Impact Likely Significant

Table X Bicester Area Strategic Employment Sites		
<p>** Bicester Business Park (Policy Bicester 4 in the 2015 Plan) is an existing allocation with residual capacity of 3.3ha beyond completions and extant planning permissions at 1st April 2022 that is being saved through this Local Plan.</p>		
<p>Core Policy 71: Delivery of Strategic Transport Schemes within the Bicester Area</p>	<p>This policy identifies highway infrastructure which is needed to mitigate the impact of planned growth within the Heyford area. Highway infrastructure identified for development include:</p> <ul style="list-style-type: none"> • A south east link road north of Wendlebury • Improvements associated with London Road level crossing changes • A bus priority route adjacent to the A41, on the Banbury Road • The realignment of Howes Lane. 	<p>Potential likely significant effects in combination</p> <p>This policy identifies new highway infrastructure development within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality
<p>Core Policy 72: Safeguarding of Land for Strategic Transport Schemes in the Bicester Area</p>	<p>The policy safeguards lands for the delivery of identified transport schemes identified in Core Policy 71. This is a development management policy which sets criteria to ensure the delivery of the transport schemes mentioned in policy Delivery of Strategic Transport Schemes within the Bicester Area.</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways. The policy safeguards land for several road schemes but safeguarding land will not affect Habitats Sites as it does not prejudice grant of consent but prevents the land from being sterilised through conflicting</p>

Policy Reference Brief Description

Potential Likely Significant Impact

	development incompatible with its safeguarded purpose.
<p>Core Policy 73: The policy protects and enhances green infrastructure in the Bicester area and a list of specific enhancements is included</p> <p>Delivery of Green and other Strategic Infrastructure in the Bicester Area</p>	<p>No likely significant effect</p> <p>The policy aims to enhance green infrastructure however, there is a chance that new green infrastructure could potentially alter conditions within Habitats Sites, therefore it must still be considered whether the enhancements may cause a likely significant effect on any Habitats Sites. However, Bicester is over 10km from the Oxford Meadows SAC. At this distance any enhancements to green infrastructure will not cause changes in conditions to the SAC.</p>
<p>Core Policy 75: Conservation-led proposals for the former RAF Bicester site will be encouraged that help to secure a long-lasting, economically viable future for the technical site and flying field.</p> <p>Former RAF Bicester</p> <p>Proposals for heritage tourism uses, leisure, recreation, employment and community uses will be particularly encouraged. The development of hotel and conference facilities will also be supported as part of a wider package of employment uses.</p>	<p>Potential likely significant effects in combination</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality

Policy Reference Brief Description

**Potential Likely Significant
Impact**

Core Policy 76: This policy allocates development within the Kidlington area both in the form of strategic and non-strategic development.
Kidlington Area
Strategy Housing Delivery

900 homes will be delivered at Kidlington between 2020 and 2040 including the following strategic site allocations:

Site	2020-2040	
South-East of Woodstock	450	New Site Allocation
North of the Moors	300	New Site Allocation

Table X Bicester Area Strategy Allocations

The following existing strategic site policies are retained and will not be replaced:

Policy PR6a – Land East of Oxford Road

Policy PR6b – Land West of Oxford Road

Policy PR6c – Land at Frieze Farm

Policy PR7a – Land South East of Kidlington

Policy PR7b – Land at Stratfield Farm 1

Policy PR8 – Land East of the A44

Policy PR9 – Land West of Yarnton

A further allowance will be made for ‘windfalls’ of less than 10 dwellings on previously developed sites within the built-up area of Kidlington.

Employment

Potential likely significant effects in combination

This policy allocates net new dwellings and new employment area within the Cherwell District. Note that all the sites identified as PR were allocated in the Partial Review Local Plan and were subject to HRA at that time. Only the top two sites (South East Woodstock and North of The Moors) are new allocations.

This policy may have linkage to the following impact pathways:

- Recreational pressure
- Water resources, quality and hydrological change
- Air quality

Policy Reference Brief Description

Potential Impact Likely Significant

14.7 hectares of employment land will be provided for business and employment growth on new strategic employment allocations as follows:

Site	Hectares
Begbroke Science Park – Expansion	14.7

Table X Kidlington Area Strategic Employment Sites

Core Policy 77: The policy supports the continued use of the London-Oxford Airport for commercial aviation and ancillary uses. The policy is a London-Oxford Airport development management policy relating to preventing development within the airport safeguarded areas which would cause hazard to aircraft safety.

No likely significant effect
This is a development management policy. Development management policies do not provide linking impact pathways. The policy safeguards land for London-Oxford Airport but safeguarding land will not affect Habitats Sites as it does not prejudice grant of consent but prevents the land from being sterilised through conflicting development incompatible with its safeguarded purpose.

Core Policy 78: This policy identifies highway infrastructure which is needed to mitigate the impact of planned growth within the Heyford area. Delivery of Strategic Transport Schemes within the Kidlington Area Infrastructure identified for development include:

- improved bus services and facilities along:
 - the A44/A4144 corridor linking Woodstock and Oxford
 - the A4260/A4165 (Oxford Road) linking Kidlington, Gosford, Water Eaton and Oxford
 - Langford Lane
 - A44 P&R/ Transport Hub.

Potential likely significant effects in combination
This policy identifies new highway infrastructure development within the Cherwell District.

Policy Reference Brief Description

Potential Impact Likely Significant

<ul style="list-style-type: none"> the enhancement of the off-carriageway Cycle Track/ Shared Use Path along the western side of the A44 and the provision of at least one pedestrian and cycle and wheelchair crossing over the A44. the prioritisation of the A44 over the A4260 as the primary north-south through route for private motor vehicles into and out of Oxford. improved rapid transit/bus services and associated Super Cycleway along the A4260 into Oxford. improvements to the public realm through the centre of Kidlington associated with (d) above. the provision of new and enhanced pedestrian, cycling and wheelchair routes into and out of Oxford. the provision of the proposed cycle route network in Kidlington's Local Cycling and Walking Implementation Plan (LCWIP)¹. 	<p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> Recreational pressure Water resources, quality and hydrological change Air quality
<p>Core Policy 79: The policy safeguards lands for the delivery of identified transport schemes which are identified in Core Policy 78: Delivery of Safeguarding of Strategic Transport Schemes within the Kidlington Area.</p> <p>Land for Strategic Transport Schemes in the Kidlington Area</p> <p>This is a development management policy which sets criteria to ensure the delivery of the transport schemes</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways. Safeguarding land does not presume any grant of consent and is intended to prevent conflicting development from coming forward.</p>
<p>Core Policy 80: The policy aims to protect and enhance green and blue infrastructure within the Kidlington Area and seeks financial contribution to strategic projects identified by the Council.</p> <p>Kidlington Green and Blue Infrastructure</p> <p>The schemes are listed below:</p> <ul style="list-style-type: none"> Strategic project 1: Expanding and enhancing Kidlington's network of footpaths and trails Strategic project 2: Enhancing the Oxford Canal and River Cherwell blue corridors Strategic project 3: New and enhanced access to the canal and river Strategic project 4: Greening Kidlington village centre and supporting walking and cycling 	<p>No likely significant effect</p> <p>Although the policy aims to improve green and blue infrastructure in the area consideration must still be given to adverse impacts on Habitats Sites when altering habitats outside and within the zone of influence of the Habitats Sites.</p>

Policy Reference Brief Description

Potential Likely Significant Impact

	<p>Kidlington is at its closest point approximately 2km north of the Oxford Meadows SAC and therefore schemes hydrological and pollution pathways must be considered. However, the schemes listed should not have a significant effect on hydrology or water quality within the SAC.</p>
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<p>Core Policy 81: This policy identifies sites within or close to Kidlington which are supported as locations for change and/or redevelopment:</p> <p>Kidlington Areas of Change</p> <ul style="list-style-type: none"> • Site 1 – Skoda Garage – Oxford Road/ Lyne Road – saved allocation • Site 2 – Walts Way Piazza – saved allocation • Site 3 – Exeter Close <p>The policy lists criteria by which proposals within these sites will be supported.</p>	<p>Potential likely significant effects in combination</p> <p>This policy identifies new highway infrastructure development within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality
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<p>Core Policy 34: Cherwell will provide 25,860 homes from 2020 to 2040</p> <p>District Wide Housing Distribution</p> <table border="1"> <tr> <td>Banbury</td> <td>5950</td> <td>Bicester</td> <td>9100</td> </tr> <tr> <td>Kidlington</td> <td>900</td> <td>Heyford Park</td> <td>3120</td> </tr> <tr> <td>Rural Area</td> <td>1390</td> <td>Partial review Sites</td> <td>440</td> </tr> <tr> <td>Windfall Projection</td> <td>1000</td> <td></td> <td></td> </tr> </table> <p>A further 4,000 homes will be provided at North-West Bicester beyond 2040.</p>	Banbury	5950	Bicester	9100	Kidlington	900	Heyford Park	3120	Rural Area	1390	Partial review Sites	440	Windfall Projection	1000			<p>Potential likely significant effects in combination</p> <p>This policy identifies new highway infrastructure development within the Cherwell District.</p>
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Rural Area	1390	Partial review Sites	440														
Windfall Projection	1000																

Policy Reference Brief Description

Potential Likely Significant Impact

	<p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality 																		
<p>Core Policy 35: This policy is a development management policy which sets out the hierarchy of settlements within the district.</p> <p>Settlement Hierarchy</p>	<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>																		
<p>Core Policy 25: This policy details the area of employment and business land required within the plan period this includes 187.5 ha of land from new allocations and retained allocations from LP 2015.</p> <p>Meeting Business and Employment Needs</p> <table border="1" data-bbox="318 869 1518 1375"> <thead> <tr> <th>Site Name</th> <th>Type of Site (Uses Class)</th> <th>Available Development Land (Hectares)</th> </tr> </thead> <tbody> <tr> <td>Higham Way – Banbury</td> <td>Mixed Use – B2, B8 and E (g)</td> <td>3.0</td> </tr> <tr> <td>Canalside – Banbury</td> <td>Mixed Use – B2, B8 and E (g)</td> <td>5.0</td> </tr> <tr> <td>Land East of M40 J9 and South of Green Lane – Bicester</td> <td>Mixed Use – B2, B8 and E (g))</td> <td>40.0</td> </tr> <tr> <td>Land adjacent to Symmertry Park, North of A41 – Bicester</td> <td>Mixed Use – B2, B8 and E (g)</td> <td>6.3</td> </tr> <tr> <td>Bicester Business Park (Bicester 4)**</td> <td>Saved 2015 LP Allocation for B1 (a) and E (g)(i)</td> <td>3.3</td> </tr> </tbody> </table>	Site Name	Type of Site (Uses Class)	Available Development Land (Hectares)	Higham Way – Banbury	Mixed Use – B2, B8 and E (g)	3.0	Canalside – Banbury	Mixed Use – B2, B8 and E (g)	5.0	Land East of M40 J9 and South of Green Lane – Bicester	Mixed Use – B2, B8 and E (g))	40.0	Land adjacent to Symmertry Park, North of A41 – Bicester	Mixed Use – B2, B8 and E (g)	6.3	Bicester Business Park (Bicester 4)**	Saved 2015 LP Allocation for B1 (a) and E (g)(i)	3.3	<p>Potential likely significant effects in combination</p> <p>This policy identifies new highway infrastructure development within the Cherwell District.</p> <p>This policy may have linkage to the following impact pathways:</p> <ul style="list-style-type: none"> • Recreational pressure • Water resources, quality and hydrological change • Air quality
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Policy Reference **Brief Description**

Potential Impact **Likely** **Significant**

	Policy Reference	Brief Description			Potential Impact
	Begbroke Science Park	Science Park - E (g) (ii)	14.7		
	<p>Non-Strategic Allocations</p> <ul style="list-style-type: none"> 15 ha allowance for non-strategic employment (included in Submission Version of LP or through Neighbourhood Plans) 				
Core Policy 51: Providing Supporting Infrastructure and Services	This is a development management policy which sets out the details on and off site infrastructure requirements.				<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
Core Policy 44: The Oxford Green Belt	This is a development management policy which sets out details for the preservation of the Green Belt in Oxford.				<p>No likely significant effect</p> <p>This is a development management policy. Development management policies do not provide linking impact pathways.</p>
Core Policy 87: Contingency and Monitoring Framework	This policy states that the Council will monitor progress towards the achievement of indicators and targets set out within the Delivery and Monitoring Framework and sets out a broad indication of the contingency approach to be taken if monitoring shows targets are not being met.				<p>No likely significant effect</p> <p>This is a commitment to monitoring and does not provide linking impact pathways. No specific details are provided on contingency measures and if they involved allocating additional sites this would be picked up through Local Plan Review or the application-level development management process.</p>

Policy Reference Brief Description

**Potential Likely Significant
Impact**

Core Policy 24: This is a development management policy relating to effective and efficient land use of brownfield land and housing density.
The Effective and Efficient Use of Land – Brownfield Land and Housing Density
Housing development in Cherwell will be expected to make effective and efficient use of land. The Council will encourage the re-use of previously developed land in sustainable locations

No likely significant effect
This is a development management policy. Development management policies do not provide linking impact pathways.

Core Policy 74: Five areas of change have been identified within or close to the centre of Bicester (identified below), which are identified for specific change:
Change
Site 1 – Claremont Car Park/ Deans Court
Site 2 – Bure Place/ Sheep Street
Site 3 – Market Place (Square)
Site 4 – London Road Area
Site 5 – Bicester Depot
The policy provides development management policy

No likely significant effect
This is a development management policy. Development management policies do not provide linking impact pathways.

Core Policy 86: This is a development management policy. It identifies that in accordance with the spatial strategy and Core Policy 2: District Wide Rural Areas Strategy
Housing Distribution, the 500 dwelling non-strategic housing requirement for the rural area will only be met by site specific allocations in this Local Plan or in a Neighbourhood Plan.

No likely significant effect
This is a development management policy. Development management policies do not provide linking impact pathways.

New Strategic Housing Site Allocations in Cherwell Local Plan Review

Table 3. New Strategic Housing Site Allocations in Cherwell Local Plan Review

Site Address	Residential Units (where relevant)	Distance from Oxford Meadows SAC (m)
Land south of Chesterton and North West of A41 Bicester/Chesterton	500 (2020-2040)	12,157
North of Wykham Lane	600 (2020-2040)	27,474
Canalside Regeneration, Banbury	500 (2020-2040)	29,196
South East of Woodstock Road/Upper Campfield Road, Shipton-on-Cherwell	450 (2020-2040)	5,201
	2,778 (2020-2040)	
	(225 completions recorded before 01/04/2020)	
North West Bicester, Bicester/Bucknall	1,000 extension to 6,000 dwelling saved allocation	16,160
Land at Heyford Park, Upper Heyford	1,235 (2020-2040)	14,368
North of The Moors, Kidlington	300 (2020-2040)	4,037
South-East of Wretchwick Green	800 (2020-2040)	15,789
Withycombe Farm	230 (2020-2040)	29,538

Summary of Policy and Allocations Screening

- 3.3 Table 2 and Table 3 above identify that in isolation, all policies of the Local Plan could be screened out from resulting in a likely significant effect. However, when placed in the context of development in combination with other projects and plans, potential for likely significant effects could not be screened out, and as such Appropriate Assessment is undertaken.
- 3.4 A total of 15 policies within the Cherwell Local Plan Review have been highlighted within the screening table as having potential likely significant effects on Oxford Meadows SAC with regards to recreational pressure, hydrology and/or air quality. These are:
- Core Policy 25: Meeting Business and Employment Needs
 - Core Policy 34: District Wide Housing Distribution
 - Core Policy 62: Banbury Area Strategy
 - Core Policy 63: Delivery of Strategic Transport Schemes within the Banbury Area
 - Core Policy 67: Horton Hospital Site
 - Core Policy 68: Banbury Canalside
 - Core Policy 69: Banbury Areas of Change
 - Core Policy 70: Bicester Area Strategy
 - Core Policy 71: Delivery of Strategic Transport Schemes within the Bicester Area
 - Core Policy 75: Former RAF Bicester
 - Core Policy 76: Kidlington Area Strategy
 - Core Policy 78: Delivery of Strategic Transport Schemes within the Kidlington Area
 - Core Policy 81: Kidlington Areas of Change
 - Core Policy 82: Heyford Area Strategy
 - Core Policy 83: Delivery of Strategic Transport Schemes within the Heyford Area

4. Appropriate Assessment

Recreational Pressure

- 4.1 Recreational use of a Habitats Site has the potential to:
- Cause disturbance to sensitive species, particularly ground-nesting birds and (where relevant) wintering wildfowl.
 - Cause damage through erosion and fragmentation;
 - Cause eutrophication as a result of dog fouling; and
 - Prevent appropriate management or exacerbate existing management difficulties;
- 4.2 Different types of Habitats Sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex.
- 4.3 It should be emphasised that recreational use is not inevitably a problem. Many Habitats Sites also contain nature reserves managed for conservation and public appreciation of nature.
- 4.4 HRAs of Local Plans tend to focus on recreational disturbance as a result of new residents¹⁵.

Mechanical/abrasive damage and nutrient enrichment

- 4.5 Most types of aquatic or terrestrial Habitats Site can be affected by trampling, which in turn causes soil compaction and erosion:
- Wilson & Seney (1994)¹⁶ examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
 - Cole et al (1995a, b)¹⁷ conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each tramped between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. Cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.
 - Cole (1995c)¹⁸ conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with

¹⁵ The RTPI report 'Planning for an Ageing Population' (2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.

¹⁶ Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off road bicycles on mountain trails in Montana. Mountain Research and Development 14:77-88

¹⁷ Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. Journal of Applied Ecology 32: 203-214

Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. Journal of Applied Ecology 32: 215-224

¹⁸ Cole, D.N. 1995c. Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.

walking boots, there was no significant difference after one year. Heavier trampers caused a greater reduction in vegetation height than lighter trampers, but there was no difference in effect on cover.

- Cole & Spildie (1998)¹⁹ experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse traffic was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance but recovered rapidly. Higher trampling intensities caused more disturbance.

4.6 Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling.

Cothill Fen SAC

4.7 Many Habitats Sites are National Nature Reserves (e.g., Cothill Fen) or nature reserves managed by wildlife trusts or nature conservation charities, at which access is encouraged and resources are available to ensure that recreational use is managed appropriately. Cothill Fen comprises terrain that on the whole is of an inaccessible nature away from designated paths. At Parsonage Moor the habitat is extremely wet off-path, whilst footpaths through other parts of the SAC are lined by dense growth of reedbeds. The SAC is part designated for its 'alder woodland on floodplains' and theoretically in places visitors and dogs could stray from the designated paths into this habitat.

4.8 However, access overall is limited by a minimal number of off-road parking spaces (approximately 10-15 at Cothill, close to Parsonage Moor and only 3-4 at Lashford Lane), though parking on residential streets and other public areas is possible. The majority of access is however likely to be through walking or cycling. Where footpaths exist at Parsonage Moor and Lashford Lane, off-path access is restricted in places by fencing, whilst Parsonage Moor has signs and gates/stiles restricting access for dog walkers. Parsonage Moor also lacks a circular walk, with only a small section of board walk over marshy ground which again limits the number of people likely to enter the Fen.

4.9 Part of the SAC is a National Nature Reserve so access is managed. Natural England and the Oxford Conservation Volunteers undertake footpath management/improvement specifically to ensure that people are discouraged from travelling 'off-track'. Moreover, under-grazing and a lack of trampling appear to have historically been more of a problem at this site than excessive trampling. Recreational pressure is not recognised as a threat to the site under its Site Improvement Plan. Considering the limited access, marshy ground off track and the distance between Cothill Fen SAC and Cherwell District growth within Cherwell District would not contribute to an adverse effect on the integrity of Cothill Fen SAC either alone or in combination with other plans or projects.

Oxford Meadows SAC

4.10 Oxford Meadows SAC contains unique vegetation communities. These reflect the long-term grazing and hay-cutting practices on lowland hay meadows. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function.

4.11 Cassington Meadows are a cluster of neutral hay meadows and fen, which are surviving remnants of semi-natural vegetation in an area now characterised by intensive arable farming and gravel extraction. Cassington Meadows is located within West Oxfordshire District. Port Meadow is a classic site for studying the effects of grazing on plant communities. The site consists of a series of neutral grasslands situated in the Thames floodplain. Despite the generally low species-diversity of Port Meadow compared with adjoining hay fields a total of 178 flowering plants have been recorded. These include the Red Data Book species creeping marshwort *Apium repens*, for which Port Meadow is now one of only two sites in Britain. Wolvercote Meadows, bordering the River Thames consists of unimproved and semi-improved neutral grassland that continues to be managed traditionally for hay and pasture and support a rich flora. Pixey and Yarnton Meads are unimproved floodplain meadows on alluvium over calcareous gravel on the first terrace bordering the River Thames and are internationally renowned. They are amongst the best remaining examples of neutral grassland in lowland England. Oxford Meadows SAC is within and adjacent to the southern boundary of Cherwell District.

4.12 Creeping marshwort, part of the designation of Oxford Meadows SAC is susceptible to recreational pressure through dog fouling and possibly trampling if pressure is sufficiently great. Dogs on site can also potentially

¹⁹ Cole, D.N., Spildie, D.R. 1998. Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* 53: 61-71

- interfere with the aftermath grazing regime. An increase in recreational pressure could cause an adverse effect on the plant community and affect the conservation status of this plant.
- 4.13 Recreational pressure is an inherently in-combination impact pathway as small developments can build to make a much larger impact together. Recreational pressure is also generally quantified using a core recreational catchment which look at the effects of all development within the recreational catchment collectively together, in-combination.
- 4.14 The Supplementary Advice on Conservation Objectives (SACO)²⁰ does not state that there is a current issue with recreational pressure upon the SAC, although *Apium repens* and hay meadows are somewhat sensitive to changes in nitrogen. The main driver of change with regards to nitrogen within this SAC is likely to be habitat management and inundation flooding from the river. The SACO states that “*Too little flooding may compromise the necessary management due to reduced nutrient inputs which will reduce hay yields, making hay management less viable and sustainable whilst summer flooding may prevent hay cutting and grazing. Prolonged summer flooding can also have damaging effects on soils and can affect vegetation composition by encouraging the spread of weedy species and by washing away the seeds of plants*” additionally it says for *Apium repens* “*The availability of bare ground present as small gaps in the turf created by grazing animals and as more extensive areas created by flooding is important for the survival of Apium repens. These areas provide opportunities for seeding establishment early in the year before other competing plants have fully developed. However, Apium repens often inhabits a narrow zone around hollows at the site as larger bare areas may be utilised as ‘dust bath’ type features by grazing stock, so it is important that a range of bare ground features are available in suitable areas across the site.*” Given that inundation by flooding is a necessary part of maintenance of the hay meadows and the *Apium repens* populations at the site and as inundation also plays a major part in controlling nutrient levels at the site, it is likely this is a larger driver for change in the *Apium repens* population than dog fouling.
- 4.15 However, to understand if recreational pressure, namely dog fouling, does put additional pressure on nutrient levels on the site, the level of recreation currently felt on the SAC was quantified for the Oxford Meadows SAC as part of the Oxford Local Plan 2036²¹. The visitor survey was undertaken in 2017 and was an update of a previous visitor survey in 2011. The results of the 2017 survey were reported within the Habitats Regulations Assessment Report for the Local Plan²². The visitor survey noted that 66.7% of the visits over the survey period were from within Oxford City itself (OX1 and OX2 postcodes) with 55% coming from postcodes within OX2. The area for which OX2 postcodes are located is the section of Oxford immediately adjacent to the east side of the Port Meadow. Outside of these two postcodes the only other postcodes with visitor numbers above 1% were OX3 at 4.0%, OX4 at 5.8% and OX5 at 6.3% of visitors. Clearly the majority of visitors to Oxford Meadows SAC are coming from within Oxford itself with only a small percentage coming from a Cherwell District postcode (e.g. OX5), which encompasses areas including Yarnton in the south up to Tackley and Northbrook in the north and east to Murcott. Therefore, approximately 67% of visitors to the SAC are from Oxford City, with only 6% from Cherwell.
- 4.16 The main potential impact from recreational pressure on the SAC has been identified in the Oxford City Local Plan HRA to be eutrophication from dog fouling. From the visitor survey 47% of all visitors came with a dog to the SAC and the majority arrived by either walking (43.3%) or by car (43%). The proportion of visitors who walk to site is unusually high and reflects the large residential population very close to the SAC at Oxford City. With regards to assessing Oxford Local Plan’s contribution to recreational impact on the SAC a public consultation was undertaken as part of “Oxford City Green Space Study” which revealed that Oxford residents would walk approximately 1.9km to large greenspaces. This is the distance which the Oxford Local Plan utilised within the HRA to assess contribution to recreational pressure. All residential sites outside of the 1.9km distance were screened out from impact. This distance was used as it is the most likely distance at which residential development would materially increase the number of dog-walkers utilising the site. In combination with the Northern Gateway Site this increase was predicted to be 4.5% increase in visitor numbers over the plan period.
- 4.17 The Oxford Local Plan 2036 HRA was able to conclude that “*There is no indication that current visitor numbers have a detrimental effect on the condition of Apium repens at Oxford Meadows SAC. Indeed, the JNCC listing for the SAC shows the Apium repens to have excellent population, conservation status and global grade. As such recreational (dog-fouling) impacts on the SAC will be minimal and will not affect the*

²⁰ <http://publications.naturalengland.org.uk/file/6544105484320768> Accessed 21/10/2022

²¹ https://www.oxford.gov.uk/download/downloads/id/7380/adopted_oxford_local_plan_2036.pdf Accessed 21/10/2022

²² https://www.oxford.gov.uk/download/downloads/id/5105/habitats_regulations_assessment_-_appropriate_assessment.pdf Accessed 21/10/2022

integrity of the SAC". The conclusion of the HRA backs up the findings of the SACO, which highlight management and inundation as greater agents of change for the hay meadows and *Apium repens* population.

- 4.18 Any increase in visitor numbers coming from development presented within the Cherwell Local Plan Review would be significantly smaller than that predicted for Oxford itself as just 6.3% come from a Cherwell postcode (OX5). Additionally, the majority of development within Cherwell will be at a distance greater than 5km from the site. Five kilometres is the general figure utilised for inland SACs to define the area in which it is likely for significant numbers of recreational visits by car. As parking at the SAC is very limited (2 parking sites one in the north – Godstow Car Park, and one in the south – Port Meadow South Car Park) this will also restrict numbers of visitors arriving by car. Any development within Cherwell within 1.9km of the SAC would also face barriers to walking to site. Anyone attempting to walk to the SAC would be cut off by both the A40 and the A34 (dual carriageway) as well as the rail line from both Tackley and Hanborough into Oxford, significantly restricting visits by foot.
- 4.19 Additionally, there is a policy within the Cherwell Local Plan Review which aims to ensure protection and enhancement of biodiversity across the district. The Core Policy 11: Protection and Enhancement of Biodiversity states that “*Any development with the potential to impact on a SAC, SPA and/or Ramsar site within the district will be subject to Habitats Regulations Assessment and will not be permitted unless it can be demonstrated that there will be no adverse effects on the integrity of the international site, either alone or in combination with other plans and projects, or that effects can be mitigated to avoid any effect on integrity*’.
- 4.20 As 66% of visitors are from Oxford itself and only 6.3% of visitors come from a postcode within the Cherwell District, the likely increase from either car or foot from Cherwell district being minimal, it is likely that the conclusion of the Oxford Local Plan HRA would also hold true in-combination with development within the SAC. This is also supported by the fact that the main driver for biological change in the SAC is management the habitats and flooding inundation altering nutrient input. With the addition of the protective policy regarding all development ensuring no likely significant effects (or effective mitigation) on Habitats Sites, it can be concluded that development within Cherwell, would not cause an adverse effect on the integrity of the SAC alone or in-combination with other plans and projects.

Water Quality and Resources

- 4.21 Increased amounts of housing or business development can lead to reduced water quality of rivers and estuarine environments. Sewage and industrial effluent discharges can contribute to increased nutrients on Habitats Sites leading to unfavourable conditions. In addition, diffuse pollution, partly from urban run-off has been identified during an Environment Agency Review of Consents process and a joint Environment Agency and Natural England evidence review, as being a major factor in causing unfavourable condition of Habitats Sites.
- 4.22 The quality of the water that feeds Habitats Sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:
- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour. Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity, and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen;
 - Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life; and
 - Increased discharge of treated sewage effluent can result both in high levels of macroalgal growth, which can smother the mudflats of value to SPA birds and in greater scour (as a result of greater flow volumes).

- 4.23 At sewage treatment works (called Water Recycling Centres by Anglian Water), additional residential development increases the risk of effluent escape into aquatic environments in addition to consented discharges to the catchment. In many urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk.
- 4.24 Thames Water supply area extends from Cirencester in the west to Dartford in the east and from Banbury in the north to Guilford in the south and covers 5,000 square miles. Thames Water is the sole supplier of clean drinking water to the Cherwell District as well as treating the district's sewage. Water supplies are derived from a mixture of surface (storage reservoirs supplied from the River Thames and River Lee) and ground water sources. Thames supply is split into 6 water resource zones (WRZ). Cherwell is based in the second largest WRZ the Swindon and Oxfordshire WRZ (SWOX). This WRX relies primarily on abstraction of water from the River Thames for drinking water.

Cothill Fen SAC

- 4.25 Cothill Fen SAC is vulnerable to hydrological change; however, the site has a small surface water hydrological catchment area which is well outside of the Cherwell District and not connected to surface water of the Thames River, which is likely where effluent would be discharged once treated. Therefore, Cothill fen can be screened out of further discussion with regards to water quality. Additionally, the Cothill Fen SAC is within Thames Catchment (the Ock catchment) the SAC is upstream of the River Thames, abstraction within the Thames itself is unlikely cause hydrological changes SACs which are upstream of the River Thames, therefore, Cothill Fen can also be screened out of further discussion with regards to water resources.

Oxford Meadows SAC

- 4.26 With regards to Oxford Meadows the main pressure with hydrology according to the Site Improvement Plan is that *"it is considered that [a declining population of creeping marshwort] may be associated directly or indirectly with hydrological changes, possibly deeper, more prolonged and frequent flood events"* rather than through a lowering of the water table which excessive abstraction can cause.
- 4.27 A review of consents process was undertaken by the Environment Agency in 2008 to determine the impact of continued and increase abstraction licences on the environment. This underpins the Thames Water WRMPs test of likely significant effects. The consents process concluded after appropriate assessment that no adverse impacts on Oxford Meadows would occur with regards to the flow of the River Thames or the inundation pattern on the Oxford Meadows SAC. Additionally, the HRA of the Thames Water WRMP included an assessment of impacts of public water supply abstraction on the Oxford Meadows SAC both alone and in combination with other plans and projects and, with mitigation for some options, the HRA could conclude that no adverse effect on integrity would occur due to the Thames Water WRMP either alone or in combination with other plans and projects. This is fundamental to the HRA of the Cherwell Local Plan Review because the WRMP goes well beyond the end date of the Local Plan Review and is based on robust population growth projections. There is therefore no basis to conclude that the delivery of Cherwell Local Plan Review would result in an increase in abstraction for public water supply that would be detrimental to Oxford Meadows SAC.
- 4.28 Development within the hydrological catchment of a Habitats Site could affect water levels, flows and quality, although this is far more likely for sub-surface extractive processes such as minerals development that operate below the water table than for housing and employment development that will generally only affect the surface ground layers. The nearest new allocation to the Oxford Meadows SAC is an employment development at Kidlington (2 Begbroke Science Park Reserved Land), approximately 2.7km from the SAC and almost 3km north of the River Thames and the immediate surface and groundwater catchment of the SAC. Additionally, within the Cherwell Local Plan Review there is a policy specifically protecting the Oxford Meadows SAC with regards to water quality and hydrological change. Core Policy 10: Protection of the Oxford Meadows SAC states: *"Developers will be required to demonstrate that:*
- i. during construction of the development there will be no adverse effects on the water quality or quantity of any adjacent or nearby watercourse*
 - ii. during operation of the development any run-off of water into adjacent or surrounding watercourses will meet Environmental Quality Standards (and where necessary oil interceptors, silt traps and Sustainable Drainage Systems will be included)*

- iii. *new development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity and quality, and*
- iv. *run-off rates of surface water from the development will be maintained at greenfield rates.”*

4.29 Given the WRMP concerning the Oxford Meadows SAC could conclude no adverse effects on integrity and with the specific protection policy within the Cherwell Local Plan Review itself and that Cothill Fen is outside the district and upstream of any development and the River Thames, it can be concluded that the Cherwell Local Plan Review will not have an adverse effect on the integrity of either Cothill Fen or Oxford Meadows SAC either alone or in combination with other plans and projects.

Atmospheric Pollution (Atmospheric Nitrogen Deposition)

4.30 The main pollutants of concern for Habitats Sites are oxides of nitrogen (NO_x), ammonia (NH₃) and sulphur dioxide (SO₂). NO_x can have a directly toxic effect upon vegetation. In addition, greater NO_x or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

Table 4: Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO ₂ , NO _x and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased nitrogen emissions may cancel out any gains produced by reduced sulphur levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH ₃)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO ₂ and NO _x emissions to produce fine ammonium (NH ₄ ⁺) containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are direct toxicity and as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH ₃ is rapidly deposited, some of the most acute problems of NH ₃ deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NO _x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations.	Deposition of nitrogen compounds (nitrates (NO ₃), nitrogen dioxide (NO ₂) and nitric acid (HNO ₃)) can lead to both soil and freshwater acidification. In addition, NO _x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.
Nitrogen deposition	(N) The pollutants that contribute to nitrogen deposition derive mainly from NO _x and NH ₃ emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O ₃)	A secondary pollutant generated by photochemical reactions from NO _x and volatile organic compounds	Concentrations of O ₃ above 40 ppb can be toxic to humans and wildlife, and can affect

(VOCs). These are mainly released by the buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities. The increase in background ozone concentration, species composition in semi-natural plant communities across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.

Sulphur Dioxide SO ₂	Main sources of SO ₂ emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO ₂ emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO ₂ acidifies soils and freshwater and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.
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- 4.31 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. Ammonia emissions are dominated by agriculture, with some chemical processes and some vehicle exhaust emissions also making notable contributions. As such, it is unlikely that material increases in SO₂ emissions will be associated with Local Plans. NO_x emissions are dominated by the output of vehicle exhausts. Within a 'typical' housing development, by far the largest contribution to NO_x (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison²³. Emissions of NO_x could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the Local Plan Review.
- 4.32 According to the World Health Organisation, the critical NO_x concentration (critical threshold) for the protection of vegetation is 30 µgm⁻³; the threshold for sulphur dioxide is 20 µgm⁻³. In addition, ecological studies have determined 'Critical Loads'²⁴ of atmospheric nitrogen deposition (that is, NO_x combined with ammonia NH₃) for key habitats within Habitats Sites.
- 4.33 According to the Department of Transport's Transport Analysis Guidance, "*Beyond 200 m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant*"²⁵.

²³ Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. <http://www.airquality.co.uk/archive/index.php>

²⁴ The Critical Load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

²⁵ www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf

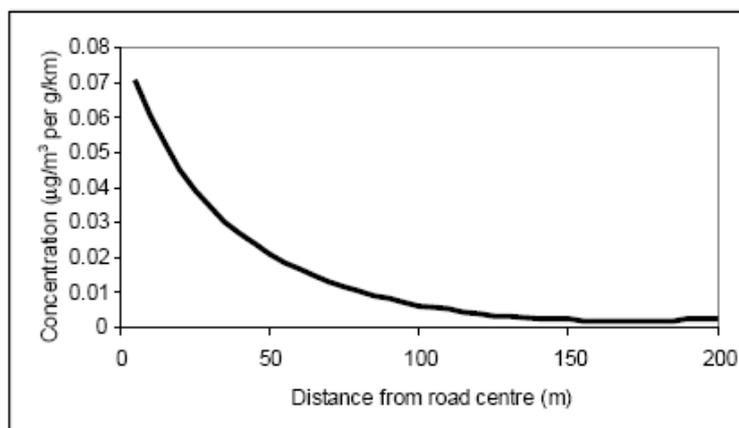


Plate 1. Traffic contribution to concentrations of pollutants at different distances from a road (Source: DFT)

- 4.34 This is therefore the distance that is used throughout the HRA process in order to determine whether a Habitats Site is likely to be significantly affected by development under a Plan.
- 4.35 There are no major roads within 200m of Cothill Fen SAC and none of the minor roads would serve as significant routes associated with journeys to work arising in Cherwell District. Therefore this impact pathway can be screened out from further discussion for this SAC.
- 4.36 With regards to Oxford Meadows SAC, the A34 and the A40, major A roads, are located within 200m of the SAC. Increasing net residential and business development by at least 28,459 new dwellings (including over 18,000 existing commitments) within Cherwell District by 2040, in combination with increases in adjacent districts such as Oxford, Vale of White Horse and West Oxfordshire, could potentially significantly increase the number of car journeys within 200m of the SAC and this may increase nitrogen deposition therefore traffic and air quality modelling was undertaken (external of AECOM) for the Cherwell Local Plan Review contribution alone and in-combination with other plans and projects.
- 4.37 To understand if there would be an adverse effect upon the Oxford Meadows SAC a test of whether the contribution from the Cherwell Local Plan Review either alone or (if not alone) then in combination with other plans and projects would exceed 1% of the critical load is applied e.g. $3\mu\text{g}/\text{m}^3$ for NO_x (oxides of nitrogen) and $0.3\mu\text{g}/\text{m}^3$ for NH_3 (ammonia).
- 4.38 To understand this we first look at Total Annual Mean NO_x . Tables showing the full modelling results can be seen in Appendix B. Seven transects were modelled across the A40 and A34. T5 which is located at its closest point 10.33m from the SAC, has the largest concentrations of NO_x present (Shown in Table 5). The Total Annual Mean NO_x at T5 10.33m from the SAC is $193.90\mu\text{g}/\text{m}^3$. This exceeds the Critical Level of $30\mu\text{g}/\text{m}^3$. This is the total background NO_x concentrations as of 2019 the initial modelling year. Compared to the 2019 Future Baseline, which is the concentration levels expected if there is no further growth in traffic over the plan period, this reduces to $67.06\mu\text{g}/\text{m}^3$. As there is no further traffic modelled within the 2019 Future Baseline this shows the effect of improvements in vehicle emission technology, which although still over the critical level is a significant improvement over the plan period compared to the 2019 baseline. The DM 2040 scenario is the 2019 Future Baseline with the addition of all predicted growth including Cherwell Local Plan Review but excluding the effect of the Oxfordshire Local Transport and Connectivity Plan. At T5 10.33m from the SAC this is modelled at $77.62\mu\text{g}/\text{m}^3$ which is a $10.56\mu\text{g}/\text{m}^3$ increase on the 2019 Future Baseline.
- 4.39 Therefore, all growth predicted over and above the current baseline is predicted to increase NO_x concentrations at this transect point by more than 1% of the critical level. However, Oxfordshire County Council have a strategic Local Transport and Connectivity Plan which, if the targets are met, will affect flows on the relevant roads adjacent to the SAC. to understand the effect of this on NO_x concentrations we look at the DS 2040 scenario. This takes into account the 2019 Future Baseline, all growth outside and inside Cherwell and the effect of the Local Transport and Connectivity Plan. At T5 10.33m from the SAC this reduces to $58.91\mu\text{g}/\text{m}^3$ a reduction of $18.71\mu\text{g}/\text{m}^3$ from the DM 2040 scenario where traffic growth was predicted to increase concentrations from the 2019 Future Baseline. Compared to the future baseline e.g., no further growth in traffic passing the SAC the Cherwell Local Plan Review is forecast to reduce NO_x by $8.15\mu\text{g}/\text{m}^3$ at this transect point and reductions apply throughout the transect. Therefore, it can be seen that

if the mode share targets and associated volumes of traffic within the Oxfordshire Local Transport and Connectivity Plan are achieved there would be resultant air quality improvements, both from the DM 2040 (all growth but without the Local Transport and Connectivity Plan) and the future baseline (no growth) scenarios. With regards to NO_x the Cherwell Local Plan Review therefore does not cause an adverse effect on the integrity of Oxford Meadows because of the forecast role of the Oxfordshire Local Transport and Connectivity Plan in reducing total NO_x concentrations to below those that would occur by 2040 without either the Local Plan Review growth or the Local Transport and Connectivity Plan.

- 4.40 NO_x is only one part of air quality impacts and NH₃ (ammonia) and nitrogen deposition (made up of NO_x and NH₃) also need to be examined to determine overall significant effect. The below table shows the air quality modelling results for NO_x and NH₃ and for total nitrogen deposition at transect T5 10.33m from the SAC.

Table 5. Air quality modelling results for transect T5 at 10.33m from the SAC showing oxides of nitrogen, ammonia and combined nitrogen deposition

Pollutant	2019 Baseline	2040 Future Baseline	2040 DM	2040 DS	DS-DM	DS-FB	Over Critical Load	1% of Critical Load Test
NO _x (ug/m ³)	193.90	67.06	77.62	58.91	-18.71	-8.15	Yes	No
NH ₃ (ug/m ³)	8.86	9.65	11.08	8.49	-2.59	-1.16	Yes	No
Nitrogen Deposition (kg N/ha/yr)	65.20	61.08	69.12	54.57	-14.55	-6.51	Yes	No

- 4.41 As can be seen from Table 5 above, ammonia (NH₃) follows a similar pattern as NO_x. The only difference between NO_x and ammonia is that the 2040 Future Baseline for ammonia rises from the 2019 Baseline. This is because improvements in emissions technology are focused on oxides of nitrogen as these are believed to be the most damaging pollutants to human health. Improvements in emissions technology do not currently include ammonia, and steps to reduce NO_x emissions tend to involve increases in ammonia emissions; therefore some increase to current levels can be seen in the modelled results within the 2019 Future Baseline scenario even with no additional traffic on the road. However, as with NO_x at T5 10.33m from the SAC, ammonia in the 2040 DS scenario is reduced when looking at both the 2040 DM (all growth but without the Local Transport and Connectivity Plan) and the 2040 Future Baseline (no growth) by 2.59 and 1.16ug/m³ respectively. This again means that when all traffic changes (including the Cherwell Local Plan Review) is taken into consideration with the achievement of the targets in the Local Transport and Connectivity Plan, there would be an improvement in ammonia concentrations compared to a situation without either traffic growth or the Local Transport and Connectivity Plan. The Cherwell Local Plan Review will therefore not cause an adverse effect on integrity either alone or in combination with regards to ammonia concentrations on the SAC.

- 4.42 Finally, the modelling looks at the overall Total Annual Mean Nitrogen (N) deposition, this is made up of the background deposition as well as the concentrations of NO_x and NH₃. Again, in Table 5 there is a reduction between the 2019 Baseline and the 2040 Future Baseline, although not as much as the NO_x reduction; this is because it takes into consideration the increase in ammonia over that time period. The reductions in between DS and DM and DS and the 2040 Future Baseline also mirror both the NO_x and NH₃ results, as these are the two pollutants that cause nitrogen deposition. It can be seen that when the Local Transport and Connectivity Plan is taken into consideration the Total Annual Mean Nitrogen Deposition at T5 10.33m from the SAC is -14.55 kg N/ha/yr. This is calculated by comparing the 2040 DS scenario to the 2040 DM scenario. The criteria which shows a significant impact on a Habitats Site is 1% of the critical load, which in the case of nitrogen deposition is +0.2 Kg N/ha/yr. As the actual forecast change is a negative number (a reduction), this is a positive improvement in air quality within the boundaries of the SAC. Tables 6-8 within Appendix B shows the DS-DM change (or the alone impact) for each of the modelling component (NO_x, NH₃ and N dep). Within this table the modelling shows a negative (i.e. improved) in-combination (DS-FB) contribution across all transects and road links.

- 4.43 Due to expected positive impact on future travel mode share as a result of the Oxfordshire Local Transport and Connectivity Plan it can be concluded that the Cherwell Local Plan Review will not cause an adverse effect upon the integrity of Oxford Meadows SAC either alone or in combination with other plans and projects. This assessment will be reviewed for the Regulation 19 Local Plan HRA.

5. Conclusions

- 5.1 The Cherwell Local Plan Review will not have an adverse effect on the integrity of any Habitats Sites either alone or in combination with other plans and projects.

Appendix A Background to Habitats Sites and Map

A.1 Oxford Meadows SAC

Conservation Objectives

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;

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

Qualifying Features

The site is designated as a SAC for the following 'Qualifying Features':

- Lowland hay meadows: for which the site is considered to be one of the best areas in the United Kingdom.
- Creeping marshwort *Apium repens*: for which the site is the only known outstanding locality in the United Kingdom. The plant is known from 15 or fewer 10 x 10 km squares in the United Kingdom.

Environmental Vulnerabilities

The Site Improvement Plan for Oxford Meadows²⁶ indicates the following threats that, at the least, are identified as requiring investigation:

- Hydrological changes; and
- Invasive species.

The Site Improvement Plan does not specifically identify recreational pressure or air quality as a significant current or expected future threat; although that does not mean that no risk is presented via either pathway. However, they are clearly not the main focus of concern.

A.2 Cothill Fen SAC

Conservation Objectives

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;

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

Qualifying Features

The site is designated as a SAC for the following 'Qualifying Features':

²⁶ <http://publications.naturalengland.org.uk/publication/4942743310696448?category=4981459005734912>

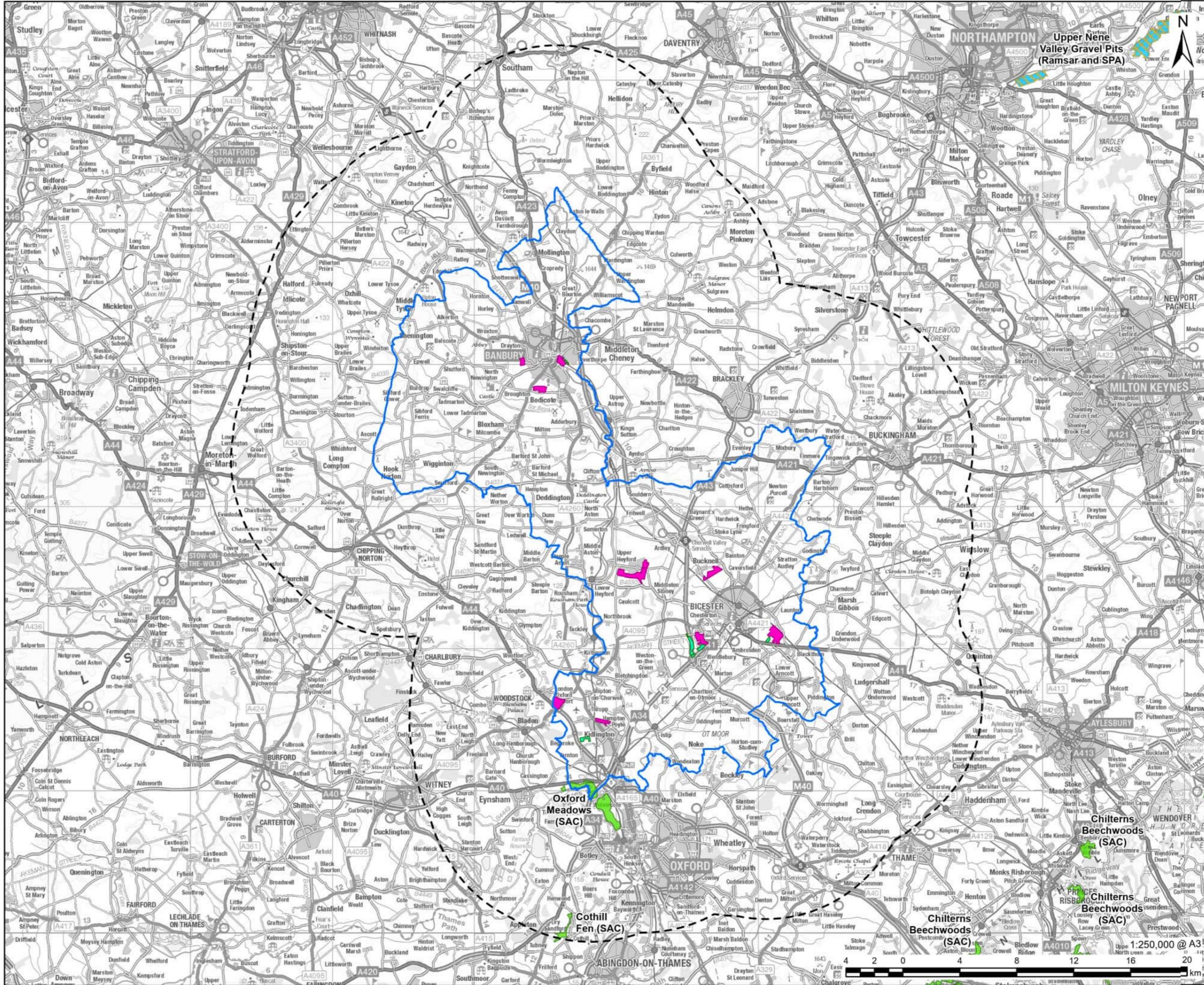
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)
- Alkaline fens; Calcium-rich springwater-fed fens
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*); Alder woodland on floodplains
- Southern Damselfly *Coenagrion mercurial*

Environmental Vulnerabilities

The Site Improvement Plan for Cothill Fen²⁷ indicates the following threats that, at the least, are identified as requiring investigation:

- Hydrological changes;
- Water pollution; and
- Air pollution.

²⁷ <http://publications.naturalengland.org.uk/publication/6482436405854208?category=4981459005734912>



Appendix B Air Quality Modelling Results (see separate report for methodology)

Table 6. Total Annual Mean NO_x (ug/m³) for Transect T1 - T7

5.2 (Bold numbers denote values over relevant critical load)

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T1	T1_181.54m	181.54m	18.54	11.78	12.14	11.48
T1	T1_190m	190m	18.31	11.71	12.05	11.43
T1	T1_200m	200m	18.06	11.63	11.96	11.36
T2	T2_77.21m	77.21m	25.69	14.00	14.87	13.30
T2	T2_80m	80m	25.34	13.89	14.74	13.21
T2	T2_90m	90m	24.25	13.55	14.32	12.93
T2	T2_100m	100m	23.35	13.27	13.98	12.70
T2	T2_110m	110m	22.59	13.04	13.69	12.51
T2	T2_120m	80m	21.95	12.84	13.44	12.35
T2	T2_130m	90m	21.39	12.66	13.23	12.21
T2	T2_140m	100m	20.90	12.51	13.04	12.08
T2	T2_150m	110m	20.47	12.38	12.88	11.98
T2	T2_160m	80m	20.09	12.26	12.73	11.88
T2	T2_170m	90m	19.75	12.15	12.60	11.79
T2	T2_180m	100m	19.45	12.06	12.49	11.72
T2	T2_190m	110m	19.17	11.97	12.38	11.65
T2	T2_200m	80m	18.92	11.90	12.28	11.58
T3	T3_9.17m	9.17m	62.39	27.30	30.38	24.79
T3	T3_10m	10m	60.57	26.73	29.69	24.33
T3	T3_20m	20m	47.17	22.57	24.62	20.91
T3	T3_30m	30m	40.67	20.55	22.15	19.25
T3	T3_40m	40m	36.82	19.35	20.69	18.27
T3	T3_50m	50m	34.28	18.56	19.73	17.62
T3	T3_60m	60m	32.47	18.00	19.04	17.16
T3	T3_70m	70m	31.13	17.58	18.53	16.82
T3	T3_80m	80m	30.08	17.25	18.13	16.56
T3	T3_90m	90m	29.25	16.99	17.81	16.35
T3	T3_100m	100m	28.57	16.78	17.55	16.18
T3	T3_110m	110m	28.01	16.61	17.34	16.03
T3	T3_120m	120m	27.55	16.46	17.16	15.92

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T3	T3_130m	130m	27.15	16.34	17.00	15.82
T3	T3_140m	140m	26.80	16.23	16.87	15.73
T3	T3_150m	150m	26.51	16.14	16.76	15.65
T3	T3_160m	160m	26.25	16.06	16.66	15.59
T3	T3_170m	170m	26.03	15.99	16.58	15.53
T3	T3_180m	180m	25.84	15.93	16.50	15.48
T3	T3_190m	190m	25.66	15.88	16.44	15.44
T3	T3_200m	200m	25.51	15.83	16.38	15.40
T4	T4_5.72m	5.72m	193.91	67.47	78.33	59.16
T4	T4_10m	10m	156.84	56.10	64.75	49.49
T4	T4_20m	20m	113.73	42.88	48.99	38.22
T4	T4_30m	30m	91.78	36.15	40.96	32.50
T4	T4_40m	40m	78.25	32.00	36.00	28.97
T4	T4_50m	50m	68.88	29.13	32.55	26.53
T4	T4_60m	60m	62.01	27.02	30.02	24.75
T4	T4_70m	70m	56.68	25.39	28.05	23.37
T4	T4_80m	80m	52.44	24.08	26.47	22.28
T4	T4_90m	90m	48.95	23.01	25.18	21.38
T4	T4_100m	100m	46.06	22.13	24.10	20.64
T4	T4_110m	110m	43.61	21.38	23.18	20.01
T4	T4_120m	120m	41.52	20.73	22.40	19.48
T4	T4_130m	130m	39.71	20.18	21.72	19.02
T4	T4_140m	140m	38.13	19.69	21.13	18.61
T4	T4_150m	150m	36.75	19.27	20.61	18.26
T4	T4_160m	160m	35.52	18.89	20.15	17.95
T4	T4_170m	170m	34.44	18.56	19.74	17.68
T4	T4_180m	180m	33.47	18.27	19.37	17.43
T4	T4_190m	190m	32.61	18.00	19.05	17.21
T4	T4_200m	200m	31.83	17.76	18.75	17.01
T5	T5_10.33m	10.33m	193.90	67.06	77.62	58.91
T5	T5_20m	20m	147.66	52.87	60.83	46.75
T5	T5_30m	30m	121.60	44.88	51.39	39.89
T5	T5_40m	40m	105.14	39.83	45.42	35.56
T5	T5_50m	50m	93.56	36.27	41.21	32.51
T5	T5_60m	60m	84.98	33.64	38.09	30.26
T5	T5_70m	70m	78.27	31.58	35.64	28.51
T5	T5_80m	80m	72.86	29.92	33.67	27.09

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T5	T5_90m	90m	68.40	28.55	32.03	25.93
T5	T5_100m	100m	64.61	27.39	30.63	24.95
T5	T5_110m	110m	61.37	26.40	29.44	24.11
T5	T5_120m	120m	58.57	25.54	28.40	23.38
T5	T5_130m	130m	56.10	24.78	27.49	22.75
T5	T5_140m	140m	53.89	24.11	26.67	22.18
T5	T5_150m	150m	51.91	23.50	25.93	21.67
T5	T5_160m	160m	50.14	22.96	25.27	21.22
T5	T5_170m	170m	48.53	22.46	24.67	20.80
T5	T5_180m	180m	47.07	22.02	24.13	20.43
T5	T5_190m	190m	45.74	21.61	23.63	20.09
T5	T5_200m	200m	44.52	21.24	23.18	19.78
T6	T6_3.78m	3.78m	50.13	23.76	26.14	21.71
T6	T6_10m	10m	41.67	20.88	22.64	19.40
T6	T6_20m	20m	36.01	18.96	20.30	17.85
T6	T6_30m	30m	33.23	18.02	19.16	17.10
T6	T6_40m	40m	31.54	17.45	18.46	16.64
T6	T6_50m	50m	30.37	17.06	17.98	16.32
T6	T6_60m	60m	29.50	16.77	17.62	16.09
T6	T6_70m	70m	28.82	16.54	17.34	15.90
T6	T6_80m	80m	28.26	16.35	17.12	15.75
T6	T6_90m	90m	27.79	16.20	16.93	15.63
T6	T6_100m	100m	27.39	16.06	16.76	15.52
T6	T6_110m	110m	27.04	15.95	16.62	15.42
T6	T6_120m	120m	26.73	15.85	16.50	15.34
T6	T6_130m	130m	26.45	15.75	16.39	15.27
T6	T6_140m	140m	26.20	15.67	16.29	15.20
T6	T6_150m	150m	25.97	15.60	16.19	15.14
T6	T6_160m	160m	25.76	15.53	16.11	15.08
T6	T6_170m	170m	25.56	15.46	16.03	15.03
T6	T6_180m	180m	25.37	15.40	15.96	14.98
T6	T6_190m	190m	25.20	15.35	15.89	14.93
T6	T6_200m	200m	25.04	15.29	15.82	14.89
T7	T7_2.775m	2.775m	41.17	20.66	22.44	19.49
T7	T7_10m	10m	35.79	18.80	20.17	17.86
T7	T7_20m	20m	33.11	17.88	19.05	17.05
T7	T7_30m	30m	31.76	17.42	18.49	16.65

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T7	T7_40m	40m	30.88	17.13	18.13	16.40
T7	T7_50m	50m	30.23	16.91	17.87	16.21
T7	T7_60m	60m	29.72	16.74	17.66	16.07
T7	T7_70m	70m	29.28	16.60	17.49	15.94
T7	T7_80m	80m	28.91	16.48	17.34	15.84
T7	T7_90m	90m	28.57	16.37	17.21	15.75
T7	T7_100m	100m	28.26	16.27	17.09	15.66
T7	T7_110m	110m	27.98	16.18	16.98	15.59
T7	T7_120m	120m	27.71	16.10	16.87	15.52
T7	T7_130m	130m	27.46	16.02	16.78	15.45
T7	T7_140m	140m	27.22	15.94	16.68	15.39
T7	T7_150m	150m	27.00	15.87	16.60	15.33
T7	T7_160m	160m	26.78	15.80	16.51	15.27
T7	T7_170m	170m	26.57	15.74	16.43	15.21
T7	T7_180m	180m	26.37	15.67	16.36	15.16
T7	T7_190m	190m	26.18	15.61	16.28	15.11
T7	T7_200m	200m	25.99	15.55	16.21	15.06

Table 7. Total Annual Mean NH3 (ug/m3) for Transect T1 - T7

5.3 (Bold numbers denote values over relevant critical load)

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T1	T1_181.54m	181.54m	2.54	2.56	2.61	2.52
T1	T1_190m	190m	2.53	2.55	2.60	2.51
T1	T1_200m	200m	2.52	2.54	2.58	2.50
T2	T2_77.21m	77.21m	2.79	2.84	2.95	2.74
T2	T2_80m	80m	2.78	2.83	2.93	2.73
T2	T2_90m	90m	2.74	2.78	2.88	2.70
T2	T2_100m	100m	2.71	2.75	2.84	2.67
T2	T2_110m	110m	2.68	2.72	2.80	2.65
T2	T2_120m	80m	2.66	2.69	2.77	2.63
T2	T2_130m	90m	2.64	2.67	2.74	2.61
T2	T2_140m	100m	2.62	2.65	2.72	2.59
T2	T2_150m	110m	2.61	2.64	2.70	2.58
T2	T2_160m	80m	2.59	2.62	2.68	2.57
T2	T2_170m	90m	2.58	2.61	2.67	2.56
T2	T2_180m	100m	2.57	2.60	2.65	2.55

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T2	T2_190m	110m	2.56	2.59	2.64	2.54
T2	T2_200m	80m	2.55	2.58	2.63	2.53
T3	T3_9.17m	9.17m	3.86	4.05	4.44	3.70
T3	T3_10m	10m	3.80	3.98	4.36	3.64
T3	T3_20m	20m	3.33	3.46	3.72	3.22
T3	T3_30m	30m	3.10	3.20	3.41	3.02
T3	T3_40m	40m	2.97	3.05	3.22	2.90
T3	T3_50m	50m	2.88	2.95	3.10	2.82
T3	T3_60m	60m	2.82	2.88	3.01	2.76
T3	T3_70m	70m	2.77	2.83	2.95	2.72
T3	T3_80m	80m	2.73	2.79	2.90	2.69
T3	T3_90m	90m	2.70	2.75	2.86	2.66
T3	T3_100m	100m	2.68	2.73	2.83	2.64
T3	T3_110m	110m	2.66	2.71	2.80	2.62
T3	T3_120m	120m	2.64	2.69	2.78	2.61
T3	T3_130m	130m	2.63	2.67	2.76	2.60
T3	T3_140m	140m	2.62	2.66	2.74	2.59
T3	T3_150m	150m	2.61	2.65	2.73	2.58
T3	T3_160m	160m	2.60	2.64	2.71	2.57
T3	T3_170m	170m	2.59	2.63	2.70	2.56
T3	T3_180m	180m	2.58	2.62	2.69	2.56
T3	T3_190m	190m	2.58	2.61	2.69	2.55
T3	T3_200m	200m	2.57	2.61	2.68	2.55
T4	T4_5.72m	5.72m	8.82	9.60	11.08	8.42
T4	T4_10m	10m	7.44	8.06	9.24	7.12
T4	T4_20m	20m	5.84	6.27	7.10	5.61
T4	T4_30m	30m	5.03	5.36	6.01	4.84
T4	T4_40m	40m	4.53	4.80	5.34	4.37
T4	T4_50m	50m	4.18	4.41	4.87	4.04
T4	T4_60m	60m	3.93	4.13	4.53	3.81
T4	T4_70m	70m	3.73	3.90	4.26	3.62
T4	T4_80m	80m	3.57	3.73	4.05	3.47
T4	T4_90m	90m	3.45	3.58	3.88	3.35
T4	T4_100m	100m	3.34	3.46	3.73	3.25
T4	T4_110m	110m	3.25	3.36	3.61	3.17
T4	T4_120m	120m	3.17	3.28	3.50	3.10
T4	T4_130m	130m	3.10	3.20	3.41	3.04

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T4	T4_140m	140m	3.04	3.14	3.33	2.98
T4	T4_150m	150m	2.99	3.08	3.26	2.94
T4	T4_160m	160m	2.95	3.03	3.20	2.89
T4	T4_170m	170m	2.91	2.98	3.14	2.86
T4	T4_180m	180m	2.87	2.94	3.09	2.82
T4	T4_190m	190m	2.84	2.91	3.05	2.80
T4	T4_200m	200m	2.81	2.87	3.01	2.77
T5	T5_10.33m	10.33m	8.86	9.65	11.08	8.49
T5	T5_20m	20m	7.15	7.73	8.81	6.86
T5	T5_30m	30m	6.19	6.65	7.54	5.95
T5	T5_40m	40m	5.58	5.97	6.73	5.37
T5	T5_50m	50m	5.15	5.49	6.16	4.96
T5	T5_60m	60m	4.83	5.13	5.74	4.66
T5	T5_70m	70m	4.58	4.86	5.41	4.42
T5	T5_80m	80m	4.38	4.63	5.14	4.23
T5	T5_90m	90m	4.22	4.45	4.92	4.08
T5	T5_100m	100m	4.08	4.29	4.73	3.94
T5	T5_110m	110m	3.96	4.15	4.56	3.83
T5	T5_120m	120m	3.85	4.04	4.42	3.73
T5	T5_130m	130m	3.76	3.94	4.30	3.65
T5	T5_140m	140m	3.68	3.84	4.19	3.57
T5	T5_150m	150m	3.60	3.76	4.09	3.50
T5	T5_160m	160m	3.54	3.69	4.00	3.44
T5	T5_170m	170m	3.48	3.62	3.92	3.39
T5	T5_180m	180m	3.42	3.56	3.84	3.34
T5	T5_190m	190m	3.37	3.50	3.77	3.29
T5	T5_200m	200m	3.33	3.45	3.71	3.25
T6	T6_3.78m	3.78m	3.19	3.31	3.52	3.04
T6	T6_10m	10m	2.99	3.08	3.25	2.88
T6	T6_20m	20m	2.85	2.92	3.06	2.78
T6	T6_30m	30m	2.79	2.85	2.97	2.72
T6	T6_40m	40m	2.74	2.80	2.91	2.69
T6	T6_50m	50m	2.72	2.77	2.87	2.67
T6	T6_60m	60m	2.69	2.74	2.84	2.65
T6	T6_70m	70m	2.68	2.72	2.81	2.63
T6	T6_80m	80m	2.66	2.70	2.79	2.62
T6	T6_90m	90m	2.65	2.69	2.77	2.61

Transect ID Road Link Distance From Road (m) 2019 2019 Future Base 2040 DM 2040 DS

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T6	T6_100m	100m	2.64	2.68	2.76	2.60
T6	T6_110m	110m	2.63	2.67	2.75	2.60
T6	T6_120m	120m	2.62	2.66	2.73	2.59
T6	T6_130m	130m	2.61	2.65	2.72	2.58
T6	T6_140m	140m	2.60	2.64	2.71	2.57
T6	T6_150m	150m	2.60	2.63	2.70	2.57
T6	T6_160m	160m	2.59	2.63	2.70	2.56
T6	T6_170m	170m	2.59	2.62	2.69	2.56
T6	T6_180m	180m	2.58	2.61	2.68	2.55
T6	T6_190m	190m	2.57	2.61	2.67	2.55
T6	T6_200m	200m	2.57	2.60	2.67	2.54
T7	T7_2.775m	2.775m	3.03	3.12	3.31	2.95
T7	T7_10m	10m	2.91	2.99	3.14	2.85
T7	T7_20m	20m	2.85	2.92	3.06	2.80
T7	T7_30m	30m	2.82	2.88	3.01	2.77
T7	T7_40m	40m	2.80	2.86	2.98	2.75
T7	T7_50m	50m	2.78	2.84	2.95	2.74
T7	T7_60m	60m	2.76	2.82	2.93	2.72
T7	T7_70m	70m	2.75	2.80	2.92	2.71
T7	T7_80m	80m	2.74	2.79	2.90	2.70
T7	T7_90m	90m	2.73	2.78	2.89	2.69
T7	T7_100m	100m	2.72	2.77	2.87	2.68
T7	T7_110m	110m	2.71	2.76	2.86	2.68
T7	T7_120m	120m	2.70	2.75	2.85	2.67
T7	T7_130m	130m	2.69	2.74	2.84	2.66
T7	T7_140m	140m	2.68	2.73	2.83	2.65
T7	T7_150m	150m	2.68	2.72	2.82	2.65
T7	T7_160m	160m	2.67	2.71	2.81	2.64
T7	T7_170m	170m	2.66	2.71	2.80	2.63
T7	T7_180m	180m	2.66	2.70	2.79	2.63
T7	T7_190m	190m	2.65	2.69	2.78	2.62
T7	T7_200m	200m	2.64	2.68	2.77	2.61

Table 8. Total Annual Mean Nitrogen Deposition (kg N/ha/yr) for Transect T1 - T7

5.4 (Bold numbers denote values over relevant critical load)

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T1	T1_181.54m	181.54m	22.35	20.40	20.67	20.17
T1	T1_190m	190m	22.29	20.35	20.61	20.13
T1	T1_200m	200m	22.23	20.29	20.54	20.08
T2	T2_77.21m	77.21m	24.18	22.03	22.67	21.47
T2	T2_80m	80m	24.09	21.95	22.57	21.40
T2	T2_90m	90m	23.82	21.71	22.27	21.21
T2	T2_100m	100m	23.59	21.50	22.02	21.04
T2	T2_110m	110m	23.39	21.33	21.81	20.91
T2	T2_120m	80m	23.23	21.18	21.63	20.79
T2	T2_130m	90m	23.08	21.06	21.47	20.69
T2	T2_140m	100m	22.96	20.94	21.33	20.60
T2	T2_150m	110m	22.85	20.85	21.21	20.52
T2	T2_160m	80m	22.75	20.76	21.11	20.45
T2	T2_170m	90m	22.66	20.68	21.01	20.39
T2	T2_180m	100m	22.59	20.61	20.93	20.34
T2	T2_190m	110m	22.51	20.55	20.85	20.29
T2	T2_200m	80m	22.45	20.49	20.78	20.24
T3	T3_9.17m	9.17m	32.32	29.36	31.60	27.35
T3	T3_10m	10m	31.87	28.95	31.10	27.02
T3	T3_20m	20m	28.56	25.91	27.41	24.58
T3	T3_30m	30m	26.94	24.44	25.61	23.40
T3	T3_40m	40m	25.97	23.56	24.55	22.70
T3	T3_50m	50m	25.33	22.99	23.85	22.24
T3	T3_60m	60m	24.87	22.58	23.34	21.91
T3	T3_70m	70m	24.53	22.27	22.97	21.66
T3	T3_80m	80m	24.27	22.03	22.68	21.48
T3	T3_90m	90m	24.05	21.85	22.45	21.33
T3	T3_100m	100m	23.88	21.69	22.26	21.20
T3	T3_110m	110m	23.74	21.57	22.10	21.10
T3	T3_120m	120m	23.62	21.46	21.97	21.02
T3	T3_130m	130m	23.52	21.37	21.86	20.95
T3	T3_140m	140m	23.43	21.29	21.77	20.89
T3	T3_150m	150m	23.36	21.23	21.69	20.83
T3	T3_160m	160m	23.29	21.17	21.62	20.79
T3	T3_170m	170m	23.24	21.12	21.55	20.75

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T3	T3_180m	180m	23.19	21.07	21.50	20.71
T3	T3_190m	190m	23.14	21.04	21.45	20.68
T3	T3_200m	200m	23.11	21.00	21.41	20.66
T4	T4_5.72m	5.72m	64.93	60.79	69.09	54.17
T4	T4_10m	10m	56.06	52.10	58.74	46.81
T4	T4_20m	20m	45.59	41.95	46.66	38.21
T4	T4_30m	30m	40.17	36.77	40.48	33.83
T4	T4_40m	40m	36.78	33.56	36.65	31.12
T4	T4_50m	50m	34.41	31.34	33.99	29.25
T4	T4_60m	60m	32.66	29.71	32.03	27.88
T4	T4_70m	70m	31.29	28.44	30.50	26.82
T4	T4_80m	80m	30.20	27.43	29.28	25.98
T4	T4_90m	90m	29.30	26.61	28.28	25.29
T4	T4_100m	100m	28.54	25.92	27.44	24.72
T4	T4_110m	110m	27.90	25.34	26.73	24.24
T4	T4_120m	120m	27.36	24.84	26.12	23.83
T4	T4_130m	130m	26.88	24.41	25.60	23.47
T4	T4_140m	140m	26.47	24.03	25.14	23.16
T4	T4_150m	150m	26.11	23.70	24.73	22.89
T4	T4_160m	160m	25.78	23.41	24.37	22.65
T4	T4_170m	170m	25.50	23.15	24.06	22.44
T4	T4_180m	180m	25.24	22.92	23.77	22.25
T4	T4_190m	190m	25.01	22.72	23.52	22.08
T4	T4_200m	200m	24.81	22.53	23.29	21.92
T5	T5_10.33m	10.33m	65.20	61.08	69.12	54.57
T5	T5_20m	20m	54.15	50.26	56.36	45.35
T5	T5_30m	30m	47.83	44.13	49.14	40.13
T5	T5_40m	40m	43.80	40.25	44.56	36.82
T5	T5_50m	50m	40.94	37.52	41.33	34.49
T5	T5_60m	60m	38.80	35.49	38.92	32.77
T5	T5_70m	70m	37.11	33.90	37.03	31.42
T5	T5_80m	80m	35.75	32.62	35.50	30.34
T5	T5_90m	90m	34.61	31.55	34.24	29.44
T5	T5_100m	100m	33.65	30.66	33.16	28.68
T5	T5_110m	110m	32.82	29.89	32.23	28.04
T5	T5_120m	120m	32.10	29.22	31.43	27.48
T5	T5_130m	130m	31.46	28.63	30.72	26.99

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T5	T5_140m	140m	30.89	28.10	30.08	26.55
T5	T5_150m	150m	30.38	27.63	29.51	26.16
T5	T5_160m	160m	29.92	27.21	28.99	25.80
T5	T5_170m	170m	29.50	26.83	28.53	25.49
T5	T5_180m	180m	29.12	26.48	28.10	25.20
T5	T5_190m	190m	28.77	26.16	27.71	24.93
T5	T5_200m	200m	28.45	25.86	27.36	24.69
T6	T6_3.78m	3.78m	27.98	25.13	26.44	23.61
T6	T6_10m	10m	26.36	23.74	24.75	22.62
T6	T6_20m	20m	25.26	22.80	23.60	21.95
T6	T6_30m	30m	24.71	22.33	23.03	21.62
T6	T6_40m	40m	24.37	22.04	22.68	21.41
T6	T6_50m	50m	24.13	21.84	22.43	21.27
T6	T6_60m	60m	23.96	21.69	22.25	21.16
T6	T6_70m	70m	23.81	21.56	22.10	21.07
T6	T6_80m	80m	23.70	21.46	21.98	20.99
T6	T6_90m	90m	23.60	21.38	21.87	20.93
T6	T6_100m	100m	23.51	21.31	21.78	20.88
T6	T6_110m	110m	23.43	21.24	21.70	20.83
T6	T6_120m	120m	23.37	21.18	21.63	20.78
T6	T6_130m	130m	23.30	21.13	21.57	20.74
T6	T6_140m	140m	23.25	21.08	21.51	20.71
T6	T6_150m	150m	23.20	21.03	21.45	20.67
T6	T6_160m	160m	23.15	20.99	21.40	20.64
T6	T6_170m	170m	23.10	20.95	21.35	20.61
T6	T6_180m	180m	23.06	20.92	21.31	20.58
T6	T6_190m	190m	23.02	20.88	21.26	20.55
T6	T6_200m	200m	22.98	20.85	21.22	20.53
T7	T7_2.775m	2.775m	26.69	24.11	25.19	23.14
T7	T7_10m	10m	25.69	23.27	24.17	22.50
T7	T7_20m	20m	25.17	22.84	23.64	22.16
T7	T7_30m	30m	24.90	22.61	23.36	21.98
T7	T7_40m	40m	24.72	22.46	23.17	21.86
T7	T7_50m	50m	24.58	22.34	23.03	21.77
T7	T7_60m	60m	24.47	22.24	22.91	21.69
T7	T7_70m	70m	24.37	22.15	22.80	21.62
T7	T7_80m	80m	24.28	22.08	22.71	21.56

Transect ID	Road Link	Distance From Road (m)	2019	2019 Future Base	2040 DM	2040 DS
T7	T7_90m	90m	24.20	22.01	22.63	21.51
T7	T7_100m	100m	24.13	21.94	22.55	21.45
T7	T7_110m	110m	24.06	21.89	22.48	21.41
T7	T7_120m	120m	24.00	21.83	22.41	21.36
T7	T7_130m	130m	23.94	21.77	22.34	21.32
T7	T7_140m	140m	23.88	21.72	22.28	21.27
T7	T7_150m	150m	23.82	21.67	22.22	21.23
T7	T7_160m	160m	23.77	21.62	22.16	21.19
T7	T7_170m	170m	23.72	21.58	22.10	21.16
T7	T7_180m	180m	23.66	21.53	22.05	21.12
T7	T7_190m	190m	23.62	21.49	21.99	21.08
T7	T7_200m	200m	23.57	21.45	21.94	21.05

Table 9. Change in the DS-DM Scenarios – Alone Impact

Transect ID	Road Link	Distance From Road (m)	Annual Mean NO _x (ug/m ³)	Annual Mean NH ₃ (ug/m ³)	Total Annual Mean N Dep (Kg N/ha/yr)
T1	T1_181.54m	181.54m	-0.66	-0.09	-0.50
T1	T1_190m	190m	-0.63	-0.08	-0.48
T1	T1_200m	200m	-0.60	-0.08	-0.46
T2	T2_77.21m	77.21m	-1.57	-0.21	-1.20
T2	T2_80m	80m	-1.53	-0.20	-1.17
T2	T2_90m	90m	-1.39	-0.18	-1.06
T2	T2_100m	100m	-1.28	-0.17	-0.98
T2	T2_110m	110m	-1.18	-0.16	-0.90
T2	T2_120m	80m	-1.10	-0.15	-0.84
T2	T2_130m	90m	-1.02	-0.14	-0.78
T2	T2_140m	100m	-0.96	-0.13	-0.73
T2	T2_150m	110m	-0.90	-0.12	-0.69
T2	T2_160m	80m	-0.85	-0.11	-0.66
T2	T2_170m	90m	-0.81	-0.11	-0.62
T2	T2_180m	100m	-0.77	-0.10	-0.59
T2	T2_190m	110m	-0.73	-0.10	-0.56
T2	T2_200m	80m	-0.70	-0.09	-0.54
T3	T3_9.17m	9.17m	-5.59	-0.74	-4.25
T3	T3_10m	10m	-5.36	-0.71	-4.08
T3	T3_20m	20m	-3.71	-0.49	-2.83
T3	T3_30m	30m	-2.90	-0.39	-2.22

T3	T3_40m	40m	-2.42	-0.32	-1.85
T3	T3_50m	50m	-2.10	-0.28	-1.61
T3	T3_60m	60m	-1.87	-0.25	-1.44
T3	T3_70m	70m	-1.70	-0.23	-1.31
T3	T3_80m	80m	-1.57	-0.21	-1.20
T3	T3_90m	90m	-1.46	-0.19	-1.12
T3	T3_100m	100m	-1.37	-0.18	-1.06
T3	T3_110m	110m	-1.30	-0.17	-1.00
T3	T3_120m	120m	-1.24	-0.17	-0.95
T3	T3_130m	130m	-1.19	-0.16	-0.92
T3	T3_140m	140m	-1.14	-0.15	-0.88
T3	T3_150m	150m	-1.11	-0.15	-0.85
T3	T3_160m	160m	-1.07	-0.14	-0.83
T3	T3_170m	170m	-1.04	-0.14	-0.81
T3	T3_180m	180m	-1.02	-0.14	-0.78
T3	T3_190m	190m	-0.99	-0.13	-0.77
T3	T3_200m	200m	-0.97	-0.13	-0.75
T4	T4_5.72m	5.72m	-19.17	-2.66	-14.93
T4	T4_10m	10m	-15.26	-2.11	-11.93
T4	T4_20m	20m	-10.77	-1.49	-8.45
T4	T4_30m	30m	-8.46	-1.17	-6.65
T4	T4_40m	40m	-7.03	-0.97	-5.53
T4	T4_50m	50m	-6.02	-0.83	-4.74
T4	T4_60m	60m	-5.27	-0.73	-4.14
T4	T4_70m	70m	-4.67	-0.64	-3.68
T4	T4_80m	80m	-4.19	-0.58	-3.30
T4	T4_90m	90m	-3.79	-0.52	-2.99
T4	T4_100m	100m	-3.46	-0.48	-2.72
T4	T4_110m	110m	-3.17	-0.44	-2.49
T4	T4_120m	120m	-2.92	-0.40	-2.30
T4	T4_130m	130m	-2.70	-0.37	-2.13
T4	T4_140m	140m	-2.51	-0.34	-1.98
T4	T4_150m	150m	-2.34	-0.32	-1.84
T4	T4_160m	160m	-2.19	-0.30	-1.73
T4	T4_170m	170m	-2.06	-0.28	-1.62
T4	T4_180m	180m	-1.94	-0.27	-1.53
T4	T4_190m	190m	-1.84	-0.25	-1.44
T4	T4_200m	200m	-1.74	-0.24	-1.37
T5	T5_10.33m	10.33m	-18.72	-2.59	-14.55

T5	T5_20m	20m	-14.09	-1.95	-11.00
T5	T5_30m	30m	-11.50	-1.59	-9.01
T5	T5_40m	40m	-9.86	-1.36	-7.74
T5	T5_50m	50m	-8.70	-1.20	-6.83
T5	T5_60m	60m	-7.83	-1.08	-6.15
T5	T5_70m	70m	-7.14	-0.98	-5.61
T5	T5_80m	80m	-6.57	-0.91	-5.17
T5	T5_90m	90m	-6.10	-0.84	-4.80
T5	T5_100m	100m	-5.69	-0.78	-4.47
T5	T5_110m	110m	-5.33	-0.73	-4.20
T5	T5_120m	120m	-5.02	-0.69	-3.95
T5	T5_130m	130m	-4.74	-0.65	-3.73
T5	T5_140m	140m	-4.49	-0.62	-3.53
T5	T5_150m	150m	-4.26	-0.59	-3.35
T5	T5_160m	160m	-4.06	-0.56	-3.19
T5	T5_170m	170m	-3.87	-0.53	-3.04
T5	T5_180m	180m	-3.70	-0.51	-2.91
T5	T5_190m	190m	-3.54	-0.49	-2.78
T5	T5_200m	200m	-3.39	-0.46	-2.67
T6	T6_3.78m	3.78m	-4.43	-0.48	-2.83
T6	T6_10m	10m	-3.25	-0.36	-2.12
T6	T6_20m	20m	-2.45	-0.28	-1.65
T6	T6_30m	30m	-2.06	-0.24	-1.41
T6	T6_40m	40m	-1.82	-0.22	-1.26
T6	T6_50m	50m	-1.66	-0.20	-1.16
T6	T6_60m	60m	-1.54	-0.19	-1.09
T6	T6_70m	70m	-1.44	-0.18	-1.03
T6	T6_80m	80m	-1.36	-0.17	-0.98
T6	T6_90m	90m	-1.30	-0.16	-0.94
T6	T6_100m	100m	-1.25	-0.16	-0.91
T6	T6_110m	110m	-1.20	-0.15	-0.88
T6	T6_120m	120m	-1.16	-0.15	-0.85
T6	T6_130m	130m	-1.12	-0.14	-0.82
T6	T6_140m	140m	-1.09	-0.14	-0.80
T6	T6_150m	150m	-1.06	-0.13	-0.78
T6	T6_160m	160m	-1.03	-0.13	-0.76
T6	T6_170m	170m	-1.00	-0.13	-0.74
T6	T6_180m	180m	-0.98	-0.13	-0.73
T6	T6_190m	190m	-0.95	-0.12	-0.71

T6	T6_200m	200m	-0.93	-0.12	-0.70
T7	T7_2.775m	2.775m	-2.95	-0.35	-2.05
T7	T7_10m	10m	-2.32	-0.29	-1.68
T7	T7_20m	20m	-2.00	-0.26	-1.48
T7	T7_30m	30m	-1.84	-0.24	-1.38
T7	T7_40m	40m	-1.74	-0.23	-1.31
T7	T7_50m	50m	-1.66	-0.22	-1.26
T7	T7_60m	60m	-1.60	-0.21	-1.22
T7	T7_70m	70m	-1.55	-0.21	-1.18
T7	T7_80m	80m	-1.50	-0.20	-1.15
T7	T7_90m	90m	-1.46	-0.19	-1.12
T7	T7_100m	100m	-1.42	-0.19	-1.10
T7	T7_110m	110m	-1.39	-0.19	-1.07
T7	T7_120m	120m	-1.36	-0.18	-1.05
T7	T7_130m	130m	-1.33	-0.18	-1.02
T7	T7_140m	140m	-1.30	-0.17	-1.00
T7	T7_150m	150m	-1.27	-0.17	-0.98
T7	T7_160m	160m	-1.25	-0.17	-0.96
T7	T7_170m	170m	-1.22	-0.16	-0.95
T7	T7_180m	180m	-1.20	-0.16	-0.93
T7	T7_190m	190m	-1.17	-0.16	-0.91
T7	T7_200m	200m	-1.15	-0.16	-0.89

Table 10. Change in the DS-FB Scenarios – In-combination Impact

Transect ID	Road Link	Distance From Road (m)	Annual Mean NO _x (ug/m ³)	Annual Mean NH ₃ (ug/m ³)	Total Annual Mean N Dep (Kg N/ha/yr)
T1	T1_181.54m	181.54m	-0.29	-0.04	-0.24
T1	T1_190m	190m	-0.28	-0.04	-0.23
T1	T1_200m	200m	-0.27	-0.04	-0.21
T2	T2_77.21m	77.21m	-0.70	-0.10	-0.56
T2	T2_80m	80m	-0.68	-0.10	-0.55
T2	T2_90m	90m	-0.62	-0.09	-0.50
T2	T2_100m	100m	-0.57	-0.08	-0.46
T2	T2_110m	110m	-0.53	-0.07	-0.42
T2	T2_120m	80m	-0.49	-0.07	-0.39
T2	T2_130m	90m	-0.46	-0.06	-0.37
T2	T2_140m	100m	-0.43	-0.06	-0.35
T2	T2_150m	110m	-0.40	-0.06	-0.32
T2	T2_160m	80m	-0.38	-0.05	-0.31

T2	T2_170m	90m	-0.36	-0.05	-0.29
T2	T2_180m	100m	-0.34	-0.05	-0.28
T2	T2_190m	110m	-0.33	-0.05	-0.26
T2	T2_200m	80m	-0.31	-0.04	-0.25
T3	T3_9.17m	9.17m	-2.51	-0.35	-2.01
T3	T3_10m	10m	-2.41	-0.34	-1.93
T3	T3_20m	20m	-1.66	-0.23	-1.33
T3	T3_30m	30m	-1.30	-0.18	-1.04
T3	T3_40m	40m	-1.08	-0.15	-0.87
T3	T3_50m	50m	-0.94	-0.13	-0.75
T3	T3_60m	60m	-0.83	-0.12	-0.67
T3	T3_70m	70m	-0.76	-0.11	-0.61
T3	T3_80m	80m	-0.70	-0.10	-0.56
T3	T3_90m	90m	-0.65	-0.09	-0.52
T3	T3_100m	100m	-0.61	-0.09	-0.49
T3	T3_110m	110m	-0.58	-0.08	-0.46
T3	T3_120m	120m	-0.55	-0.08	-0.44
T3	T3_130m	130m	-0.53	-0.07	-0.42
T3	T3_140m	140m	-0.50	-0.07	-0.41
T3	T3_150m	150m	-0.49	-0.07	-0.39
T3	T3_160m	160m	-0.47	-0.07	-0.38
T3	T3_170m	170m	-0.46	-0.06	-0.37
T3	T3_180m	180m	-0.45	-0.06	-0.36
T3	T3_190m	190m	-0.44	-0.06	-0.35
T3	T3_200m	200m	-0.43	-0.06	-0.35
T4	T4_5.72m	5.72m	-8.31	-1.18	-6.62
T4	T4_10m	10m	-6.61	-0.94	-5.29
T4	T4_20m	20m	-4.66	-0.66	-3.74
T4	T4_30m	30m	-3.66	-0.52	-2.94
T4	T4_40m	40m	-3.03	-0.43	-2.44
T4	T4_50m	50m	-2.59	-0.37	-2.09
T4	T4_60m	60m	-2.27	-0.32	-1.83
T4	T4_70m	70m	-2.01	-0.28	-1.62
T4	T4_80m	80m	-1.80	-0.25	-1.45
T4	T4_90m	90m	-1.63	-0.23	-1.31
T4	T4_100m	100m	-1.49	-0.21	-1.20
T4	T4_110m	110m	-1.36	-0.19	-1.10
T4	T4_120m	120m	-1.25	-0.18	-1.01
T4	T4_130m	130m	-1.16	-0.16	-0.94

T4	T4_140m	140m	-1.08	-0.15	-0.87
T4	T4_150m	150m	-1.01	-0.14	-0.81
T4	T4_160m	160m	-0.94	-0.13	-0.76
T4	T4_170m	170m	-0.89	-0.13	-0.71
T4	T4_180m	180m	-0.84	-0.12	-0.67
T4	T4_190m	190m	-0.79	-0.11	-0.64
T4	T4_200m	200m	-0.75	-0.11	-0.61
T5	T5_10.33m	10.33m	-8.15	-1.16	-6.51
T5	T5_20m	20m	-6.12	-0.87	-4.91
T5	T5_30m	30m	-4.99	-0.71	-4.00
T5	T5_40m	40m	-4.27	-0.60	-3.43
T5	T5_50m	50m	-3.76	-0.53	-3.02
T5	T5_60m	60m	-3.38	-0.48	-2.72
T5	T5_70m	70m	-3.08	-0.44	-2.48
T5	T5_80m	80m	-2.83	-0.40	-2.28
T5	T5_90m	90m	-2.62	-0.37	-2.11
T5	T5_100m	100m	-2.45	-0.35	-1.97
T5	T5_110m	110m	-2.29	-0.32	-1.85
T5	T5_120m	120m	-2.16	-0.30	-1.74
T5	T5_130m	130m	-2.04	-0.29	-1.64
T5	T5_140m	140m	-1.93	-0.27	-1.55
T5	T5_150m	150m	-1.83	-0.26	-1.48
T5	T5_160m	160m	-1.74	-0.25	-1.40
T5	T5_170m	170m	-1.66	-0.23	-1.34
T5	T5_180m	180m	-1.59	-0.22	-1.28
T5	T5_190m	190m	-1.52	-0.21	-1.23
T5	T5_200m	200m	-1.46	-0.21	-1.17
T6	T6_3.78m	3.78m	-2.05	-0.26	-1.52
T6	T6_10m	10m	-1.49	-0.19	-1.11
T6	T6_20m	20m	-1.11	-0.15	-0.84
T6	T6_30m	30m	-0.93	-0.12	-0.71
T6	T6_40m	40m	-0.81	-0.11	-0.63
T6	T6_50m	50m	-0.74	-0.10	-0.57
T6	T6_60m	60m	-0.68	-0.09	-0.53
T6	T6_70m	70m	-0.64	-0.09	-0.49
T6	T6_80m	80m	-0.60	-0.08	-0.47
T6	T6_90m	90m	-0.57	-0.08	-0.45
T6	T6_100m	100m	-0.54	-0.07	-0.43
T6	T6_110m	110m	-0.52	-0.07	-0.41

T6	T6_120m	120m	-0.50	-0.07	-0.40
T6	T6_130m	130m	-0.49	-0.07	-0.39
T6	T6_140m	140m	-0.47	-0.07	-0.37
T6	T6_150m	150m	-0.46	-0.06	-0.36
T6	T6_160m	160m	-0.45	-0.06	-0.35
T6	T6_170m	170m	-0.43	-0.06	-0.35
T6	T6_180m	180m	-0.42	-0.06	-0.34
T6	T6_190m	190m	-0.41	-0.06	-0.33
T6	T6_200m	200m	-0.40	-0.06	-0.32
T7	T7_2.775m	2.775m	-1.16	-0.17	-0.97
T7	T7_10m	10m	-0.94	-0.14	-0.78
T7	T7_20m	20m	-0.83	-0.12	-0.68
T7	T7_30m	30m	-0.77	-0.11	-0.63
T7	T7_40m	40m	-0.73	-0.10	-0.59
T7	T7_50m	50m	-0.70	-0.10	-0.57
T7	T7_60m	60m	-0.68	-0.10	-0.55
T7	T7_70m	70m	-0.66	-0.09	-0.53
T7	T7_80m	80m	-0.64	-0.09	-0.52
T7	T7_90m	90m	-0.62	-0.09	-0.50
T7	T7_100m	100m	-0.61	-0.09	-0.49
T7	T7_110m	110m	-0.59	-0.08	-0.48
T7	T7_120m	120m	-0.58	-0.08	-0.47
T7	T7_130m	130m	-0.57	-0.08	-0.46
T7	T7_140m	140m	-0.56	-0.08	-0.45
T7	T7_150m	150m	-0.54	-0.08	-0.44
T7	T7_160m	160m	-0.53	-0.08	-0.43
T7	T7_170m	170m	-0.52	-0.07	-0.42
T7	T7_180m	180m	-0.51	-0.07	-0.42
T7	T7_190m	190m	-0.50	-0.07	-0.41
T7	T7_200m	200m	-0.49	-0.07	-0.40

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