Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Needs

Proposed Submission Plan

Habitat Regulations Assessment Screening Report

Cherwell District Council

June 2017

Plan Design Enable

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Executive Summary

A Habitat Regulations Assessment (HRA) Stage 1 (Screening) was completed on the four previous iterations of the Cherwell District Council adopted Local Plan. The Cherwell Local Plan 2011-2031 (Part 1) was adopted in July 2015 and provides for Cherwell's development needs to the year 2031. The Council is now undertaking a Partial Review of the adopted Local Plan to help address Oxford's unmet housing need.

In the Local Plan the Council committed to working jointly with the other Oxfordshire Councils to assess the extent of the housing need that could not be met elsewhere in the Oxfordshire Housing Market Area. In particular, it was understood that there could be a need arising from Oxford that could not be met by Oxford City Council due to its tight administrative boundary and its limited supply of land. Cherwell District Council's commitment was to consider the extent of the need and, if necessary, to 'partially review' its Local Plan within two years from its adoption. As such the Partial Review is effectively a supplement or addendum to the adopted Cherwell Local Plan 2011-2031 which will become part of the statutory Development Plan for the district when adopted.

The Partial Review Proposed Submission Plan provides for the apportionment of an additional 4,400 dwellings to Cherwell district, and identifies proposed strategic housing sites where development may take place. The Partial Review Proposed Submission Plan includes a draft vision, four new strategic objectives and 18 policies to support Oxford's unmet housing need.

All European sites within Cherwell and up to 20 km from its boundaries were identified. There is one European site within the district (Oxford Meadows SAC), located in the south-western corner of Cherwell. There are also four other European sites within 20 km, located approximately 8.75 km, 17.5 km, 18.1 km and 19.1 km from the district boundary.

Adverse effects from the Partial Review Proposed Submission Plan are considered unlikely to extend far beyond the Plan boundary. Therefore Cothill Fen SAC, Little Wittenham SAC, Aston Rowant SAC and Chiltern Beechwoods SAC have been excluded from the HRA process as it is extremely unlikely that there would be any significant effects on these sites given their distance to the Plan boundary. Therefore, this HRA is a record of the assessment of 'likely significant effects' from the Partial Review Proposed Submission Plan on Oxford Meadows SAC only.

The HRA found that the additional four strategic objectives will directly or indirectly lead to development, however, the objectives do not provide any detail of where development may be located and therefore the objectives themselves are not considered to have a likely significant effect on the European site.

Of the 18 policies in the Partial Review Proposed Submission Plan, policies PR1, PR2, PR3, PR4a, PR4b, PR5, PR11 PR12a, PR12b and PR13 would either not themselves lead to development (they are intended to protect the natural environment, including biodiversity) or would have no effect because no development could occur through the policy itself - the development being implemented through later policies in the same plan, which are more specific and therefore more appropriate to assess for their effects on European sites and associated sensitive areas.

Policies PR6a, PR6b, PR6c, PR7a, PR7b, PR8, PR9 and PR10 all relate to specific development sites and are therefore classed as Policy Type 2: policies that could have a negative effect but would not be likely to have a significant effect on a European site alone or in combination with other projects or plans. For these policies a screening assessment has been carried out considering the impacts that might lead to significant effects on Oxford Meadows SAC.

The in-combination assessment with other projects and plans identified will not lead to significant effects on Oxford Meadows SAC in combination with the proposals contained in the Partial Review Proposed Submission Plan, provided that any mitigation measures identified for other projects and plans are put in place.

The HRA Stage 1 (Screening) assessment has determined that the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Need Proposed Submission Plan will not lead to likely significant effects, either alone or in combination, on the qualifying features of Oxford Meadows SAC.

1. Introduction

1.1. Background to this Assessment

A Habitat Regulations Assessment Stage 1 (Screening) was completed on the four previous iterations of the adopted Local Plan:

- Cherwell District Council's Options for Growth: Consultation on Directions of Growth and Strategic Sites – Core Strategy Development Plan Document (September 2008). The HRA report, Options for Growth - Consultation on Directions of Growth and Strategic Sites: Core Strategy Development Plan Document Habitats Regulations Assessment (Stage 1), was produced by Atkins in October 2009;

- Cherwell District Council's Draft Core Strategy (February 2010). The HRA report, Draft Core Strategy (February 2010): Habitats Regulations Assessment, Stage 1 – Screening, was produced by Atkins in February 2011;

- Proposed Submission Cherwell Local Plan (August 2012). Screenings of the draft Plan and proposed changes to it were produced by Atkins in August 2012, March 2013 and October 2013;

- Submission Cherwell Local Plan incorporating Proposed Modifications (October 2014). Habitats Regulations Assessment: Stage 1 – Screening, October 2014.

The Cherwell Local Plan 2011-2031 (Part 1) was adopted in July 2015. The Council is now undertaking a Partial Review of the adopted Local Plan to address Oxford's unmet housing need, and published an Options Consultation document in November 2016 to seek views on how the unmet housing need should be addressed.

A Habitats Regulations Assessment (HRA) report on the Options Consultation document and additional sites identified through consultation was undertaken by Atkins Limited (Atkins) on behalf of Cherwell District Council to inform the preparation of the Proposed Submission Plan. The HRA Screening concluded that, depending on the options taken forward, the sites in the Options Paper might lead to likely significant effects on the qualifying features of Oxford Meadows SAC. As such, it indicated that the precautionary principle should be followed and a Stage 1 (screening) of the HRA would be repeated on the Proposed Submission Partial Review Plan (which will include site specific locations to meet Oxford's unmet housing need) and, if necessary, subsequent stages of HRA.

This HRA screening report therefore assesses the Proposed Submission Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) to address Oxford's Unmet Housing Need. This information has been gathered on behalf of the Competent Authority (in this case Cherwell District Council) to allow them to make a decision on whether there will be significant impacts on European sites as a result of the proposals contained in the Proposed Submission Plan..

The Partial Review Proposed Submission Plan is hereafter referred to as 'the Plan'. The Plan covers the whole of Cherwell District.

1.2. Background to Habitat Regulations Assessment

HRA is required by Regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations) for all plans and projects which may have likely significant effects on a European site and are not directly connected with or necessary to the management of the European site.

European sites include Special Areas of Conservation (SAC), Special Protection Areas (SPA) and listed Wetlands of European Importance (Ramsar sites). HRA is also required, as a matter of UK Government policy, for potential SPAs (pSPA), candidate SACs (cSAC) and proposed Ramsar sites (pRamsar) for the purposes of considering plans and projects, which may affect them[1]. Hereafter, all the above-designated nature conservation sites are referred to as 'European sites'.

[1] *National Planning Policy Framework*. Department for Communities and Local Government. March 2012.

The stages of HRA process are:

- **Stage 1 – Screening**: To test whether a plan or project either alone or in combination with other plans and projects is likely to have a significant effect on an European site;

- **Stage 2 – Appropriate Assessment**: To determine whether, in view of an European site's conservation objectives, the plan (either alone or in combination with other projects and plans) would have an adverse effect (or risk of this) on the integrity of the site with respect to the site structure, function and conservation objectives. If adverse impacts are anticipated, potential mitigation measures to alleviate impacts should be proposed and assessed;

- **Stage 3 – Assessment of alternative solutions**: Where a plan is assessed as having an adverse impact (or risk of this) on the integrity of an European site, there should be an examination of alternatives (e.g. alternative locations and designs of development); and,

- **Stage 4 – Assessment where no alternative solutions remain and where adverse impacts remain**: In exceptional circumstance (e.g. where there are imperative reasons of overriding public interest), compensatory measures to be put in place to offset negative impacts.

This report comprises the Stage 1 – Screening of the Plan.

1.3. Outline of this Report

Following this introduction:

- Section 2 outlines the methodology used for this HRA;

- Section 3 outlines details of the Proposed Submission Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Need;

- Section 4 summarises the European sites;

- Section 5 details the other projects and plans identified which may lead to in-combination effects on the European sites;

- Section 6 details the results of the HRA for all of the European sites; and,

- Section 7 provides the conclusions of the HRA.

2. Methodology

2.1. The Plan

All available information about the Plan was gathered in order to analyse whether the Plan is likely to have any likely significant effects on the European sites.

2.2. Determination of the European Sites included in the HRA

The European sites that should be included in the HRA were then determined. An initial review of the Plan in light of the Habitats Regulations has been undertaken by Atkins as part of the HRA process. This initial review looked at the geographic extent or zone of influence of any impacts which could arise as a result of the Plan and considered which European sites should be included within the assessment.

As a starting point, all European sites within Cherwell and up to 20 km from its boundaries were identified[2]. There is one European site within the district (Oxford Meadows SAC), located in the south-western corner of Cherwell.

There are also four other European sites within 20 km of the district boundary. These comprise:

- Cothill Fen SAC: Located approximately 8.75 km south-west of the district boundary;
- Little Wittenham SAC: Located approximately 17.5 km south of the district boundary;
- Aston Rowant SAC: Located approximately 18.1 km south of the district boundary; and
- Chiltern Beechwoods SAC: Located approximately 19.1 km south-east of the district boundary.

A plan showing the location of the European sites is provided in Appendix A.

The Plan sets out the policies for meeting Oxford's unmet housing need in the Cherwell district. The Plan therefore focuses on future development within the district. Adverse effects from the Plan are considered unlikely to extend far beyond the Plan boundary. There are unlikely to be significant emissions to air or discharge to water which could be generated through developments such as large scale power stations and quarry operations, as these types of development are not included in the Plan. Cothill Fen SAC, Little Wittenham SAC, Aston Rowant SAC and Chiltern Beechwoods SAC have therefore been excluded from the HRA process as it is extremely unlikely that there would be any significant effects on these sites given their distance from the Plan boundary.

The previous iterations of the Local Plan considered the inclusion of Cothill Fen SAC within this HRA. The previous iterations had subsequently excluded Cothill Fen SAC from assessment, based on consultation with Thames Water and the Environment Agency which determined that the Review of Consents process carried out by these two organisations confirmed that there are currently no significant adverse effects on this European site as a result of water abstraction in this area. Furthermore, at the time of these assessments, Natural England stated that Cothill Fen SAC is not a well known site for recreational use and therefore, given its distance from the district, it is considered extremely unlikely that residents from Cherwell will visit this site over and above the green space within the district.

Therefore this HRA is a record of the assessment of 'likely significant effects' from the Plan on one European site only: Oxford Meadows SAC. Further details of this European site including its location, designation details and conservation objectives are provided in Section 4.

[2] The Environment Agency Integrated Pollution Control (IPC) and Pollution Prevention and Control (PPC) guidance notes that a proposal to construct a coal or oil fired power station should consider impacts on European sites up to 15 km away (Page 4 of the *Habitats Directive – Work Instruction: Appendix 7 Technical and Procedural Issues Specific to IPC and PPC* produced by the Environment Agency in July 2004). The most recent England Leisure Visits report states that people will travel up to 17.3 km to a countryside destination (*England Leisure Visits: Summary of the 2005 Leisure Visits Survey*, Natural England, 2005). The Department for Transport National Travel Survey 2014 has shown a reduction in the distance travelled. However, using the precautionary approach 20 km has been used to ensure that all sites that may be impacted by a new development are considered as part of the HRA process.

2.3. Obtaining Information on European Sites with the Potential to be Affected

The next step is to gather the information on the European sites to be included in the HRA. This includes contacting Natural England for the conservation objectives and favourable conditions Tables for each European site.

The conservation objectives[3] and favourable conditions Tables for Oxford Meadows SAC have been obtained from Natural England for the purpose of this assessment.

2.4. Obtaining Information on Other Projects and Plans

In accordance with the Habitats Regulations, there is a need to consider the potential for likely significant effects of the Plan 'in combination' with other projects and plans.

Statutory bodies surrounding, or in close proximity to, the Oxford Meadows SAC were contacted for details of any projects or plans that have been subject to HRA to assess effects on the Oxford Meadows SAC (in order to determine whether there is a cumulative impact on this European site).

An internet search of the following organisations has been undertaken for details of other projects and plans which have the potential for adverse effects upon the Oxford Meadows SAC.

County Councils

- Buckinghamshire County Council; and,
- Oxfordshire County Council.

Local Planning Authorities

- Aylesbury Vale District Council;
- Chiltern District Council;
- Dacorum Borough Council;
- Oxford City Council;
- Reading Borough Council;
- South Oxfordshire District Council;
- Vale of White Horse District Council;
- West Berkshire Council;
- West Oxfordshire District Council;
- Windsor and Maidenhead Council;
- Woking Borough Council;
- Wycombe District Council; and,
- Wokingham Borough Council.

[3] http://publications.naturalengland.org.uk/publication/5815888603250688

Other Statutory Bodies

- Environment Agency;
- Natural England; and,
- Thames Water.

2.5. Assessing the Impacts of the Plan 'Alone' and 'In Combination'

Following the gathering of information on the European sites an assessment has been undertaken to predict the likely significant effects of the Plan 'alone' on the Oxford Meadows European site. In order to inform this process, all parts of the Plan were assessed to see whether they could result in likely significant effects on the European site. This HRA assesses each of the strategic objectives and policies within the Plan.

The screening assessment has been carried out considering the following impacts that might lead to significant effects on Oxford Meadows SAC identified as potentially being affected:

- recreation;
- water quality;
- water abstraction;
- groundwater flows;
- air pollution.

These impacts were identified through consideration of the potential impact pathways of development and the conservation objectives and vulnerabilities of the sites identified, using the professional judgement of experienced and qualified consultant ecologists, and in consultation with Natural England.

The Oxford Meadows SAC is also vulnerable to invasive species. However, as the potential allocation sites are all in excess of 1.5 km from the SAC, it is considered unlikely that any development of the potential allocation sites could result in a spread of invasive species to the SAC and for this reason invasive species has been excluded from assessment.

The findings of the assessment are given in Table B2 in Appendix B. In order to support this assessment of likely significant effects on Oxford Meadows SAC from the Plan, an air quality assessment was completed (see Appendix C).

Section 6 summarises the findings of the HRA in relation to Oxford Meadows SAC. Where possible, policies that have been found to have no likely significant effect on an European site have been categorised into one of five different types. This has been based on The Habitats Regulations Assessment of Local Development Documents (Revised Draft Guidance) produced by Natural England in February 2009:

- Policy Type A1: Policies that will not themselves lead to development (e.g. because they relate to design or other qualitative criteria for development, or they are not a land use planning policy);
- Policy Type A2: Policies intended to protect the natural environment, including biodiversity;
- Policy Type A3: Policies intended to conserve or enhance the natural, built or historic environment, where enhancement measures will not be likely to have any negative effect on an European site;
- Policy Type A4: Policies that positively steer development away from European sites and associated sensitive areas; and,
- Policy Type A5: Policies that would have no effect because no development could occur through the policy itself, the development being implemented through later policies in the same plan, which are

more specific and therefore more appropriate to assess for their effects on European sites and associated sensitive areas.

The potential for likely significant effects of the Plan 'in combination' with other projects and plans for each European site has also been considered in this HRA. As part of this process all HRAs that have been completed due to possible impacts on the European site included in this HRA were reviewed in order to determine whether there is the potential for in-combination effects (see Section 5).

Likely significant effects are assessed by reference to the conservation objectives of the qualifying features (interest features) of the European site. Any project or plan that causes the cited interest features of a site to fall into unfavourable condition can be considered to have a likely significant effect on the site. Stage 1 of the HRA process does not assess effects on the integrity of European sites (this forms Stage 2 of the HRA process). However, the definition of integrity provided below has been taken into account during the assessment of likely significant effects:

> *'…the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified'.*[4]

Projects or plans can adversely affect a site by:

- Causing delays in progress towards achieving the conservation objectives of the site;
- Interrupting progress towards achieving the conservation objectives of the site;
- Disrupting those factors that help to maintain the favourable conditions of the site; and
- Interfering with the balance, distribution and density of key species that are the indicators of the favourable condition of the site.

HRA is an iterative process. Where necessary, suggestions can be made of how to amend the Plan to avoid likely significant effects on a European site. This iterative approach has been adopted as part of this assessment.

The precautionary principle (as enshrined in the Habitats Regulations) has been taken into account during this HRA. The precautionary principle is used when an HRA cannot objectively demonstrate that there will be no likely significant effects on the European sites. If this occurs the subsequent stages of HRA must be completed for the project or plan. A further HRA Stage 1 (screening) will be undertaken to accompany the Submission Partial Review Plan in due course to assess any changes made between the Proposed Submission and Submission stages of the Plan.

The approach taken for the air quality assessment in support of this HRA is the same approach which was undertaken for the Cherwell Local Plan 2011-2031 (Part 1) which was adopted in July 2015 and agreed with Natural England,

[4] Part I, Section B, Paragraph 20 of *ODPM Circular 06/2005* accompanying *Planning Policy Statement 9: Biodiversity and Geological Conservation*

3. The Plan

The Cherwell Local Plan 2011-2031 (Part 1), was adopted by Cherwell District Council in July 2015, and provides for Cherwell's development needs to the year 2031.

In the Local Plan the Council committed to working jointly with the other Oxfordshire Councils to assess the extent of the housing need that could not be met elsewhere in the Oxfordshire Housing Market Area. In particular, it was understood that there could be a need arising from Oxford that could not be met by Oxford City Council due to its tight administrative boundary and its limited supply of land. Cherwell District Council's commitment was to consider the extent of the need and, if necessary, to 'partially review' its Local Plan within two years of its adoption.

The Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) (the subject of this HRA) contains policies and proposals for addressing Cherwell's apportionment of Oxford's unmet housing need (4,400 dwellings to 2031). The Partial Review is effectively a supplement or addendum to the adopted Cherwell Local Plan 2011-2031, which will become part of the statutory Development Plan for the district once adopted.

The Partial Review provides a vision, objectives and specific policies for delivering additional development to help meet Oxford's housing needs.

Applications for planning permission for housing in Cherwell to meet Oxford's needs will be considered having regard to the policies in the Partial Review and to other relevant policies from the adopted Development Plan.

There are three reasons why this Partial Review of the Local Plan has been prepared:

1. Oxford needs additional homes;

2. There is a need to meet national policy and legal requirements;

3. Cherwell was required to make a commitment to undertaking the review.

3.1. Potential Additional Strategic Objectives

The Partial Review Proposed Submission Plan ('the Plan') has identified four new Strategic Objectives to support Oxford's unmet housing need:

Strategic Objective SO16

To work with Oxford City Council and Oxfordshire County Council, and other neighbouring authorities as required, in delivering Cherwell's contribution to meeting Oxford's unmet housing needs with its required infrastructure by 2031

Strategic Objective SO17

To provide Cherwell's contribution to meeting Oxford's unmet housing needs so that it supports the projected economic growth which underpins the agreed Oxfordshire Strategic Housing Market Assessment 2014 and the local economies of Oxford and Cherwell

Strategic Objective SO18

To provide housing for Oxford so that it substantively provides affordable access to new homes for those requiring 'affordable' housing, new entrants to the housing market, key workers and those requiring access to Oxford's key employment areas, and to provide well designed development that responds to both needs and the local context.

Strategic Objective SO19

To provide Cherwell's contribution to meeting Oxford's unmet housing needs in such a way that it complements the County Council's Local Transport Plan, including where applicable, its Oxford Transport Strategy and so that it facilitates demonstrable and deliverable improvements to the availability of sustainable transport for access to Oxford.

3.2. Policies

The Plan identifies 18 policies to meet the unmet housing need, these comprise the following:

Achieving Sustainable Development for Oxford

- Policy PR1 – Achieving Sustainable Development for Oxford's needs

Housing Mix, Tenure and Size

- Policy PR2 - Housing Mix, Tenure and Size

The Oxford Green Belt

- Policy PR3 - The Oxford Green Belt

Transport Infrastructure

- Policy PR4a – Sustainable Transport
- Policy PR4b – Kidlington Centre

A Connected Green Infrastructure

- Policy PR5 – Green Infrastructure

North Oxford

- Policy PR6a – Land East of Oxford Road
- Policy PR6b – Land West of Oxford Road
- Policy PR6c – Land at Frieze Farm

Kidlington

- Policy PR7a – Land South East of Kidlington
- Policy PR7b – Land at Stratfield Farm

Begbroke

- Policy PR8 – Land East of the A44

Yarnton

- Policy PR9 – Land West of Yarnton

Woodstock

- Policy PR10 – Land South East of Woodstock

Providing the Infrastructure

- Policy PR11 - Infrastructure Delivery

Maintaining Housing Supply

- Policy PR12a - Delivering Sites and Maintaining Housing Supply
- Policy PR12b – Sites Not Allocated in the Partial Review

Monitoring and Securing Delivery

- Policy PR13 - Monitoring and Securing Delivery

4. The European Site

Table 4-1 includes information about Oxford Meadows SAC, its designation status, the location of the site, a brief description of the site and its conservation objectives.

Table 4-1 Information about the Oxford Meadows SAC

Site Designation Status	Oxford Meadows SAC
Location of European Site	The site is located in the south-western corner of the district of Cherwell. The majority of the SAC falls within the Oxford City Council boundary, although small sections are located within the districts of Cherwell and West Oxfordshire. The River Thames flows through the centre of the site. The nearest settlement to the SAC in Cherwell is Yarnton (located approximately 0.85 km north of the SAC).
Brief Description of the European Site	Oxford Meadows qualifies for European protection due to the lowland hay meadow habitats it supports (Annex I habitat which is a primary qualifying feature of the site). The site includes vegetation communities that are considered to be potentially unique in the world (due to the influence of long-term grazing and hay-cutting). The site has been traditionally managed for several centuries and so exhibits good conservation of structure and function. The site is also designated as a European important site as it supports creeping marshwort (*Apium repens*) (an Annex II species which is a primary qualifying feature of the site). This is one of only two known sites in the UK that support this plant species.
Vulnerabilities of the European Site	Previous iterations of the Cherwell Local Plan Part 1 HRA used the following site sensitivities, which were identified at a HRA screening workshop carried out for the South East Plan (as noted in the Oxford Core Strategy Habitats Regulations Assessment, produced by Oxford City Council in September 2008): • Minimal air pollution; • Absence of excessive nutrient enrichment of waters/good water quality; • Balanced hydrological regime: alteration to adjacent rivers may alter flooding regime and reduce botanical diversity; • Maintenance of traditional hay cut and light aftermath grazing; and • Absence of direct fertilisation. However, the Oxford Meadows SAC Natural 2000 – Standard Data Form submitted to the European Commission on the 22/12/2015[5] states that the Oxford Meadows SAC is vulnerable to impacts from the following sources: • Pollution to surface waters (limnic & terrestrial, marine & brackish); • Invasive non-native species; and, • Human induced changes in hydraulic conditions. Following discussions with Natural England it was agreed this HRA should use the vulnerabilities listed in the Natural 2000 – Standard Data Form and that in addition the Oxford Meadows SAC is also vulnerable from changes in air quality[6] and therefore this should also be considered.
Conservation Objectives of the European Site	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

[5] http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0012845.pdf
[6] Telecon with Rebecca Tibbetts (Natural England) 03/03/17.

	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.

5. Other Projects and Plans

In addition to the other projects and plans recorded in previous iterations of the HRA, a total of 33 HRAs have been identified as part of the search for “other projects and plans” undertaken in support of the Stage 1 Screening of the Proposed Submission Partial Review Plan, to ensure that the assessment of “in combination” effects reflects the most up to date information. Reviews and updates were undertaken for each stage of the HRA of the adopted Cherwell Local Plan Part 1. The details of HRAs reviewed during previous assessments have been included in Table 5-1 below.

Table 5-1 HRAs carried out due to possible impacts on Oxford Meadows SAC

Statutory Body	Title of HRA	Findings of HRA	In Combination Effects
Buckinghamshire County Council	Buckinghamshire Local Transport Plan 4, Habitat Regulations Assessment Screening Report March 2016	The HRA recognises that taking forward sustainable transport growth in the area does pose risks to European sites, but that at this strategic level, the direction and objectives relating to that growth is very high level in nature. The policies included for a reduction of air quality emissions to below critical threshold levels as identified by air pollution information system (APIS) and others. The control of water abstraction and discharge of water is required via the Water Framework Directive, the consideration of impacts on designated sites is covered under the Habitats Regulations, Wildlife and Countryside Act 1981 (as amended), and national and local planning policy. It is therefore considered that likely significant effects can be avoided / minimised for the majority of cases where Schemes are brought forward under the LTP4 policies. An assessment of any likely significant effects will be made and full recommendations for mitigation will be provided within each project/plan-level HRA. These will suggest measures to reduce the potential for any development to result in impacts upon the Natura 2000 network or Ramsar sites.	The proposed submission plan will not have any significant effects on the Oxford Meadows SAC. The proposed submission plan is still underpinned by the existing Cherwell Local Plan Part 1 Policies and as such provides measures to protect the European sites. In addition, the LTP 4 and the adopted Local Plan provide measures to protect the European sites and therefore any proposals arising from the plans would not be developed unless it can be proven that they would not have a detrimental impact on the European sites.
Oxfordshire County Council	Oxfordshire Minerals and Waste Local Plan Part 1 Core Strategy Habitats Regulations Assessment Screening Report August 2015	The assessment concluded that the Core Strategy would not have a likely significant effect on air quality, water resources, recreation, hazardous and radioactive materials.	The assessment considered potential effects of air quality, however, the predicted increases in traffic were not considered to generate a likely significant impact on Oxford Meadows SAC. The air quality assessment for the Partial Review Proposed Submission Plan has shown that there will be no impact on Oxford Meadows SAC. In addition Policy C4 of the (to be adopted) Minerals and Waste Plan sates that: “Proposals for minerals and waste development will need to demonstrate that there would be no unacceptable adverse impact on or risk to: • The quantity or quality of surface or groundwater resources required for habitats, wildlife and human activities; • The quantity or quality of water obtained through abstraction unless acceptable provision can be made; and • The flow of groundwater at or in the vicinity of the site; and • Waterlogged archaeological remains. Proposals for minerals and waste development should ensure that the River Thames and other watercourses and canals of significant landscape, nature conservation, or amenity value are adequately protected from unacceptable adverse impacts.” Therefore, it is considered that there is no potential for in-combination effects.
	Habitats Regulations Assessment Screening Report Local Transport Plan 4 (2015-2030) June 2015	The HRA Screening found that no likely ‘strategic’ significant effects are predicted from the local transport plan (LTP) on any European sites, subject to appropriate design and mitigation. An Appropriate Assessment is therefore not considered to be required at this strategic level. However, project level HRA Screening of ‘Likely Significant Effects’ for Oxford Meadows SAC, Cothill Fen SAC and Little Wittenham SAC may be required (in consultation with Natural England) when further details of the delivery of transport schemes currently in development (and not published as part of the current LTP 4) are available, together with the details of other plans, to ensure compliance with the Habitats Regulations.	Although the LTP recognises that further assessment may be required for Oxford Meadows SAC, it will be a requirement for Oxfordshire County Council to consider in-combination effects with the Cherwell Local Plan Part 1 when this stage is reached.
	Oxfordshire County Council A40 Science Transit 2 Project Habitat Regulations Assessment - Screening November 2016	Potential likely significant effects on European sites associated with construction and operational activity were investigated following an Activity – Change – Effect model. Through the implementation of standard good practice during the construction period, use of standard highway design guidance (e.g. with regard to drainage) and acknowledgement of the predicted falls in emissions deposition over the course of the next decades, it can be concluded that the project will not result in any likely significant effects either due to the project alone or in-combination with other projects and plans.	It has been concluded that there is no potential for likely significant effects from the A40 Science Transit 2 Project, therefore no in-combination effects are likely to occur with this Plan.
	Habitats Regulations Assessment	**Conclusion:** This Stage 1 Screening and preliminary Stage 2 – Appropriate Assessment has concluded that	None: Although the Minerals and Waste Plan may

	for Oxfordshire Minerals Planning Strategy - Technical Supplement (January 2012)	there are four sites within the plan which may lead to adverse impacts on the integrity of Oxford Meadows SAC (through hydrological changes such as water levels, water quality and nutrient enrichment). The HRA states that it is currently unclear if these impacts can be successfully mitigated. A series of recommendations for mitigation are put forward but more detailed assessment is required.	lead to adverse effects on the integrity of Oxford Meadows SAC these effects are in relation to changes in hydrology. In addition, the Cherwell Local Plan policies ESD8 and ESD9 requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses and that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore no in-combination effects are likely to occur with this Plan.
	Oxfordshire Minerals and Waste Plan - Minerals and Waste Core Strategy Habitats Regulations Assessment: Screening Report for Mineral and Waste Preferred Strategies (August 2011)	**Conclusion:** This HRA concluded that there may be likely significant effects due to potential impacts on groundwater and surface water flows at Oxford Meadows SAC from a number of mineral extraction sites. Further HRA assessment needed (see below).	
Oxford City Council	Screening Statement on the determination of the need for a Strategic Environmental Assessment (SEA) in accordance with the Environmental Assessment of Plans and Programmes Regulations 2004 and European Directive 2001/42/EC for the Headington Neighbourhood Plan, February 2016	**Conclusion** The Oxford Meadows SAC is currently judged by Natural England to be in favourable condition. This HRA has concluded that none of the policies within the Headington Neighbourhood Plan are likely to have adverse effects on the integrity of the Oxford Meadows SAC either 'alone' or 'in combination' with other plans, projects or programmes.	The Headington Neighbourhood Plan screened out all potential likely significant effects on the Oxford Meadows SAC, therefore there is no potential for in combination effects with the proposed submission plan of the Partial Review Proposed Submission Plan.
	Habitat Regulations Assessment for the Northern Gateway Area Action Plan, July 2015	The assessment concluded no likely significant effects as a result of air quality and recreational use of Oxford Meadows SAC.	The proposed submission plan has concluded that there will be no effects from recreation owing to the distance from the SAC, limited parking at the SAC and the provision of 'green spaces' as part of any development. The air quality assessment for the Partial Review Proposed Submission Plan has shown that there will be no impact on Oxford Meadows SAC, therefore it is considered that there is no potential for in-combination effects.
	Sites and Housing Plan Sustainability Appraisal and Habitats Regulations Assessment Post-Adoption Statement February 2013.	The appropriate assessment stage considered the impacts of individual sites on the Oxford Meadows SAC based on their proximity to the SAC. **Conclusion** With regards to air quality, only one site was considered to have a potential impact on the SAC – SP63 - Wolvercote Paper Mill. A desk based assessment was undertaken and the appropriate assessment concluded that given the background trends (the contribution of road transport to nitrogen oxide background levels and nutrient nitrogen deposition will decrease in future years coupled with a reduction in overall emissions), the additional traffic generated by development at the Wolvercote Paper Mill is not nearly of such significance that it would have an adverse impact on air quality at the Oxford Meadows SAC.	As any potential effect on air quality from the Wolvercote Paper Mill development is so small it is considered that there is no potential for in-combination effects with the Proposed Submission Plan.
	Sites and Housing Development Plan Document (DPD): Habitats Regulations Assessment (February 2012)	**Conclusion:** The HRA concluded that this DPD is not likely to have any adverse impact on the Oxford Meadows SAC, either alone, or in combination with other projects or plans (with mitigation measures put in place)	None (with mitigation measures put in place)
	Barton Area Action Plan DPD: Habitats Regulations Assessment – Screening (February 2012)	**Conclusion:** The HRA concluded that this DPD is not likely to have likely significant effects on the Oxford Meadows SAC (including effects from air pollution, water quality, changed hydrological regime, increased recreational pressure, changed maintenance of habitats and changes in fertilisation).	None
	Oxford Core Strategy - Habitats Regulations Assessment (April 2011)	**Conclusion:** The HRA concluded that none of the policies in the Plan are likely to have adverse effects on the integrity of Oxford Meadows SAC with regard to the following environmental requirements of the site: maintenance of traditional hay cut and light aftermath grazing, absence of direct fertilisation, minimal air pollution, absence of nutrient enrichment of waters, good water quality, balanced hydrological regime and recreational pressures.	None

	Oxford Core Strategy Habitats Regulations Assessment (updated version, July 2009)	**Conclusion:** This HRA has concluded that none of the policies in the Oxford 2026 Core Strategy Proposed Submission Document are likely to have significant effects on the Oxford Meadows SAC. **Natural England's View:** Natural England had concerns relating to the Northern Gateway Project and thinks further assessment is required in relation to recreational pressure, air quality and hydrology. The Core Strategy states that HRA will be undertaken of lower tier documents (e.g. the Area Action Plan). The Core Strategy (and the Natural England comments) has been submitted to the Planning Inspector and it has now been adopted.	None
	Oxford Core Strategy Habitats Regulations Assessment (September 2008)	**Conclusion:** No likely significant effects on the Oxford Meadows SAC are anticipated.	None
South Oxfordshire District Council	Local Plan Part 1 2031 Habitat Regulations Assessment January 2015	The assessment concluded that four growth scenarios may have an impact on the European sites (which includes Oxford Meadows SAC) in regard of in-combination effects on air quality, water abstraction and recreation. The HRA made recommendations which were considered sufficient to provide mitigation for the European sites.	The air quality assessment for the proposed submission plan has concluded that changes in air quality would be inconsequential with the levels in 2031 being significantly lower than currently experienced with the SAC currently in favourable conservation status. When considered in combination with the South Oxfordshire District Council Local Plan Part 1 2031 HRA, there will be no in combination effects provided that the mitigation measures identified are implemented .
	Appropriate Assessment of South Oxfordshire District Council's Proposed Submission Core Strategy December 2010	The screening assessment identified those sites which were most likely to be affected as a result of the Core Strategy policies. The result of the screening exercise indicated that all six of the SAC's within influencing distance were potentially at risk of significant effects. Each of the sites identified as being at risk of significant effects was then subject to Appropriate Assessment. The assessments concluded that none of the six European Sites assessed would be adversely impacted by the plans and policies contained in the Core Strategy alone or in combination with other plans and policies. As a result of this assessment it will not be necessary to carry out stages 3 and 4 of the assessment. **Conclusion** It will be necessary to update this assessment as further policies within the Local Development Framework are defined, particularly those associated with the allocation of housing developments within the larger villages.	The assessment concluded there would be no increase in traffic on the A34 and therefore no impact from air quality - hence no potential for in-combination effects with the Proposed Submission Plan.
	Appropriate Assessment of South Oxfordshire District Council's Submission Core Strategy (February 2012)	**Conclusion:** The HRA concluded that the plans and policies within this Plan will not lead to likely significant effects on Oxford Meadows SAC, alone or in combination with other projects and plans.	None
Vale of White Horse	Local Plan Statement to Inform Habitats Regulations Assessment of the Schedule of Proposed Modifications, July 2016	Following the hearings into the Vale of White Horse Local Plan Part 1, the Planning Inspector has identified a series of necessary Main Modifications in order to ensure the plan is sound. From an HRA point of view these changes were not considered significant.	None – modifications made no change to the assessment previously undertaken.
	Vale of White Horse District Council: Local Plan Part 1 Submission Document Habitats Regulations Assessment February 2015	The assessment concluded that there would be no impacts from recreation. Effects of water quality on Oxford Meadows SAC are considered unlikely to occur, given the policy commitments in the Local Plan Part 1 to provision of adequate infrastructure to accompany new development. It is considered likely that housing across Oxfordshire will result in an increase in nitrogen deposition and NOx concentration within a small part of the Oxford Meadows SAC as it lies adjacent to the A34 and A40. Although Vale of the White Horse contribution to nitrogen deposition will be trivial, there will be a small contribution to changes in NOx concentrations, although one that is not significant. It is concluded that, given the incorporation of policies to address air quality, and following the incorporation of the small number of outstanding recommendations the Submission document policies will not lead to likely significant effects on European sites either alone, or in combination with other projects and plans. It is concluded that no strategic housing sites would lead to likely significant effects, either alone or in combination.	The policies within the Vale of White Horse District Council: Local Plan Part 1 Submission Document and the Cherwell Local Plan Part 1 will ensure that developments will not have an in-combination effect.
	Vale of White Horse District Council: Preferred Approach Local Plan 2029 Part 1 HRA February 2014	**Conclusion:** Pending consultation with Natural England, this HRA concludes that the development set out in the Vale of White Horse Local Plan 2029 Part 1 will not lead to likely significant effects on any European sites, either alone or in combination with other projects or plans.	None
	Vale of White Horse Local Development Framework Core Strategy: Preferred Approaches Habitat Regulations Assessment	**Conclusion:** Issues of recreational pressure, air quality and water quality have all been considered in relation to impacts of the Core Strategy on the Oxford Meadows SAC. The assessment concluded no likely significant effects on Oxford Meadows SAC. **Natural England's View:** Natural England has objected to the findings of the HRA in relation to air quality (the	There is the potential for in-combination effects on the Oxford Meadows SAC resulting from the Vale of White Horse Core Strategy. However, in order for the Local Development Framework (LDF)

	(April 2010)	baseline data relating to nitrogen oxides was not up to date and needed reviewing). Natural England has asked that the HRA is revised. ***The Core Strategy was superseded by the Local Plan Part 1 in 2015 (see above).***	documents to be adopted it will be necessary for its Plans to be subject to a repeat of Stage 1 of the HRA process (and potentially the completion of Stage 2). Depending on the findings of the assessment(s) the documents may need to be subject to the further stages of the HRA process: Stage 3 – Assessment of Alternative Solutions and Stage 4 - IROPI. Where necessary, appropriate mitigation measures for the documents will need to be agreed with Natural England (to ensure adverse effects on integrity of Oxford Meadow SAC do not occur). Should the documents progress to Stage 4 of the HRA process it will be necessary for the Vale of White Horse District Council to agree suitable compensatory measures to offset the negative effects with the Secretary of State and Natural England. Only once the mitigation measures or compensatory measures have been agreed with the relevant bodies will the plan(s) be adopted. The mitigation measures will ensure that there are no in-combination effects on Oxford Meadow SAC.
	Habitat Regulations Assessment of the Vale of the White Horse LDF Core Strategy Issues and Options - Screening Report (Final) (November 2008)	Possible impacts on Oxford Meadows SAC from policies in the Core Strategy due to: • Decreased water quality; and • Increased recreational usage of the site. The report suggests avoidance and mitigation measures to be incorporated into the final draft of the Core Strategy. **Conclusions:** Potential for likely significant effects on Oxford Meadows SAC if no mitigation measures are put in place. Stage 2 and potentially Stage 3 of HRA required to determine impacts on the Oxford Meadows SAC from decreased water quality. N.B. Conclusions now superseded by information provided in the HRA of the Preferred Approaches Core Strategy produced by this Council in April 2010	As for the Vale of White Horse LDF Core Strategy: Preferred Approaches Habitat Regulations Assessment (April 2010) above.
West Oxfordshire District Council	Screening Statement on the determination of the need for a Strategic Environmental Assessment (SEA) in accordance with the Environmental Assessment of Plans and Programmes Regulations 2004 and European Directive 2001/42/EC for the Longworth Neighbourhood Development Plan, August 2015	The assessment concluded that Longworth Neighbourhood Plan will not allocate sites for housing and therefore will not result in an increase in traffic using the A420 and A34 to Oxford. The Neighbourhood Plan will therefore not result in potential air quality effects on the Oxford Meadows SAC. The other Local Plan 2031 Part 1 policies relevant to Longworth are categorised as green, meaning that there are no likely significant effects. **Conclusion** The Longworth Neighbourhood Plan is unlikely to have significant environmental effects on any Natura 2000 sites and an Appropriate Assessment for the Longworth Neighbourhood Plan is not required.	As the Longworth Neighbourhood Development Plan will not lead to development there is no potential for in-combination effects.
	West Oxfordshire District Council Oxford Core Strategy Habitats Regulations Assessment Stage 1 Screening and Appropriate Assessment 2012	The stage 1 screening concluded that there were potential impacts of reduced air quality, reduced water quality & quantity and increased recreational pressure on Oxford Meadows SAC. **Appropriate Assessment** ***Increased water abstraction*** Policy CS21 in the West Oxon Core Strategy requires all new housing to achieve Code for Sustainable Homes Level 3 with immediate effect, Code Level 4 from 2013 and Code Level 6 from 2016. The policy also states that within strategic development sites, specific elements / themes of the Code for Sustainable Homes / BREAMM will need to be achieved, relating to water consumption. Natural England confirmed that Oxford Meadows SAC was sensitive to flooding, rather than typical water levels in the river that might be affected by water abstraction. ***Reduction in water quality*** Policy CS22 states 'all development proposals will be required to show consideration of the efficient and prudent use and management of natural resources including causing no deterioration and, where possible, achieving improvement in water or air quality'. ***Increased recreational pressure*** West Oxon DC should provide additional evidence in relation to future green space requirements arising from	The proposed submission plan has concluded that there will be no effects from recreation owing to the distance from the SAC, limited parking at the SAC and the provision of 'green spaces' as part of any development. The West Oxfordshire Core Strategy HRA 2012 concluded that any increases in traffic would have no discernible impact on the SAC. The air quality assessment for the proposed submission plan has concluded that changes in air quality would be inconsequential with the levels in 2031 being significantly lower than currently experienced with the SAC currently in favourable conservation status.

		new development over the plan period. This evidence base, which is likely to take the form of a green infrastructure plan/green space strategy will be necessary in order to ensure that new development coming forward within West Oxfordshire does not have a significant impact on Oxford Meadows through increased visitor numbers and recreational pressure. The green space provided in the developments should be designed to encourage people to use these local green spaces rather than driving to Oxford Meadows. ***Reduction in air quality*** Policy CS22 states 'all development proposals will be required to show consideration of the efficient and prudent use and management of natural resources including causing no deterioration and, where possible, achieving improvement in water or air quality'. Therefore West Oxon DC will need to demonstrate, through traffic modelling that, in combination with other projects and plans, the Core Strategy will contribute to less than 1% of the critical load (lower limit 20kg/ha/year) of nitrogen deposition. The studies required to demonstrate this may also need to be carried out by other planning authorities so it may be possible to take a joint approach to these studies.	
	East of Carterton, Oxfordshire: Habitat Regulations Assessment – Stage 1 Screening (February 2012)	**Conclusion:** The HRA concluded that this project is unlikely to have likely significant effects upon Oxford Meadows SAC as a result of altered water quality, water quantity, decreased air quality and/increased recreational pressure.	None
	Sustainability Appraisal Scoping Report - Appendix 4 Appropriate Assessment – Scoping Statement (February 2008)	Possible impacts on Oxford Meadows SAC from policies in the Plan due to: • Alteration of hydrological regime (due to increased water abstraction); • Decreased water quality; • Increased air pollution; and, • Mineral extraction. The report suggests avoidance and mitigation measures to be considered when site options are developed in West Oxfordshire and when Local Development Framework Plans are developed (which will be subject to the HRA screening and assessment process). **Conclusions:** Potential for likely significant effects on Oxford Meadows SAC if no mitigation measures are put in place. **Natural England's View:** Natural England has requested that the relevant stages of the HRA process are completed for the West Oxfordshire Local Development Framework Plans as they are developed.	None provided the mitigation measures identified in the Appropriate Assessment – Scoping Statement (February 2008) are implemented.
	West Oxfordshire Pre-Submission Local Plan Habitats Regulations Assessment March 2015	Issues of recreational pressure, air quality and water quantity and quality have all been considered in relation to impacts of the West Oxfordshire Final Version Pre-Submission Draft Local Plan on the Oxford Meadows SAC. It is possible to conclude that following recommendations likely significant effects on the Oxford Meadows SAC as a result of development under the West Oxfordshire Final Version Pre-Submission Draft Local Plan will not occur.	The West Oxfordshire Pre-Submission Local Plan will not have a likely significant effect on the Oxford Meadows SAC. The additional housing in the Partial Review Proposed Submission Plan will not have a likely significant effect on the Oxford Meadows SAC and the policies within the adopted local plan will still apply. Therefore, there is no potential for in-combination effects.
Cherwell District Council	Submission Cherwell Local Plan incorporating Proposed Modifications (October 2014) Habitats Regulations Assessment: Stage 1 – Screening October 2014	For those policies that will lead to development the Plan provides policies which seek to protect the environment including policies specific to Oxford Meadows SAC.	The Cherwell Local Plan 2011-2031 (Part 1) Partial Review Proposed Submission Plan can be considered an update to this the Cherwell Local Plan incorporating Proposed Modifications (October 2014). The additional housing in the Partial Review Proposed Submission Plan will not have a likely significant effect on the Oxford Meadows SAC and the policies within the adopted local plan will still apply. Therefore, there is no potential for in-combination effects.
	Appropriate Assessment of Draft Revised Comprehensive Planning Brief Supplementary Planning Document (SPD) for the Upper Heyford Airbase: Screening (September 2006)	Possible impacts on the Oxford Meadows SAC from a possible decrease in air quality and a change in hydrological regime (HRA completed before the Environment Agency Review of Consents and Flood Risk Management Strategy – see below). The report suggests avoidance and mitigation measures to be incorporated into the final draft of the SPD. **Conclusions:** Potential for likely significant effects on Oxford Meadows SAC if no mitigation measures are put in place.	None provided the mitigation measures identified are implemented.
Environment Agency	Oxford Flood Risk Management Strategy - Strategic Environmental Assessment - Environmental	Possible impacts on Oxford Meadows SAC from flood risk management and water resource plans suggested within the report. There are some uncertainties regarding operation of a flood storage area and potential impacts on Oxford Meadows SAC. To address these uncertainties, the Environment Agency is recommending further research. If this work shows that there would be significant impacts to designated nature conservation sites	None – the Cherwell Local Plan 2011-2031 (Part 1) Partial Review Proposed Submission Plan has not identified water abstraction as risk.

	Report (June 2009)	which could not be mitigated or compensated for, then the flood storage area will not be implemented. However, there are no likely significant impacts on the SAC from current water abstraction activities. **Conclusion:** No likely significant effects on the Oxford Meadows SAC are anticipated.	
Thames Water Utilities Ltd	Habitats Regulations Assessment Of Thames Water Utilities Ltd Draft Drought Plan, Screening Report, September 2016	**Construction** There will be no loss of designated habitat due to the scheme as the construction footprint does not impinge on any designated sites and, given the distance between Oxford Meadows SAC and the four locks (Iffley, Osney, Godstow and King's Weir) (>5 km), impacts from noise or dust are unlikely. Transport of materials and equipment during construction on site will require minimal general construction traffic. Transport will utilise the existing road network. The temporary increase in vehicle numbers required for the construction of the scheme is considered to be negligible. Therefore, the construction phase of this scheme is not likely to have significant effects on the qualifying features of any European sites. **Operation** The proposed scheme will impact low flows between ~ May and December, and not flood flows over winter. Therefore, no likely significant effects on the qualifying features are anticipated. No likely significant effects are anticipated from the construction or operation of the Farmoor drought option on the Oxford Meadows SAC, either alone, or in combination with other licences and consents.	The Draft Drought Plan will not in any way result in a decrease in air quality which could have an adverse effect on the Oxford Meadows SAC and therefore there is no potential for in-combination effects.
South East England Regional Assembly	Regional Spatial Strategy (RSS) for the South East - Sustainability Appraisal and Habitats Regulations Assessment/ Appropriate Assessment of the Secretary of State's Final Revisions (April 2009)	The HRA concluded that although the final RSS has not itself lowered housing allocations for those sub-regions or districts in which the HRA/AA of the draft Proposed Changes identified a potential conflict with European sites it does provide within Policy NRM5 a clear opportunity for this to occur if lower tier assessments and the further detail that will arise during implementation planning confirm that the required levels of housing cannot be delivered. Although the RSS does not provide detailed avoidance and mitigation strategies for all impacts and effects that may arise from the Plan upon every European site (both since the housing and employment etc. allocations in the RSS generally lack sufficient spatial specificity to allow a detailed assessment. Because it would require a policy for each European site which would make the Plan repetitive and unwieldy) it sets out a policy framework through which additional guidance of this nature to local authorities can and will be provided by the Secretary of State through Supplementary Planning Documents or similar. **Conclusion**: The final South East Regional Spatial Strategy has (within the constraints of mechanisms available to regional planning policy) made extensive changes to policy in order to ensure that adverse effects do not result on European sites. There is also acknowledgement within the RSS that the regional HRA/AA and mitigating policies are inevitably high-level, but this is recognised and allowed for through a policy framework to produce more detailed tailored guidance and for regional allocations to be revised in the light of new data coming forward from lower tier HRA/AA or other relevant studies (e.g. Water Cycle Studies). These measures thus ensure the greatest confidence possible within the confines of regional planning that development under the South East Plan will not result in adverse effects on European sites.	None
Department for Communities and Local Government	Eco-towns Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme Weston Otmoor and Cherwell (November 2008).	Possible impacts on Oxford Meadows SAC from policies in the Plan due to increased recreational usage of the site. The report suggests avoidance and mitigation measures to be incorporated into the Eco-Towns Planning Policy Statement. **Conclusions:** Potential for likely significant effects on Oxford Meadows SAC if no mitigation measures are put in place.	None (with mitigation measures put in place by Eco-towns), no impacts from increased recreation identified for the Partial Review Proposed Submission Plan owing to the connectivity for walkers and lack of parking at the Oxford Meadows SAC.

6. HRA Results

The HRA screening assessment for the Plan is provided in Table 6-1 below.

Table 6-1 HRA Screening Results

Site Designation Status	Oxford Meadows SAC
Describe the individual elements of the Plan likely to give rise to impacts on the European Site	None of the four strategic objectives or 18 policies (or the proposals therein) present in the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) Proposed Submission Plan will lead to likely significant effects on Oxford Meadows SAC. The Partial Review of the Cherwell Local Plan 2011 – 2031 (Part1): Oxford's Unmet Housing Need Proposed Submission Plan has provided an additional four Strategic Objectives for inclusion in the Plan. Although these objectives will directly or indirectly lead to development the objectives do not provide any detail of where development may be located and therefore the objectives themselves are not considered to have a likely significant effect on the European site. Of the 18 policies in the Partial Review Proposed Submission Plan policies PR1, PR2, PR3, PR4a, PR4b, PR5, PR11 PR12a, PR12b and PR13 would either not themselves lead to development (they are intended to protect the natural environment, including biodiversity), or would have no effect because no development could occur through the policy itself - the development being implemented through later policies in the same plan, which are more specific and therefore more appropriate to assess for their effects on European sites and associated sensitive areas. Policies PR6a, PR6b, PR6c, PR7a, PR7b, PR8, PR9 and PR10 all relate to specific development plots and are therefore classed as Policy Type 2: policies that could have a negative effect but would not be likely to have a significant effect on an European site alone or in combination with other projects or plans. For these policies a screening assessment has been carried out considering the impacts that might lead to significant effects on Oxford Meadows SAC. The assessment concluded that there are no likely significant effects on the qualifying features of the Oxford Meadows SAC from the Plan alone. Any planning application would also have to take into account the possibility of likely significant effects on the qualifying features of the Oxford Meadows SAC resulting from the proposed works, through consideration of Policies ESD8, ESD 9 and ESD 10 of the adopted Plan (which seek to safeguard and protect biodiversity and the natural environment). The Plan also commits to an HRA at the development management stage (in accordance with the Protection and Enhancement of Biodiversity and the Natural Environment text supporting Policies ESD 9 and ESD 10). The HRA of any proposed development will have to prove that the work will not have any likely significant or adverse effects on the integrity Oxford Meadows SAC (or that effects can be adequately mitigated). If it cannot be proven that there will no likely significant or adverse effects on the integrity of this European site and/or it is not possible to mitigate for these effects the Council will not allow the development to be constructed. Therefore, there are no likely significant effects on the qualifying features of the Oxford Meadows SAC from the Plan alone .
Describe any likely direct, indirect or secondary impacts of the Plan on the European Site by virtue of: • Size and scale; • Land take;	There are no likely direct, indirect or secondary impacts on the qualifying features of Oxford Meadows SAC from any of the policies in the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) Proposed Submission Plan (see Table B2 in Appendix B below).

• Resource requirements (i.e. water extraction etc.); • Emissions (disposal to land, water or air); • Excavation requirements; • Duration of construction, operation, decommissioning etc.; and • Other.	
Describe any likely changes to the European site arising as a result of: • Reduction of habitat area; • Disturbance to key species; • Habitat or species fragmentation; • Reduction in species density; • Changes in key indicators of conservation value (e.g. water quality); and • Climate change	There are no likely changes to the qualifying features of Oxford Meadows SAC from any of the policies in the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) Proposed Submission Plan (see Table B2 in Appendix B below).
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known	There are no likely significant effects on the Oxford Meadows SAC from the Plan alone (see above). In combination effects have been considered as part of this assessment. None of the other projects and plans identified in Section 5 (see above) will lead to significant effects on Oxford Meadows SAC, provided mitigation measures identified in other projects and plans are implemented. An air quality assessment has been completed (see Appendix C) and it has been determined that there are no likely significant effects on Oxford Meadows SAC from the development proposed in the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) Proposed Submission Plan (see Table B2 in Appendix B).

7. Conclusion

Atkins has completed Stage 1 of the HRA process for the Cherwell District Council's Partial Review of the Cherwell Local Plan 2011 – 2031 (Part1) Proposed Submission Plan.

HRA is required by Regulation 61 the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations) for all projects and plans which may have likely significant effects on an European site and are not directly connected with or necessary to the management of the European site. One European site is considered in this HRA: Oxford Meadows SAC. This HRA has assessed whether the four Draft Strategic Objectives and 149 potential allocation sites are likely to lead to significant effects on Oxford Meadows SAC and what these likely impacts are.

Protection is afforded to the Oxford Meadows European site through the policies contained within the adopted Cherwell Local Plan 2011 – 2031 (Part1). Any planning application would have to take into account the possibility of likely significant effects on the qualifying features of the Oxford Meadow SAC resulting from the proposed works, through consideration of Policies ESD8, ESD9 and ESD 10 (which seek to safeguard and protect biodiversity and the natural environment). The Plan also commits to an HRA at the development control stage (in accordance with the Protection and Enhancement of Biodiversity and the Natural Environment text supporting Policies ESD 9 and ESD 10). The HRA of any proposed development will have to prove that the work would not have any likely significant or adverse effects on the integrity of Oxford Meadows SAC (or that effects could be adequately mitigated). If it cannot be proven that there would be no likely significant or adverse effects on the integrity of this European site and/or it is not possible to mitigate for these effects the Council will not allow the development to be constructed.

The Partial Review of the Cherwell Local Plan 2011 – 2031 (Part1): Oxford's Unmet Housing Need Proposed Submission Plan has provided an additional four Strategic Objectives for inclusion in the Plan. Although these objectives will directly or indirectly lead to development the objectives do not provide any detail of where development may be located and therefore the objectives themselves are not considered to have a likely significant effect on the European site.

Of the 18 policies in the Partial Review Proposed Submission Plan policies PR1, PR2, PR3, PR4a, PR4b, PR5, PR11 PR12a, PR12b and PR13 will either not themselves lead to development (they are intended to protect the natural environment, including biodiversity), or would have no effect because no development could occur through the policy itself - the development being implemented through later policies in the same plan, which are more specific and therefore more appropriate to assess for their effects on European sites and associated sensitive areas.

Policies PR6a, PR6b, PR6c, PR7a, PR7b, PR8, PR9 and PR10 are all relative to specific development plots and are therefore classed as Policy Type 2: policies that could have a negative effect but would not be likely to have a significant effect on an European site alone or in combination with other projects or plans. For these policies a screening assessment has been carried out considering the impacts that might lead to significant effects on Oxford Meadows SAC. The consideration of these impacts is summarised below:

Recreation

The parking provision at Oxford Meadows is limited and there are no proposals to increase parking provision. Studies have shown that the majority of the visitors to Oxford Meadows SAC are from Oxford itself with people willing to walk up to 1.9 km to the SAC. The sites proposed for development are all separated from the SAC by existing roads and railways which will act as a deterrent for people willing to walk to the SAC. The policies associated with some of the development sites also include for the provision for green spaces and infrastructure which will also limit the number of people wishing to walk from the development sites to the SAC. When considered with the supporting policies within the adopted Cherwell Local Plan for the provision of green spaces, it is considered that there will be no likely significant effects on the SAC as a result of further development within Cherwell district.

Water Quality

A review of contour mapping shows that the some of the development sites would drain away from the Oxford Meadows SAC. However, for those sites where this is not the case the precautionary principle has

been used to assume that any water discharging from the site would likely discharge to the local sewer system which may enter the River Thames without treatment. Policies ESD8 and ESD9 of the adopted Cherwell Local Plan require developers to ensure that surface water and groundwater quality are not affected by development. Therefore, with the implementation of policies ESD8 and ESD9 any development would not have a likely significant effect on water quality at the Oxford Meadows SAC.

Water Abstraction

Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem, in that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore there are no likely significant effects of water abstraction on the Oxford Meadows SAC.

Groundwater Flows

A review of the British Geological Survey website has shown that the development sites are underlain by a mixture of clays. Owing to this layer of clay the ground is considered to be only semi-permeable and unlikely to have a significant contribution to groundwater recharge. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quality. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC.

Air Quality

An update to the assessment of the impact of road traffic emissions on air quality at Oxford Meadows SAC has been undertaken (see Appendix C). The assessment updates the assessment undertaken in 2014 for the adopted Cherwell Local Plan, and uses the most up to date assessment tools. The traffic data used is for "2031 Cherwell Transport Improvement Package 2 plus Cycle Super Route" which includes all the planned and permitted housing and employment detailed in the adopted Cherwell Local Plan with additional housing identified in the emerging Cherwell Local Plan Part 1 Partial Review (an additional 4,400 dwellings), as well as additional policies to moderate road traffic increases and promote a modal shift to other forms of transport, notably cycling. The assessed scenario is referred to as "Scenario 4".

Concentrations of annual mean NOx were estimated to be below the critical level in 2031 with the exception of the A34, up to 50 m to the north-west and 100 m to the south-east of the road centreline. The increases at these sites with Scenario 4 compared to the adopted Local Plan are just 0.3 $\mu g/m^3$ or less. This is an inconsequential change in NOx concentrations given baseline conditions (which are already well in excess of the critical level) and the limited extent of the area subject to the change in 2031, relative to the total SAC area.

In 2031, the difference between the results for the adopted Cherwell Local Plan and Scenario 4 is less than 0.1 kg/ha/yr. Such a change (equivalent to less than 0.01 $g/m^2/yr$) is inconsequential by itself but particularly so, given that the nitrogen deposition rates within the Oxford Meadows SAC are expected to be below the lower critical load for low altitude hay meadows of 20 kg/ha/yr.

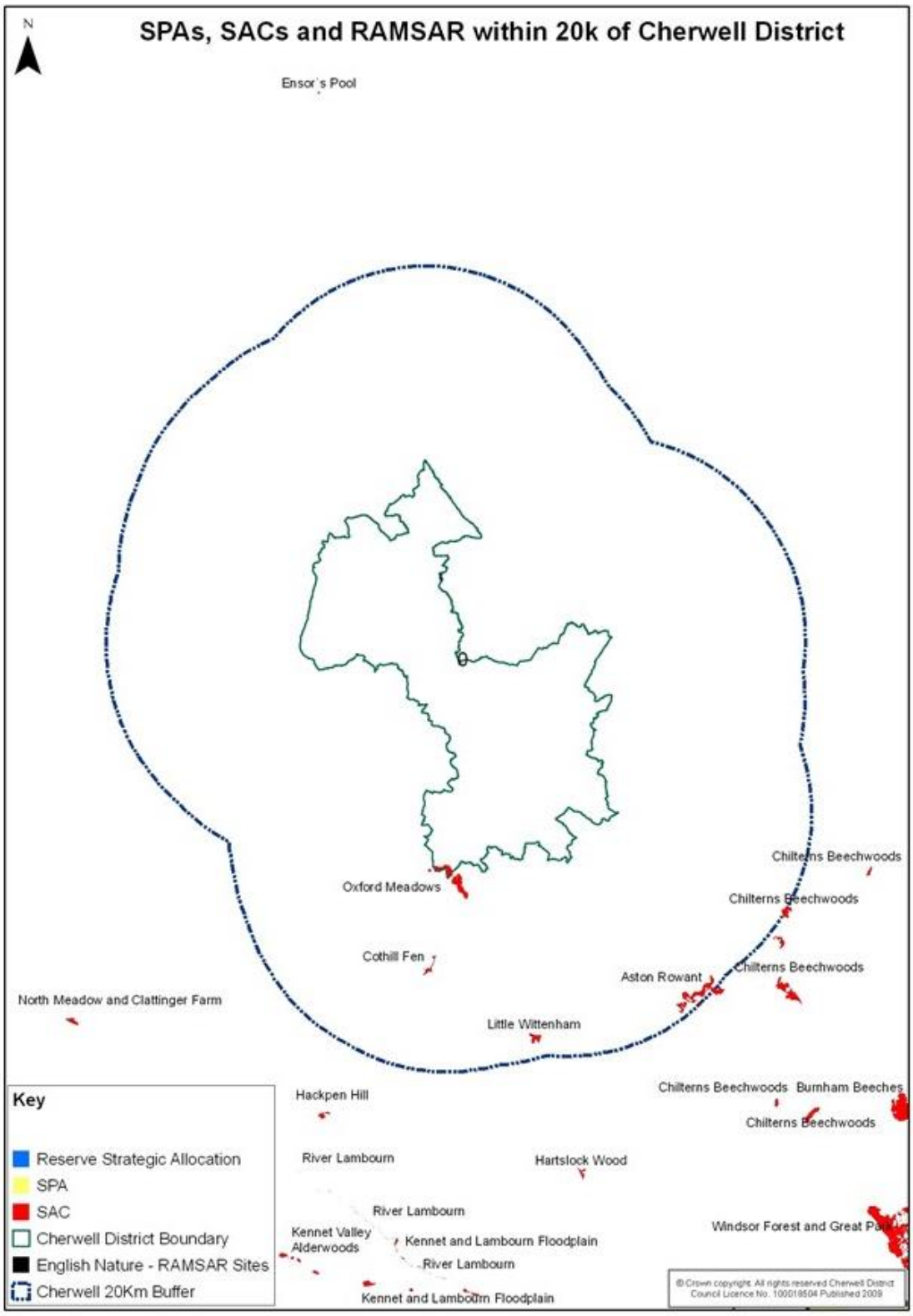
Summary

In accordance with the Habitats Regulations, this Stage 1 of the HRA has also completed an in-combination assessment. None of the other projects and plans identified (see Section 5) will lead to likely significant effects on Oxford Meadows in combination with the proposals contained in the Partial Review Proposed Submission Plan, provided that any mitigation measures identified for other projects and plans are put in place.

In conclusion, the Stage 1 (Screening) assessment has determined that the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Need Proposed Submission Plan will not lead to likely significant effects, either alone or in combination, on the qualifying features of Oxford Meadows SAC.

Appendices

Appendix A. Locations of European Sites within 20 km of Cherwell District



Appendix B. Screening Assessment

B.1. HRA Results Tables

This appendix contains Table B.2 (see below) which summarises the features of each of the proposed policies within the Plan and whether each policy is considered to have a likely significant effect on the Oxford Meadows SAC. The likely significant effects take into account the measures in the Plan which seek to protect the European sites.

Where possible, policies that have been found to have no likely significant effect on an European site have been categorised into four different types:

- **Policy Type A1:** Policies that will not themselves lead to development (e.g. because they relate to design or other qualitative criteria for development, or they are not a land use planning policy);
- **Policy Type A2:** Policies intended to protect the natural environment, including biodiversity;
- **Policy Type A3:** Policies intended to conserve or enhance the natural, built or historic environment, where enhancement measures will not be likely to have any negative effect on a European site;
- **Policy Type A4:** Policies that positively steer development away from European sites and associated sensitive areas;
- **Policy Type A5:** Options/policies that would have no effect because no development would occur through the policy itself, the development being implemented through later policies in the same plan (which are more specific and therefore more appropriate to assess for their effects on European sites and associated sensitive areas)

This has been based on The Habitats Regulations Assessment of Local Development Documents (Revised Draft Guidance) produced by Natural England in February 2009

Where possible, policies have then categorised into the sub policy types as summarised in Table B-1 below.

Table B-1 Policy Categories

Category	Sub Category	Description
Policy Type 1	A1	Policies that will not themselves lead to development e.g. because they relate to design or other qualitative criteria for development, or they are not a land use planning policy.
	A2	Policies intended to protect the natural environment, including biodiversity.
	A3	Policies intended to conserve or enhance the natural, built or historic environment, where enhancement measures will not be likely to have any negative effect on an European site.
	A4	Policies that positively steer development away from European sites and associated sensitive areas.
	A5	Policies that would have no effect because no development could occur through the policy itself, the development being implemented through later policies in the same plan, which are more specific and therefore more appropriate to assess for their effects on European sites and associated sensitive areas.
Policy Type 2	N/A	Policies that could have a negative effect but would not be likely to have a significant effect on an European site alone or in combination with other plans or projects.
Policy Type 3	C1	The policy could **directly affect** an European site because it provides for, or steers, a quantity or type of development onto an European site, or adjacent to it.
	C2	The policy could **indirectly affect** a European site e.g. because it provides for

		or steers, a quantity or type of development that may be very close to it, or ecologically, hydrologically or physically connected to it or it may increase disturbance as a result of increased recreational pressures.
	C3	Proposals for a **magnitude of development** that no matter where it was located, the development would be likely to have a significant effect on a European site.
	C4	A policy that makes provision for a quantity / type of development but the effects are uncertain because the detailed location of the development is to be selected following **consideration of options at a later, more specific plan.**
	C5	Policies for developments or infrastructure projects that could **block options or alternatives** for the provision of other development or projects in the future which will be required in the public interest that may lead to adverse effects on European sites, which would otherwise be avoided.
	C6	Policies which **depend on how the policies etc are implemented** in due course. There is a theoretical possibility that if implemented in one or more particular ways the proposals could possibly have a significant effect on a European site.
	C7	Any policies that would be **vulnerable to failure** under the Habitat Regulations at project assessment stage to include them in the plan would be regards by the EC as 'faulty planning'.
	C8	Any other proposal that may have an adverse effect on a European site which might try to pass the tests of the Habitat Regulations at project assessment stage by arguing that the **plan provides the imperative reasons** of overriding public interest to justify its consent despite a negative assessment.
Policy Type 4	D1	The policy alone would not be likely to have significant effects but if its effects are combined with the effects of other policies or proposals **provided for or coordinated** by the LDD (internally) the **cumulative** effects would be likely to be significant.
	D2	Policies that alone would not be likely to have significant effects but if their effects are **combined with the effects of other plans or projects** and possibly the effects of other developments provided for in the LDD as well the combined effects would be likely to be significant.
	D3	Policies that are or could be part of a **programme or sequence of development** delivered over a period where the implementation of the early stages would not have a significant effect on the location, timing of the whole project, the later stages of which could have an adverse effect on such sites.

This has been based on The Habitat Regulations Assessment of Local Development Projects (Revised Draft Guidance), David Tyldesley & Associates for Natural England, February 2009.

B.2. Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Proposed Submission Plan Policies

Policy	Policy Title	Policy Details	Likely Significant Effects on Oxford Meadows SAC?	Justification of Findings
Strategic Objective SO16	N/A	To work with Oxford City Council and Oxfordshire County Council, and other neighbouring authorities as required, in delivering Cherwell's contribution to meeting Oxford's unmet housing needs with its required infrastructure by 2031	No	**Policy Type 1- A5:** This objective will lead to development, however, it is a commitment to work with the City and County Councils in meeting Cherwell's contribution to meeting Oxford's unmet housing needs and therefore does not detail how and where construction will be undertaken. The proposed policies that will deliver development are screened below. This objective is considered to have no likely significant effects on the European sites.
Strategic Objective SO17	N/A	To provide Cherwell's contribution to meeting Oxford's unmet housing needs so that it supports the projected economic growth which underpins the agreed Oxfordshire Strategic Housing Market Assessment 2014 and the local economies of Oxford and Cherwell	No	**Policy Type 1- A5:** This objective will lead to development, however, it is a commitment to support the projected economic growth which underpins the agreed Oxfordshire Strategic Housing Market Assessment 2014 and the local economies of Oxford and Cherwell and therefore does not detail how and where construction will be undertaken. The proposed policies that will deliver development are screened below. This objective is considered to have no likely significant effects on the European sites.
Strategic Objective SO18	N/A	To provide housing for Oxford so that it substantively provides affordable access to new homes for those requiring 'affordable' housing, new entrants to the housing market, key workers and those requiring access to Oxford's key employment areas, and to provide well designed development that responds to both needs and the local context.	No	**Policy Type 1- A5:** This objective will lead to development, however, it is a commitment to provide affordable access to new homes for those requiring 'affordable' housing, new entrants to the housing market, key workers and those requiring access to Oxford's key employment areas, and to provide well designed development that responds to both needs and the local context. The objective does not detail how and where construction will be undertaken. The proposed policies that will deliver development are screened below. This objective is considered to have no likely significant effects on the European sites.
Strategic Objective SO19	N/A	To provide Cherwell's contribution to meeting Oxford's unmet housing needs in such a way that it complements the County Council's Local Transport Plan, including where applicable, its Oxford Transport Strategy and so that it facilitates demonstrable and deliverable improvements to the availability of sustainable transport for access to Oxford.	No	**Policy Type 1- A5:** This objective will lead to development, however, it is a commitment to ensure that the housing contribution complements the County Council's Local Transport Plan, including where applicable, its Oxford Transport Strategy and so that it facilitates demonstrable and deliverable improvements to the availability of sustainable transport for access to Oxford. The objective does not detail how and where construction will be undertaken. The proposed policies that will deliver development are screened below. This objective is considered to have no likely significant effects on the European sites.
Policy PR1:	Achieving Sustainable Development for Oxford's Needs	Cherwell District Council will work with Oxford City Council, West Oxfordshire District Council, Oxfordshire County Council, and the developers of allocated sites to deliver: a. 4,400 homes to help meet Oxford's unmet housing needs by 2031 b. the Vision, Objectives and Policies set out in this Partial Review of the Local Plan Development proposals to meet Oxford's needs will be supported if they: 1. Accord with the Vision, Objectives and Policies of this Partial Review, 2. Comply with other material Development Plan policies, and 3. If it is demonstrated that they will achieve sustainable development. For the purpose of the Partial Review, the definition of sustainable development includes development that meets Oxford's housing needs and does not cause harm to the delivery of the Cherwell Local Plan 2011-2031 (adopted July 2015).	No	**Policy Type 1- A1:** This policy will not itself lead to development (because it relates to design and other qualitative criteria for development and it is not a site specific land use planning policy). This policy is considered to have no likely significant effects on the European sites.

Policy PR2:	Housing Mix, Tenure and Size	The strategic developments provided for under Policies PR6 to PR10 will be expected to meet the following requirements to help meet Oxford's housing needs: 1. All housing to be provided as self-contained dwellings (use class C3) only 2. Provision of 80% of the affordable housing as affordable rent/social rented dwellings and 20% as other forms of intermediate affordable homes 3. Delivery of 25 to 30% of the affordable homes as one-bedroomed properties, 30 to 35% as two-bedroomed properties, 30 to 35% as three-bedroomed properties and 5 to 10% as four+ bedroomed properties unless otherwise agreed with Cherwell District Council in consultation with Oxford City Council 4. Delivery of a mix of sizes of market homes to meet current and future needs and to create socially mixed and inclusive communities. The mix of housing is to be agreed with Cherwell District Council in consultation with Oxford City Council having regard to the most up-to-date evidence on Oxford's housing need and available evidence on local market conditions 5. Provision for key workers as part of both the affordable and market housing mix. The provision shall be made in accordance with Oxford City Council's definition of key workers unless otherwise agreed with Cherwell District Council in consultation with Oxford City Council 6. Provision of an opportunity for community self-build or self-finish housing to be agreed with Cherwell District in consultation with Oxford City Council	No	**Policy Type 1- A5:** This policy will lead to development by informing other policies, however this policy does not outline any development proposals and the exact details of where development may be located other than the general area. Their design and/or when (or if) these sites will be constructed upon are not stated. The proposed policies that will deliver development are screened below. This policy is considered to have no likely significant effects on the European sites.
Policy PR3:	The Oxford Green Belt	The Oxford Green Belt boundary in Cherwell District is revised as shown on the Policies Maps and on the Green Belt Plan at Appendix 2. Within the allocated strategic development sites, the areas of land removed from the Green Belt are as follows: Policy PR6a - removal of 32.1 hectares of land as shown on inset Policies Map PR6a Policy PR6b - removal of 31.6 hectares of land as shown on inset Policies Map PR6b Policy PR7a - removal of 10.8 hectares of land as shown on inset Policies Map PR7a Policy PR7b - removal of 4.3 hectares of land as shown on inset Policies Map PR7b Policy PR8 - removal of 111.8 hectares of land as shown on inset Policies Map PR8 Policy PR9 - removal of 17.7 hectares of land as shown on inset Policies Map PR9 In addition, the following land is removed from the Green Belt and safeguarded beyond the Plan period: a. 7.8 hectares of land east of the A44 and north-west of the railway line (to the south of the strategic development site allocated under policy PR8 as shown on inset Policies Map PR8) The following land is removed from Green Belt: b. 0.7 hectares of land adjoining and to the west of the railway (to the east of the strategic development site allocated under policy PR8 as shown on inset Policies Map PR8) c. 11.8 hectares of land south of the A34 and west of the railway line (to the west of the strategic development site allocated under policy PR6b as shown on inset Policies Map PR6b d. 9.9 hectares of land comprising the existing Oxford Parkway Railway Station and the Water Eaton Park and Ride (as shown on inset Policies Map 6a) e. 14.7 hectares of land to north, east and west of Begbroke Science Park (as shown on inset Policies Map PR8. In order to compensate for loss of Green Belt land, development proposals on land to be removed from the Green Belt will be required to contribute to improvements to the environmental quality and accessibility of land remaining in the Green Belt, as detailed in the strategic site allocation policies.	No	**Policy Type 1- A5:** This policy will lead to development by informing other policies, however this policy does not outline any development proposals and the exact details of where development may be located other than the general area. Their design and/or when (or if) these sites will be constructed upon are not stated. The proposed policies that will deliver development are screened below This policy is considered to have no likely significant effects on the European sites.
Policy PR4a:	Sustainable Transport	The strategic developments provided for under Policies PR6 to PR10 will be expected to provide proportionate financial contributions directly related to the development in order to secure necessary improvements to, and mitigations for, the highway network and to deliver necessary improvements to infrastructure and services for public transport. Where necessary, the provision of land will be required to support the implementation of relevant schemes set out in the Local Transport Plan 4 (including the Oxford Transport Strategy), the A44 /A4260 Corridor Study and Local Plan Partial Review Transport Mitigation Assessment. These schemes shall include: a. improved bus services and facilities along: i. the A44/A4144 corridor linking Woodstock and Oxford ii. the A4260/A4165 (Oxford Road) linking Kidlington, Gosford, Water Eaton and Oxford iii. Langford Lane b. 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	No	**Policy Type 1- A5:** This policy will lead to development by informing other policies, however this policy does not outline any development proposals and the exact details of where development may be located other than the general area. Their design and/or when (or if) these sites will be constructed upon are not stated. The policy provides for transport infrastructure and mitigation which affects the HRA screening conclusions. However, the transport implications of development are considered through the screening of the proposed site specific policies that will deliver development (see below. This policy is considered to have no likely significant effects on the European sites.

		c. the prioritisation of the A44 over the A4260 as the primary north-south through route for private motor vehicles into and out of Oxford d. improved rapid transit/bus services and associated Super Cycle Route along the A4260 into Oxford e. improvements to the public realm through the centre of Kidlington associated with (d) above f. the provision of new and enhanced pedestrian, cycling and wheelchair routes into and out of Oxford		
Policy PR4b:	Kidlington Centre	Proposals to support sustainable transport improvements and associated infrastructure, to reduce private motorised through traffic along the A4260 in Kidlington and improve the built and natural environment along this corridor which are consistent with the themes and objectives of the adopted Kidlington Masterplan SPD will be supported.	No	**Policy Type 1- A5:** This policy will lead to development by informing other policies, however this policy does not outline any development proposals and the exact details of where development may be located other than the general area. Their design and/or when (or if) these sites will be constructed upon are not stated. The policy supports the provision of sustainable transport infrastructure along the A4260 corridor. The transport implications of development, including the effects of route re-prioritisation, are considered through the screening of the proposed site specific policies that will deliver development (see below) This policy is considered to have no likely significant effects on the European sites.
Policy PR5:	Green Infrastructure	The strategic developments provided for under Policies PR6 to PR10 will be expected to protect and enhance green infrastructure (GI) and incorporate green assets and the water environment into the design approach for each site. Provision will be expected to be made on site. Financial contributions in lieu of on-site provision will only be allowed in exceptional circumstances and where it is agreed that it will not be possible to provide on-site net biodiversity gains. Applications will be expected to: 1. Identify existing GI and its connectivity and demonstrate how this will, as far as possible, be protected and incorporated into the layout, design and appearance of the proposed development 2. Show how existing and new GI will be connected and the opportunities for off-site connectivity and improvement 3. Show how restored or re-created habitats can be accommodated into the development and how biodiversity will be improved 4. Show how existing trees will be protected and the opportunities for planting new trees 5. Demonstrate the opportunities for improving the existing and proposed built and natural landscape through the provision of GI and for the protection or enhancement of the historic environment 6. Demonstrate how GI will be provided along movement corridors (including for motor vehicles, pedestrians, cycles and wheelchairs) and to benefit the provision of informal and formal open space, play areas and gardens 7. Demonstrate how the provision of GI will assist in the beneficial use and permanence of the Green Belt 8. Demonstrate where multi-functioning GI can be achieved 9. Provide details of how GI will be maintained and managed	No	**Policy Type 1- A2:** This policy will not itself lead to development but rather seeks to protect the environment. This policy is considered to have no likely significant effects on the European sites.
Policy PR6a -	Land East of Oxford Road	An urban extension to Oxford City will be developed on 48 hectares of land to the east of Oxford Road as shown on inset Policies MapPR6a. Development proposals will be permitted if they meet the following requirements: Key Delivery Requirements 1. Construction of 650 dwellings (net) on approximately 24 hectares of land as shown (the residential area as shown). The dwellings are to be constructed at an approximate average net density of 40 dwellings per hectare 2. The provision of 50% of the homes as affordable housing as defined by the National Planning Policy Framework 3. The provision of a primary school with at least three forms of entry on 3.2 hectares of land in the location shown 4. The provision of a local centre on 0.5 hectares of land in the location shown unless the location is otherwise agreed with Cherwell District Council. The Local Centre shall include provision for local convenience retailing (use class A1 - no more than 500 square metres net floor space and no less than 350 square metres), ancillary business development (use class B1(a) only) and/or financial and professional uses (use class A2); a café or restaurant (use class A3); the provision of community building to required standards providing the opportunity for social and childcare facilities, the opportunity for required health facilities to be provided and provision for required emergency services infrastructure 5. The provision of facilities for formal sports, play areas and allotments to adopted standards within the developable area 6. The provision of public open green space as an extension to Cutteslowe Park on 11 hectares of land in the location shown and including land set aside for the creation of wildlife habitats and for nature trail/circular walks accessible from the new primary school	No	**Policy Type 2** **Recreation** PR6a is located approximately 1.48 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are willing to walk up to 1.9 km to the SAC. Creeping marshwort (*Apium repens)* is not sensitive to trampling, however, dog fouling may have an effect through nutrient enrichment. PR6a Land East of Oxford Road is located within 1.9 km of the SAC and therefore there is the potential for an increase in the number of dog walkers and associated dog fouling. However, the site is separated from the SAC by the A4165, A40 and A44 all of which are major roads which may act as a deterrent for dog walkers from the site. In addition, the policy includes for public open space and a significant extension to Cuttleslowe Park thus any increase in housing is unlikely to lead to significant increases in dog walkers within the SAC. Policy PR6a provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 5, 6, 7 and 10). Policy PR6a is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation

		7. The creation of a green infrastructure corridor on 8 hectares of land incorporating a pedestrian, wheelchair and all-weather cycle route along the site's eastern boundary as shown. The route will connect Cutteslowe Park with Oxford Parkway Railway Station/Water Eaton Park and Ride and provide connection with the public rights of way network 8. The retention of 3 hectares of land in agricultural use in the location shown Planning Application Requirements 9. The application(s) shall be supported by, and prepared in accordance with, a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be prepared in consultation with Oxfordshire County Council and Oxford City Council. 10. The Development Brief shall include: (a) A scheme and outline layout for delivery of the required land uses and associated infrastructure (b) Points of vehicular access and egress from and to existing highways, primarily from Oxford Road (c) An outline scheme for public vehicular, cycle, pedestrian and wheelchair connectivity within the site, to the built environment of Oxford, to Cutteslowe Park to the allocated site to the west of Oxford Road (policy PR6b) enabling connection to Oxford City Council's allocated 'Northern Gateway' site, to Oxford Parkway and Water Eaton Park and Ride, and to existing or new points of connection off-site and to existing or potential public transport services. (d) Protection and connection of existing public rights of way and an outline scheme for pedestrian and cycle access to the surrounding countryside (e) Design principles which seek to deliver a connected and integrated urban extension to Oxford and which respond to historic setting of the city (f) Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with (11) below (g) The sites for the required school and the Local Centre (h) An outline scheme for vehicular access by the emergency services 11. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology) to be agreed with Cherwell District Council 12. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the findings of the BIA and habitat surveys and to be agreed before development commences. The BIMP shall include: (a) measures for securing net biodiversity gain within the site and within the residential area and for the protection of wildlife during construction (b) measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development (c) demonstration that designated environmental assets will not be harmed, including that there will be no detrimental impacts down-river in the Cherwell Valley through hydrological, hydro chemical or sedimentation impacts (d) measures for the protection and enhancement of existing wildlife corridors (e) the creation of a green infrastructure network with connected wildlife corridors, including within the residential area, and the improvement of the existing network including through the protection/enhancement of the existing hedgerow network and the protection of mature trees (f) measures to minimise light spillage and noise levels on connective features and other habitat features of biodiversity value (g) The protection of the orchard and waterbody adjoining the site at St. Frideswide Farm (h) Farmland bird compensation (i) Proposals for long-term wildlife management and maintenance including for the wildlife habitats accessible from the primary school (j) A scheme for the provision for in-built bird and bat boxes, for wildlife connectivity between gardens and for the viable provision of designated green walls and roofs 13. The application(s) shall be supported by phase 1 habitat surveys including habitat suitability index (HSI) survey for great crested newts, great crested newt presence/absence surveys (dependent on HSI survey), surveys for badgers, breeding birds and reptiles, an internal building assessment for roosting barn owl, a tree survey and an assessment of the watercourse that forms the south-eastern boundary of the site and Hedgerow Regulations Assessment		purposes. People are likely to use these areas of land for recreation purposes. In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR6a is located approximately 1.48 km (at its closest point) from the Oxford Meadows SAC. A review of contour mapping shows that the site has its high point in the west dropping to the east. Therefore, any surface water discharge from the site would likely go via the River Cherwell (approximately 780m to the east) which joins the River Thames downstream of the Oxford Meadows SAC and therefore any pollution being discharged from PR6a would not have a hydrological link to Oxford Meadows SAC. Should this not be the case Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. The measures for ensuring this are unknown at this stage and will be dependent upon the assessment and development, however, such measures may include treatment works and the use of Sustainable Urban Drainage Schemes (SUDS). Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** A review of the British Geological Survey website has shown that PR6a is located in an area where superficial deposits are not recorded, with the exception of a small area covered by Wolvercote Sand and Gravel Member - Sand And Gravel. The underlying bedrock is Oxford Clay Formation and West Walton Formation (undifferentiated) - Mudstone. A review of borehole logs within the site identified for housing shows a mixture of clays. Owing to this layer of clay the ground is considered to be only semi-permeable and unlikely to have a significant contribution to groundwater recharge. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part

		14. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity, minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development 15. The application shall be supported by a Heritage Impact Assessment which will include measures to avoid or minimise conflict with the identified heritage assets within the site, particularly the Grade 2* Listed St Frideswide Farmhouse 16. The application shall be supported by a Flood Risk Assessment informed by a suitable ground investigation, and having regard to guidance contained within the Council's Level 2 Strategic Flood Risk Assessment. A surface water management framework shall be prepared to maintain run-off rates to greenfield run-off rates and volumes, with use of Sustainable Drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Council's Level 1 and Level 2 SFRAs. 17. The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network 18. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures. 19. The application(s) shall include proposals for the securing the long-term use, management and maintenance of the community building, formal sports provision and play areas 20. The application(s) shall include proposals for securing the use, management and maintenance of the public open green space / extension to Cuttelowe Park and agricultural land in perpetuity 21. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year 22. The application shall include an Employment, Skills and Training Plan to be agreed with the Council Place shaping principles 23. A layout, design and appearance for a contemporary urban extension to Oxford City that responds to the 'gateway' location of the site, is fully integrated and connected with the existing built environment, maximises the opportunity for sustainable travel into Oxford, provides a high quality, publicly accessible and well connected green infrastructure and ensures a sensitive relationship with the site's Cherwell Valley setting 24. The provision of a landscaped green infrastructure corridor at the eastern settlement edge which links Cutteslowe Park to Oxford Parkway, minimises the visual and landscape impact of the development, creates an appropriate setting to the Listed St. Frideswide Farmhouse and Wall, and provides a clear distinction between the site and the Green Belt 25. The provision of connecting green infrastructure corridors running east-west across the site 26. The provision of an active frontage along Oxford Road while maintaining a well treed streetscape 27. The public open green space/extension to Cutteslowe Park and agricultural land to be kept free of buildings to avoid landscape impact 28. The location of archaeological features, including the Tumuli to the east of the Oxford Road, should be made evident in the landscape design of the site 29 Layout and design that encourages the sustainable and safe management of waste by individual households and by residents collectively while minimising the visual and pollution impacts		1) HRA was updated. The air quality assessment respectively is included in Appendix C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.
Policy PR6b	Land West of Oxford Road	An urban extension to Oxford City will be developed on 32 hectares of land to the west of Oxford Road as shown on inset Policies MapPR6bX. Development proposals will be permitted if they meet the following requirements: Key Delivery Requirements 1. Construction of 530 dwellings (net) on 32 hectares of land (the residential area as shown). The dwellings are to be constructed at an approximate average net density of 25 dwellings per hectare. 2. The provision of 50% of the homes as affordable housing as defined by the National Planning Policy Framework	No	**Policy Type 2** **Recreation** PR6b is located approximately 1.28 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are willing to walk up to 1.9 km to the SAC. Creeping marshwort (Apium repens) is not sensitive to trampling, however, dog fouling may have an effect though

		3. Proportionate financial contributions to the delivery of the local centre services and facilities and school on Land to the East of Oxford Road (PolicyPR6a) in accordance with adopted standards 4. Land to be reserved within the site to facilitate improvements to the existing footbridge over the railway on the western boundary of the site to make it wheelchair and cycle accessible and so improve links to Oxford City's allocated 'Northern Gateway' site 5. Provision for required emergency services infrastructure 6. The provision of facilities for formal sports, play areas and allotments to adopted standards within the developable area Planning Application Requirements 7. The application(s) shall be supported by, and prepared in accordance with, a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be prepared in consultation with Oxfordshire County Council and Oxford City Council. 8. The Development Brief shall include: (a) A scheme and outline layout for delivery of the residential development and associated infrastructure (b) Points of vehicular access and egress from and to existing highways (c) An outline scheme for public vehicular, cycle, pedestrian and wheelchair connectivity within the site, to the built environment of Oxford, to the allocated site to the east of Oxford Road (policy PRPR6a) enabling connection to Cutteslowe Park, to provide accessibility to Oxford City Council's allocated 'Northern Gateway' site from Oxford Road, to Oxford Parkway and Water Eaton Park and Ride, and to existing or new points of connection off-site and to existing or potential public transport services. (d) The protection of existing public rights of way and an outline scheme for pedestrian and cycle access to the surrounding countryside (e) Design principles which seek to deliver a connected and integrated urban extension to Oxford and which respond to the historic setting of the city (f) Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with (9) below (g) An enhanced area of woodland along the northern boundary of the developable area to provide a clear distinction between the site and the Green Belt to the north (h) An outline scheme for vehicular access by the emergency services 9. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology), to be agreed with Cherwell District Council 10. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the BIA and habitat surveys and submitted Tree Survey and be agreed before development commences. The BIMP shall include: (a) measures for securing net biodiversity gain within the site and for the protection of wildlife during construction. Measures for off-site biodiversity offsetting if a net gain within the site is shown to be unviable (b) measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development (c) a scheme identifying significant trees, areas of woodland and hedgerows for retention and protection, and those for removal to be agreed with the Council and for the incorporation of mature trees into the public realm or private gardens (d) demonstration that designated environmental assets will not be harmed, including no detrimental impacts down-river in the Cherwell Valley through hydrological, hydro chemical or sedimentation impacts (e) measures for the protection and enhancement of wildlife corridors including linear woodland and scrub, along the boundary with the railway line and existing water habitats (f) measures to minimise light spillage and noise levels on habitats especially along wildlife corridors (g) A scheme for the provision for in-built bird and bat boxes, for wildlife connectivity between gardens and for the viable provision of designated green walls and roofs (h) the creation of a green infrastructure network with connected wildlife corridors within the site and the improvement of the existing network (i) proposals for wildlife compensation from the loss of trees and wildlife management and maintenance (j) examination of the opportunity to provide wildlife corridors over or under the A34 and A4260 (Freize		nutrient enrichment. PR6a Land East of Oxford Road is located within 1.9 km of the SAC and therefore there is the potential for an increase in the number of dog walkers and associated dog fouling. However, the site is separated from the SAC by the A40, A34 and A44 all of which are major roads which may act as a deterrent for dog walkers from the site. In addition the policy includes for public open space thus any increase in housing is unlikely to lead to significant increases in dog walkers within the SAC. Policy PR6b is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. Policy PR6b provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 4, 6, 7 and 8). These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation purposes. People are likely to use these areas of land for recreation purposes. In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR6b is located approximately 1.28 km (at its closest point) from the Oxford Meadows SAC. A review of contour mapping shows that the site has its high point in the middle of the site and therefore the direction of any discharge is unknown at this stage. Using the precautionary approach it is assumed that any water discharging from the site would likely discharge to the local sewer system which may enter the River Thames without treatment. However, Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. The measures for ensuring this are unknown at this stage and will be dependent upon the assessment and development, however, such measures may include treatment works and the use of Sustainable Urban Drainage Schemes (SUDS). Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** A review of the British Geological Survey website has shown that PR6b is located in an area where superficial deposits are not recorded. The underlying bedrock is Oxford Clay Formation and West Walton Formation (undifferentiated) - Mudstone. A review of borehole logs within and adjacent to the site show that the site is underlain by a mixture of clays. Owing to this layer of clay the ground is considered to be only semi permeable and unlikely to have a significant contribution to groundwater recharge. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and

		Way) to Stratfield Brake District Wildlife Site 11. The application(s) shall be supported by phase 1 habitat surveys including habitat suitability index (HSI) survey for great crested newts, great crested newt presence/absence surveys (dependent on HSI survey), surveys for badgers, breeding birds and reptiles, an internal building assessment for roosting barn owl, a tree survey and an assessment of water bodies 12. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity, minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development 13. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures 14 The application shall be supported by a Flood Risk Assessment, informed by a suitable ground investigation and having regard to guidance contained within the Council's Level 1 Strategic Flood Risk Assessment. A surface water management framework shall be prepared to maintain run off rates to greenfield run off rates and volumes, with use of Sustainable drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Level 1 SFRA. 15 The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network. 16. The application(s) shall include proposals for securing the long-term use, management and maintenance of the formal sports provision, play areas and other informal open space 17. The application shall be supported by sufficient information to demonstrate that the tests contained in paragraph 74 of the NPPF are met to enable development of the golf course 18. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement 19. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year. 20. The application shall include an Employment, Skills and Training Plan to be agreed with the Council 21 A programme for the submission of proposals and the development of land at Freize Farm as a replacement golf course (under policy PR6c) before development of land west of Oxford Road commences, or the submission of evidence to demonstrate that a replacement course is not required Place shaping principles 22. A layout, design and appearance for a contemporary urban extension to Oxford City that responds to the 'gateway' location of the site, is fully integrated and connected with the existing built environment, maximises the opportunity for sustainable travel into Oxford, provides a high quality, publicly accessible and well connected green infrastructure and maintains a well treed landscape to reflect the historic use of the site and protect biodiversity 23. The establishment of a connecting pedestrian, cycle and wheelchair accessible route from Oxford Road to the point of the existing footbridge on the western boundary of the site to enable linkages with the wider area including the Northern Gateway site 24. The provision of an active frontage along Oxford Road while maintaining a well treed streetscape 25. The accommodation of larger plots and wider streets to accommodate the mature trees of the former golf course and ensure a well-treed character for the new development 26 Layout and design that encourages the sustainable and safe management of waste by individual households and by residents collectively while minimising the visual and pollution impacts		that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of

				Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.
Policy PR6c	Land at Freize Farm	Land at Frieze Farm will be reserved for the potential construction of a golf course should this be required as a result of the development of Land to the West of Oxford Road under Policy PR6b. The application will be expected to be supported by, and prepared in accordance with, a Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council and in consultation with Oxfordshire County Council. The Development Brief shall incorporate design principles that respond to the landscape and Green Belt setting and the historic context of Oxford.	No	**Policy Type 2** **Recreation** PR6c is located approximately 985 m (at its closest point) from Oxford Meadows SAC. This policy is for a golf course which will therefore not lead to increased recreational use of the Oxford Meadows SAC as any visitors to the golf course will be for recreation at that site only. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR6c is located approximately 985 m (at its closest point) from the Oxford Meadows SAC. A review of contour mapping shows that the site has its high point in the centre of the site dropping to the north, west and south. Therefore, any surface water discharge from the site may discharge to the River Thames. However, as it is a golf course any discharge from the site is likely to be clean as it will be draining the golf course only. Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** PR6c is currently pasture and therefore if a golf course was constructed the hydrology would not change significantly. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix

				C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.

Policy PR7a	Land South East of Kidlington	An extension to Kidlington will be developed on within 32 hectares of land to the east of Bicester Road as shown on inset Policies MapPR7a. Development proposals will be permitted if they meet the following requirements: Key delivery requirements 1. Construction of 230 dwellings (net) on 11 hectares of land (the residential area as shown). The dwellings to be constructed at an approximate average net density of 35 dwellings per hectare. 2. The provision of 50% of the homes as affordable housing as defined by the National Planning Policy Framework 3. The provision of 0.7 hectares of land within the developable area for an extension to Kidlington Cemetery. 4. The provision of 21.5 hectares of land to provide formal sports facilities for the development and for the wider community and green infrastructure within the Green Belt 5. Provision for required emergency services infrastructure 6. The provision of facilities for play areas and allotments to adopted standards within the developable area 7. Contributions to the provision of community facilities in accordance with the Council's adopted standards Planning Application Requirements 8. The application(s) shall be supported by and prepared in accordance with, a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be prepared in consultation with Oxfordshire County Council and Oxford City Council. 9. The Development Brief shall include: a. A comprehensive scheme and outline layout for delivery of the residential development, formal sports provision and associated infrastructure b. The site for the cemetery extension c. Points of vehicular access and egress from and to existing highways d. An outline scheme for public vehicular, cycle, pedestrian and wheelchair connectivity within the site, to the built environments of Kidlington, to Oxford Parkway Railway Station and Water Eaton Park and Ride, to enable the crossing of Bicester Road, to achieve public accessibility between the residential development and the land for formal sports, and to existing or new points of connection off-site and to existing or potential public transport services. e. The protection of the existing public right of way on the eastern boundary of the site and an outline scheme for pedestrian and cycle access to the surrounding countryside f. Design principles which seek to deliver a connected and integrated extension to Kidlington while being sensitive to the historic development pattern of Water Eaton g. Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with (10) below h. An enhanced area of woodland along the south-eastern boundary of the site and the establishment of a new area of woodland planting i. The maintenance and enhancement of the tree lines and hedgerows j. An outline scheme for vehicular access by the emergency services 10. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology), to be agreed with Cherwell District Council 11. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the BIA and habitat surveys and submitted Tree Survey and be agreed before development commences. The BIMP shall include: k. measures for securing net biodiversity gain within the site and within the residential area and for the protection of wildlife during construction l. measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development m. demonstration that designated environmental assets will not be harmed, including no detrimental impacts down-river in the Cherwell Valley through hydrological, hydro chemical or sedimentation impacts n. measures for the protection and enhancement of existing wildlife corridors o. the creation of a green infrastructure network with connected wildlife corridors, including within the residential area, and the improvement of the existing network including through the protection/enhancement of the existing hedgerow network and the protection of mature trees p. Measures to minimise light spillage and noise levels on habitats especially along wildlife corridors q. The protection of the water environment	No	**Policy Type 2** **Recreation** PR7a is located approximately 2.68 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are will to walk up to 1.9 km to the SAC. Creeping marshwort (Apium repens) is not sensitive to trampling, however, dog fouling may have an effect though nutrient enrichment. PR7a is located in excess of 1.9 km of the SAC and therefore it is considered unlikely that there would be a significant increase in the number of dog walkers and associated dog fouling. The site is also separated from the SAC by the A40, A44 and the A4165 all of which are major roads which may act as a deterrent for dog walkers from the site. In addition the policy includes for public open space thus any increase in housing is unlikely to lead to significant increases in dog walkers within the SAC Policy PR7a is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation purposes. Policy PR7a provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 4, 6, and 9). People are likely to use these areas of land for recreation purposes. In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR7a is located approximately 2.68 km (at its closest point) from the Oxford Meadows SAC. A review of contour mapping shows that the site has it high point in the west dropping to the east. Therefore, any surface water discharge from the site would likely go via the River Cherwell (approximately 545m to the east) which joins the River Thames downstream of the Oxford Meadows SAC and therefore any pollution being discharged from PR7a would not have a hydrological link to Oxford Meadows SAC. Should this not be the case Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. The measures for ensuring this are unknown at this stage and will be dependent upon the assessment and development, however, such measures may include treatment works and the use of Sustainable Urban Drainage Schemes (SUDS). Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows**

		r. Farmland bird compensation s. Proposals for long-term wildlife management and maintenance t. A scheme for the provision of in-built bird and bat boxes, wildlife connectivity between gardens and for the viable provision of designated green walls and roofs 12. The application(s) shall be supported by phase 1 habitat surveys including habitat suitability index (HSI) survey for great crested newts, great crested newt presence/absence surveys (dependent on HSI survey), surveys for badgers, breeding birds and reptiles, an internal building assessment for roosting barn owl, a tree survey and an assessment of water bodies 13. A Flood Risk Assessment shall be submitted with the application(s). The application shall be supported by a Flood Risk Assessment, informed by a suitable ground investigation and having regard to guidance contained within the Council's Level 2 SFRA. A surface water management framework shall be prepared to maintain run off rates to greenfield run off rates and volumes, with use of Sustainable Drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Council's Level1 and Level 2 SFRAs. Residential development should be located outside the modelled Flood Zone 2 and 3 envelope which extends into the north eastern corner of the site. 14. The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network. 15. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity, minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development 16. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures 17. The application(s) shall include proposals for the securing the long-term use, management and maintenance of the formal sports provision and play areas 18. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement 19. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year 20. The application shall include an Employment, Skills and Training Plan to be agreed with the Council Place Shaping Principles 21. A layout, design and appearance for an extension to Kidlington that seeks to improve the appearance of, and is fully integrated and connected with, the existing built environment, which maximises the opportunity for walking, cycling and wheelchair use, which provides for a modern, highly functioning outdoor sports facility, which provides high quality, publicly accessible and well connected green infrastructure and which provides for well designed connectivity and interface between the residential development and the sport facilities 22. The establishment of a connecting pedestrian, cycle and wheelchair route from site across the Bicester Road and from the sports pitches and residential development to Water Eaton Lane and the public right of way along the eastern boundary of the site 23. The provision and maintenance of enhanced native landscaping help to emphasise the Green Belt location of the outdoor sports facilities, to minimise the urbanising influence of the sports pitches, to maintain openness and to enhance the distinction between the site and land to the south of the A34 24. Protection of the residential amenities of properties on Water Eaton Lane 25. Layout and design that encourages the sustainable and safe management of waste by individual households while minimising the visual and pollution impacts		A review of the British Geological Survey website has shown that PR7a is located in an area where superficial deposits are not recorded. The underlying bedrock is Oxford Clay Formation and West Walton Formation (undifferentiated) - Mudstone. There are no borehole logs available for within the site, however, a review of borehole logs adjacent to the site show that the site is underlain by a mixture of clays. Owing to this layer of clay the ground is considered to be only semi permeable and unlikely to have a significant contribution to groundwater recharge. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two

				scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.
Policy PR7b	Land at Stratfield Farm	An extension to Kidlington will be developed within 10.5 hectares of land at Stratfield Farm as shown on the inset Policies MapPR7b. Development proposals will be permitted if they meet the following requirements: Key delivery requirements 1. Construction of 100 homes (net) on four hectares of land (the residential area). The dwellings to be constructed at an approximate average net density of 25 dwellings per hectare. 2. The provision of 50% of the homes as affordable housing as defined by the National Planning Policy Framework 3. Land and proportionate financial contributions to secure a foot, cycle and wheel chair accessible bridge over the Oxford Canal to enable the site to be connected to the allocated site to the east of the A44 (PolicyPR8) 4. Provision for required emergency services infrastructure. 5. The provision of facilities for play areas and allotments to adopted standards within the developable area and contributions for off-site formal sports provision 6. The improvement, extension and protection of the existing orchard marked on the inset Policies Map for community benefit 7. Creation of a nature conservation area on 6.3 hectares of land as shown on the inset Policies Map, incorporating the community orchard and with the opportunity to connect to and extend Stratfield Brake District Wildlife Site 8. A new public bridleway/green link suitable for all-weather cycling and connecting Land at Stratfield Farm with Land East of the A44 (PR9) across the Oxford Canal, and key facilities on the A4165 including proposed sporting facilities at Land at South East Kidlington (PR7a) and Oxford Parkway . Planning Application Requirements 9. The application(s) shall be supported by, and prepared in accordance with a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be prepared in consultation with Oxfordshire County Council and Oxford City Council. 10. The Development Brief shall include: a. A scheme and outline layout for delivery of the required land uses and associated infrastructure b. Points of vehicular access and egress from and to existing highways with at least two separate points: first, from the Kidlington Roundabout junction, and second, from Croxford Gardens. c. An outline scheme for public vehicular, cycle, pedestrian and wheelchair connectivity within the site, to the built environment of Kidlington to the allocated site to the east of the A44 (Policy PR8) enabling accessibility over the Oxford Canal and to existing or new points of connection off-site and to existing or potential public transport services. The scheme shall include an access road from the Kidlington Roundabout to the easternmost development parcels and the Stratfield Farm building complex only as shown on the inset Policies Map. d. An outline scheme for pedestrian and cycle access to the surrounding countryside e. Design principles which seek to deliver a connected and integrated extension to Kidlington and a high quality landscape setting which responds to the historic environment of the farm and the Oxford	No	**Policy Type 2** **Recreation** PR7b is located approximately 2.11 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are willing to walk up to 1.9 km to the SAC. Creeping marshwort (Apium repens) is not sensitive to trampling, however, dog fouling may have an effect though nutrient enrichment. PR7b is located in excess of 1.9 km of the SAC and therefore it is considered unlikely that there would be a significant increase in the number of dog walkers and associated dog fouling. The site is also separated from the SAC by the A40, A44 and the A4260 all of which are major roads which may act as a deterrent for dog walkers from the site. Policy PR7b provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 3, 5, 6, 7 and 10). Policy PR7b is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation purposes. People are likely to use these areas of land for recreation purposes. In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR7b is located approximately 2.11 km (at its closest point) from the Oxford Meadows SAC. A review of contour mapping shows that the site has its high point in the north dropping to the south. Using the precautionary approach it is assumed that any water discharging from the site would likely discharge to the local sewer system which may enter the River Thames without treatment. However, Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. The measures for ensuring this are unknown at this stage and will be dependent upon the assessment and development, however, such measures may include treatment works and the use of Sustainable Urban Drainage Schemes

		Canal f. Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with 11below g. The maintenance and enhancement of the protected trees, existing tree lines and hedgerows h. An outline scheme for vehicular access by the emergency services 11. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology), to be agreed with Cherwell District Council 12. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the findings of the BIA and habitat surveys and submitted Tree Survey and be agreed before development commences. The BIMP shall include: a. measures for securing net biodiversity gain within the site and for the protection of wildlife during construction b. measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development c. the re-creation and restoration of hedgerows reflecting the historic field pattern and enhancement of existing grassland habitats d. demonstration that designated environmental assets will not be harmed, including no detrimental impacts on down-canal Sites of Special Scientific Interest and Local Wildlife Sites through hydrological, hydro chemical or sedimentation impacts e. measures for the protection and enhancement of wildlife corridors and existing water habitats f. measures for enhancing existing designated and non-designated environmental assets g. A scheme for the provision for in-built bird and bat boxes, wildlife connectivity between gardens and the viable provision of designated green walls and roofs h. the creation of a green infrastructure network with connected wildlife corridors, including within the residential area, and the improvement of the existing network including within the Lower Cherwell Conservation Target Area and to the Meadows West of the Oxford Canal Local Wildlife Site i. Measures to minimise light spillage and noise levels on habitats and wildlife corridors including to maintain connectivity for nocturnal species in an east-west direction j. Measures for the protection and enhancement of the Oxford Canal corridor and towpath including the creation and restoration of water vole habitat in the Lower Cherwell Conservation Target Area and the maintenance of a dark canal corridor through the minimisation of light pollution k. Farmland bird compensation l. Proposals for wildlife management in conjunction with conservation organisations m. The protection and enhancement of the part of the site within the Lower Cherwell Conservation Target Area. There shall be no building in the CTA other than for a fenced footpath/cycle/wheelchair path and for the construction of the canal bridge 13. The application(s) shall be supported by phase 1 habitat surveys including a habitat suitability index (HSI) survey for great crested newts, great crested newt presence/absence surveys (dependent on HSI survey), hedgerow and tree survey, surveys for badgers, water vole, otter, invertebrate, dormouse, breeding birds and reptiles, an internal building assessment for roosting barn owl, and an assessment of water bodies 14. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity, minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development 15. The application shall be supported by a Flood Risk Assessment informed by a suitable ground investigation and having regard to guidance contained within the Council's Level 1 Strategic Flood Risk Assessment. A surface water management framework shall be prepared to maintain run off rates to greenfield run off rates and volumes, with use of Sustainable Drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Council's Level 1 SFRA. 16. The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network. 17. The application shall be supported by a Heritage Impact Assessment which will include measures to avoid or minimise conflict with the identified heritage assets within the site, particularly Stratfield Farmhouse. 18. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures 19. The application(s) shall include proposals for the securing the long-term use, management and maintenance of public open green space and play area/public open green space 20. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement 21. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and		(SUDS). Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** A review of the British Geological Survey website has shown that PR7b is located in an area where superficial deposits are not recorded. The underlying bedrock is Oxford Clay Formation And West Walton Formation (undifferentiated) - Mudstone. There are no borehole logs available within the site, however, a review of borehole logs adjacent to the site show that the site is underlain by a mixture of clays. Owing to this layer of clay the ground is considered to be only semi permeable and unlikely to have a significant contribution to groundwater recharge. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34

		phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year 22. The application shall include an Employment, Skills and Training Plan to be agreed with the Council 23. The nature conservation area shall be kept free from built development and the application for planning permission shall include proposals for securing the area for that use in perpetuity Place Shaping Principles 24. A layout, design and appearance for an extension to Kidlington that seeks to improve the appearance of, and is fully integrated and connected with, the existing built environment, which maximises the opportunity for walking, cycling and wheelchair use, which provides for a development that is integrated with high quality, publicly accessible and well connected green infrastructure and which provides a transitional interface with Stratfield Brake Sports Ground and Stratfield Brake District Wildlife Site and protects and enhances the Oxford Canal Conservation Area 25. The establishment of a connecting pedestrian, cycle and wheelchair route from the site's junction with Kidlington Roundabout to the allocated site to the East of the A44 (Policy PR8) 26. The maintenance and enhancement of native landscaping to emphasise the Green Belt location of the land outside of the residential area and to provide for the potential accommodation of that land within the Stratfield Brake District Wildlife Site 27. The character and appearance of the Grade II Listed Stratfield Farmhouse and its setting is to be enhanced through appropriate building restoration and landscaping 28. Layout and design that encourages the sustainable and safe management of waste by individual households while minimising the visual and pollution impacts		compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.
Policy PR8 -	Land East of the A44	A new urban neighbourhood will be developed on 190 hectares of land to the east of the A44 as shown on inset Policies MapPR8. Development proposals will be permitted if they meet the following requirements: Key Delivery Requirements 1. Construction of 1,950 dwellings (net) on approximately 66 hectares of land (the residential area as shown). The dwellings are to be constructed at an approximate average net density of 45 dwellings per hectare 2. The provision of 50% of the homes as affordable housing as defined by the National Planning Policy Framework 3. A secondary school on 8.2 hectares of land in the location shown, to incorporate a four court sports hall to Sport England specification, made available for community use" 4. The provision of a primary school with at least three forms of entry on 3.2 hectares of land in the location shown 5. The provision of a primary school with at least two forms of entry on 2.2 hectares of land in the location shown if required in consultation with the Education Authority and unless otherwise agreed with Cherwell District Council 6. The provision of a local centre on one hectare of land in the location shown unless the location is otherwise agreed with Cherwell District Council. The Local Centre shall include provision for local convenience retailing (use class A1 - no more than 500 square metres net floor space and no less than 350 square metres), ancillary business development (use class B1(a) only) and/or financial and professional uses (use class A2); a café or restaurant (use class A3); the provision of community building to required standards providing the opportunity for social and childcare facilities, the opportunity for required health facilities to be provided and provision for required emergency services infrastructure 7. The provision of facilities for formal sports and play areas to adopted standards within the developable area 8. The creation of a publicly accessible Local Nature Reserve on 29.2hectares of land based on Rowel Brook in the location shown 9. The creation of a nature conservation area on 12.2 ha of land to the east of the railway line, south of the Oxford Canal and north of sandy Lane as shown	No	**Policy Type 2** **Recreation** PR8 is located approximately 1.70 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are willing to walk up to 1.9 km to the SAC. Creeping marshwort (*Apium repens*) is not sensitive to trampling, however, dog fouling may have an effect though nutrient enrichment. PR8 is located within 1.9 km of the SAC and therefore there is the potential for an increase in the number of dog walkers and associated dog fouling. However, the site is separated from the SAC by the A40 and A44 both of which are major roads which may act as a deterrent for dog walkers from the site. Policy PR8 provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 7, 8, 9, 10, 12, 13 and 18). Policy PR8 is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation purposes. People are likely to use these areas of land for recreation purposes. In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR8 is located approximately 1.70 km (at its closest point) from the Oxford Meadows SAC.

		10. The provision of public open green space as informal canalside parkland on 23.4hectares of land as shown 11. The retention of 12 hectares of land in agricultural use in the location shown 12. New public bridleways suitable for pedestrians, all-weather cycling, and wheelchair users connecting with the existing public rights of way network13. Provision for a pedestrian, cycle and wheelchair bridge over the Oxford Canal to enable the site and public bridleways to be connected to the allocated site at Stratfield Farm (PolicyPR7b) 14. The reservation 0.5 hectares of land within the developable area for a future railway halt/station in the approximate location shown unless otherwise agreed with Cherwell District Council in consultation with Oxfordshire County Council, Network Rail and rail service providers 15. The reservation of 14.7 hectares of land for the potential expansion of Begbroke Science Park 16. The provision of a limited number of new homes, to be agreed with the Council, to provide for students and those working for the University at the Science Park to support its expansion and reduce car journeys Planning Application Requirements 17. The application(s) shall be supported by a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be prepared in consultation with Oxfordshire County Council and Oxford City Council. 18. The Development Brief shall include: a. A scheme and outline layout for delivery of the required land uses and associated infrastructure b. Points of vehicular access and egress from and to existing highways with at least two separate points from and to the A44 including the use of the existing Science Park access road c. An outline scheme for public vehicular, cycle, pedestrian and wheelchair connectivity within the site (including for public transport services), to the built environments of Begbroke, Kidlington, Yarnton and to existing or new points of connection off-site and to existing or potential public transport services d. Protection of existing public rights of way and an outline scheme for pedestrian and cycle access to the countryside surrounding Begbroke, Kidlington and Yarnton e. Accommodation of the pedestrian, cycle and wheelchair accessible bridge over the Oxford Canal f. In consultation with Oxfordshire County Council, proposals for the closure/unadoption of Sandy Lane, the closure of the Sandy Lane level crossing to motor vehicles (other than for direct access to existing properties on Sandy Lane), and the use of Sandy Lane as a 'green' pedestrian, cycle and wheelchair route between the development and the built-up area of Kidlington including the incorporation of a bridge or subway g. Design principles which seek to deliver an urban neighbourhood that responds positively to the Science Park and the canal location and which respects the historic development of nearby villages h. Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with 19 below i. The sites for the required schools and the Local Centre j. Proposals for the safe remediation and use of the former landfill site as shown including a wildlife "stepping stone" within the development k. The retention or replacement (to an equivalent quantity and quality) of the existing allotments and proposals for extending the allotment space in accordance with adopted standards l. The reserved land within the site for the future railway halt/station m. A outline scheme for vehicular access by the emergency services 19. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology), prepared in consultation and agreed with Cherwell District Council. The BIA shall include investigation of any above or below ground hydrological connectivity between Rowel Brook and Rushy Meadows SSSI. 20. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the findings of the BIA and habitat surveys and be agreed before development commences. The BIMP shall include: a. measures for securing net biodiversity gain within the site and within the residential area b. measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development c. demonstration that designated environmental assets will not be harmed, including no detrimental impacts on down-canal Sites of Special Scientific Interest and Local Wildlife Sites through hydrological, hydro chemical or sedimentation impacts d. measures to minimise light spillage and noise levels on habitats especially along wildlife corridors e. measures for enhancing existing designated and non-designated environmental assets		A review of contour mapping shows that the site is relatively at the same grade as the Oxford Meadows SAC. PR8 is located approximately 3.23 km (at its closest point) from the River Evenlode to the west and approximately 3.10 km (at its closest point) from the River Cherwell to the east. It is not known where any water would discharge to at this stage and therefore using a worst case scenario for the purposed of this assessment it is assumed that any water discharge would go to the River Evonlode which joins the River Thames immediately upstream of Oxford Meadows SAC, approximately 4.24 km downstream from the River Evenlode's closest pint to PR8. The precautionary approach assumes that any water discharging from the site would likely discharge to the local sewer system which may enter the River Thames without treatment. However, Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. The measures for ensuring this are unknown at this stage and will be dependent upon the assessment and development, however, such measures may include treatment works and the use of Sustainable Urban Drainage Schemes (SUDS). Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** A review of the British Geological Survey website has shown that PR8 is located in an area where superficial deposits comprise Alluvium - Clay, Silt, Sand And Gravel and Summertown-radley Sand And Gravel Member - Sand And Gravel. . The underlying bedrock is Oxford Clay Formation And West Walton Formation (undifferentiated) - Mudstone. Only one borehole is located within the site which shows that the site overlies a band of clay approximately 0.7 thick below which is first terrace deposits of sandy gravel. Owing to this layer of clay the ground is considered to be only semi permeable and unlikely to have a significant contribution to groundwater recharge. In addition Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix

		f. A scheme for the provision of in-built bird and bat boxes, for wildlife connectivity between gardens and for the viable provision of designated green walls and roofs g. measures for the protection and enhancement of Sandy Lane and Yarnton Lane as green links and wildlife corridors and wildlife connectivity from Sandy Lane to the required Local Nature Reserve h. the creation of a green infrastructure network with connected wildlife corridors, including within the residential area and alongside the railway line, and the improvement of the existing network including within the Lower Cherwell Conservation Target Area and to the Rushy Meadows Site of Special Scientific Interest, the Meadows West of the Oxford Canal Local Wildlife Site and to Stratfield Farm (policy PR7b) i. a scheme and programme for the creation of the required Local Nature Reserve and nature conservation area to be agreed with the Council. The scheme for the LNR shall include habitats to be restored to SSSI quality and measures for the protection of the Rushy Meadows SSSI. Both schemes shall provide for works to be undertaken outside of the bird nesting season. j. measures for the protection and enhancement of the Oxford Canal corridor and towpath including the creation and restoration of water vole habitat in the Lower Cherwell Conservation Target Area and the maintenance of a dark canal corridor through the minimisation of light pollution k. farmland bird compensation l. proposals for wildlife management in conjunction with conservation organisations including for the Local Nature Reserve and nature conservation area. The proposals shall include measures for restricting public access to sensitive habitats 21. The application(s) shall be supported by phase 1 ecological surveys including for badgers, nesting birds, amphibians (in particular Great Crested Newts), reptiles and for bats including associated tree assessment, hedgerow regulations assessment. 22. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity, minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development 23. The application shall be supported by a Flood Risk Assessment informed by suitable ground investigation, and having regard to guidance contained within the Council's Level 2 Strategic Flood Risk Assessment. A surface water management framework shall be prepared to maintain run off rates to greenfield run off rates and volumes with use of Sustainable Drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Council's Level 1 and Level 2 SFRAs. 24. The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network. 25. The application shall be supported by a Heritage Impact Assessment which will include measures to avoid or minimise conflict with the identified heritage assets within the site, particularly the Oxford Canal Conservation Area and the listed structures along its length. 26. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures. 27. The application(s) shall include proposals for securing the long-term use, management and maintenance of the community building, formal sports provision and play areas 28.. The application(s) shall include proposals for securing the use of the Local Nature Reserve, nature conservation area, public open green space/informal canal side parkland and agricultural land in perpetuity 29.. In the interest of encouraging an educational relationship between the secondary school and the University of Oxford's Begbroke Science Park, the application(s) should demonstrate that the secondary school site has been designed in consultation with the University of Oxford 30.. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year. 31. The application shall include an Employment, Skills and Training Plan to be agreed with the Council Place shaping principles 32. A layout, design and appearance for a contemporary urban neighbourhood in a high quality, publicly accessible and well connected green infrastructure and canalside setting and for a location associated with		C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.

		a University Science Park and a primary transport corridor to Oxford 33. A sensitively designed approach to the provision of the pedestrian, cycling and wheelchair route connecting the development, Sandy Lane and the canalside parkland/public open space to the canal corridor and the new bridge over the canal to Stratfield Farm (policy PR7b) 34. Improved east-west pedestrian, cycle and wheelchair connections between the built up areas of Yarnton, Begbroke and Kidlington 35. The development of the secondary school shall include provision for out-of-school hours shared community use including indoor sports and provision for controlled pedestrian, cycle and wheelchair access between the site and Begbroke Science Park. The playing pitches should be located to help maintain a gap between the development and Begbroke village (east). 36. The Local Nature Reserve, nature conservation area, public open green space/informal canalside parkland shall be designed to reflect and enhance local landscape character and wildlife including that of the Oxford Canal and Rowel Brook. These areas and the agricultural land shall be kept free of buildings to avoid harm to the remaining Green Belt 37. The contrast between the dense urban development and canalside parkland setting should be used as a positive design feature. 38. The development must be designed to have a sensitive interface with Yarnton village (east). Development should provide an attractive frontage to the A44, to support a change in character away from a highways dominated environment, with appropriately located crossing points for pedestrians, cyclist and wheelchair users 39. Development must not prevent the continued use of Begbroke Science Park or its potential expansion into the reserved area shown. It must not harm to the Grade II Listed Begbroke Farmhouse 40. Layout and design that encourages the sustainable and safe management of waste by individual households and by residents collectively while minimising the visual and pollution impacts		
Policy PR9	Land West of Yarnton	A village extension to Yarnton will be developed within 99 hectares of land to the west of Yarnton as shown on inset Policies MapPR9. Development proposals will be permitted if they meet the following requirements: Key Delivery Requirements 1. Construction of 530 dwellings (net) on approximately 16 hectares of land (the residential area as shown). The dwellings are to be constructed at an approximate average net density of 35 dwellings per hectare 2. The provision of 50% of the homes as affordable housing as defined by the National Planning Policy Framework 3. The provision of 1.6 hectares of land for use by the existing William Fletcher Primary School to enable potential school expansion within the existing school site and the replacement of playing pitches and amenity space 4. The provision of facilities for formal sports, play areas and allotments to adopted standards within the developable area (unless shared or part shared use with William Fletcher Primary School is agreed with the Education Authority) 5. Public access within the 74 hectares of land to the west of the residential area and a new Local Nature Reserve accessible to William Fletcher Primary School 6. The creation of an area of a community woodland within 7.8 hectares of land to the north-west of the developable area and to the east of Dolton Lane Planning Application Requirements 7. The application(s) shall be supported by, and prepared in accordance with a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be prepared in consultation with Oxfordshire County Council and Oxford City Council. 8. The Development Brief shall include: a. A scheme and outline layout for delivery of the required land uses and associated infrastructure b. Points of vehicular access and egress to and from the A44 c. An outline scheme for public vehicular, cycle, pedestrian and wheelchair connectivity within the site (including public transport), to services and facilities in Yarnton, including William Fletcher Primary School, to the allocated site to the east of the A44 (Policy PR8) and to existing or new points of connection off-site and to existing or potential public transport services. d. Protection of existing public rights of way and an outline scheme for the creation of new pedestrian, cycle and wheelchair routes through the publicly accessible open space and to the surrounding countryside, including new public bridleways for horse riding, and connecting with the existing public right of way network. e. Design principles which seek to deliver an extension to Yarnton which responds positively to	No	**Policy Type 2** **Recreation** PR9 is located approximately 1.78 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are will to walk up to 1.9 km to the SAC. Creeping marshwort (*Apium repens*) is not sensitive to trampling, however, dog fouling may have an effect though nutrient enrichment. PR9 is located within 1.9 km of the SAC and therefore there is the potential for an increase in the number of dog walkers and associated dog fouling. However, the site is separated from the SAC by the A40, a minor road and a railway which may act as a deterrent for dog walkers from the site. In addition, the shortest route to the SAC via public footpaths is approximately 2.42 km, a distance greater than the 1.9 km distance that people walk to the SAC identified by previous studies. Policy PR9 provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 4, 5, 6, and 8). Policy PR9 is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation purposes. People are likely to use these areas of land for recreation purposes. In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC. Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR8 is located approximately 1.78 km (at its closest point) from the Oxford Meadows SAC. A review of contour mapping shows that the site is elevated above the Oxford Meadows SAC. The precautionary principal assumes that any water discharging from the site would likely discharge to the local sewer system which may enter the

		development planned to the east of the A44 and the historic context of Begbroke (west) f. Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with 9 below g. The land reserved for education use by Yarnton Primary School h. An outline scheme for vehicular access by the emergency services 9. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology) and agreed with Cherwell District Council 10. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the findings of the BIA and habitat surveys and agreed before development commences. The BIMP shall include: a. measures for securing net biodiversity gain within the site and within the residential area and for the protection of wildlife during construction b. measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development c. demonstration that designated environmental assets will not be harmed, including no detrimental impacts to watercourses through hydrological, hydro chemical or sedimentation impacts d. measures for the protection and enhancement of existing wildlife corridors, including along Frogwelldown Lane District Wildlife Site and Dolton Lane, and the protection of existing hedgerows and trees e. the creation of a new green infrastructure network with connected wildlife corridors, including within the developable area. The improvement of the existing network including hedgerows between the required Community Woodland and Begbroke Wood f. Measures to minimise light spillage and noise levels on habitats especially along wildlife corridors g. A scheme for the provision for in-built bird and bat boxes, for wildlife connectivity between gardens and for the viable provision of designated walls and roofs h. Farmland bird compensation i. proposals for wildlife management in conjunction with conservation organisations including for the Local Nature Reserve and community woodland 11. The application(s) shall be supported by phase 1 habitat surveys including habitat suitability index survey for great crested newts, great crested newt presence/absence surveys (dependent on HSI survey), for badgers, breeding birds, internal building assessment for roosting barn owl, dormouse, reptile, tree and building assessment for bats, bat activity, hedgerow regulations assessment and assessment of water courses 12. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity and minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development 13. The application shall be supported by a Flood Risk Assessment informed by a suitable ground investigation and having regard to guidance contained within the Council's Level 2 Strategic Flood Risk Assessment. A surface water management framework shall be prepared to maintain run off rates to greenfield run off rates and volumes, with use of Sustainable Drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Council's Level 1 and Level 2 SFRAs 14. The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network. 15. The application shall be supported by a Heritage Impact Assessment which will include measures to avoid or minimise conflict with identified heritage assets within or adjacent to the site 16. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures. 17. The application(s) shall include proposals for the securing the long-term use, management and maintenance of the formal sports provision and play areas 18. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year 19. The application shall include an Employment, Skills and Training Plan to be agreed with the Council		River Thames without treatment. However, Policy ESD8 and ESD9 of the adopted Plan requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effects on water quality of any adjacent or nearby watercourses. The measures for ensuring this are unknown at this stage and will be dependent upon the assessment and development, however, such measures may include treatment works and the use of Sustainable Urban Drainage Schemes (SUDS). Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** A review of the British Geological Survey website has shown that PR9 is located in an area where superficial deposits are not recorded. The underlying bedrock is Oxford Clay Formation And West Walton Formation (undifferentiated) - Mudstone. Only one borehole is located within the site which shows that the site overlies a band of clay approximately 0.9 thick below which is first terrace deposits of sandy gravel. Owing to this layer of clay the ground is considered to be only semi permeable and unlikely to have a significant contribution to groundwater recharge. In addition Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix C. The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction.

		Place shaping principles 20. A layout, design and appearance to achieve an extension to Yarnton village that responds to the site's prominent position on the A44 corridor, its proximity and connectivity to the allocated site Land to the East of the A44 (policy PRPR8), the need to protect the identity of Begbroke village (west), the opportunity for sustainable travel into Oxford and the provision of green infrastructure and access to the countryside for the local community 21. A layout, design and appearance that responds sensitively to the topography and landscape character of Frogwelldown Lane 22. A landscaping structure for the community woodland which helps retain the perceived separation between Yarnton and Begbroke (west) and helps protect Begbroke Wood Local Wildlife Site 23. Development which provides a frontage to the A44 which both reflects the character of Yarnton and responds to the planned development to the east of the A44 24. The historic hedge lined bridleway of Dolton Lane shall be extended southwards through the developable area to create a potential connection to Yarnton Primary School 25. Layout and design that encourages the sustainable and safe management of waste by individual households and by residents collectively while minimising the visual and pollution impacts		The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.
Policy PR10 –	Land South East of Woodstock	An extension to Woodstock village West Oxfordshire will be developed within 52 hectares of land as shown on the inset Policies MapPR10. Development proposals will be permitted if they meet the following requirements: Key delivery requirements 1. Construction of 410 dwellings (net) on 16 hectares of land (the residential area as shown). The dwellings to be constructed at an approximate average net density of 30 dwellings per hectare 2. Delivery of 50% of the homes as affordable housing as defined by the National Planning Policy Framework 3. 3.1 hectares of land and financial contributions for a new primary school with at least 2.2 forms of entry. The school buildings should be provided on site unless provision is made elsewhere and required education/sports facilities are instead provided in agreement between the Council, West Oxfordshire District Council and Oxfordshire County Council. 4. Provision of a community facility in accordance with adopted standards 5. The provision of formal sports facilities, play areas and allotments to adopted standards within the developable area 6. Creation of a community woodland and the retention of land in agricultural use 7. Creation of a nature conservation area accessible by the local community Planning Application Requirements 8. The application shall be made in full and for the entire site. All matters shall be included in the application. 9. The application(s) shall be supported by, and prepared in accordance with, a comprehensive Development Brief for the entire site to be jointly prepared and agreed in advance between the appointed representative(s) of the landowner(s) and Cherwell District Council. The Development Brief shall be	No	**Policy Type 2** **Recreation** PR10 is located approximately 5.18 km from Oxford Meadows SAC. Parking provision at Oxford Meadows SAC is very limited and previous studies have identified that people visiting Oxford Meadows SAC for recreational purposes shows that people are willing to walk up to 1.9 km to the SAC. Therefore, based on its distance from the SAC and the limited parking available at the SAC that any development at PR10 would not result in a significant change to recreational use of the SAC. Policy PR10 is also supported by Policy ESD18 of the adopted Plan which outlines how improvements are to be made to Cherwell's green infrastructure network, Policy BSC10 also outlines how new community and recreation facilities will be provided and Policy BSC11 outlines how new development will provide areas of green space. These policies will help to protect the Oxford Meadows SAC as they will help to retain people in the local area rather than having to travel further afield for recreation purposes. People are likely to use these areas of land for recreation purposes. Policy PR10 also provides delivery requirements that look to ensure that provision of recreation is included within the development (bullets 4, 5, 6 and 10). In addition, recreation is also not currently listed on the Natura 2000 Data Form as a risk for the SAC.

		prepared in consultation with West Oxfordshire District Council, Historic England and Oxfordshire County Council 10. The Development Brief shall include: a. A scheme and outline layout for delivery of the required land uses and associated infrastructure which unambiguously responds to the nationally significant heritage of the Blenheim Palace World Heritage Site, the Grade 1 Registered Park and Garden and the Blenheim Villa Scheduled Ancient Monument, their settings and influences on the historic, built and natural environments b. points of vehicular access and egress from and to existing highways c. an outline scheme for public vehicular, cycle and pedestrian connectivity within the site, to the built environment of Woodstock including the approved development immediately to the west of the site, to existing or new points of connection off-site and to existing or potential public transport services d. an outline scheme for pedestrian and cycle access to the surrounding countryside e. design principles which seek to deliver a connected and integrated extension to Woodstock which respond with the utmost sensitivity to the proximity of Blenheim Palace and Blenheim Park and the public approaches to the town f. Outline measures for securing net biodiversity gains informed by a Biodiversity Impact Assessment in accordance with 11 below g. the site for the required school provision/facilities h. The maintenance and enhancement of existing tree lines and hedgerows i. An outline scheme for vehicular access by the emergency services 11. The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology), to be agreed with Cherwell District Council 12. The application(s) shall be supported by a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the findings of the BIA and habitat surveys and submitted Tree Survey and to be agreed before development commences. The BIMP shall include: a. measures for securing net biodiversity gain within the site and within the residential area and for the protection of wildlife during construction b. measures for retaining and conserving protected/ notable species (identified within baseline surveys) within the development c. demonstration that designated environmental assets will not be harmed, including no detrimental impacts through hydrological, hydro chemical or sedimentation impacts d. farmland bird compensation e. measures for the protection and enhancement of existing wildlife corridors and water habitats f. measures for enhancing existing designated and non-designated environmental assets g. A scheme for the provision for in-built bird and bat boxes, for wildlife connectivity between gardens and for the viable provision of designated green walls and roofs h. the creation of a green infrastructure network with connected wildlife corridors, including within the residential area, and the improvement of the existing network i. measures to minimise light spillage and noise levels on habitats especially along wildlife corridors j. Contributions towards measures for the creation/protection/enhancement/restoration of important habitat (wetland, hedgerow, woodland and species specific) in the Blenheim and Ditchley Parks Conservation Target Area k. Create crossing which link new development to existing and proposed networks including Oxford Road and Campsfield Road. 13. The application(s) shall be supported by phase 1 habitat surveys including habitat suitability index (HSI) survey for great crested newts, great crested newt presence/absence surveys (dependent on HSI survey), hedgerow and tree survey, surveys for badgers, breeding birds and reptiles 14. The green infrastructure, woodland and agricultural land outside of the developable area be kept free from development and the application for planning permission shall include proposals for securing those uses in perpetuity 15. The south and east boundaries to address the open aspect and landscape sensitivity for this area of land at the edge of Woodstock town and the Green Belt to the east by maintaining its openness, providing a Green Belt buffer and protecting the setting of Blenheim Palace World Heritage Site and Grade 1 Registered Park and Garden 16. The application(s) shall be supported by a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity and minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development		Therefore, there are no likely significant effects of recreation on the Oxford Meadows SAC. **Water Quality** PR10 is located approximately 5.18 km (at its closest point) from the Oxford Meadows SAC. PR10 is located approximately 1.28 km from the River Glyme which flows into the River Evendale which joins the River Thames immediately upstream of Oxford Meadows SAC, approximately 8.83 km from PR10 closest point to the River Glyme. As yet it is not known how PR10 would be drained and therefore for the purposes of this assessment it is assumed that surface water is discharged to the River Glyme. Discharges to the River Glyme during construction would be managed through standard working practices and therefore no risk of pollution entering the River Glyme. During operation any pollution discharges, such as traffic accidents could enter the River Glyme, however, based on the probability of a significant pollution incident occurring in a housing development, the distance of PR10 from the River Glyme and distance from the River Thames (approximately 8.83 km) any incident would be suitably dispersed before it reached the Oxford Meadows SAC. Policy ESD8 and ESD9 will ensure that any water that is discharged to watercourses will not have an effect on water quality in local watercourses and therefore there will be no effect on the Oxford Meadows SAC. Therefore, there are no likely significant effects of water quality on the Oxford Meadows SAC. **Water Abstraction** There are no anticipated impacts on the Oxford Meadows SAC due to increased water abstraction. Thames Water Final Water Resources Management Plan 2015 – 2040 (WRMP14) identified that the Swindon and Oxfordshire area has a planning problem that in dry conditions there will be a water supply deficit from 2019/20 of 0.1 Ml/d, increasing to 32.7 Ml/d by 2039/40. The WRMP14 has addressed this through a number of short term (2015-2020) (and medium term (2020 – 2040) actions aimed at reducing household usage. Therefore, there are no likely significant effects of water abstraction on the Oxford Meadows SAC. **Groundwater Flows** A review of the British Geological Survey website has shown that PR10 is located in an area where superficial deposits are not recorded. The underlying bedrock Cornbrash Formation - Limestone. The boreholes located within the site show that the sites overlies a mixture of cobble to a depth of less than 1m with clay below. Owing to this layer of clay the ground is considered to be only semi permeable and unlikely to have a significant contribution to groundwater recharge. In addition, Policy ESD9 of the adopted Plan states that all developers must demonstrate that the development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity. Policy ESD9 will ensure that the water quality within Oxford Meadows SAC is protected. Therefore, there will be no likely significant effects of groundwater flows on the Oxford Meadows SAC. **Air Quality** It was considered possible that there may be a deterioration in air quality on the roads surrounding Oxford Meadows SAC when this allocation site is considered 'in combination' with the existing housing development (a total of 22,840 houses) outlined within the adopted Cherwell Local Plan 2011-2031 (Part 1) and the additional 4,400 houses outlined in the Partial Review Proposed Submission Plan (with Transport Improvement Package 2 plus Super Cycle Route). Therefore, the air quality assessment undertaken in support of the Cherwell Local Plan 2011-2031 (Part 1) HRA was updated. The air quality assessment respectively is included in Appendix C.

		17. The application shall be supported by a Heritage Impact Assessment which will include measures to avoid or minimise conflict with identified heritage assets within and adjacent to the site 18. The application(s) shall be supported by a desk-based archaeological investigation which may then require predetermination evaluations and appropriate mitigation measures in particular around the Scheduled Ancient Monument 19. The application will be supported by a Flood Risk Assessment, informed by a suitable ground investigation and having regard to guidance contained within the Council's Level 1 Strategic Flood Risk Assessment. A surface water management framework shall be prepared to maintain run off rates to greenfield run off rates and volumes, with use of Sustainable Drainage Systems in accordance with adopted Policy ESD7, taking into account recommendations contained in the Council's Level 1 SFRA. 20. The application should demonstrate that Thames Water has agreed in principle that foul drainage from the site will be accepted into its network. 21. A single comprehensive, outline scheme shall be approved for the entire site. The scheme shall be supported by draft Heads of Terms for developer contributions that are proposed to be secured by way of legal agreement. The application(s) shall be supported by a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year 22. The application shall include an Employment, Skills and Training Plan to be agreed with the Council Place Shaping Principles 23. A layout, design and appearance for an extension to Woodstock that responds to the internationally and nationally significant heritage of the Blenheim Palace World Heritage Site, the Grade 1 Registered Park and Garden, and of Woodstock town. An approach that is fully integrated and connected with, the existing and planned built environment, which maximises the opportunity for walking, cycling and wheelchair use, which provides for a development that is integrated with a high quality green infrastructure and sensitive landscape setting, that fully protects the setting of the WHS and the Blenheim Villa Scheduled Ancient Monument and which greatly enhances the eastern built up edge of Woodstock 24. Development that causes no harm to Blenheim Palace World Heritage Site and the Grade 1 Registered Park and Garden and their settings. 25. Development that enhances the built and natural environment and provides green infrastructure that responds to the local historic context 26. Creation of routes/green infrastructure links to ensure a layout that affords good access to Woodstock 27. The siting, layout, and design of buildings and of green infrastructure to be the subject of design panel review. The panel shall be appointed by Cherwell and West Oxfordshire District Councils in consultation with Historic England. 28. Development that fully integrates with the approved development to the west and the wider area through provision of public footpath and cycle ways and connectivity to public transport services. 29. The cultural value of the Scheduled Ancient Monument should be reinforced through the design of public open space around the SAM appropriate to its setting and the setting of Blenheim Park. The provision of interpretation material should be accommodated 30. Development should create an attractive built frontage to the north of the open space surrounding the Scheduled Ancient Monument. 31. The existing wooded edges of the site to the A44 and Upper Campsfield Road are to be strengthened with new woodland planting creating a landscape buffer which limits views from the site towards the proposed Park & Ride to the south and from the World Heritage Site to the west. The character of the woodland should mirror the character of woodland to the west of the A44 including an avenue of larger trees planted on the road frontage, creating a distinctive gateway to Woodstock. 32. Pedestrian, cycle and wheelchair connections are to be created across the site connecting the public open space with the wider footpath network and A44 cycle route via new crossing points over the A44 and Upper Campsfield Road 33. Layout and design that encourages the sustainable and safe management of waste by individual households and by residents collectively while minimising the visual and pollution impacts		The air quality assessment was updated to address changes from additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014. The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Wolvercote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Two receptor transects listed were examined in detail to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre. • T1: Perpendicular to A40, west of A34 in a southerly direction. • T2: Perpendicular to A34, south of A40 in an east - westerly direction. The assessment found that the annual mean NOx exceeds the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NOx concentrations (around 30 µg/m3) and the proximity of the site to existing busy roads. Concentrations of annual mean NOx were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The greatest increase of 0.3 µg/m3 or less on the A34 compared to the assessment without the additional 4,400 homes (outlined in the Partial Review Proposed Submission Plan). The total concentration is however considerably lower in 2031 than is currently experienced. The increase on the A40 with Scenario 4 compared to the previous Local Plan is just 0.5 µg/m3 or less**, but here the critical level is expected to be met in 2031. The marginal increases in NOx concentrations are inconsequential given existing baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area. The condition of the Oxford Meadows SAC is currently favourable despite existing concentrations well above the critical level; small changes in NOx are therefore not considered to be significant. The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr). The total deposition rates at locations in transect 1 (A40) and transect 2 (A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios. When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the 4,400 homes (outlined in the Partial Review Proposed Submission Plan with Transport Improvement Package 2 plus Super Cycle Route). For some receptors, a change of 0.1 kg N/ha/yr is reported, however, this is down to rounding the decimal place. All changes are less than 1% of the lower critical load, equivalent to 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower critical load. It is therefore concluded that the changes introduced by the Partial Review Proposed Submission Plan in combination with the planned development in the rest of Oxfordshire by 2031, will not lead to any likely significant effects on the qualifying features of Oxford Meadows SAC. **NB. there is a marginally greater change of 0.5 µg/m3 next to the A40 (this is due to closer proximity of SAC boundary to the road here) but total concentrations are expected to remain below the critical level in 2031 due to lower traffic flows.
Policy PR11	**Infrastructure Delivery**	The Council's approach to infrastructure planning to contribute in meeting Oxford's unmet housing needs will be to ensure delivery by 1. Working with partners including central Government, the Local Enterprise Partnership, Oxford City Council,	No	**Policy Type 1- A1:** This policy will not itself lead to development (because it relates to design and other qualitative criteria for development and it is not a site specific land use planning

		West Oxfordshire District Council, Oxfordshire County Council and other service providers to (a) provide physical, community and green infrastructure (b) identify infrastructure needs and costs, phasing of development, funding sources and responsibilities for delivery 2. Completing and keeping up-to-date a Development Contributions Supplementary Planning Document setting out the Council's approach to the provision of essential infrastructure including affordable housing, education, transport, health, flood defences and open space 3. Development proposals will be required to demonstrate that infrastructure requirements can be met including the provision of transport education, health, social, leisure and community facilities, wastewater treatment and sewerage, and with necessary developer contributions to adopted requirements		policy). This policy is considered to have no likely significant effects on the European sites.
Policy PR12a	Delivering Sites and Maintaining Housing Supply	The Council will manage the supply of housing land for the purpose of constructing 4,400 homes to meet Oxford's needs. A separate five year housing land supply will be maintained for meeting Oxford's needs. At least 1700 homes will be delivered for Oxford for the period 2021 to 2026 for which a five year land supply shall be maintained on a continuous basis from 1 April 2021. The remaining homes will be delivered by 2031. Land South East of Kidlington (Policy PR7a – 230 homes) and Land South East of Woodstock (Policy PR10 – 410 homes) will only be permitted to commence development before 1 April 2026 if the calculation of the five year land supply over the period 2021 to 2026 falls below five years. For the period 2026-2031, the Council will maintain a land supply equivalent to the number of remaining years of that period taking into account any delivery surplus or shortfall and a 5% additional requirement. If there has been a record of persistent under delivery of housing in meeting Oxford's needs, the Council will increase the buffer to 20%. Permission will only be granted for any of the allocated sites if it can be demonstrated at application stage that they will deliver a continuous five year housing land supply on a site specific basis (i.e. measured against the allocation for the site). In the interest of securing delivery, planning conditions will be used to place time restrictions on the unimplemented 'life' of planning permissions. Should planning permission be granted for housing that will be delivered beyond 2031 and which results in the requisite 4,400 homes for Oxford being exceeded, this will be taken into account in meeting Cherwell's housing need in the next Local Plan review. Should the 4400 homes not be fully delivered by 2031, they will continue to be developed but will not contribute in meeting Cherwell's housing need in the next Local Plan review.	No	**Policy Type 1- A5:** This policy will lead to development by informing other policies, however this policy does not outline any development proposals and the exact details of where development may be located other than the general area. Their design and/or when (or if) these sites will be constructed upon are not stated. The Cherwell Local Plan 2011-2031 (Part 1) seeks to protect European sites through Policies ESD 9 and ESD 10. Therefore, should development arise from this objective, the need for HRA will be highlighted and will be undertaken at the development management stage and/or the preparation of Local Plan documents (including site specific policies in the Proposed Submission Partial Review Plan). Future allocations sites/planning applications will only be taken forward if it can be proven through HRA that there will be no adverse effect on the integrity of the European Sites from any of the proposed allocations sites/proposed planning applications. Any adverse effects on the integrity of European sites must be effectively mitigated. This policy is considered to have no likely significant effects on the European sites.
Policy PR12b	Sites Not Allocated in the Partial Review	Applications for planning permission for the development of sites to meet Oxford's needs that are not allocated in the Partial Review will not be supported unless: 1. Cherwell District Council has taken a formal decision that additional land beyond that allocated in the Partial Review is required to ensure the requisite housing supply 2. the proposed developments comply with Policy PR1 3. the site has been identified in the Council's Housing and Economic Land Availability Assessment as a potentially developable site 4. that prior consultation has been undertaken with the local community in a form to be agreed with the Council and the proposed development has the demonstrable support of the local community 5. the application is supported by: a. a comprehensive Development Brief to be agreed by the Council in consultation with Oxfordshire County Council and Oxford City Council b. a Delivery Plan demonstrating how the implementation and phasing of the development shall be secured comprehensively and how individual development parcels, including the provision of supporting infrastructure, will be delivered. The Delivery Plan shall include a start date for development, demonstration of how the development would be completed by 2031 and a programme showing how a five year supply of housing (for the site) will be maintained year on year c. a Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology) to be agreed with Cherwell District Council d. a proposed Biodiversity Improvement and Management Plan (BIMP) informed by the BIA and habitat surveys and to be agreed with the Council before development commences. e. phase 1 habitat surveys and other ecological surveys as appropriate f. a Transport Assessment and Travel Plan including measures for maximising sustainable transport connectivity, minimising the impact of motor vehicles on new residents and existing communities, and actions for updating the Travel Plan during construction of the development g. a Flood Risk Assessment h. a Heritage Impact Assessment which will include measures to avoid or minimise conflict with identified heritage assets within or adjacent to the site i. a desk-based archaeological investigation which may then require predetermination evaluations and	No	**Policy Type 1- A5:** This policy will lead to development by informing other policies, however this policy does not outline any development proposals and the exact details of where development may be located other than the general area. Their design and/or when (or if) these sites will be constructed upon are not stated. The Cherwell Local Plan 2011-2031 (Part 1) seeks to protect European sites through Policies ESD 9 and ESD 10. Therefore, should development arise from this objective, the need for HRA will be highlighted and will be undertaken at the development management stage and/or the preparation of other Local Plan documents. Future allocations sites/planning applications will only be taken forward if it can be proven through HRA that there will be no adverse effect on the integrity of the European Sites from any of the proposed allocations sites/proposed planning applications. Any adverse effects on the integrity of European sites must be effectively mitigated. This policy is considered to have no likely significant effects on the European sites.

		appropriate mitigation measures j. proposals for securing the long-term use, management and maintenance of the formal sports provision and play areas k. draft Heads of Terms for developer contributions to be secured by way of legal agreement		
Policy PR13	Monitoring and Securing Delivery	The delivery of the policies contained within this Partial Review of the Local Plan will be monitored at least annually against the framework at Policy PR12a in order to complete the construction of 4,400 homes by 2031, to meet the strategic objectives and achieve the vision. The Council will work closely with relevant site promoters, developers and landowners to ensure that Development Briefs and applications for planning permission are prepared and considered within a timescale that will facilitate the delivery of homes required to deliver the Plan requirement and the maintenance of land supply. The Council will work in partnership with the Oxfordshire local authorities and other stakeholders to address strategic requirements arising from the cumulative effect of growth in the County. This will include the implementation of Local Plans and County wide strategies such as the Local Transport Plan and the Oxfordshire Infrastructure Strategy. The results of monitoring will be used to assess: 1. whether there are any obstacles to development that the Council can act upon 2. whether there are any obstacles to development that require discussion with site promoters, developers, service and infrastructure providers or Government agencies 3. whether there is a significant risk to the delivery of the Plan's requirements or the maintenance of land supply 4. delivery progress including for reporting to through the Oxfordshire Growth Board If monitoring indicates that the vision and objectives cannot be met, the Council will consider whether it wishes to ask the Secretary of State for Communities and Local Government to revoke the Partial Review under Section 25 of the Planning and Compulsory Purchase Act 2004 in the interest of releasing alternative sites that will achieve delivery by 2031.	No	**Policy Type 1- A5:** This policy will lead to development, however, the details of where development may be located, their design and/or when (or if) these sites will be constructed are not contained in the policy. The Cherwell Local Plan 2011-2031 (Part 1) seeks to protect European sites through Policies ESD 9 and ESD 10. Therefore, should development arise from this objective, the need for HRA will be highlighted and will be undertaken at the development management stage and/or the preparation of other Local Plan documents. Future allocations sites/planning applications will only be taken forward if it can be proven through HRA that there will be no adverse effect on the integrity of the European Sites from any of the proposed allocations sites/proposed planning applications. Any adverse effects on the integrity of European sites must be effectively mitigated. This policy is considered to have no likely significant effects on the European sites.

Appendix C. Air Quality Assessment

Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Need Proposed Submission Plan HRA

Air Quality Assessment Update 2017

Cherwell District Council

6 June 2017

Notice

This document and its contents have been prepared and are intended solely for Cherwell District Council's information and use in relation to the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) Oxford's Unmet Housing Need Proposed Submission Plan HRA Air Quality Assessment Update.

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1 Introduction

1.1 Background

This report describes the assessment of air quality impacts on the ecosystems within Oxford Meadows Special Area of Conservation (SAC), for the purposes of the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Needs Proposed Submission Plan- Habitats Regulations Assessment (HRA). The HRA is required under the Habitats Directive (92/43/EEC), implemented in England by the Conservation of Habitats and Species Regulation 2010 (SI 2010/490).

An air quality assessment was originally undertaken by Atkins in 2010 for the Cherwell Draft Core Strategy Habitats Regulations Assessment: Stage 1 – Screening, which was subsequently updated in 2012, 2013 and 2014 to address changes to the total housing and employment provision accommodated in the Local Plan, revisions to the associated Oxfordshire County Council (OCC) strategic traffic model (OSM) and updates to air quality assessment tools produced by the Department for Environment, Food and Rural Affairs (DEFRA). This report updates the "Proposed Modifications to the Submission Cherwell Local Plan August 2014 – Habitats Regulations Assessment Screening - Air Quality Ecosystem Assessment Update 2014".

Cherwell District Council (Cherwell) has examined a new scenario described as the "2031 Cherwell Transport Improvement Package 2 plus Cycle Super Route" (Scenario 4) which includes all the planned and permitted housing and employment detailed in the adopted Cherwell Local Plan with additional housing identified in the emerging Cherwell Local Plan Part 1 Partial Review (an additional 4,400 dwellings),plus additional policies to moderate road traffic increases and promote a modal shift to other forms of transport, notably cycling.

The changes have been accounted for in a further revision to the OSM (which has a 2013 Base Year and a 2031 Future Year), and three new air quality scenarios are examined: a base model for the year 2013, a Do Minimum scenario for 2031 with the Cherwell Local Plan policies in place and a Do Something Scenario 4, described as the "2031 Cherwell Transport Improvement Package 2 plus Super Cycle Route scenario". The transport models take account of the latest information on development completions, commitments and allocations in the other Oxfordshire districts.

In 2016, DEFRA published updated air quality technical guidance[7] and associated tools relating to background concentrations, vehicle emission factors. These tools are re-issued periodically and represent the current understanding of vehicle emissions and assumptions regarding future trends in air pollutant concentrations.

This report presents the findings of an updated air quality assessment to estimate the change in concentrations and deposition within the Oxford Meadows SAC from implementing the Cherwell Local Plan 2011-2031 (Part 1) Partial Review Proposed Submission Plan compared to the previously assessed Cherwell Local Plan (Atkins 2014), using the most up to date traffic data and assessment tools.

1.2 Air pollutants and criteria

Concentrations of pollutants in ambient air and their consequent deposition to vegetation, soil and water can potentially damage vegetation directly or indirectly, through:

- reduced plant health and productivity,
- a shift in the competitive balance between species,
- changes in plant species composition or,
- subtle changes in vegetation structure which could affect the use of a habitat by an animal species.

The main air pollutants affecting vegetation and ecosystems are oxides of nitrogen (NO_x), sulphur dioxide (SO_2) and ammonia (NH_3). These have both direct effects e.g. through exposure to the gas itself; and indirect effects, e.g. through deposition of the gas to soil and freshwater (dry deposition) or with precipitation (wet deposition).

[7] Local Air Quality Management. Technical Guidance 2016, Defra, (LAQM.TG(16)) available at https://laqm.defra.gov.uk/technical-guidance/

This report focusses on the effect of additional vehicle emissions (a key source of NO_x emissions) due to the future development traffic within Cherwell on NO_x concentrations and dry nitrogen deposition within the Oxford Meadows SAC.

An increase in road traffic due to the additional development may cause an adverse effect on the habitat within a designated site. The magnitude of the impact on air quality at the designated site will depend upon the magnitude of the source (number, type and speed of vehicles), the distance from pollution source, and other site characteristics such as ground cover which affect dispersion and deposition. The potential for significant effects on the vegetation within the site will depend on the sensitivity of the species to changes in nitrogen deposition and the existing conditions within the site.

The European Directive on ambient air quality (2008/50/EC) sets a critical level for annual mean NO_x concentrations for the protection of vegetation of 30 µg/m³, as an annual average. This value is based on the work of the United Nations Economic Commission for Europe (UNECE) and World Health Organisation (WHO). In England, the critical levels have been incorporated into the Air Quality Standards Regulations 2010, Schedule 6 (SI 2010/1001). The Directive 2008/50/EC identifies that "*The risk posed by air pollution to vegetation and natural ecosystems is most important in places away from urban areas. The assessment of such risks and the compliance with critical levels for the protection of vegetation should therefore focus on places away from built-up areas*."

It should be noted that assessment against the 30 µg/m^3 annual mean NOx critical level is only strictly applicable at locations more than 20 kilometres (km) from towns with more than 250,000 inhabitants or more than five km from other built-up areas, industrial installations or motorways (including major roads with over 50,000 vehicles). The Oxford Meadows SAC is less than five kilometres from the built-up areas of north Oxford, and the A34 is classed as a major road. Nevertheless, the policy of the Statutory Nature Conservation Agencies in the UK (in England, Natural England) is to apply the critical levels as a benchmark in all European designated conservation sites, on a precautionary basis.

In addition to the critical level for annual mean NO_x concentrations, critical loads for nitrogen deposition flux have been set by UNECE. These represent, according to current knowledge, the exposure below which there should be no significant harmful effects on sensitive elements of the ecosystem. The critical loads have been established for many habitat types that are dependent on low nitrogen levels. Critical loads are expressed in deposition units of kilograms of nitrogen per hectare per year (kg N/ha/yr). The main source of critical loads is the Air Pollution Information System (APIS) online resource.

It is noted that the main role of NOx is as a source of nitrogen and the critical level for NOx is set at a precautionary level[8] to allow for effects from increased atmospheric inputs. The comparison with the critical load should be the overriding consideration in an assessment of potential effects.

[8] WHO Regional Office for Europe, Copenhagen, Denmark, 2000. Air Quality Guidelines – Second Edition. Chapter 11 Effects of nitrogen containing air pollutants: critical levels. The evidence presented in this report indicates that, other than growth effects, biochemical or physiological effects have been demonstrated in vascular plants from exposure to annual average concentrations of more than 100 µg/m^3.

2. Methodology

2.1 Changes since 2014

This air quality assessment update for the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Need Proposed Submission Plan HRA considers the impact of updates to the OSM transport model and scenario modelling since 2014, plus changes to DEFRA air quality assessment guidance and supporting tools published in 2016.

The calculation of roadside pollutant concentrations uses the detailed atmospheric dispersion model, ADMS-Roads (v4.0).

The assessment for estimating impacts at ecological sites follows Annex F of Highways Agency's Design Manual for Roads and Bridges, Volumes 11, Section 3, Part 1 (May 2007)[9] and supporting Interim Advice Notes (IAN)[10]

The assessment uses:

- DEFRA Technical Guidance LAQM.TG16
- Emission Factor Toolkit (EFT) 2016 (v 7.0)
- 2013 reference year background maps for years 2013-2030[11]
- updated version of the NO_x to NO_2 Calculator (v5.1) [12]

2.2 Spatial scope

For the purposes of HRA, an examination of concentrations of NOx concentrations and nitrogen deposition flux (rate) is required where any national or European designated sites (Natura 2000) are identified within 200 metres (m) of roads affected by the proposals and where the designated features are sensitive to air pollution.

The study area for this air quality assessment update is limited to the Oxford Meadows SAC. This site, situated in the Thames Valley Distribution, currently demonstrates good conservation of structure and function of lowland hay meadows (an Annex 1 habitat). Additional information about the site is provided in the Atkins report "Partial Review of the Cherwell Local Plan 2011-2031 (Part 1) –Oxford's Unmet Housing Need Proposed Submission Plan -Habitat Regulations Assessment Screening Report".

The Oxford Meadows SAC is adjacent to the south of the A40 and straddles the A34 at Lower Woodcote. A small section of a minor road, Godstow Road, passes adjacent to it at Wolvercote. Therefore, three receptor transects were examined to estimate the effect of vehicle emissions from these roads up to a distance of 200 m from the road centre (see Table 2-1 and Appendix A, Figure A-1).

Table 2-1 Transects used in the assessment of Oxford Meadows SAC

Transect	Location
T1	Perpendicular to A40, west of A34 in a southerly direction.
T2	Perpendicular to A34, south of A40 in an east - westerly direction.
T3	Perpendicular to Godstow Road in a south easterly direction.

[9] Highways Agency Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 1, Air Quality, revised May 2007 (Ref: HA 207/07)
[10] http://www.standardsforhighways.co.uk/ha/standards/ians/
[11] Available at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013
[12] Available at https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc

2.3 Traffic data

The traffic flow data used in the assessment were taken from the OSM. A summary of traffic data for road links within 200 m of the SAC is provided in Table B-1 of Appendix B The traffic data used in the 2012 and 2014 air quality updates are presented in Table B-2 and Table B-3 for comparison.

The traffic modelling outputs assessed in this report are:

- 2013 Baseline- representing travel conditions in 2013
- 2031 Do Minimum scenario - includes all the planned and permitted housing and employment detailed in the adopted Cherwell Local Plan and that of neighbouring local authorities.
- 2031 Do Something -Scenario 4 'Transport Improvement Package 2 and Super Cycle Route', includes all the planned and permitted housing and employment in the Cherwell Local Plan and that of neighbouring authorities plus additional housing identified in the emerging Cherwell Local Plan Part 1 Partial Review (4,400 dwellings), transport mitigation Package 2 and Super Cycle Route.

The Annual Average Daily Traffic (AADT) flows for 24 hours, twenty-four hour daily average speed and percentage HDV data were provided by the transport modelling team, factored from the OSM morning (AM) and evening (PM) peak period data.

The traffic data for each of the roads adjacent to the transects were examined and the changes in 2031 due to the revised Local Plan were compared with assessment criteria to determine the extent of assessment required. In light of the recent Wealden Forest Case judgment, an amendment to the standard DMRB affected roads criteria was adopted[13]. Roads were therefore included in the modelling where they met any of the following criteria:

- within 200 m of the designated site; and
- Total daily traffic flows will change by 500 AADT or more; or
- Heavy Duty Vehicle (HDV)[14] flows will change by 100 AADT or more; or
- daily average speed will change by 10 km/hr or more; or
- peak hour speed will change by 20 km/hr or more; or
- road alignment will change by 5 m or more.

The HDV percentages used in this assessment include Heavy Goods Vehicles (HGVs) as well as buses and coaches. This represents an improvement in the methodology compared with the 2014 air quality assessment update, where bus and coach numbers were estimated to be zero.

The 2031 Scenario 4 (Do Something) data were compared with the Cherwell Local Plan (Do Minimum) data and the following changes in traffic flow and speed were identified:

- A40, west of A34: +1,129 AADT, +26 HDV, -2 kph;
- A34, south of the A40: +1,008 AADT, +24 HDV, 0 kph; and
- Godstow Road: -56 AADT, -3 HDV, 0 kph.

The changes on the A34 and A40 clearly require further examination; however, the change in traffic on Godstow Road would result in an inconsequential change in NO_x and N deposition (based on recent work by Atkins).

The latest traffic data representing the latest Cherwell Local Plan in 2031 were compared with the Cherwell Local Plan in 2031 used in the 2014 air quality assessment update. The following changes (rounded to nearest 10 vehicles) are noted:

[13] A High Court judgment handed down on 20 March 2017 Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351 (Admin) has shed doubt on the acceptability of the Highways England criterion of 1,000 AADT. Until further clarification is received, Atkins advises using a more stringent criterion of 500 AADT. Such a change was estimated to give an inconsequential increase of 0.2% in nitrogen deposition at Oxford Meadows in 2031 (extract from forthcoming Non Statutory HRA for Oxfordshire, Atkins 2017).
[14] Any vehicle with a gross weight greater than 3.5 tonnes, including heavy goods vehicles (HGVs), buses and coaches.

- A40: decrease ~180 AADT, decrease in HDVs from 11% to 4% (-1440 vehicles);
- A34: decrease ~3,800 AADT, decrease in HDVs from 9% to 2%; (-6,300 vehicles); and
- Godstow Road: increase ~1,120 AADT, decrease in HDVs from 9% to 3% (-350 vehicles).

This suggests that findings from the 2014 air quality assessment update may no longer be relied upon, and confirms that with the revisions to air quality tools released in 2016 an updated detailed assessment is appropriate where the SAC borders the A40 and the A34.

Further assessment at Godstow Road is not deemed necessary. The total flow on Godstow Road remains low at only 7,000 AADT and the findings from all previous assessment work identified no risk of ecological receptors near Godstow Road exceeding the critical level or the critical load for the site. Although an increase in traffic flows since the 2014 assessment is expected, this will be partly offset by the lower number of HDVs meaning there will be little change to overall vehicle emissions on the road link in question.

2.4 Detailed dispersion modelling

The ADMS-Roads(v4.0) detailed dispersion model and associated air quality assessment tools were used to estimate concentrations of nitrogen oxides (NOx) and nitrogen dioxide (NO_2)[15] along the A34 and A40 transects. Model receptors were placed at intervals from the closest SAC boundary to the road up to a distance of 200 m from the road centreline.

The air dispersion modelling uses:

- annual average daily vehicle flows and speeds;
- the proportion of HDVs;
- diurnal profile to represent the change in flow over a typical week;
- hour by hour meteorological conditions over a year;
- changes in future exhaust emissions due to legislation;
- road type; and
- the distance between the receptor and the roads carrying the traffic.

Emission rates for each road link were calculated using the DEFRA EFT (v7.0). Background concentrations from DEFRA (2013 base year), and the DEFRA NO_x to NO_2 calculator (v5.1) were used to convert the NOx contribution output from the detailed dispersion model to total NO_x and NO_2 concentrations.

No change in emission factors is assumed beyond 2030, as this is the limit of the EFT projections.

Model verification was undertaken in line with DEFRA guidance LAQM.TG16.

Further detail on the air dispersion model input data, verification process and assessment criteria are provided in Appendix C.

2.5 Background concentrations

The ADMS-Roads dispersion model provides an estimate of the explicitly modelled emissions from the road links. These must be added to a background component to estimate total NO_x.

Estimates of background concentrations were obtained for the study area from one-kilometre square resolution maps published by DEFRA. These provide total concentrations of NOx and NO_2 for each grid square. In addition, the data are broken down by source sectors for NOx to enable the individual emission sectors to be subtracted from the total concentrations when modelling of that sector has been carried out. This avoids double counting of sources and is an important element of road dispersion modelling.

Not all roads within the one kilometre grid squares of interest have been modelled explicitly. On this basis, no road sectors have been subtracted for total grid square NO_x backgrounds for this assessment. This is a precautionary approach.

[15] NO_2 rather than NO_x concentrations are used in the calculation of the road increment of nitrogen deposition according to HA207/07.

The background concentrations for the one kilometre grid squares containing the transects are provided in Table 2-2 below. As for the EFT, background concentrations are only available up to 2030, beyond which it is assumed that these concentrations would not change.

Table 2-2 DEFRA Background concentrations for the 1km grid squares used in the assessment (µg/m^3)

Transect	1km Grid Square	2013		2031	
		NO_x	NO_2	NO_x	NO_2
T1 (A40)	448500, 210500	32.0	21.6	19.5	13.8
T2 (A34)	448500, 209500	29.0	19.9	17.5	12.6

The tabulated values suggest that for Transect 1, the annual mean NOx background concentration marginally exceeds the critical level for the protection of vegetation of 30 µg/m^3 in 2013, i.e. before modelled road contributions are added. The background concentration at Transect 2 is just below the critical level. In 2031, annual mean NO_x background concentrations are expected to reduce by approximately one third and thus meet the objective (note, a discussion on trends is provided below in the section on uncertainty).

Modelling of the additional contribution of road traffic emissions was undertaken (results presented in Section 3) to allow a comparison of total pollutant concentrations with the critical level for NO_x and subsequent calculation of nitrogen deposition.

For nitrogen deposition flux calculations in accordance with DMRB (HA207/07) (see next section) average background concentrations of NO_x and NO_2 are required for a five-kilometre grid square. This is calculated from the average of the one kilometre grid squares covering the same area. The background concentrations for the five-kilometre grid squares containing the transects are provided in Table 2-3 Table .

Table 2-3 Average DEFRA Background concentrations for the APIS 5km grid squares (µg/m^3)

Transect	5km Grid Square	2013		2031	
		NO_x	NO_2	NO_x	NO_2
T1 (A40)	445000,210000	22.6	15.9	13.8	10.1
T2 (A34)	445000,205000	22.1	15.6	13.2	9.8

2.6 Nitrogen deposition

The Oxford Meadows SAC is designated for its important lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) and is one of only two known sites in the UK where creeping meshwork (*Apium ripens*) is present. The critical load range for nitrogen deposition is 20 to 30 kg N/ha/yr for low and medium altitude hay meadow. The effect of nitrogen deposition in excess of this range is an increase in tall grasses and decreased diversity.

The Air Pollution Information System (APIS) is used to evaluate the effects of air pollution on ecological habitats as part of consenting or permitting work. The APIS website[16] provides modelled pollutant concentrations, nitrogen and acid deposition rates across the whole of the UK and site specific data for SSSIs, SACs and SPAs. The data are provided as a 2014 average (2013 to 2015) at a 5 km grid resolution.

The background nitrogen deposition rate across the entire area of the Oxford Meadows SAC (2014 average) is 17.1 kg N/ha/yr, below the lower critical load. The range across the SAC is a maximum of 21.4 kgN/ha/yr and a minimum of 15.3 kg N/ha/yr (see Table 2-3). To estimate the change in total nitrogen deposition rate from traffic changes on roads adjacent to the SAC, total average nitrogen deposition rates were determined using the value for the appropriate 5 km grid square within which each transect lies.

The 2014 APIS deposition rates were adjusted to estimate conditions in the opening year 2031, by reducing rates by a set amount each year. In previous HRA air quality assessments (2012 and 2014) a sensitivity test was carried out whereby the total nitrogen deposition rate was reduced by 1% per year instead of the 2%

[16] http://www.apis.ac.uk/

used in the standard DMRB methodology. (This approach was agreed with Natural England for the 2014 assessment). More recently evidence from nitrogen deposition monitoring across the country has confirmed a 2% decrease in total nitrogen deposition each year is unrealistic (see Appendix D). Therefore, for this assessment, a rate of reduction of 1% per annum has been directly applied to the APIS nitrogen deposition rates for 2014 (see Table 2-4 below). This is in line with projected trends in background NO_x concentrations (Appendix D).

Average total nitrogen deposition rates obtained for 2014 and the 2031 future scenarios are shown in.

Table 2-4 APIS 5km Nitrogen Deposition Rates (kgN/ha/yr)

Transect	5km Grid Square	Average Total Nitrogen Deposition Rate	
		2014	2031*
T1 (A40)	445000,210000	21.4	17.8
T2 (A34)	445000,205000	15.3	12.7

*estimated based on a 1% year on year reduction

It is noted that the nitrogen deposition rates presented in Table 2-4 for the two transects the background rate for T1 is 40% higher than T2, though the average background NO_x concentrations for the equivalent 5 km grid squares (presented in Table 2-3) are relatively similar. The mapping methodology for determining the total nitrogen deposition includes many aspects which are not related to airborne NO_x concentrations. The 5km maps do not provide sufficient resolution to determine whether the elements which lead to a higher deposition rate in square 445000, 210000 are likely to reflect the conditions at the SAC. Thus, the APIS deposition rates have been applied for each transect without any adjustment, in line with standard methodology.

To estimate the total nitrogen deposition rates for the 2031 scenarios, the total annual mean NO_2 concentration at each transect receptor, according to the procedure described in Annex F of DMRB. The road increment at each transect receptor is the remainder when the average background NO_2 values for the 5 km grid square, presented in Table 2-3 Table are removed from the modelled total NO_2 concentration at the receptor and adjusted to the dry NO_2 deposition rate by multiplying by 0.1. The average total nitrogen deposition rate is the background nitrogen deposition rate presented in Table 2-4 plus the road increment. The calculated total nitrogen deposition rates can then be compared with the critical load for Oxford Meadows SAC, 20-30 kg N/ha/yr.

2.7 Consideration of uncertainty

Since the previous air quality assessment update was undertaken in 2014, several of the uncertainties explored within that report have been addressed. The following improvements have been made:

- use of a detailed atmospheric dispersion model instead of the DMRB air quality screening method;
- use of the latest estimates of background NO_x and NO_2 concentrations from the updated DEFRA mapping;
- verification of the model results for the base year against monitoring data to ensure the model is representative of real world conditions;
- applied the latest DEFRA EFT (v7.0) which forecast traffic composition and vehicle emission rates up to 2030.
- use of a realistic method to reduce background nitrogen deposition in future years, based on recent evidence.

There is expected to be a further update to the EFT and background maps in 2017, to reflect new information about vehicle emissions. Until this information becomes available from DEFRA, the currently published data must be applied. The suitability of assumptions within the current version of background maps has been verified through comparison to monitoring data from the past 11 years. There is evidence of declining background pollutant concentrations (details in Appendix D) at a rate of 0.7 $\mu g/m^3$ NO_x per year, or a 40% reduction over the 11-year period examined (approximately 4% per year). This is in line with the rate of reduction used in the background mapped concentrations for the study area, therefore the use of 2030 projections is appropriate. Further evidence of a declining trend in concentrations across the Cherwell

district, including at roadside locations, is found in the Cherwell Annual Status Report for local air quality management[17].

There remain some uncertainties that cannot be fully addressed as they are outside the scope of an individual assessment; for instance, the resolution of the APIS background nitrogen deposition rates being limited to 5km grid squares. However, the application of robust assumptions throughout the assessment ensures that the findings of this air quality assessment update are appropriate.

2.8 Assessment criteria

The assessment of air quality impacts is made against the critical level of 30 µg/m^3 for general vegetation and the critical load range of 20 to 30 kg N/ha/yr for low altitude hay meadows. Below these values, significant effects on vegetation are not expected to occur.

The Environment Agency risk assessment guidance[18], the Institute of Air Quality Management Position Statement[19] and Highways England IAN on evaluating significant local air quality effects[20] all refer to a 1% threshold below which an increase in pollution can be deemed to be inconsequential (either alone or in combination) and therefore the potential for significant effects is insignificant. This 1% threshold represents a "*de minimis*" amount, which air quality professionals deem to be inconsequential since it is a) challenging to measure to an accurate degree (i.e. it is within the precision range of even the best available instrumentation) and b) very difficult if not impossible to differentiate from natural fluctuations in background levels (e.g. due to meteorological conditions and other, variable emission sources).

A 1% threshold has been adopted for use in this screening assessment, and thus where the modelled increment at the location within the designated site nearest to the road edge is less than 1% of the criterion in terms of NOx (0.3 µg/m^3) or critical load (0.02 kg N/ha/yr for the habitat in question)[21] it is deemed to have no risk of significant adverse effects.

In summary,

- If the PC does not exceed 1% of relevant critical level/load the potential for significant effects is insignificant; and
- If the PC exceeds 1% but the resulting total concentration is below the relevant critical level/load, the potential for significant effects is considered not to be significant;
- If the PC exceeds 1% and the PEC exceeds the relevant critical level/load, the potential for significant effects cannot be ruled out and further consideration is recommended.

[17] http://www.cherwell.gov.uk/media/pdf/h/1/2016_Annual_Status_Report.pdf
[18] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas
[19] IAQM (2016) Use of a Criterion for the Determination of an Insignificant Effect of Air Quality Impacts on Sensitive Habitats
[20] http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian174.pdf The IAN notes that, even if considered further, a change of 1% of the critical level for NOx would be reversible within approximately two years based on current long term trends.
[21] The absolute contribution of a pollutant to an ecosystem which receives an impact at this level is deemed to be inconsequential. A contribution of 1% of the critical load of 20 kg/ha/yr is equivalent to 0.02 grams of nitrogen per square metre per year. It is extremely unlikely that an emission at this level will result in a significant effect.

3. Assessment results

3.1 Oxides of nitrogen

Annual mean NO_x concentrations were estimated at the boundary of the Oxford Meadows SAC and at regular intervals up to 200 m from the road centreline on two transects (A40 and A34), identified in Table 2-. The results are presented in Table for the three modelled scenarios (Base, Do Minimum (DM) and Do Something (DS)) and the two transects of interest. Note that Transect 2 (A34) covers both sides of the road.

As identified in the methodology section, the modelled road contribution to NOx is added to the mapped background NO_x concentration. For the grid square containing Transect 1, the background annual average NO_x concentration is 32.0 µg/m^3 in 2013; for Transect 2 the background NO_x concentration is 29.0 µg/m^3. The assessment of annual mean NO_x concentrations shows that the critical level is exceeded in the 2013 base scenario up to 200 m from the A40 and A34 adjacent to the Oxford Meadows SAC (including SSSI units 2 and 3 of Pixey and Yarnton Meads). The condition of these SSSI units was identified[22] as favourable (from 1997 to 2012). There is anticipated to be a substantial improvement in NO_x concentrations between 2013 and 2031.

In 2031 estimated concentrations at Transect 1 (A40) are below the critical level at all receptors for both scenarios. The difference in NO_x concentrations between the Do Something (2031 Cherwell Transport Improvement Package 2 plus Cycle Super Route; Scenario 4) and the Do Minimum (2031 Cherwell Local Plan) is an increase in NO_x concentrations of 0.5 µg/m^3 at the closest receptor to the A40 i.e. at the SAC boundary. The modelled differences in NO_x concentrations are 0.3 µg/m^3 (1% of the critical level) or less beyond 25 m of the road centreline. At all locations, total NO_x concentrations are below the critical level.

Annual mean NO_x concentrations at Transect 2 (A34) exceed the critical level in the 2013 base scenario at all transect receptor locations up to 200 m from the road. This road carries a high volume of traffic thus this is not unexpected. In 2031 the critical level is still exceeded up to 50 m to the north west of the road and 100 m to the south east of the A34 in both scenarios. The highest concentration is estimated at 24 m south east of the road centreline, the closest point to the SAC. Estimated concentrations were below the critical level at all other locations. The difference in NO_x concentrations between the Do Something (2031 Cherwell Transport Improvement Package 2 plus Cycle Super Route; Scenario 4) and the Do Minimum (2031 Cherwell Local Plan) is an increase in NO_x concentrations of 0.3 µg/m^3 (1% of the critical level) or less at all receptors.

In summary, the largest modelled difference in NO_x concentrations in 2031 as a result of Cherwell Transport Improvement Package 2 plus Cycle Super Route (Scenario 4) compared to the Cherwell Local Plan is an increase of 0.5 µg/m^3 at the closest receptor to the A40. The total NO_x concentration is less than the critical level in 2031 at all locations. The NO_x critical level is exceeded within 50 m to the north west and 100 m to the south east of the A34 in 2031. The difference between the two modelled scenarios is just 0.3 µg/m^3 or less at 25m from the road centreline. This change in NO_x concentration is just 1% of the critical level and occurs over a relatively small area of the total site.

[22] http://magic.defra.gov.uk/

Table 3-1 Estimated annual mean NOx concentrations (µg/m^3)

Receptor Distance	2013 Base	2031 Cherwell Local Plan (DM)	2031 Transport Improvement Package 2 plus Super Cycle Route (DS)	Change
Transect 1 (A40)				
14m	**49.7**	26.9	27.4	0.5
24m	**44.6**	25.4	25.7	0.3
34m	**42.1**	24.5	24.8	0.3
44m	**40.6**	24.0	24.3	0.3
53m	**39.5**	23.6	23.8	0.2
73m	**38.3**	23.1	23.3	0.2
83m	**37.8**	22.9	23.1	0.2
102m	**37.2**	22.6	22.8	0.2
122m	**36.8**	22.4	22.5	0.1
142m	**36.5**	22.3	22.4	0.1
161m	**36.2**	22.2	22.3	0.1
181m	**36.1**	22.1	22.2	0.1
199m	**35.9**	22.0	22.1	0.1
Transect 2 (A34)				
199m	**36.8**	22.0	22.0	<0.1
173m	**37.9**	22.5	22.6	0.1
152m	**39.0**	23.0	23.1	0.1
131m	**40.5**	23.7	23.8	0.1
111m	**42.5**	24.6	24.7	0.1
90m	**45.3**	25.8	25.9	0.1
69m	**49.5**	27.4	27.6	0.2
48m	**56.8**	30.0	**30.1**	0.1
38m	**63.0**	**31.9**	**32.0**	0.1
24m	**87.8**	**48.3**	**48.6**	0.3
34m	**74.6**	**41.7**	**41.9**	0.2
44m	**66.8**	**37.8**	**38.0**	0.2
55m	**61.5**	**35.1**	**35.3**	0.2
65m	**57.8**	**33.2**	**33.3**	0.1
85m	**52.6**	**30.5**	**30.7**	0.2
105m	**49.2**	28.7	28.8	0.1
125m	**46.7**	27.4	27.5	0.1
146m	**44.8**	26.4	26.5	0.1
166m	**43.3**	25.6	25.7	0.1
186m	**42.1**	24.9	25.0	0.1
199m	**41.4**	24.6	24.6	<0.1
Values shown in **bold** highlight NO_x concentrations above the critical level for NO_x annual mean 30 µg/m^3				

3.2 Nitrogen deposition

The nitrogen deposition rate was calculated using the APIS background deposition rates plus the modelled increment from the road within 200 m. The change in deposition rate due to the change in traffic data was noted and the total deposition rate compared with the UNECE critical load for low and medium altitude hay meadow habitat (20-30 kg N/ha/yr).

The total nitrogen deposition rate, the road increment and the comparison with the critical load on each transect are presented in Table 3.2 and Table 3.3.

The total deposition rate at locations in transect 1(A40) and transect 2(A34) were all estimated to be below the lower threshold of the critical load at all locations and for both 2031 scenarios.

When the results for the two scenarios are compared, there is no measurable change in nitrogen deposition rates as a result of implementing the Transport Improvement Package 2 plus Super Cycle Route. The change in nitrogen deposition is reported as 0.1 kg N/ha/yr or less for all receptors. For some receptors, a change of 0.1 is reported, however this is down to rounding the figures to the nearest 0.1 decimal place and does not occur at the receptors closest to the road. All changes are less than 1% of the lower critical load which is 0.02 kg N/ha/yr, and all estimated nitrogen deposition rates are below the lower limit of the critical load.

Table 3-2 Nitrogen deposition assessment at Oxford Meadows SAC Transect 1 (A40)

Distance from centre (m)	Total N deposition rate (kgN/ha/yr)			Road increment (kgN/ha/yr)			Road increment as % of total N deposition rate		Critical Load Range (kgN/ha/yr)	Critical Load Exceedance Range	
	DM	DS	Change	DM	DS	Change	DM	DS		DM	DS
14m	18.6	18.6	<0.1	0.8	0.8	<0.1	4.3%	4.3%	20 - 30	Not Exceeded	Not Exceeded
24m	18.5	18.5	<0.1	0.7	0.7	<0.1	3.8%	3.8%	20 - 30	Not Exceeded	Not Exceeded
34m	18.4	18.5	0.1	0.6	0.7	0.1	3.3%	3.8%	20 - 30	Not Exceeded	Not Exceeded
44m	18.4	18.4	<0.1	0.6	0.6	<0.1	3.3%	3.3%	20 - 30	Not Exceeded	Not Exceeded
53m	18.4	18.4	<0.1	0.6	0.6	<0.1	3.3%	3.3%	20 - 30	Not Exceeded	Not Exceeded
73m	18.4	18.4	<0.1	0.6	0.6	<0.1	3.3%	3.3%	20 - 30	Not Exceeded	Not Exceeded
83m	18.4	18.4	<0.1	0.6	0.6	<0.1	3.3%	3.3%	20 - 30	Not Exceeded	Not Exceeded
102m	18.3	18.4	0.1	0.5	0.6	0.1	2.7%	3.3%	20 - 30	Not Exceeded	Not Exceeded
122m	18.3	18.3	<0.1	0.5	0.5	<0.1	2.7%	2.7%	20 - 30	Not Exceeded	Not Exceeded
142m	18.3	18.3	<0.1	0.5	0.5	<0.1	2.7%	2.7%	20 - 30	Not Exceeded	Not Exceeded
161m	18.3	18.3	<0.1	0.5	0.5	<0.1	2.7%	2.7%	20 - 30	Not Exceeded	Not Exceeded
181m	18.3	18.3	<0.1	0.5	0.5	<0.1	2.7%	2.7%	20 - 30	Not Exceeded	Not Exceeded
199m	18.3	18.3	<0.1	0.5	0.5	<0.1	2.7%	2.7%	20 - 30	Not Exceeded	Not Exceeded

Table 3-3 Nitrogen deposition assessment at Oxford Meadows SAC Transect 2 (A34)

Distance from centre (m)	Total N deposition rate (kgN/ha/yr)			Road increment (kgN/ha/yr)			Road increment as % of total N deposition rate		Critical Load Range (kgN/ha/yr)	Critical Load Exceedance Range	
	DM	DS	Change	DM	DS	DM	DS	Change	DM	DS	DM
199m	13.2	13.2	<0.1	0.5	0.5	<0.1	3.8%	3.8%	20 - 30	Not Exceeded	Not Exceeded
173m	13.2	13.3	0.1	0.5	0.6	0.1	3.8%	4.5%	20 - 30	Not Exceeded	Not Exceeded
152m	13.3	13.3	<0.1	0.6	0.6	<0.1	4.5%	4.5%	20 - 30	Not Exceeded	Not Exceeded
131m	13.3	13.3	<0.1	0.6	0.6	<0.1	4.5%	4.5%	20 - 30	Not Exceeded	Not Exceeded
111m	13.4	13.4	<0.1	0.7	0.7	<0.1	5.2%	5.2%	20 - 30	Not Exceeded	Not Exceeded
90m	13.4	13.4	<0.1	0.7	0.7	<0.1	5.2%	5.2%	20 - 30	Not Exceeded	Not Exceeded
69m	13.5	13.5	<0.1	0.8	0.8	<0.1	5.9%	5.9%	20 - 30	Not Exceeded	Not Exceeded
48m	13.6	13.6	<0.1	0.9	0.9	<0.1	6.6%	6.6%	20 - 30	Not Exceeded	Not Exceeded
38m	13.7	13.7	<0.1	1.0	1.0	<0.1	7.3%	7.3%	20 - 30	Not Exceeded	Not Exceeded
24m	14.5	14.5	<0.1	1.8	1.8	<0.1	12.4%	12.4%	20 - 30	Not Exceeded	Not Exceeded
34m	14.2	14.2	<0.1	1.5	1.5	<0.1	10.6%	10.6%	20 - 30	Not Exceeded	Not Exceeded
44m	14.0	14.0	<0.1	1.3	1.3	<0.1	9.3%	9.3%	20 - 30	Not Exceeded	Not Exceeded
55m	13.9	13.9	<0.1	1.2	1.2	<0.1	8.6%	8.6%	20 - 30	Not Exceeded	Not Exceeded
65m	13.8	13.8	<0.1	1.1	1.1	<0.1	8.0%	8.0%	20 - 30	Not Exceeded	Not Exceeded
85m	13.7	13.7	<0.1	1.0	1.0	<0.1	7.3%	7.3%	20 - 30	Not Exceeded	Not Exceeded
105m	13.6	13.6	<0.1	0.9	0.9	<0.1	6.6%	6.6%	20 - 30	Not Exceeded	Not Exceeded
125m	13.5	13.5	<0.1	0.8	0.8	<0.1	5.9%	5.9%	20 - 30	Not Exceeded	Not Exceeded
146m	13.4	13.5	0.1	0.7	0.8	0.1	5.2%	5.9%	20 - 30	Not Exceeded	Not Exceeded
166m	13.4	13.4	<0.1	0.7	0.7	<0.1	5.2%	5.2%	20 - 30	Not Exceeded	Not Exceeded
186m	13.4	13.4	<0.1	0.7	0.7	<0.1	5.2%	5.2%	20 - 30	Not Exceeded	Not Exceeded
199m	13.4	13.4	<0.1	0.7	0.7	<0.1	5.2%	5.2%	20 - 30	Not Exceeded	Not Exceeded

4. Conclusions

An update to the air quality assessment for the Cherwell Local Plan HRA has been undertaken to reflect additional housing, Transport Improvement Package 2 and Cycle Super Route (Scenario 4) and associated changes to the traffic model, guidance and air quality assessment tools since 2014.

Concentrations of annual mean NO_x exceed the critical level for the protection of vegetation within 200m of the A40 and A34 in the 2013 base year. These exceedances are dominated by high background NO_x concentrations (around 30 µg/m^3) and the proximity of the site to existing busy roads.

Concentrations of annual mean NO_x were estimated to be below the critical level in all 2031 scenarios with the exception of the A34, up to 50 m to the north west and 100 m to the south east of the road centreline. The increases at these sites with Scenario 4 compared to the previous Local Plan are just 0.3 µg/m^3 or less. This is an inconsequential change in NO_x concentrations given baseline conditions and the limited extent of the area subject to the change, relative to the total SAC area.

Compared to the previous Local Plan, Scenario 4 gives NO_x concentrations up to 0.5 µg/m^3 higher at the closest receptor to the A40; however, the total NO_x concentration here in 2031 is below the critical level so this is not considered to be a significant change in NO_x concentrations.

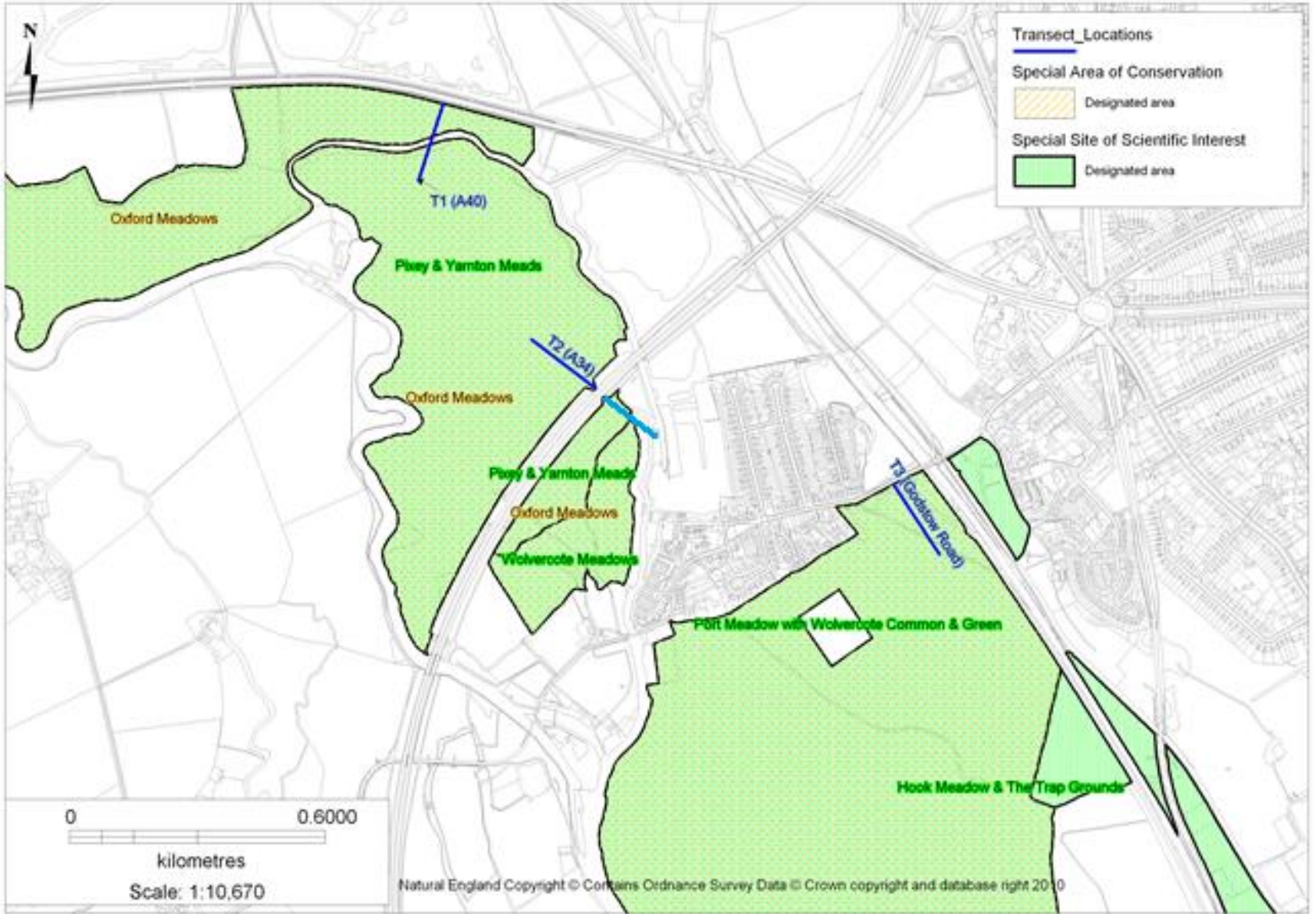
In 2031, the difference between the results for the previous Cherwell Local Plan and Scenario 4 is less than 0.1 kg/ha/yr. Such a change (equivalent to less than 0.01 g/m^2/yr) is inconsequential by itself but particularly given the nitrogen deposition rates within the Oxford Meadows SAC are expected to be below the lower critical load for low altitude hay meadows of 20 kg/ha/yr.

Further assessment is not recommended on the basis of these estimated changes in NO_x concentration and nitrogen deposition.

Air Quality Assessment Appendices

Appendix A. Transect Locations

Figure A-1 Map showing transect locations within designated sites



Appendix B. Traffic Data

Table B-1 Traffic data used in the 2017 air quality assessment update

Link Name	2013 (and 2031) Base			2031 Cherwell Local Plan			'Transport Improvement Package 2 and Super Cycle Route'		
	AADT	%HGV	Speed (kph)	AADT	%HGV	Speed (kph)	AADT	%HGV	Speed (kph)
A40 (W of A34)	20,022	2.7	55.8	21,819	4.3	45.5	22,948	4.2	43.4
A34 (S of A40)	83,196	2.5	67.8	96,296	2.4	64.2	97,304	2.4	64.0
Godstow Rd	4,791	4.1	39.0	7,317	2.9	39.3	7,261	2.8	39.3

Table B-2 Traffic data used in the 2014 air quality assessment update

Link Name	2013 (and 2031) Base			2031 Cherwell growth			2031 Cherwell growth with SHMA		
	AADT	%HGV	Speed (kph)	AADT	%HGV	Speed (kph)	AADT	%HGV	Speed (kph)
A40 (W of A34)	18,000	4.5	57.4	22,000	10.8	52.1	21,800	10.9	52.8
A34 (S of A40)	69,900	5.5	74.4	100,100	8.6	64.2	102,000	8.7	64.2
Godstow Rd	1,300	6.3	34.7	6,200	9.1	39.2	6,900	8.5	39.3

Table B-3 Traffic data used in the 2012 air quality assessment

Link Name	2009 (and 2030) Base			2030 Cherwell Growth			2030 Ref		
	AADT	%HGV	Speed (kph)	AADT	%HGV	Speed (kph)	AADT	%HGV	Speed (kph)
A40 (W of A34)	21,629	14.3	56	25,436	5.8	53	25,033	6.3	54
A34 (S of A40)	84,899	13.5	78	102,593	12.7	68	102,593	12.7	68
Godstow Rd	1,548	0	35	2,760	0	35	2,622	0	35

Table B-4 Traffic data used in the 2017 air quality assessment update for Base 2013 Scenario

Link Name	2013 (and 2031) Base		
	AADT	%HDV	Speed (kph)
A34(T) -WESTERN BY-PASS ROAD_South	84,647	2.5	67.4
WESTMINSTER WAY-Jct with A34	11,714	2	34.9
NORTH HINKSEY LANE - S	4,416	2.6	38.7
A34(T) -SOUTHERN BY-PASS ROAD _Botley South	76,812	2.2	69.3
A34 - A420 Junction	17,171	1.8	97
A34(T) -SOUTHERN BY-PASS ROAD _Hincksey Hill Int approach	81,027	2.4	68.3
A34 - A420 Junction	28,167	1.6	40
A34 - A420 Junction	13,329	2.5	27.9
A34 - A420 Junction	15,060	1	30
A34 - A420 Junction	17,945	1.8	30
A34 - A420 Junction	7,077	2.5	26.2
A34 - A420 Junction	15,935	2.4	35
A34 - A420 Junction	9,827	1	43.7
A34 - A420 Junction	10,446	1.5	78
A34(T) -SOUTHERN BY-PASS ROAD _Botley Jct SB	27,658	2.7	73.8
A34 - A420 Junction	9,045	1.2	47.4
A34(T) -SOUTHERN BY-PASS ROAD _Botley Jct NB	30,557	2.4	72.9
A34 - A420 Junction	13,107	2.4	54.5
A34(T) -WESTERN BY-PASS ROAD_North	83,196	2.5	67.8
Stanley Close	2,256	1	24
A34(T) -SOUTHERN BY-PASS ROAD_Botley North	77,085	2.2	69.3
A34(T) -SOUTHERN BY-PASS ROAD _South of Botley	78,772	2.4	68.8
A34 - A420 Junction	8,578	2	25
A34 - A420 Junction	19,595	1.5	25.2
A34 - A420 Junction	25,750	1.9	40
A34 - A420 Junction	24,980	2	40
A34 - A420 Junction	28,391	1.7	30
A40 -Northern Bypass	20,022	2.7	55.8
WEST WAY - E	12,486	5.4	30
WESTMINSTER WAY - N	6,491	4	22.1
WEST WAY - W	7,724	5.5	28.2
WESTMINSTER WAY - C	5,529	3.8	40
YARNELL'S HILL	2,831	0.3	38.6
WESTMINSTER WAY - S	8,351	2.6	48.4

Appendix C. Detailed Dispersion Modelling

C.1 Emission Factors

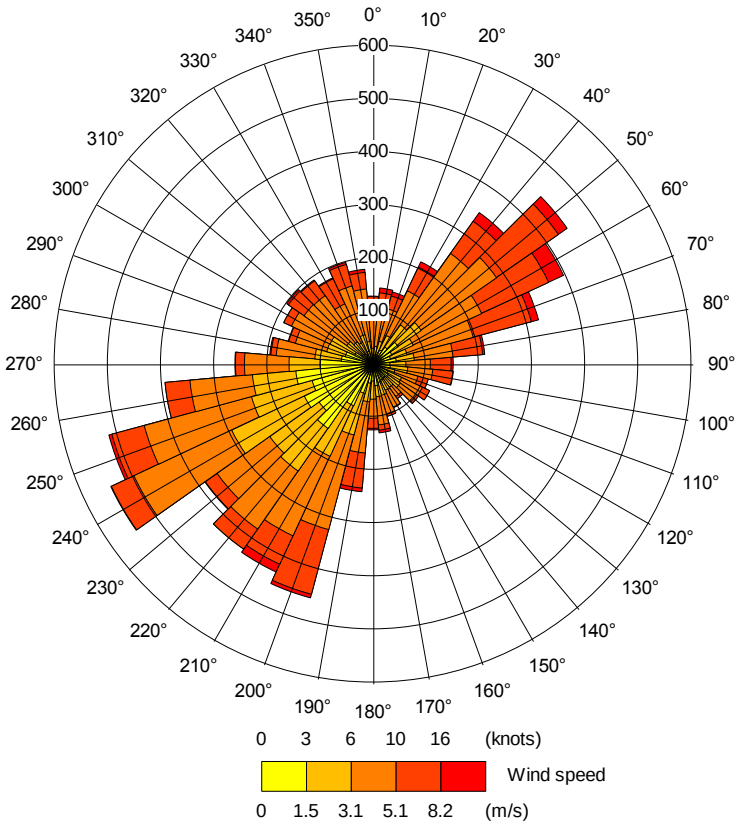
Vehicle exhaust emissions of NO_x for each road link in each scenario were calculated using DEFRA's latest Emissions Factors Toolkit (Emission Factor Toolkit (EFT) 2016 (v 7.0) using traffic data provided from the OSM by Atkins Transportation. The emission calculations assumed an Urban (not London) road type for all modelled links, on the basis of 2011 Census information identifying the area included in the modelling as urban.

C.2 Meteorological Data

Hourly sequential meteorological data were obtained from the nearest suitable weather station, in this case Brize Norton. The Brize Norton weather station is located approximately 20 km to the east of Oxford Meadows SAC. The basic data include: date, hour, direction that the wind is blowing from, wind speed, how many eighths ('oktas') of the sky are covered by cloud, and surface air temperature.

A windrose for the Brize Norton weather station for the year 2013 (the base year in the air quality assessment) is presented in Figure C-1, which shows winds predominantly blowing from the south-west quadrant, with a secondary prevailing wind from the north-east.

Figure C-1 Windrose for Brize Norton (2013)



C.3 Modelled Receptors

A total of 38 discrete receptor points were included in the ADMS dispersion model. These comprised 34 ground level receptors across two transects through the SAC estimating the effect of road emissions on vegetation and 4 local authority air quality monitoring sites (for use in model verification). The assessed receptors are listed in Table C-1 and shown in Figure C-2 and Figure C-3. Figure C-4 shows the monitoring sites used for model verification (verification is discussed in detail later in this Appendix).

Figure C-2 Air Quality Assessment Receptor Locations

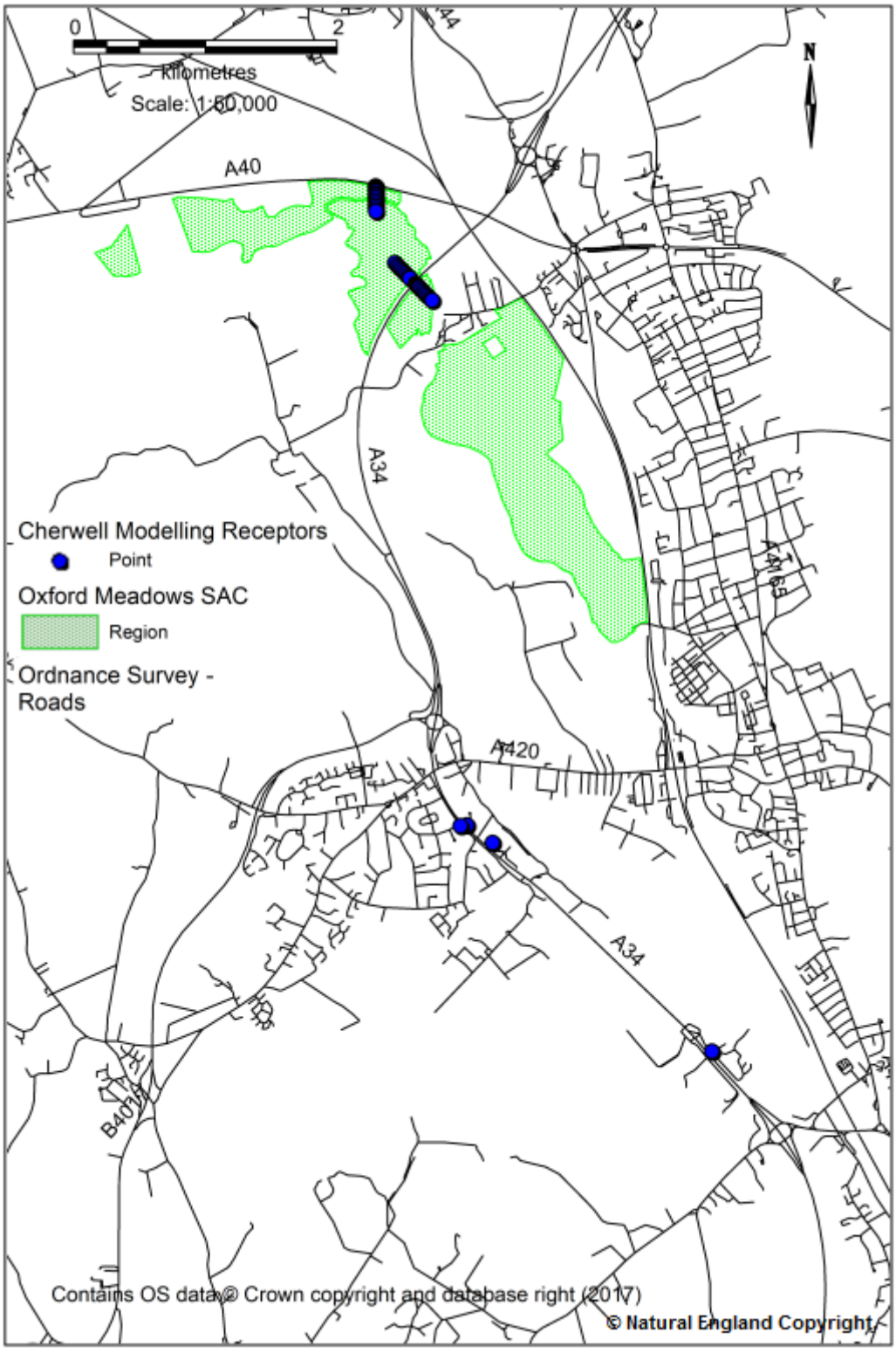


Figure C-3 Air Quality Assessment Receptors - Detailed map showing transect receptors

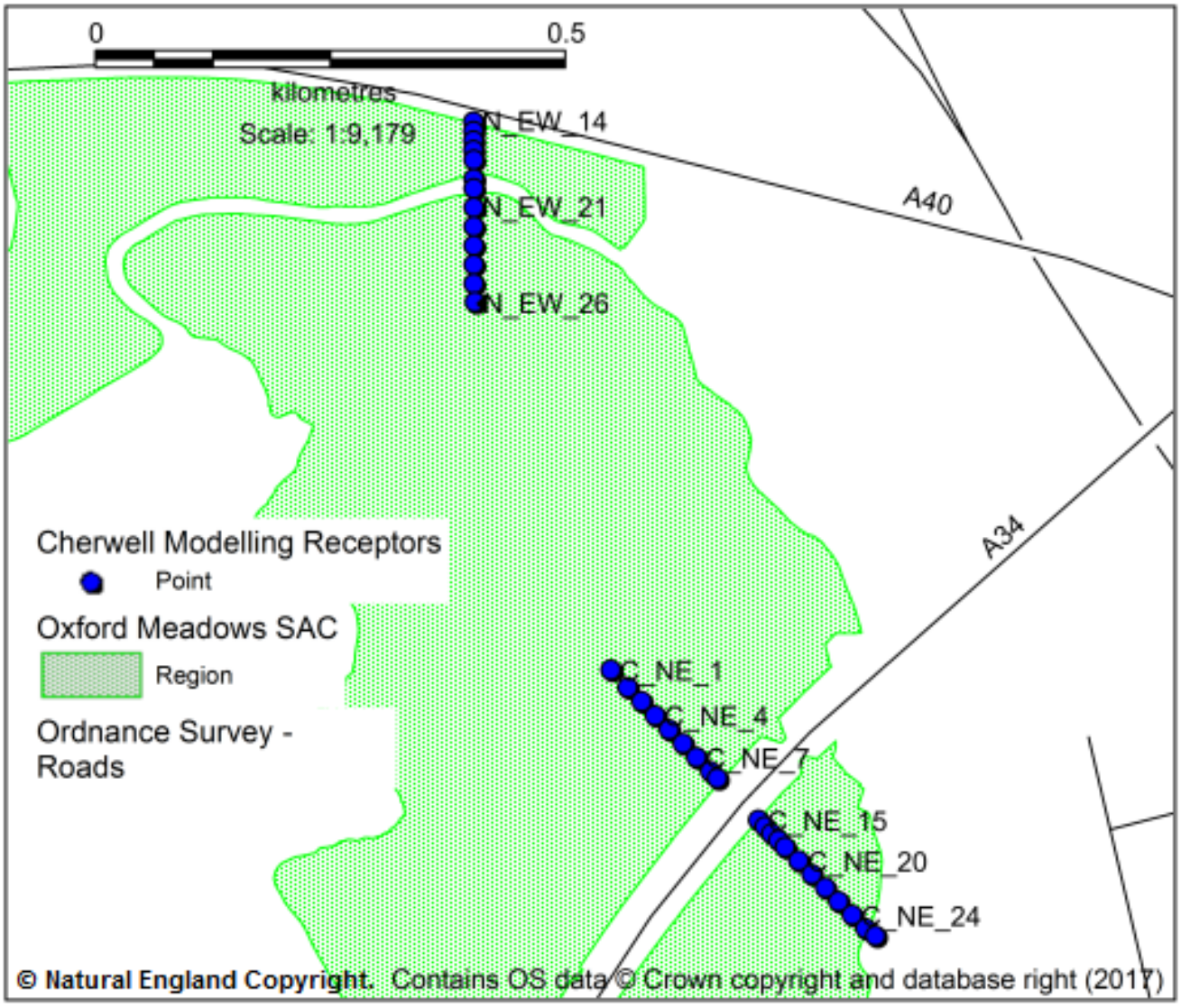


Figure C-4 Air quality monitoring sites used in model verification

The height of all transect receptors was set at 0 m above ground level to represent vegetation height. The height of the monitoring sites used for verification were set at 2 m except where local photography indicated that 2 m was not the correct height. The x, y co-ordinates, height and distance from the nearest road are presented in the table below.

Table C-1 Location of Modelled Air Quality Receptors

ID	Distance from receptor to road	X	Y	Z (Height), m
Transect 1 (A40)				
N_EW_14	14	448223	210657	0
N_EW_15	24	448223	210647	0
N_EW_16	34	448223	210637	0
N_EW_17	44	448223	210626	0
N_EW_18	53	448223	210616	0
N_EW_19	73	448223	210596	0
N_EW_20	83	448223	210586	0
N_EW_21	102	448223	210566	0
N_EW_22	122	448223	210545	0
N_EW_23	142	448223	210525	0
N_EW_24	161	448223	210505	0
N_EW_25	181	448223	210485	0
N_EW_26	199	448224	210465	0
Transect 2 (A34)				
C_NE_1	199	448369	210074	0
C_NE_2	173	448387	210055	0
C_NE_3	152	448401	210041	0
C_NE_4	131	448416	210026	0
C_NE_5	111	448431	210011	0
C_NE_6	90	448445	209996	0
C_NE_7	69	448460	209981	0
C_NE_8	48	448475	209966	0
C_NE_9	38	448482	209959	0
C_NE_15	24	448526	209915	0
C_NE_16	34	448533	209908	0
C_NE_17	44	448540	209900	0
C_NE_18	55	448547	209893	0
C_NE_19	65	448554	209886	0
C_NE_20	85	448568	209872	0
C_NE_21	105	448583	209857	0
C_NE_22	125	448597	209843	0
C_NE_23	146	448611	209828	0
C_NE_24	166	448625	209814	0
C_NE_25	186	448640	209799	0
C_NE_26	199	448650	209791	0
Monitoring Sites				
S1	33	450771	204098	1.5
S2	48	449108	205679	2
S3	4	448913	205813	1.5
S4	4	448866	205807	2

C.4 ADMS Roads model parameters

The ADMS-Roads model v4.0 was used for the detailed dispersion modelling for Oxford Meadows SAC. For the study area, a latitude of 52 degrees and a minimum Monin Obukhov length of 30 m were selected. Meteorological data for 2013 from the Brize Norton monitoring site was used, with a surface roughness of 0.2 m set for the meteorological site. All other model parameters were model default settings except surface roughness at the dispersion site, discussed further below.

The 2013 Baseline model study area was larger than the study area to include monitoring data representing conditions in 2012. Therefore, an appropriate surface roughness was chosen for each model scenario to reflect these conditions. The extreme of grassland coverage across the modelled transects identified at Oxford Meadows SAC is represented by selecting a surface roughness of 0.02 m. To represent conditions around the monitoring sites which are generally village / suburban a surface roughness of 0.5 m is selected.

Table C-2 summarises the modelling parameters. Figure C-5 presents the diurnal profiles applied to the traffic increment for A-roads to represent the change in flow over a typical week.

Table C-2 Summary of dispersion modelling parameters

Model element	Parameter
Pollutant	NO_x
Scenario	2013 Base, 2031 DM and 2031 Scenario 4
Meteorological data	Brize Norton 2013
Surface roughness, m	Grassland: 0.02 Suburban: 0.5
Minimum Monin-Obukhov (MO), m	30
Model receptors	Transect 1 and 2
Receptor height, m	0
Extent of model	Oxford Meadows and monitoring in Botley
Traffic scenario	As detailed in traffic data input tables
Diurnal profile used	A34 profile for A roads
Method to estimate road emissions	DEFRA EFT v7.0
Traffic mix used in EFT	Basic split
Average speed or hourly profile?	Average based on flow weighted average of AM and PM modelled speed
Background values used	2013 and 2030 DEFRA maps for NO_x (without removal of in-square roads component) and NO_2. 2013 APIS maps for N deposition (reduced by 1% per year for 2031)
Calculation of NO_2 from NOx	DEFRA NO_x-NO_2 calculator (v5.1)

C.5 Model verification

Since the dispersion model output is in the form of nitrogen oxide (NO_x) contributions for the modelled roads, this is compared to the NO_x road contribution derived from available monitoring data and Defra background maps and the NO_x-NO_2 calculator (v5.1). Where systematic bias is evident in the verification, adjustment is applied to bring modelled concentrations more into line with monitored concentrations.

Monitoring sites were chosen from across the limited traffic model area within the study area. The bias adjusted monitored NO_2 concentration and the background NO_2 concentration obtained from the Defra background mapping are presented in Table C-3. A comparison of modelled estimates of annual mean total NO_2 ($\mu g/m^3$) with the Monitored NO_2 are presented in Table C-4.

TableC-3 Monitoring Sites Used in Model Verification

ID*	Description	X	Y	2013 Measured NO_2 Annual Mean ($\mu g/m^3$)	2013 Background NO_2 Annual Mean ($\mu g/m^3$)**
S1	Diffusion tube, roadside – South Hinksey	450771	204098	29.5	20.4
S2	Diffusion tube, roadside – Southern bypass	449108	205679	26.4	19.9
S3	Diffusion tube, roadside – Stanley Close	448913	205813	45.6	16.8
S4	Diffusion tube, roadside – Westminster Way	448866	205807	37.8	16.8
*Local authority monitoring site ID					
** No background sector removal undertaken					

TableC-4 Comparison of Unadjusted Modelled Annual Mean NO_2 to Monitored Annual Mean NO_2

Site Name	Monitored Annual Mean Total NO_2 ($\mu g/m^3$)	Modelled Annual Mean Total NO_2 ($\mu g/m^3$)	% Difference (unadjusted modelled NO_2 - monitored NO_2) / monitored NO_2 * 100
S1	29.5	39.6	34.2%
S2	26.4	35.5	34.5%
S3	45.6	45.7	0.2%
S4	37.8	34.4	-8.9%

Table C-5 Model Statistics Without Adjustment

RMSE[i]	FB[ii]	R[iii]
7.00	-0.11	0.64

Notes:

[i] Root Mean Square Error: RMSE is used to define the average error or uncertainty of the model (units $\mu g/m^3$). Ideal value is 0.01. In the case of modelled annual mean NO_2 a value of less than 10 is acceptable.

[ii] Fractional Bias: FB is used to identify if the model shows a systematic tendency to over or under estimate. Ideal value is 0.

[iii] Correlation coefficient: r is used to measure the linear relationship between modelled and observed data. Ideal value is 1.

The comparison of annual mean NO_2 monitoring and modelling presented in Table C-4reveals that two monitoring sites, S3 and S4 have good agreement as the modelled results are within 10% of the monitoring values. For two sites, S1 and S2, the modelling is more than 25% greater than the monitoring results. Closer inspection of the monitoring sites for S1 and S2 reveal that there is small barrier between the A34 and the tube at site S1 and the diffusion tube located at S2 is mounted on the façade of a house. These factors could justify monitoring results being lower than the modelled concentrations. No adjustment was applied to the model results to avoid underprediction at these sites from application of an adjustment factor of 0.8. The model statistics without adjustment are presented in Table C-5 and reveal the performance is within the standard parameters with an acceptable though not ideal RMSE of less than 10 $\mu g/m^3$.

C.6 Diurnal profiles used in detailed dispersion modelling

Figure C-5 A34 Diurnal Traffic Profile

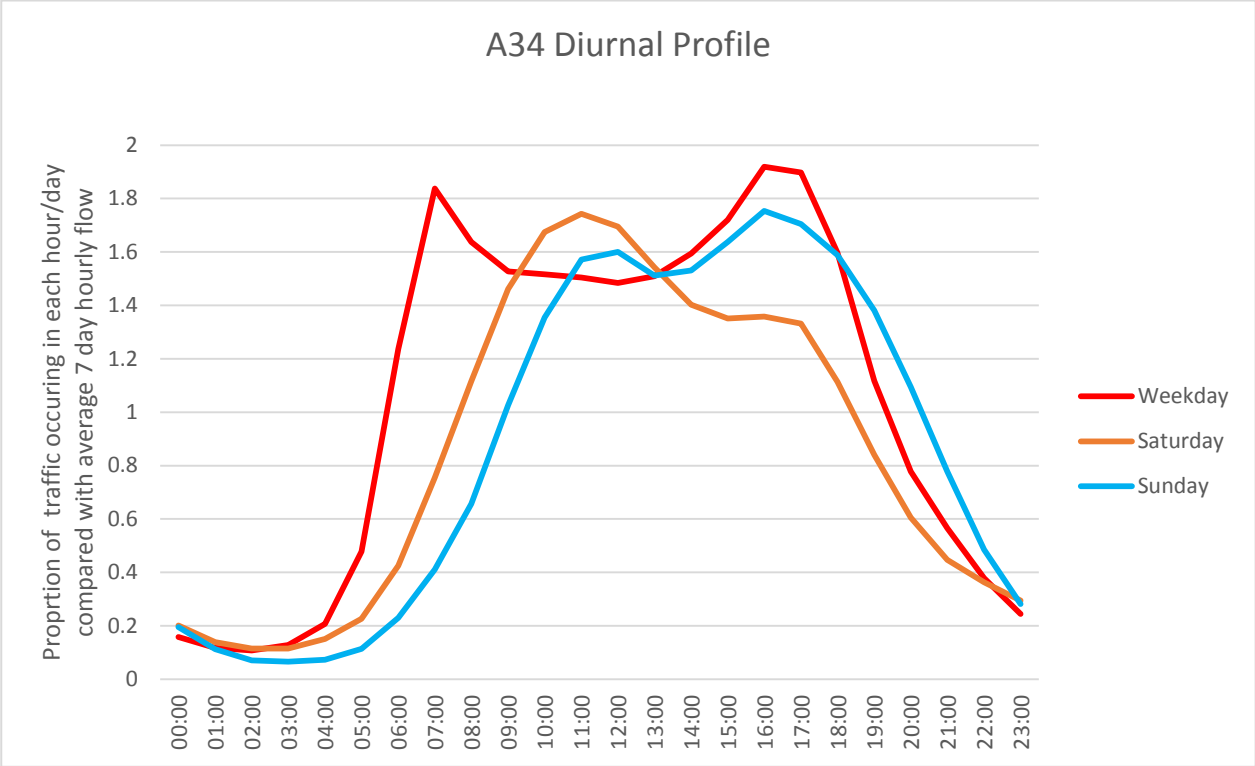
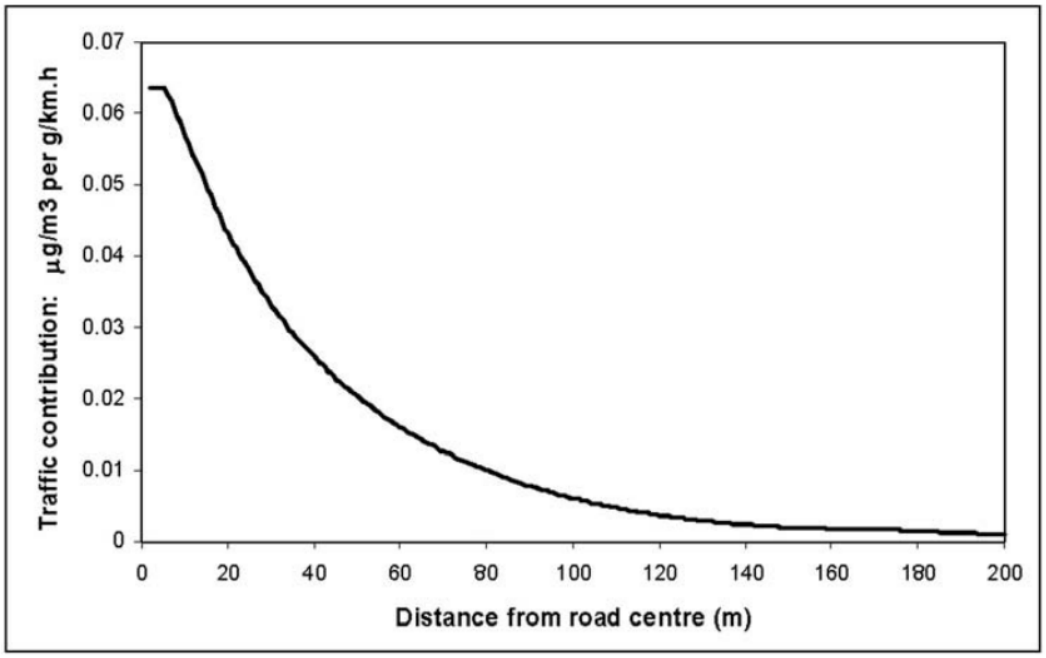


Figure C-6 Decrease in traffic contribution to concentration with distance from road



Source: DMRB HA207/07

Appendix D. Trend Analysis

D.1 NO_x concentrations

Trends in background pollutant concentrations recorded at an Automatic Rural Monitoring Network analyser at a rural background site in Oxfordshire (Harwell) have been analysed, to inform decisions regarding the projection of concentrations and deposition rates to the year 2031.

The data were analysed using the MAKESENS 1.0 MS Excel template for detecting and estimating trends in times series of annual values of atmospheric chemistry. The Mann-Kendall test requires at least four years' data to determine if there is an increasing or decreasing trend and calculation of the confidence intervals for the Sen's slope estimate requires at least 10 values in a time series. Annual mean NO_2 concentrations are presented for the 11 year period 2005 to 2015 were analysed.

The data and analysis are presented in Figure D-1. A significant downward trend was detected with a level of confidence of +/- 0.01 as indicated by the ** rating in the Significance box. The estimated rate of decrease in annual mean NO_2 is 0.7 µg/m^3 per year, a 40% reduction over the 11-year period, or approximately 4% per year.

Figure D-1 Rural background NOx monitoring trends 2005 – 2015

Oxfordshire HRA- Annual Mean NO2 Trend (ug/m3)

TsNumber	1
Name	CMS1
Years	2005 - 2015
n	10
Test S	
Test Z	-2.89
Signific.	**
Q	-6.67E-01
Qmin99	-1.00E+00
Qmax99	-2.11E-01
Qmin95	-1.00E+00
Qmax95	-3.93E-01
B	1.60E+01
Bmin99	1.85E+01
Bmax99	1.37E+01
Bmin95	1.85E+01
Bmax95	1.47E+01

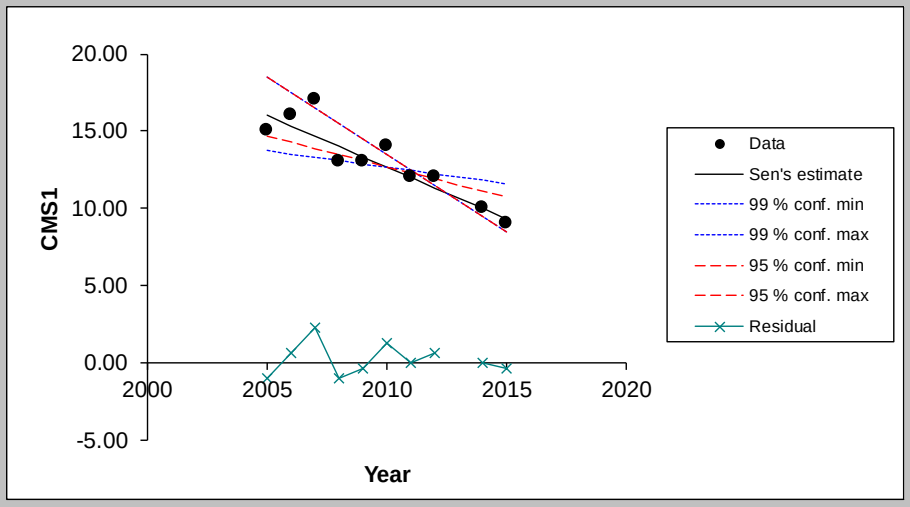


Chart options

- ☑ show 99 % confidence interval
- ☑ show 95 % confidence interval
- ☑ show residuals

Update chart outlook

Equation of the lines:
f(year) = Q*(year-firstDataYear) + B
FirstDataYear= 2005

Point values for the chart

Year	Data	Sen's estir	99 % conf. m	99 % conf. m	95 % conf. m	95 % conf. m	Residual
2005	15.00	16.00	18.50	13.74	18.50	14.66	-1.00
2006	16.00	15.33	17.50	13.53	17.50	14.27	0.67
2007	17.00	14.67	16.50	13.32	16.50	13.88	2.33
2008	13.00	14.00	15.50	13.11	15.50	13.48	-1.00
2009	13.00	13.33	14.50	12.89	14.50	13.09	-0.33
2010	14.00	12.67	13.50	12.68	13.50	12.70	1.33
2011	12.00	12.00	12.50	12.47	12.50	12.30	0.00
2012	12.00	11.33	11.50	12.26	11.50	11.91	0.67
2013		10.67	10.50	12.05	10.50	11.52	
2014	10.00	10.00	9.50	11.84	9.50	11.12	0.00
2015	9.00	9.33	8.50	11.63	8.50	10.73	-0.33

The projected concentrations for the year 2031 from DEFRA mapping are considered to be suitable to apply in the modelling as the rate of reduction at Oxford Meadows SAC is equal to 0.7 µg/m^3 per year over the 17 year period from 2013 to 2030 (32.0 to 19.5 µg/m^3 and 29.0 to 17.5.9 µg/m^3 at T1 and T2 respectively).

D.2 Nitrogen deposition

Nitrogen deposition rates reported in APIS for the average period 2012-2014 need to be forecast to 2031 for use in the assessment. Annex F of the DMRB provides guidance on the assessment of designated sites[23]. The guidance advises that "*The total average deposition rates obtained from the Air Pollution Information System for 2000 should be reduced by 2% per year to estimate deposition*". The Institute of Air Quality Management advises (pers comm)[24] that a 2% per annum reduction in nitrogen deposition rates, as recommended in Highways England may not be a valid for assessments examining an assessment year in 2031. As the DMRB guidance was published in 2007 this assumption has been interrogated.

This footnote to the DMRB method explains the use of the 2% change,

"Reduced nitrogen generally contributed about 45% of the total nitrogen deposited in Britain in 1997 with oxidised nitrogen contributing the remainder, although the proportion will vary depending on the location of the site and sources. Based on the results of transboundary deposition modelling for 1997 and 2010, deposition of reduced and oxidised nitrogen is expected to decrease on average across Britain by 1.5% and 2.6% per annum respectively due to increasingly stringent emission limits (National Expert Group on Transboundary Air Pollution on behalf of Defra and the devolved administrations. Transboundary Air Pollution: Acidification, eutrophication and ground level ozone in the UK. ISBN 1 870393 61 9, 2001). As the deposition of oxidised nitrogen is expected to decrease faster than that of reduced nitrogen, the proportion of the total nitrogen deposited from reduced nitrogen will increase in the future. It is expected to have reached 60% by 2010. If reduced and oxidised nitrogen are assumed to contribute to total deposition in equal proportions, then the annual decrease in nitrogen deposition can be assumed to be 2% (estimated in a non-cumulative manner, i.e. decrease over five years is 5 x 2% = 10%) However, the deposition changes will not be linear across the country but 2% should be indicative of the typical change."

More recent work was published in 2012, RoTAP (2012) Review of Transboundary Air Pollution: Acidification, Eutrophication, Ground Level Ozone and Heavy Metals in the UK[25], CEH report. The summary for policy makers identified the following information:

"Eutrophication from atmospheric deposition in the UK is caused by the emissions of nitrogen oxides and ammonia. Emissions of nitrogen oxides have decreased by 58% since 1970, with a corresponding 50% reduction in air concentrations at background locations. Emissions of ammonia are only reliable from 1990 onwards, since when they have decreased by 21%, although there is large inter-annual variability, masking any overall trend. Concentrations of ammonia have changed little over the last decade*. The proportion of ammonia to total nitrogen deposition has increased over the last twenty years from 45 to 50%.*

Despite the large reduction in emissions, total deposition of nitrogen (oxidised and reduced forms) has changed little. This surprising result is due to changes in atmospheric chemistry leading to accelerated oxidation and deposition of nitrogen compounds over the UK compared to the rates measured in the late 1980s. Thus a larger proportion of UK nitrogen emissions is deposited in the UK than occurred twenty years ago. The main consequence of the emission reductions has been a reduction in the export of pollution.

At sites in the UK where nitrogen deposition exceeds the capacity of the vegetation and soil to sequester inputs, nitrate is leaching into surface waters and has the potential to stimulate algal *growth and affect species composition.*

Between 2006 and 2008, 58% of all habitat areas sensitive to eutrophication from nitrogen deposition exceeded the Critical Load for nutrient nitrogen. This figure is predicted to decrease to 48% by 2020. Data from field surveys and experimental studies in the terrestrial environment provide a strong body of coherent evidence that these exceedances are associated with adverse effects on biodiversity*, and in particular the loss of species adapted to the low nutrient availability that is characteristic of many habitats of high conservation importance."*

[23] Highways Agency, Design Manual for Roads and Bridges (DMRB), Volume 11, part 3, section 1, Air Quality, May 2007 (HA207/07);
[24] Discussion meeting with IAQM, 24/05/17.
[25] RoTAP (2012) Review of Transboundary Air Pollution: Acidification, Eutrophication, Ground Level Ozone and Heavy Metals in the UK. Contract Report to the Department for Environment, Food and Rural Affairs. Centre for Ecology & Hydrology.

The body of the CEH report identified no overall trend in total nitrogen deposition, which has only been correctly measured since 2000 when HNO_3, gaseous NH_3 and ammonia aerosol components were included in the UK between 2000 and 2008. Overall it is expected that some elements will increase and some will decrease with no overall trend detected by this publication in 2012.

Given that the more recent monitoring data for Harwell demonstrates a significant declining trend in NOx, and this is supported by diffusion tube monitoring of NO_2 by Cherwell District Council[26], the assumption that nitrogen deposition will decrease at a rate of 1% per year has been applied to project deposition rates to 2031.

[26] http://www.cherwell.gov.uk/media/pdf/h/1/2016_Annual_Status_Report.pdf

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