

M25 junction 10/A3 Wisley interchange TR010030 6.6 EIA Scoping Report



Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

M25 junction 10/A3 Wisley interchange

The M25 junction 10/A3 Wisley interchange Development Consent Order 202[x]

6.6 EIA SCOPING REPORT

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Chapter 1

1. Introduction

1.1. Overview of project

- 1.1.1. In December 2014 the Department for Transport (DfT) published its Road Investment Strategy (RIS) for 2015-2020. The RIS sets out the list of schemes that are to be delivered by Highways England over the period covered by the RIS (2015 - 2020). The RIS identified improvements to the M25 junction 10/A3 Wisley as one of the key investments in the Strategic Road Network (SRN) for the London and South East region.
- 1.1.2. The M25 junction 10/A3 Wisley interchange lies in the south-west quadrant of the M25 London Orbital Motorway. At junction 10 the A3, a key radial route from London to Portsmouth, crosses the M25 motorway. Just to the north of junction 10 on the A3 is the Painshill junction with the A245. Together with M25 junction 10/A3 Wisley interchange, the junctions in the current configurations restrict traffic flow through the area and a package of options is required to improve junction performance. The location of the M25 junction 10/A3 interchange is shown in Figure 1.1 in Chapter 19.
- 1.1.3. The Scheme proposed provides increased capacity at the M25 roundabout by elongating the existing roundabout, providing additional lanes to provide more circulatory capacity and enabling more traffic to discharge the roundabout whilst providing dedicated free-flowing left turns. The elongated roundabout would use the existing bridges under the A3 and new bridges over the M25, with additional lanes and capacity between the traffic signals and dedicated left-turn filters at the traffic signals. Most of the existing roundabout and slip roads would be broken out and removed, with the existing structures over the M25 remaining in place.
- 1.1.4. The Scheme includes widening the A3 from Ockham to M25 junction 10 and M25 junction 10 to Painshill from three lanes to four lanes in both directions to improve the safety and capacity of the A3. Widening of the A245 to three lanes between the Painshill junction and the B365 Seven Hills Road junction will also occur. As the A3 will be widened to four lanes the current access to it from side roads and private properties will need to be closed and alternative arrangements will be put in place to provide access to the road network for the properties affected. Highways England expects to start construction in March 2020.

1.2. Need for Environmental Impact Assessment

- 1.2.1. The requirement for certain projects to report their effects on the environment is derived from EU legislation initially in Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. This legislation has been amended three times, in 1997, in 2003 and in 2009 with the amendments codified by Directive 2011/92/EU of 13 December 2011. The most recent changes being adopted in UK legislation by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the "EIA Regulations (2017)"). which transposes changes made to EU Directive 2011/92/EU1 ("the EIA Directive (2011)") by EU Directive 2014/52/EU2. The related Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("the IP Regulations (2017)") govern development given planning consent through the nationally significant infrastructure planning regime.

- 1.2.2. The EIA Regulations (2017), in Schedule 1 sets out thresholds for certain types of projects that by their scale or nature require an EIA to be prepared. Where projects do not meet these thresholds Schedule 2 of the Regulations lists projects (including highways projects) for which EIA may still be required if their effects on the environment are deemed to be significant. The process by which this decision is made is known as Screening and a Screening Report for M25 junction 10/A3 Wisley interchange was recently made. The Screening Report concluded that because of the likelihood of significant environmental effects a statutory EIA leading to an Environmental Statement (ES) would be required.
- 1.2.3. The Scheme comprises an alteration of a highway lying wholly in England, for which Highways England, being a strategic highways company, will be the highway authority. As the area of development for the alteration works will exceed the 15 hectares limit prescribed in Section 22 (4) (a) of the planning Act 2008 (as amended), the Scheme will be a Nationally Significant Infrastructure Project (NSIP). This means that a Development Consent Order (DCO) application will need to be made to the Secretary of State under Section 37 of the Planning Act 2008 to seek authorisation to build the Scheme.
- 1.2.4. The aim of EIA is to protect the environment by ensuring that the local planning authority and PINS when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision-making process. The aim of EIA is also to ensure that the public are given early and effective opportunities to participate in the decision-making procedures.
- 1.2.5. The EIA will be carried out by a team of specialists working in close collaboration with the design engineers responsible for the preliminary design of the Scheme as part of an iterative design, consultation and assessment process. This will maximise the opportunity to avoid or reduce environmental effects at source and to identify the most effective mitigation of those effects that cannot be avoided.

1.3. Purpose of the Scoping Report

- 1.3.1. Scoping is a precursor to the environmental assessment process that will lead to the preparation of the Environmental Impact Assessment (EIA) which will be reported in an ES. A Preliminary Environmental Information Report (PEIR) will also be prepared which will set out the effects of the Scheme as they are known before the ES is prepared to inform stakeholders and the public during the statutory consultation ahead of the preparation of the ES.
- 1.3.2. This document has been prepared in accordance with the DMRB Volume 11 Environmental Assessment, Section 2 and in particular:
- Part 1 HA 201/08;
 - Part 4 HA 204/08;
 - Part 6 HD 48/08; and
 - Interim Advice Note (IAN) 125/15 and 126/15.
- 1.3.3. It is also in accordance with PINS Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping.

Refer to Table 1-1 below for details on how the PINS Advice Note 7 has informed this Scoping Report.

1.3.4. The objectives of this Scoping Report are to:

- Review existing data, identify sensitive resources and receptors, and scope the work required for the EIA;
- Identify the level of impact of the Scheme;
- Determine the appropriate level of effort that should be applied to the various environmental topics, namely whether a Simple or Detailed assessment as defined in DMRB Volume 11, Section 2, Part 1 HA 201/08, Volume 11, Section 2, Part 4 HA 204/08 and Annex A of IAN 125/15, is required;
- Ensure the scope and depth of any subsequent assessment is both appropriate and proportionate; and
- Provide decision makers and stakeholders with a clear indication of how the project is to be assessed and to set out the scope/content of that assessment, whilst outlining the consultation process.

1.3.5. The Scoping Report allows the 'scoping out' of environmental topics where little or no change to the existing situation will occur, thus leading to the preparation of a concise ES.

1.4. Structure and contents of the Scoping Report

1.4.1. The EIA Regulations (2017) set out the requirements for an applicant who proposes to request a scoping opinion from PINS. Regulation 10 (3) requires a request for a scoping opinion to include:

- A plan sufficient to identify the land;
- A description of the proposed development, including its location and technical capacity;
- An explanation of the likely significant effects of the development on the environment; and
- Such other information or representations as the person making the request may wish to provide or make.

1.4.2. This Scoping Report will be submitted to the Planning Inspectorate (PINS) to support a request for a Scoping Opinion on the proposals and the information to be supplied within the ES.

1.4.3. This Scoping Report will:

- review existing data;
- present the initial baseline conditions;
- provide a preliminary evaluation of sensitivity on identified resources and receptors;
- identify the topics which significant environmental effects are likely/unlikely to arise as a consequence of the works during construction and operation;

- outline the scope, approach and methodology for each environmental topic 'scoped in' to the EIA Report;
- identify mitigation and enhancements measures and residual effects; and
- assess cumulative effects.

1.4.4. PINS Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping provides advice on the information that should be provided in the Scoping Report. Table 1-1 below lists the information requirements and identifies where they are presented in this Scoping Report.

Table 1-1: Suggested Scoping Report Contents in PINS Advice Note 7

Contents	Chapter in this Scoping Report
A plan showing: • The proposed draft DCO site boundary (identified by a red line) including any associated development; • Any permanent land take required for the proposed development; • Any temporary land take required for construction, including construction compounds; • Any existing infrastructure which would be retained or upgraded for use as part of the Scheme; • Proposed development and any existing infrastructure which would be removed; and • Features including planning constraints and designated areas on and around the site such as national parks or historic landscapes.	Chapter 19
A description of the proposed development including both the NSIP and any of the associated development.	Chapter 2
In dealing with the description of the development and its possible effects on the environment, applicants should: • Set out the information using the headings in Schedule to the EIA Regulations, being: – Characteristics of the development; – Location of the development; and – Characteristics of the potential impacts. • Ensure that all aspects of the environment likely to be significantly affected by the development are addressed.	Chapters 5-14
An outline of the main alternatives considered and the reasons for selecting a preferred option.	Chapter 3
Results of desktop and baseline studies where available.	Chapters 5-14
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal.	Chapter 19
Guidance and practice to be relied upon, and whether this has been agreed with the relevant bodies together with copies of correspondence to support these agreements.	Chapters 4-14
Methods used or proposed to be used to predict impacts and the significance criteria framework used.	Chapters 4-14
Any mitigation proposed and predicted residual impacts.	Chapters 5-14

Contents	Chapter in this Scoping Report
Where cumulative development has been identified, how the developer intends to assess these impacts in the ES.	Chapter 15
An indication of any European designated nature conservation sites that are likely to be significantly affected by the proposed development and the nature of the likely significant impacts on these sites.	Chapter 7
Where a developer seeks to scope out matters, a full justification for scoping out such matters, preferably supported by evidence of agreement with the relevant bodies.	Chapters 5-14
Key topics covered as part of the developer's scoping exercise.	Chapter 1
An outline of the structure of the proposed ES.	Chapter 4

1.4.5. The structure and content of the Scoping Report is set out in Box 1.1 below. This Scoping Report covers the following DMRB, Volume 11, Section 3 topics:

- Air Quality;
- Noise and Vibration;
- Biodiversity;
- Road Drainage and the Water Environment;
- Landscape;
- Geology and Soils;
- Cultural Heritage;
- Materials; and
- People and Communities.

1.4.6. In addition, it includes a further chapter on Climate as required under the EIA Regulations (2017) noted above. Other topics listed in the new regulations are reported in the DMRB topic chapters noted. An Equality Impact Assessment (EqIA) and a Health Impact Assessment (HIA) will be produced and reported separately to the EIA.

1.4.7. Consultation on the Scheme so far has been informal (non-statutory) but it will also be formal (statutory) during this stage of the project. Further details on the consultation undertaken to date and planned future consultation as part of the DCO process can be found in the Statement of Community Consultation document, produced separately to this Scoping Report.

Box 1.1: Structure of the Scoping Report

Chapter 1	Introduction
Chapter 2	The Project
Chapter 3	Alternatives
Chapter 4	Scope of the Assessment

Box 1.1: Structure of the Scoping Report

Chapters 5 to 14: Air Quality; Noise and Vibration; Biodiversity; Road Drainage and the Water Environment; Landscape; Geology and Soils; Cultural Heritage; Materials and Waste; People and Communities; Climate. All chapter sections are structured as follows:

- Introduction;
- Study area;
- Planning and policy context;
- Baseline conditions;
- Potential impacts;
- Proposed level and scope of assessment;
- Proposed assessment methodology;
- Proposed consultation;
- Potential mitigation measures;
- Assumptions and limitation; and
- Conclusion (inc. identification of aspects scoped out of the assessment).

Chapter 15	Assessment of Cumulative Effects

Chapter 16	Summary

Chapter 17	References

Chapter 18	Abbreviations and Glossary

Chapter 19	Location and Design Plans

Appendix A	Air Quality

Appendix B	Noise and Vibration Data

Appendix C	Ecology Legislation

Appendix D	Soils and Geology

Appendix E	Gazetteer of Heritage Assets

1.5. Responsible organisation

- 1.5.1. The responsible organisation for the Scheme is Highways England. We are a government company charged with operating, maintaining and improving England's motorways and major A roads.

1.6. The designer

- 1.6.1. The designer is Atkins Ltd. We have appointed Atkins under our Project Support Framework to undertake the Preliminary Design of the Scheme for the M25 junction 10/A3 Wisley interchange which includes EIA and the preparation of an ES for the Scheme.

1.7. Key legislation and policy

Legislative framework

- 1.7.1. On 12 March 2014, the European Parliament voted to adopt substantive amendments to the EIA Directive 2011/92/EU. These amendments made by EIA Directive 2014/52/EU were transposed into UK legislation in May 2017 as the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and will be relevant to this Scheme and the topic assessments.

Policy overview

- 1.7.2. A summary of what are considered to be the key implications of National, Regional and Local policy documents for the Scheme are shown in Table 1-2. This is followed by a summary of the key messages and implications of each.
- 1.7.3. Both Elmbridge Borough Council and the Borough of Guildford have emerging Local Plans which, subject to an Examinations in Public should be adopted within the next couple of years.

Table 1-2: Policy overview

Scale	Policy Document	Key Implications for the Scheme
National	National Networks National Policy Statement (NN NPS) (2014)	Sets out the Government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. The Secretary of State uses the NN NPS as the primary basis for making decisions on development consent application for NSIPs in England.
	Road Investment Strategy: 2015 to 2020 (2014)	Promote safe movement, satisfy users of the network, support efficient movement, can be delivered and operated within environmental constraints, support local access and well-being and be demonstrably cost effective.
	Highways England: Strategic Business Plan 2015 to 2020 (2014)	Support short-term targets as well as long-term aspirations and not significantly impact on network availability.
Regional	Surrey County Council, Surrey Transport Plan (2011)	To help people to meet their transport and travel needs effectively, reliably, safely and sustainably within Surrey; in order to promote economic vibrancy, protect and enhance the environment and improve the quality of life. In the 2017 Problems and Challenges update to the Plan, the Council identified that due to Surrey's location next to London, and the proximity of both Heathrow and Gatwick Airports, there is considerable demand for movement within, to, from, and through the county and the strategic network has evolved to principally serve London, with nationally important routes passing through. The non-strategic network serves to link the settlements. The Wisley interchange is where these networks meet and cause congestion.
Local	Elmbridge Borough Council Core Strategy (2011)	To deliver additional development and infrastructure which provides benefits across the Borough to a changing population, in a way that does not compromise

Scale	Policy Document	Key Implications for the Scheme
		peoples' quality of life or have a detrimental impact on the environment. Policy CS25 (Travel and Accessibility) states that it will support improvements to transport infrastructure by working in partnership with transport providers and Surrey County Council as the Highway Authority.
	Guildford Borough Council Local Plan 2003	Promote development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Local Plan identifies that responsibility for transport issues lie mainly with Surrey County Council but land use and transportation planning are directly linked and the Local Plan has an important role to play.

Chapter 2

2. The Project

2.1. Need for the project

- 2.1.1. The M25 junction 10/A3 interchange is positioned on a critical section of the Strategic Road Network (SRN). The M25 forms part of the 'Ten-T' Trans-European Transport Network and is therefore a nationally important link providing access to global markets and connections to the channel ports for much of the UK as well as for the South East region. The A3 is also an important strategic route, linking London with the international port of Portsmouth, as well as Guildford, which is the largest centre of employment in Surrey.
- 2.1.2. This section of the SRN, through junction 10, carries in excess of 300,000 vehicles per day, making it one of the busiest in the country. About one third of all traffic approaching junction 10 on both the A3 or the M25 use the roundabout to interchange between the two roads. Given the limited capacity of the existing roundabout to accommodate these large flows, significant delays and congestion occur in most peak periods. The junction is therefore a major impediment to the smooth flow of traffic on the SRN at this point. Journey time reliability is poor, with some journeys taking more than 2.5 times longer than expected in the peak periods. M25 junction 10 is also ranked as one of the most dangerous junctions nationally. During the period of 2009-2013 (inclusive), Highways England reported accident data include 239 accidents (just under 50 per year on average) on and around the M25 junction 10 and the A3 between Painshill and Ockham. This is partly attributable to the high levels of congestion at the junction, but is also due to there being a significant number of side roads and private accesses which connect directly to the A3 between Painshill and Ockham, thus reducing safe weaving distances for traffic. With forecast traffic growth and significant planned housing and economic development in the area, the problems at the junction are expected to deteriorate further, with delays being likely to increase by 40% by 2037 unless an improvement scheme is undertaken. Further detail on the problems at junction 10 are included in other project reports that are available if necessary.

2.2. Project objectives

- 2.2.1. The improvements to M25 junction 10 as originally stated in the RIS should deliver: "free-flowing movement in all directions, together with improvements to the neighbouring Painshill interchange on the A3 to improve safety and congestion across the two sites". The expected cost of the Scheme was in the range from £100m to £250m. For the purposes of this report, this is referred to as the aim of the Scheme.
- 2.2.2. The current challenges at the M25 junction 10/A3 Wisley interchange as noted above include:
- Congestion and delay disrupting journeys on the SRN;
 - Poor resilience resulting in frequent disruption and unreliable journey times;
 - Safety concerns; and

- Congestion causing a barrier to growth. Enterprise M3 Local Enterprise Partnership (LEP) has highlighted the M25 junction 10/A3 Wisley interchange as a part of the transport network where projected increases in traffic would cause further congestion and delays and hinder growth in the area unless addressed.

2.2.3. The Scheme objectives as set out in the Client Scheme Requirements are as follows:

- Route Operation:
 - Support any projected traffic increases from other committed schemes on the strategic road network and avoid or mitigate against causing adverse effects elsewhere on the Local Road Network.
- Capacity:
 - Reduce the average delay (time lost per vehicle per mile) on the mainline A3 and on M25 through junction running.
 - Smooth the flow of traffic by improving journey time reliability (Planning Time Index) on the mainline A3.
- Safety:
 - Reduce annual collision frequency and severity ratio on the mainline A3, slip roads and M25 junction 10 gyratory.
- Social:
 - Support the projected population and economic growth in the area.
 - Support walking and cycling by incorporating safe, convenient, accessible and attractive routes for pedestrians, cyclists and equestrians and improving crossing facilities.
 - Take account of the concerns of local communities and other key stakeholders raised during consultations.
- Environment:
 - Support compliance with the UK's legally binding limits and targets on air quality and water quality status and support targets to cut greenhouse gas emissions and objectives for local air quality management areas.
 - Avoid, mitigate and compensate for adverse effects on the integrity of the Thames Basin Heaths Special Protection Area and other statutory designated nature conservation sites and promote opportunities.
 - Recognise the significance of designated heritage assets close to the route of the Scheme, including at Painshill Park and at Wisley Gardens through incorporating suitable mitigation and/or design measures to avoid or reduce significant harm.
 - Improve the quality of life for nearby residents, through addressing the effects of noise on people in the declared noise important area's (NIA's) and ensuring that significant noise effects are mitigated.
 - Ensure through good design, that an appropriate balance is achieved between functionality and the Scheme's contribution to the quality of the

surrounding environment, addressing existing problems wherever feasible, avoiding, mitigating or compensating for significant adverse impacts and promoting opportunities to deliver positive environmental outcomes.

2.3. Project location

- 2.3.1. The M25 junction 10/A3 Wisley interchange lies in the south-west quadrant of the M25 London Orbital Motorway. At junction 10, the A3, a key radial route from London to Portsmouth, crosses the M25 motorway. Just to the north of junction 10 on the A3 is the Painshill junction with the A245. To the south of junction 10 on the A3 is the Ockham junction with the B2039 and B2215. The location of the M25 junction 10/A3 interchange is shown in Figure 1.1. The Scheme is located within the County of Surrey and within the Boroughs of Guildford and Elmbridge.

Environmental overview

- 2.3.2. The M25 junction 10/A3 junction is set within a predominantly wooded area to the south of Cobham and Byfleet and it is an attractive area despite the presence of the A3 and M25. Much of the area around junction is covered by the internationally designated Thames Basin Heaths Special Protection Area (SPA) and nationally designated Ockham and Wisley Commons Site of Special Scientific Interest (SSSI), as well as designations as a Local Nature Reserve (LNR), Site of Nature Conservation Interest (SNCI) and ancient woodland.
- 2.3.3. The RHS's headquarters are located at Wisley gardens to the south-west and Painshill Park is to the north-east of junction 10; both are designated as Registered Parks and Gardens of Historic Interest. The area immediately round the junction is designated as Common Land and/or Access Land and these areas, along with RHS Wisley and Painshill Park, are well used by the public. There are some facilities for walkers/cyclists along the A3 on the southbound carriageway but they are in a poor state. There are at-grade, controlled pedestrian and equestrian crossings at the junction and a number of Public Rights of Way (PRoW) in the surrounding area.
- 2.3.4. There are a number of Noise Important Areas (NIA) at the M25 junction 10/A3 Wisley interchange. No Air Quality Management Areas (AQMA) have been declared by the local authorities for the area immediately around the junction and there are few human health receptors nearby. The nearest AQMA is in Cobham to the north-east of junction 10.
- 2.3.5. There are four Scheduled Monuments in the area immediately around the junction and a number of Listed Buildings in the study area.
- 2.3.6. There are no Source Protection Zones or groundwater water abstractions near the junction and flooding is not an issue although the River Mole, River Wey and Guilehill Brook are nearby and the Stratford Brook crosses the Scheme at the Ockham junction.
- 2.3.7. There are a number of disused landfill sites that accepted inert waste in the study area and the sand and gravel geology means that the area is sensitive to pollution incidents.
- 2.3.8. These key environmental constraints are shown on the overall environmental constraints drawing (Figure 2.1) with other detailed environmental constraints drawings in Chapter 19.

2.4. Project description

- 2.4.1. The Scheme drawings are shown in Chapter 19 of this document. The Scheme has been developed over previous project stages and is the result of analysis and assessment of traffic, engineering, buildability and environmental factors as well as consultation with stakeholders and members of the public. Although the layout of the Scheme has been developed to a sufficient level of detail to show the size and location of the various elements that comprise it, further design and assessment will take place during this stage to refine it and provide more certainty on the layout of the Scheme. As such there is some level of uncertainty on the design of the Scheme at this point in the process. The boundary of the works has therefore been drawn with reference to the 'Rochdale Envelope' to allow for design development and the uncertainties that are inevitable at this stage.
- 2.4.2. The Scheme proposed provides increased capacity at the M25 roundabout by elongating the existing roundabout, providing additional lanes to provide more circulatory capacity and enabling more traffic to discharge the roundabout whilst providing dedicated free-flowing left turns. The elongated roundabout would use the existing bridges under the A3 and new bridges over the M25, with additional lanes and capacity between the traffic signals and dedicated left-turn filters at the traffic signals. Most of the existing roundabout and slip roads would be broken out and removed, with the existing structures over the M25 remaining in place. The alterations to junction 10 include the increase from 3 lanes to 4 lanes on the M25 through the junction to enable the introduction of smart motorway arrangements on the junction 10 to 16 section in the future.
- 2.4.3. The Scheme also includes widening the A3 from Ockham to M25 junction 10 and M25 junction 10 to Painshill from three lanes to four lanes in both directions to cater for the volumes of traffic expected to use these roads in the future. There would also be widening of the A245 to three lanes between the Painshill junction and the B365 Seven Hills Road junction. As the A3 will be widened to four lanes the current access to it from side roads and private properties will need to be closed and alternative arrangements will be put in place to provide access to the road network for the properties affected. Highways England expects to start construction in March 2020.
- 2.4.4. The Scheme includes provision for new or amended signs and gantries with associated cabling works along the A3 and the M25. On the M25 to the east and west of junction 10, beyond the area where the works to the layout of the highway would take place, alterations to signs and signals on existing gantries would be required but the gantries themselves would not be altered. The Scheme also makes allowance for improved drainage measures to be introduced on the altered sections of the A3 and M25.
- 2.4.5. The widening of the A3 necessitates the closure of the existing direct accesses to it and alternative provisions have been made which include:
- A new 2-way link road directly from the east side of the Ockham interchange roundabout along the north-western edge of the Wisley airfield site before turning northwest to rise and cross over the A3 on a new bridge close to the line of Elm Lane. This access ties into the existing level of Wisley Lane beyond the RHS entrance, which will need to be amended. The existing access to and from Wisley Lane from the northbound A3 will

be closed. The new crossing would provide access over the A3 for non-motorised users and the existing footbridge would be removed. An area of land for flood compensation is included where the structure carrying the road over the Stratford Brook watercourse might reduce the floodzone here;

- Elm Lane and Old Lane would be joined via the existing byway open to all traffic (BOAT). The existing BOAT would be reconstructed as a single lane, two-way local access road providing access from Elm Corner to the A3 via Old Lane and the M25 clockwise to A3 slip road;
- A new two-way access road connecting Birchmere Scout Campsite, Hut Hill Cottage and Park Barn Farm to Old Lane at the Ockham Bites site via a rebuilt Cockrow overbridge would be provided. The bridge would be constructed as a 'multi-use bridge' to provide habitat connectivity between ecologically valuable land on either side of the A3. The existing access to the A3 northbound to M25 clockwise slip road at junction 10 would be closed off. The existing track along Deers Farm Close and past Park Barn Farm would be retained;
- The connection to Old Lane from the A3 southbound on slip will remain;
- A two-way local access road with passing bays would be provided from Redhill Road to Seven Hills Road, providing access to Long Orchard Farm, Long Orchard House and San Domenico (Euro Garages);
- A new road bridge spanning the widened A3 will be provided just to the south of the end of Redhill Road, linking the access road from Seven Hills Road South to a new two-way local access road running parallel along the south-east side of the A3 as far as Court Close Farm, Heyswood Guides Camp and New Farm. This new link road and bridge will also form part of the NMU network around the Scheme, via a bridleway link to the re-provided NMU route south from Painshill interchange; and
- Widening the A245 from the Painshill junction to Seven Hills Road junction to D3AP, with a two-way access road between Old Byfleet Road to Seven Hills Road South for Felton Fleet School. The existing right turn from Old Byfleet Road to the A245 would be closed.

2.4.6. In addition to the Cockrow Bridge noted above there are three other bridges to be replaced that are used for private means of access, all of which also function as parts of the PRow network:

- Reinstatement of Buxton Wood Bridge across the amended M25 as an accommodation/bridleway bridge;
- Reinstatement of Clearmount Bridge across the amended M25 as an accommodation/bridleway bridge; this could have a wider bridge deck to provide multi-functional features, including potentially providing some planted vegetation to allow habitat connectivity across the bridge; and
- Reinstatement of Hatchford Park Bridge across the amended M25 as an accommodation/bridleway bridge.

2.4.7. A further new bridleway bridge would be provided over the M25 just to the east of junction 10 to link up more conveniently areas of Common Land to the north

and south of the motorway and provide better access for users of the publicly accessible land.

- 2.4.8. The Scheme is located within an area of land designated as Common Land or Access Land and is additionally designated for its ecological value as a Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI). Land take from these areas is required to accommodate the Scheme and suitable replacement land is required to compensate for the loss of this land. The Scheme includes areas of replacement land for loss of Common or Access Land and for the loss of SPA land. A greater area of replacement land is provided than is taken by the Scheme in recognition that it is not immediately of a similar quality than that taken. The areas of replacement land are provided in four locations:
- On the holding known as Park Barn Farm to the north-west of the junction;
 - On an area of land off Old Lane to the south-east of the junction;
 - On the holding known as Pond Farm to the west of the junction; and
 - On two adjacent areas of land to the east of the junction, just to the north of the M25.
- 2.4.9. These areas of land have been selected on the basis of a combination of:
- Proximity and linkages to the designated land taken;
 - Similarity of features, character, vegetation or habitat as the land lost or the potential to achieve these either with or without further work;
 - Sufficient size to accommodate the areas lost at the appropriate replacement ratios; and
 - Availability or potential availability for purchase.
- 2.4.10. Further details on the replacement land are given in a separate report that will be included as an Annex to the ES.
- 2.4.11. As part of the Scheme, the following PRow works will be proposed, to ensure that the Scheme re-provides or enhances existing NMU routes and connectivity and provides suitable rights of access to the remaining areas of existing Registered Common and Access Land and to and through the replacement land areas:
- Upgrading the existing equestrian route in the northern quadrant to bridleway status, to connect NMUs at Redhill Road to the bridleway bridge at Clearmount; this will also provide a basis for bridleway links to Areas N1, N2 and N4;
 - Bridleway connection to this upgraded equestrian route from the local road or bridleway bridge over the A3 by Red Hill;
 - A bridleway/cycleway link connecting the local access road along the east side of the A3 to Painshill interchange and to Pointers Road, with a link to the bridge over the A3 to Redhill Road;
 - A new bridleway bridge across the M25 to the southeast of the junction 10 roundabout, with bridleway links to Pointers Road and across Ockham Common (by upgrading the existing equestrian route) to Old Lane;

- A bridleway/cycleway link along the southeast side of the A3 between the above bridge and Ockham interchange, with links to the replacement Cockrow bridge, Old Lane, Wisley Lane bridge and Footpaths 14, 13 and 13a;
- Connecting the south end of Footpath 9 to the bridleway on Footpath 10 by Hut Hill;
- Provision of Pegasus crossings at Ockham interchange to provide safe access under the A3 to the B2215;
- Upgrading the existing equestrian route from Clearmount bridge to bridleway status and connecting it to the replacement for Cockrow Bridge;
- Upgrading the existing equestrian route across Ockham Common to bridleway status and connect it to the replacement for Cockrow Bridge; and
- Upgrading Footpath 7 to bridleway status to provide appropriate connection between two areas of existing Registered Common Land over the replacement Buxton Wood bridge - this will also entail a small realignment onto the farm track on the south side of Buxton Wood Bridge to avoid the existing set of steps.

2.4.12. These NMU works will also contribute towards achieving the objectives of the Scheme, as set out in section 2.2.

Land take

- 2.4.13. The permanent land take (i.e. the areas outside the existing highway boundary but within the proposed highway boundary) required for the Scheme is approximately 26 ha. The permanent land take required would include a number of areas covered by environmental designations.
- 2.4.14. The requirement for and extent of temporary land take is currently being developed but an area of 33 ha is included within the red line in which necessary construction activities might take place. The land taken temporarily will be restored and returned to its original landowners after construction has been completed. As far as possible the land will be returned in the same condition as it was before the works commenced. Where this is not possible measures will be put in place to achieve this including management operations over a long period of time. In some cases it may be possible to return the land in an enhanced condition in agreement with the original landowner.

Construction, operation and long term management

- 2.4.15. Specific construction, operational and long term management arrangements are not known in detail at this stage of the Scheme. Potential locations of construction compounds for the contractor have been identified and are included within the temporary land take for the Scheme. The assessments of construction effects will assume best practice, based on industry guidance and professional experience. Construction of the Scheme is planned to commence in March 2020, with the Scheme planned to be open for traffic in March 2022.

Decommissioning

- 2.4.16. In view of the indefinite design life of the Scheme, it is not considered appropriate for this to form part of each environmental topic assessment, rather the focus will be upon seeking to minimise disruption and to re-use materials that will also form part of the materials assessment. Decommissioning of the Scheme has therefore been scoped out of any further assessment.

Chapter 3

3. Alternatives

3.1. Introduction

- 3.1.1. In December 2014, following a number of studies looking at modal alternatives, a scheme for the M25 junction 10/A3 Wisley interchange ‘to allow free-flowing movement in all directions, together with improvements to the neighbouring Painshill interchange on the A3 to improve safety and congestion across the two sites’ was included in the Government’s RIS. The process by which the alternative proposals were developed, assessed and either discarded or chosen for further consideration is summarised below. Further detail on this process is given in a variety of reports prepared during the project’s development and can be made available if requested.

3.2. Optioneering methodology

- 3.2.1. A two-stage approach was undertaken in developing options for the Scheme. Firstly a number of high-level, strategic solutions were developed which considered ways to solve the problems identified. Secondly, with the strategic option selected more detailed Scheme options were developed and assessed.

Strategy, Shaping and Prioritisation Stage

- 3.2.2. A range of strategic options which could potentially be considered to address the key problems at M25 junction 10 were identified in the Strategy, Shaping and Prioritisation Stage. These strategic options gave high level consideration to a range of alternatives dealing with transport supply and demand, and included options for different modes of travel as well as different scales of highway intervention. Based on assessments undertaken by the project team a strategic option focussing on localised highway improvements at M25 junction 10 and Painshill interchange was confirmed as the preferred solution and taken forward to the Option Identification Stage.

Option Identification Stage

- 3.2.3. At the start of the Option Identification Stage, Atkins undertook a high-level modelling exercise to identify a range of options and determine whether they would provide sufficient capacity for a design life of ten to fifteen years was undertaken. The testing considered the scale of intervention required to ensure that the interchange would operate below capacity in ten and fifteen years’ time. It was found that either the existing roundabout would need to be significantly enlarged or at least all left turns and two busy right turns would need to be removed from the junction 10 roundabout. A long list of twenty-one options that fulfilled these criteria was developed and assessed and which was reduced down to the most suitable ten options. These ten were subject to further assessment and testing to examine their viability to achieve the objectives for the Scheme.
- 3.2.4. Of the ten options considered the following options were selected for further assessment:

- Option 16 - a large, cyclic arrangement similar to M25 junction 12 with the M3. This obtained the highest overall assessment score despite being one of the most costly and having the greatest environmental impact;
- Options 9 - which had dedicated left turns plus two free flow right turns from the A3 to M25 anti-clockwise and from the A3 to M25 clockwise. This option achieved the next highest assessment score and was thus selected for further consideration; and
- Option 14 - this option featured an elongated roundabout and dedicated left filters which scored marginally less than the other chosen options. However, it was the most affordable of all options and had the least environmental impact so for that reason it was agreed that it should be taken forward for further evaluation.

3.2.5. Predicted traffic flows on the A3 for the design year of 2037 would require the widening of the A3 carriageway from dual three lane all purpose (D3AP) to dual four lane all purpose (D4AP) between Ockham junction and Painshill junction. All three options therefore included widening of the A3 as well as improvements at the Painshill junction. Similar changes to side roads required as a result of the A3 widening were included for all three options.

3.2.6. At the end of the Option Identification Stage and ahead of consultation the cost of Option 16 was reviewed and it was deemed to be too expensive to be supported going forward and was therefore dropped from the consultation and future work.

3.2.7. It was recognised that the statement in the 2015 RIS for the Scheme 'to allow free-flowing movement in all directions' was not compatible with environmentally sensitive nature of the area. For this reason, the Options that did not provide this were not considered suitable to be taken forward to the next stage of the project.

Option Selection Stage

3.2.8. Following Scheme Options Identification, Options 9 and 14 were taken forward for further design and assessment in this stage.

Option 9 - Dedicated left turns plus two free flow right turns A3 to M25 J9 and A3 to M25 junction 11, Painshill and A3 D4AP

3.2.9. This option was based on providing half of the movements of the standard 4 level free flow interchange. The option consisted of free flow right turns from the A3 Northbound to the M25 anticlockwise and from the A3 southbound to the M25 clockwise. Free flow left turns from the A3 northbound to the M25 clockwise and the A3 southbound to the M25 anticlockwise were also provided. The right turns were provided on a large long span viaduct passing close to the centre of the existing junction with intermediate supports to fit within the constraints of the existing layout. All other vehicle movements would be carried out on the existing roundabout. New segregated non-motorised user (NMU) routes would be required. This option would include widening of the A3 carriageway to four lanes in each direction. The A3 proposals would also include widening of the A245 from two to three lanes between the Painshill interchange and the junction with Seven Hills Road. The widening would take place symmetrically on the existing line of the A245. The Painshill improvements would also reduce congestion on the A3 northbound.

- 3.2.10. Although less environmentally damaging than Option 16 this option would have significant adverse effects. The land required to build this option within an area designated for its internationally and nationally important ecological value made it difficult to support. Similarly, a large area of Common Land or Access Land would be taken and which would need to be replaced. The slip roads necessary to carry the right turning traffic would need to be elevated over the existing three level junction leading to increased visual impacts as well as increased noise effects on local people and bird species in the Special Protection Area (SPA). There would also be very large adverse effects on the setting of the scheduled monuments close to the junction and possible direct effects on the remains as well. For these and for other non-environmental reasons this option was not preferred.

Option 14 - Elongated + dedicated left filters, Painshill and A3 D4AP

- 3.2.11. This option modified the existing roundabout by creating new structures over the M25 and reusing the existing structures under the A3. The circulatory carriageway under the A3 would be widened to four lanes, five lanes of circulatory carriageway would be provided where unconstrained by the existing structures. Right turns would be carried out on the modified roundabout and left turns would use dedicated left filter lanes. Slip roads would be realigned to aid construction sequencing. NMU facilities would remain largely unchanged but minor upgrades would be required. The widening to four lanes would aid weaving and merging on the A3 as well as providing an opportunity to address side road access, lay-by provision and walking and cycling routes. The A3 improvements would also include widening of the A245 from two to three lanes between the Painshill interchange and the junction with Seven Hills Road. The widening would take place symmetrically on the existing line of the A245. The Painshill improvements would also improve conditions on the A3 northbound.
- 3.2.12. This option would have a much smaller footprint than Option 9 and hence would have a smaller effect on the designated land and habitats around the junction and require less replacement land. As the elongated roundabout would be at the same elevation as the existing gyratory the adverse visual and noise effects associated with Option 9 would also be avoided. The enlarged roundabout would bring the road infrastructure closer to the scheduled monument to the south-west of junction 10 but it would not have as large an effect as Option 9. For these and other reasons including affordability Option 14 was preferred.
- 3.2.13. Both Options 9 and 14 also required alterations to the side roads currently joining the A3 including Wisley Lane as well as private accesses, bus stops and lay-bys. The side roads options common to both Options 9 and 14 were developed further during the Option Selection Stage and are described below.

Access to Birchmere Scout Campsite and Pond Farm

- 3.2.14. A two-way access road connecting Deers Farm Close to Birchmere Scout Campsite and Pond Farm was proposed with the existing access to junction 10 slip road to be closed off. The existing track along Deers Farm Close and past Pond Farm would be refurbished to a single-track road with passing places.
- 3.2.15. The alternative to this arrangement during this stage was to retain the existing access to the slip road at the junction but this was not feasible with the free flow left turns proposed.

Elm Lane/Access to Elm Corner

- 3.2.16. This option joins Elm Lane and Old Lane via the existing byway open to all traffic (BOAT). The existing unsurfaced BOAT would be reconstructed to a single-track road providing access to junction 10 slip road and the A3 via Old Lane.
- 3.2.17. The alternative to this arrangement was to maintain the link to Elm Lane and then on to the Ockham interchange via a new road link between the Ockham junction and Wisley Lane but the residents of properties in Elm Corner served by Elm Lane expressed a preference for access to Old Lane via the BOAT.

Access to Long Orchard Farm and Long Orchard House

- 3.2.18. This option proposes a two-way local access road with passing bays from Redhill Road to Seven Hills Road, providing access to Long Orchard Farm, Long Orchard House and San Domenico (Euro Garages).
- 3.2.19. There was no alternative to this arrangement except for providing access to the road network via Redhill Road instead of Seven Hills Road but this was rejected by the residents affected.

A245/Painshill junction

- 3.2.20. This option consisted of widening the A245 from Painshill junction to Seven Hills Road junction to three lanes in each direction and a two-way access road between Old Byfleet Road to Seven Hills Road South for Felton Fleet School. The existing right turn from Old Byfleet Road to the A245 would be closed.
- 3.2.21. No alternative was proposed for this option.

Wisley Lane Options

- 3.2.22. Two options for the re-provision of access to Wisley Lane were proposed. One option consisted of a two-way local access road between Ockham junction and Wisley Lane parallel and northwest of the A3 located partly within RHS Wisley. The existing access from Mill Lane to the A3 Portsmouth Road would be closed and diverted on to the new access road. This option would have a direct effect on the Registered Park and Garden at RHS Wisley, the loss of screening trees along the boundary and heritage impacts and was rejected in favour of an alternative to the east of the A3.
- 3.2.23. The second option consisted of a two-way link road from Ockham junction to Wisley Lane, with an overbridge over the A3 carriageways linking Elm Lane to Wisley Lane. This option would affect woodland in the Common Land adjacent to the Wisley Airfield site. The existing Wisley Lane footbridge would be removed with NMU access being provided over the new bridge. Elm Lane running parallel to the A3 would be stopped up. This option was seen to be narrowly preferable to the option to the west of the A3 as it could be partly built on brownfield land on the disused Wisley Airfield, amongst other considerations.

Painshill Options

- 3.2.24. Two options were developed to provide access to properties in Painshill Park that gained access directly off the A3 southbound carriageway. One option consisted of the conversion of the service road to the southeast and parallel to the A3 to a two-way road with passing bays from the Gothic Tower within

Painshill Park to the gas compound north of Heyswood campsite. An overbridge over the A3 carriageways was required to link this road to Redhill Road (and Seven Hills Road South). This option was on the periphery of the Grade I Registered Park and Garden with limited effect on the key features of the park so despite the potential effect on the setting of the Gothic Tower this option was preferred to the alternative.

- 3.2.25. The alternative option consisted of the conversion of the service road to the southeast and parallel to the A3 to a two-way road with passing bays from the Gothic Tower to the A245 in Cobham using the existing roundabout near the Sainsbury's superstore. An overbridge over the River Mole was required to connect this road to the A245. This option would pass through the operational sections of the Grade I Registered Park and Garden and affect the setting of the listed bridge over the River Mole as well as other listed buildings within the park. It was strongly opposed by the residents of the listed buildings affected and would adversely affect the aquatic ecology of the River Mole. Consequently, it was rejected in favour of Option 04.

Legal and Policy Tests

- 3.2.26. Having established options that were viable and could satisfy the Scheme objectives, during the Option Selection Stage the Scheme options were also considered further in relation to the legal and policy tests set out in the National Policy Statement for National Networks. The Scheme was thought likely to be a highway-related Nationally Significant Infrastructure Project (NSIP) on the basis that either of the options currently under consideration would be of a scale large enough to exceed the qualifying area thresholds stipulated in the Planning Act 2008.
- 3.2.27. At the Option Selection Stage, the focus was to identify those tests that could potentially preclude the Secretary of State from being able to grant development consent, if a particular Scheme option could result in a breach of the UK's international obligations or any duty imposed under UK legislation. The tests of most relevance to the consideration of options for the Scheme are as follows:
- The European Directive 2008/50/EC, Ambient Air Quality and Cleaner Air for Europe, transposed in to UK legislation by the Air Quality Standards Regulations 2010, which would prevent consent from being granted for any scheme that would result in non-compliance with legally binding limit values for prescribed pollutants, including nitrogen dioxide (NO₂) and particulates of less than 10 microns (PM₁₀). The annual limit values for both are 40 µg/m³;
 - The European Directive 2000/60/EC, Establishing a Framework for the Community Action in the Field of Water Policy, transposed in to UK legislation by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 and the Water Industry Act 1991 (Amendment) (England) Regulations 2009. This legislation would prevent consent being granted for any scheme likely to cause deterioration in water quality status; or prevent a waterbody from achieving good ecological status; or compromise the achievement of water framework directive objectives in other classified water bodies within the same catchment;

- The European Directives 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna and 2009/147/EC on the Conservation of Wild Birds, which are transposed in to UK legislation by the Conservation of Habitats and Species Regulations 2010 (as amended by the Conservation of Habitats and Species (Amendment) Regulations 2012). These directives would prevent development consent from being granted for any scheme that would give rise to an adverse effect on the integrity of a European site (a Special Protection Area or a Special Area of Conservation), either individually or cumulatively, unless there was no less damaging, feasible alternative; that there were Imperative Reasons of Overriding Public Interest and that suitable compensation could be secured;
- The European Habitats Directive 92/43/EEC and Habitats Regulations 2010 as amended would also prevent consent and/or a mitigation licence from being granted for any scheme that would harm or disturb a European Protected Species, unless there were no satisfactory alternatives; that the favourable conservation status of the species would be maintained and that the development would be in the public interest; and
- The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, which would prevent development consent from being granted for any scheme that would disturb or harm nationally protected species, unless there were no satisfactory alternative solution.

- 3.2.28. In addition, under Section 104 (7) of the Planning Act 2008, development consent cannot be granted for any scheme if the benefits of that scheme do not outweigh its adverse impacts overall.
- 3.2.29. The difference in operational performance between the two options was found to be relatively modest, whilst the difference in environmental impact was significant. When the legal tests were also factored in, given the potential for adverse effects on the integrity of the Thames Basin Heaths SPA, there were very real risks attached to Option 9 and the ability to meet the tests required for any derogation from compliance with the Habitats and Wild Birds Directives. On this basis, the assessments pointed towards Option 14 as being the Option most likely to gain consent at examination.
- 3.2.30. It was recognised that it would be important to demonstrate that the benefits of Option 14 would outweigh its impacts and further work would be required to identify mitigation opportunities and design improvements if this option were taken forward as the preferred route.
- 3.2.31. The options for local access roads at both Painshill and at Wisley also presented significant challenges. Whilst the assessments appeared to point towards Options PAIN04 and WIS01, the appraisals were finely balanced and furthermore detailed assessments were necessary before a final decision could be made.

3.3. Preferred Option

- 3.3.1. Although the case for Option 14 over Option 9 became clear during the Option Selection Stage, a number of side road options were investigated that took into account the environmental and engineering constraints of the Scheme. The different options for the side roads included those for Wisley Lane, the access to

Pond Farm and access to the properties in Painshill Park with access off the A3. Further design, assessment and consultation was undertaken for these side roads and variations on the options for these were developed. Following the Option Selection Stage, the preferred option for the M25 junction 10/A3 Wisley interchange was announced by Highways England on 29th November 2017. The preferred option is described above in section 2.4 with the revised side road options that were chosen as noted below. The Scheme layout is shown in Chapter 19 of this report.

Side road options

- 3.3.2. Wisley Lane - A variation on the proposal to the east of the A3 - this option does not affect the SPA, Wisley Lane and access to RHS Wisley will remain open during construction and less Common Land is taken. It also includes bridleway links on both sides and a revised entry into RHS Wisley.
- 3.3.3. A variation of the access to Birchmere Scout Camp option which provides access via a replacement Cockrow bridge over the A3. The same standard of replacement bridge over the A3 is required whether either option as this is the route to Pond Farm. This bridge will provide for vehicles and bridleway users, as does the present bridge, and can be provided as a multi-function 'green' bridge for either option. The main difference is that it replaces the long vehicular route created from Pond Farm to Wisley Lane with a short vehicular link from Old Lane to the new bridge and then to the existing track. This option would have less overall effect on the SPA and the Common Land.
- 3.3.4. A variation of the Painshill option which had a bridge over the A3 is being progressed as the preferred option, making it as compact as possible to reduce land take, but with vehicles being routed via Seven Hills Road south to reach it rather than Redhill Road. Bridleway links will be added on both sides. The bridge would make provision for NMU's and do away with the need for a separate bridge to link rights of way on either side of the A3. By keeping this option as close to the A3 as possible loss of screening vegetation will be kept to a minimum and reduce the effect on the Gothic Tower.

Chapter 4

4. Scope of the Assessment

4.1. General Approach

- 4.1.1. EIA is a process and management technique which allows consideration of the likely environmental and impacts of a development prior to it proceeding. This provides an opportunity to ensure that the design is optimised in an integrated manner, minimising negative environmental impacts and maximising positive impacts.
- 4.1.2. This chapter describes the EIA process in conformance with the requirements of the Design Manual for Roads and Bridges (DMRB) requirements. For highways projects the DMRB Volume 11 is recognised as providing an appropriate methodology for the assessment of environmental effects. For some topics the DMRB methodology will be supplemented by separate best practice guidance where it improves the assessment of effects. The 2017 update to the EIA regulations requires consideration of a number of topics that were not previously included or were considered in a different format. These are:
- Biodiversity with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (previously flora and fauna);
 - Population and human health (previously population);
 - Land (not previously included);
 - Vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned;
 - Climate; and
 - Heat and radiation.
- 4.1.3. DMRB Volume 11 already covers Biodiversity, Population and Human Health and Land in existing topics but Vulnerability, Climate and Heat and Radiation are not currently included. Guidance from Highways England suggests that Vulnerability should be included in existing topic chapters. It further recommends that Heat and Radiation are scoped out as not relevant to highways schemes. The Highways England guidance does recommend that Climate is included as a new topic chapter with information from some other topics such as Air Quality which generates information on greenhouse gasses and which are a consideration in the assessment of climate effects.

4.2. The EIA process

The Design Manual for Roads and Bridges

- 4.2.1. DfT DMRB, Volume 11, Section 2, Part 1, General Principles and Guidance on Environmental Impact Assessment outlines the approach to assessment that may be relevant dependent upon the potential environmental effects and the stage of the project. The assessment levels are: scoping, simple assessment or detailed assessment. These levels are not intended to be sequential, but consequential. The assessment levels are defined as follows:

- Scoping - defines the scope of the assessment and is the purpose of this Scoping Report. Establishes the need for further assessment and whether some environmental topics can be 'scoped out' from further assessment;
- Simple Assessment - typically based on the data and information that is readily available and fulfils one of three functions:
 - To address potential aspects identified at the scoping level;
 - To reach an understanding of the likely environmental effects to inform the final design or assessment; or
 - To reach an understanding of the likely environmental effects that identified the need for a Detailed Assessment.

4.2.2. The Simple Assessment would be sufficient if it established confidently that the forecast environmental effect would not be a fundamental issue in the decision-making process.

- Detailed Assessment - Likely to require detailed field surveys and/or quantified modelling techniques. Detailed assessments would be undertaken where there is the potential to cause significant effects on environmental resources and receptors. The objective of this level of assessment is to gain an in-depth appreciation of the beneficial and adverse effects of the project.

Scoping

- 4.2.3. Prior to the commencement of works on the environmental assessment the scope of the environmental assessment will be established. The objective of this is to identify the environmental topics to be taken into account in the design of the Scheme and to set out the methodology for assessment. This assessment will ascertain which environmental topics are to be examined in greater detail i.e. a simple or detailed assessment, and which can be 'scoped out' (basic assessment) in accordance with Annex A of IAN 125/15.
- 4.2.4. The scoping process requires a good understanding of the existing environment and the Proposed Development. A gap analysis is undertaken to identify what further studies are required to gain a detailed understanding of the receiving environment. This could involve consultation with stakeholders to acquire existing data or where this does not exist, surveys can be undertaken.
- 4.2.5. Teams of experts that specialise in specific environmental topics consider the Proposed Development and what impacts are likely to arise. This exercise is completed using professional judgement and experience from similar projects and through consultation with statutory stakeholders who have detailed knowledge of the types of impacts that can arise from projects.
- 4.2.6. For each environmental topic, a list of the impacts that can arise during both construction and operation of the Scheme is produced and a commentary is provided setting out the justification as to why resulting environmental effects are likely to be significant or not. This forms the basis of the proposed scope of the EIA which is confirmed or added to by the Competent Authority (in this case the Planning Inspectorate with reference to other bodies such as Natural England) through the issue of a Scoping Opinion.

4.2.7. Volume 11, Section 1, Part 1 of the DMRB supplemented by IAN 125/15 Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment' identifies the topics the scoping of the EIA should consider. These are:

- Air Quality;
- Noise and Vibration;
- Biodiversity;
- Road Drainage and the Water Environment;
- Landscape;
- Geology and Soils;
- Cultural Heritage;
- Materials and Waste; and
- People and Communities.

4.2.8. For each environmental topic, a different level of assessment may be appropriate. The topic chapters below (chapters 5 to 14) state whether the topic is to be 'scoped in' to the EIA and whether a simple or detailed assessment will be required.

4.2.9. Each of these topics is considered in individual chapters following the same format and structure. For each topic, the current knowledge of the existing environment is summarised and any knowledge gaps are identified.

4.3. Proposed EIA approach for the Scheme

4.3.1. The key stages of the EIA process for the Scheme at this stage are:

- Scoping;
- Defining the study area;
- Establishment of baseline conditions;
- Impact assessment and identification;
- Defining assessment years;
- Development of mitigation measures;
- Prediction of residual environmental effects;
- Cumulative impact assessment;
- Transboundary impacts; and
- Environmental management.

4.3.2. These stages are discussed in more detail in the following sections.

Scoping

4.3.3. Scoping will determine the environmental topics that should be 'scoped out' of the EIA. The appropriate level of assessment, namely whether a Simple or Detailed assessment as defined in DMRB HA 201/08, HA 204/08 and Annex A of

IAN 125/15, that should be applied to the environmental topics ‘scoped in’ will be set out.

Defining the study area

- 4.3.4. Study areas are defined individually for each environmental topic, according to the geographic scope of the potential impacts relevant to that topic or of the information required to assess those impacts. It will also draw on guidance in DMRB where this specifies the extent of study areas. The study areas are defined within each relevant topic chapter of this report.

Establishment of baseline conditions

- 4.3.5. The existing baseline conditions need to be defined to allow the assessment of changes that would be caused by the Scheme. The identification of the baseline requires the description of the existing situation and then a prediction of how it is likely to change in the absence of the Scheme.
- 4.3.6. The description of the baseline conditions should clearly identify receptors that may be affected by the Scheme and also their ‘value’ or ‘sensitivity’ to potential change.

Impact assessment and identification

- 4.3.7. Methods and requirements specific to each assessment topic are set out in the relevant topic chapters (chapters 5 to 14), however, the approach set out below is common to all topics and is in accordance with relevant guidance and best practice.
- 4.3.8. With the receptors identified and their sensitivity classified, the potential impacts of the works to these aspects, for construction and operation where appropriate, will be determined and the magnitude of the impact determined.
- 4.3.9. For each topic, the assessment will combine the magnitude (major to no change) of the impacts and the sensitivity (very high to negligible) of the resources/receptors that could be affected in order to classify the effect and to establish their significance (see Table 4.1). These classifications range from negligible to major, on the environmental aspects as set out in Table 4-2.

Table 4-1: Significance of effects

Sensitivity of receptor	Magnitude of impact				
	Major	Moderate	Minor	Negligible	No change
Very high	Very large	Large or very large	Moderate or large	Slight	Neutral
High	Large or very large	Moderate of large	Slight or moderate	Slight	Neutral
Medium	Moderate or large	Moderate	Slight	Neutral or slight	Neutral
Low	Slight or moderate	Slight	Neutral or slight	Neutral or slight	Neutral
Negligible	Slight	Neutral or slight	Neutral or slight	Neutral	Neutral

Table Source: DMRB, Volume 11, Section 2, Part 5, HA 205/08, Table 2.4

Table 4-2: Effects definitions

Value	Typical descriptors
Very Large	These represent key factors in the decision-making process. These effects are generally associated with sites or features of international or national importance. However, a serious change in a site or feature of district importance may also enter this category. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.
Large	These effects are considered to be very important considerations and are likely to be material in the decision-making process
Moderate	These effects may be important at a local level, but are not likely to be key decision-making factors. The cumulative effects of such issues may become a decision-making issue if leading to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These effects may be raised as local issues. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Negligible	No effects, or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table Source: DMRB, Volume 11, Section 2, Part 5, HA 205/08, Table 2.3

4.3.10. The classification of effects also considers the following descriptors:

- Adverse, neutral or beneficial;
- Permanent or temporary;
- Duration/frequency or likelihood;
- Direct or indirect;
- Secondary; or
- Cumulative.

4.3.11. The duration of the effect will be assessed to be either temporary or permanent where:

- Temporary (e.g. demolition and construction phase):
 - Short term (< 5 years);
 - Medium term (5-10 years); or
 - Long term (> 10 years); and
- Permanent (e.g. once the works are completed and operational).

Defining assessment years

Temporal scope

Scheme phases

4.3.12. The EIA will include consideration of effects arising from the construction and operation of the Scheme. Decommissioning is not relevant for the Scheme as noted above.

Do-minimum and Do-something scenarios

- 4.3.13. The assessment of effects involves comparing a scenario with the Scheme against one without the Scheme over time. The absence and presence of the Scheme are referred to as the 'Do-Minimum' and 'Do-Something' scenarios respectively. Dependent upon the topic, the scenarios will be assessed in the baseline year and a future assessment year or a series of future assessment years (for example 15 years after opening, or the worst year in the first 15 years of operation).
- 4.3.14. The 'Do-Minimum' scenario is defined by DMRB as *"the conditions that would persist in the absence of the implementation of a construction or improvement project, but given that maintenance is ongoing"* (DMRB Volume 11, Section 2, Part 7 HA 218/08). Identification of the baseline therefore requires first the identification of the existing situation, and then the prediction of how it is likely to change between now and implementation of the Scheme.

Dealing with uncertainty

- 4.3.15. EIA is an iterative process, and the Scheme may include somewhat uncertain aspects. At the time that the EIA is submitted, it is proposed that no aspects of design would vary so much as to represent effectively different schemes. The EIA would ensure it addresses the potential for a range of impacts resulting from any undecided parameters.
- 4.3.16. The Rochdale Envelope principle would be applied in accordance with the PINS Advice Note 9 using the Rochdale Envelope. The ES will explain clearly any elements of the Scheme yet to be finalised, with justification. Where flexibility is sought in the Scheme design, the maximum potential adverse impacts of the Scheme will be assessed. The ES will confirm maximum and other dimensions of the Scheme, and that any changes to the development within such parameters would not result in significant impacts not previously identified and assessed.

Development of mitigation measures

- 4.3.17. Proposals for mitigation will follow the mitigation hierarchy of avoid, reduce, remedy and compensate. Incorporated mitigation will include Best Practicable Measures, construction environmental management procedures identified in the Construction Environmental Management Plan (CEMP) and will also describe design features that have been adapted to reduce or prevent impacts, such as noise attenuation measures. Incorporated mitigation is included within the assessment.
- 4.3.18. Mitigation is defined as *"measures intended to avoid, reduce and, where possible, remedy significant adverse environmental effects"* (DMRB Volume 11, Section 2, Part 7 HA 218/08). Enhancement measures are defined as *"measures over and above normal mitigation"* (IAN 125/15).
- 4.3.19. During the Option Selection Stage the need for eliminating or mitigating any adverse environmental impacts were considered. No specific mitigation measures were identified at this stage as they would be developed fully during this Preliminary Design Stage. Where possible, consideration will be given to reducing or avoiding adverse environmental impacts and these will be developed during the Scheme development as an iterative process. Where mitigation measures are required, these will be informed by survey data being collected for

the purposes of the Preliminary Design Stage and developed in consultation with statutory bodies. The Scheme will include all mitigation considered necessary to reduce effects to an acceptable level and the assessment will report on this basis. As well as mitigation the Scheme will also include compensation for adverse effects where necessary and again the assessment will be based on the Scheme with this included.

- 4.3.20. During construction, the responsibility for further environmental mitigation and the adherence to environmentally responsible working practices will fall to the contractor, through a CEMP prepared by the designer (Atkins) and refined as the Scheme progresses.

Prediction of residual environmental effects

- 4.3.21. The residual effect will be assessed using the same system as described above to include the mitigation proposed. The residual effect as classified will be considered for its significance. Generally, effects considered to be moderate or major are deemed significant; and those minor or negligible are deemed to be not significant, based on the described classification (Table 4-2) and professional judgement.

Cumulative impact assessment

- 4.3.22. Cumulative effects are the result of multiple actions on environmental receptors. There are principally two types of cumulative impact:
- The combined action of a number of different environmental topic specific impacts upon a single resource/receptor; and
 - The combined action of a number of different projects, in combination with the project being assessed, on a single resource/receptor.
- 4.3.23. Further details on the scope of the cumulative effects assessment is provided in Chapter 15 Assessment of Cumulative Effects.

Transboundary impacts

- 4.3.24. Regulation 24 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires PINS to notify other European Economic Area (EEA) States and publicise an application for development consent if it is of the view that the proposed development is likely to have significant effects on the environment of another EEA Member State, and where relevant to consult with the EEA State affected. The Scheme is approximately 120 km from France, the closest EEA State.
- 4.3.25. The study areas for the various environmental topics define the extent of effects anticipated and are described fully in chapters 5 to 14 and are summarised below as follows:
- Air Quality: within 200 m of the works;
 - Noise and Vibration: 600 m from the carriageway of the works;
 - Biodiversity: 2 km for statutory and non-statutory designated sites and 30 km for SACs;
 - Road Drainage and the Water Environment: 1 km around the works;

- Landscape: within the zone of visual influence of the works, i.e. areas where the Scheme can be seen from;
- Geology and Soils: 500 m from the extent of the works;
- Cultural heritage: 500 m from the works or within the area considered to be the setting of the asset;
- Materials and Waste: waste arisings within the county of Surrey; and
- People and Communities: 500 m from the works.

- 4.3.26. The study areas will cover the area where direct effects of the Scheme will be experienced as well as the area where effects on the setting of an asset might be felt, for example the setting of a listed building where the surroundings contribute to its historic value. The works include alterations to signs and signals on existing gantries that would be retained on the M25 to the east and west of the highway improvement works around junction 10. The study area for topics affected by changes in the appearance of these signs and signals may be extended to include the areas where the changed signs and signals are visible and might have a material effect.
- 4.3.27. For some topics the effects of the Scheme would extend beyond the immediate area of the works. For example, the noise and air quality effects would be experienced in the surrounding area where there would be changes in traffic flows as a result of the Scheme. The method for establishing the extent of study areas in this situation is set out in the topic chapters below.
- 4.3.28. As none of these distances reach other EEA Member States, no transboundary effects are anticipated for the Scheme.

Habitats Regulations Screening

- 4.3.29. The nearest European designated site to the Scheme is the Thames Basin Heaths SPA, which is directly adjacent to the south-east and south-west of M25 junction 10. Further details regarding this site and its qualifying interests are provided in Chapter 7 Biodiversity.
- 4.3.30. In accordance with the requirements of PINS Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects, screening for likely significant effects will be undertaken (alone or in-combination with other projects). Based on current information and the Options Selection Stage Habitat Regulations Assessment (HRA) Screening Matrix it is considered likely that the Scheme could give rise to impacts on the SPA based on displacement or reduced breeding success of qualifying bird species through habitat loss, changes in habitat quality and disturbance. Further work during the assessment stage will be undertaken to determine the effects of the Scheme including continuing surveys of bird populations, recording of existing noise levels, prediction of noise levels, assessment of likely disturbance and mitigation measures. The Options Selection Stage HRA Screening Matrix indicated an outcome of 'Significant Effects are Likely'. Initial consultation has been undertaken with Natural England, further consultation will be undertaken with Natural England regarding the outcome of the Preliminary Design Stage HRA. The conclusions of the HRA will be reported in the ES in line with normal practice and as required by the 2017 EIA regulations.

Health Impact Assessment and Equalities Impact Assessment

- 4.3.31. The assessment of the effect of the Scheme on Population and Human Health is a requirement under the 2017 EIA regulations. Guidance from Highways England indicates that this assessment is informed by the assessments in existing topics such as Air Quality and Noise. A Health Impact Assessment (HIA) will be produced and reported separately to the EIA. Similarly, an Equalities Impact Assessment (EqIA) which reports the effect of the Scheme on different social groups will also be produced and reported separately.

Major accidents and disasters

- 4.3.32. In line with the new requirements for major accidents and disasters outlined in Article 3(1) of the EIA Directive, the ES will consider:
- Vulnerability of the Scheme to risks of major accidents and/or disasters; and
 - Any consequential changes in the predicted effects of that Scheme on environmental topics.
- 4.3.33. In considering these elements of vulnerability, the ES will:
- apply professional judgement in consultation with the Overseeing Organisation to develop Scheme specific definitions of major events. It should be noted that there is no definition of 'major' in this context;
 - identify any 'major' events that are relevant to and can affect the Scheme. Major events shall include both man-made and naturally occurring events. Not all events warrant assessment and evidence should be provided to support the view that they should be classified as major events;
 - where Major events are identified, describe the potential for any change in the assessed significance of the Scheme on relevant environmental topics in qualitative terms. Report the conclusions of this assessment within the individual environmental topics; and
 - clearly describe any assumed mitigation measures, to provide an evidence base to support the conclusions and demonstrate that likely effects have been mitigated/managed to an acceptable level.
- 4.3.34. Major events will be reported within the relevant environmental topic chapters.

Environmental management

- 4.3.35. A CEMP will be prepared by the designer (Atkins) in association with Highways England's contractor delivery partner during this stage and refined as the Scheme progresses from development to construction and handover. The CEMP will detail practices that the contractor is to apply on site that will demonstrate commitments to environmental management. It will detail both generic and specifically targeted practices to enable construction to be undertaken with minimal impact on the environment and will also enable monitoring requirements to be set up. Proposals for monitoring will be developed as part of the topic impact assessments in the ES.

Chapter 5

5. Air Quality

5.1. Introduction

- 5.1.1. This chapter describes the scope of the air quality assessment for the Scheme. The air quality assessment will ascertain the likely potential effects on air quality due to the Scheme during construction and operation.
- 5.1.2. This chapter identifies and presents existing baseline air quality conditions in the Scheme area, identifies the potential impacts on air quality associated with the Scheme on human health and ecosystems both during construction and operation, and discusses mitigation measures that may be applied to mitigate any potentially significant adverse effects.

5.2. Study area

- 5.2.1. The study area for assessing the potential effects of construction dust is defined as the area within 200 m of the construction site boundary, in accordance with the DMRB Volume 11, Section 3, Part 1 HA 207/07 'Air Quality'.
- 5.2.2. The air quality study area for assessment of construction traffic and normal traffic during the operational phase is determined in accordance with traffic change criteria set out in the DMRB HA 207/07 which defines affected road networks (ARN) for local (paragraph 3.11) and regional (paragraph 3.20) air quality assessments.
- 5.2.3. The Scheme is located within the boundaries of Guildford Borough Council (GBC) and Elmbridge Borough Council (EBC). For the purposes of this Scoping Report the air quality study area is based on the ARN that was defined at the Option Selection Stage for the preferred Scheme (Option 14 with WIS10) and which extends into the local authority areas of Runnymede Borough Council (RBC), Woking Borough Council (WBC), Mole Valley District Council (MVDC), and borders the Royal Borough of Kingston upon Thames (RBK). This includes the area within 200 m of the Scheme, including the M25 junction 10, the M25 between junction 9 and 11, the A3 between Ockham and Painshill junctions, and other local roads. The ARN will be reviewed and updated on the basis of strategic traffic modelling to be undertaken in this Preliminary Design Stage to inform the assessment in the ES.
- 5.2.4. The study area for local air quality during operation is provided in Figure 5.1, which shows sensitive human health receptors and designated ecological sites within 200 m of the ARN. The study area for construction dust is provided in Figure 5.2.

5.3. Planning and policy context

Air Quality Criteria

- 5.3.1. There are two sets of ambient air quality criteria for the protection of public health: legally binding, mandatory limit values set by the European Union (EU); and objectives set out in the UK National Air Quality Strategy (AQS) which local authorities are required to work towards achieving. Both sets of criteria are implemented in Air Quality Regulations (The Air Quality Standards Regulations

2010 (SI 2010/1001)¹ for EU limit values, and The Air Quality (England) Regulations (SI 2000/928)² as amended by SI 2002/3043³ for AQS objectives). Air quality criteria relevant to the air quality assessment are summarised in Table 5-1, and for nitrogen dioxide (NO₂) and particulate matter (PM₁₀) are the same criteria for both the EU limit values and the AQS objectives.

Table 5-1: Relevant human health air quality criteria

Pollutant	Criteria
NO ₂	1-hour mean concentration should not exceed 200 µg/m ³ more than 18 times a year
	Annual mean concentration should not exceed 40 µg/m ³
PM ₁₀	24-hour mean concentration should not exceed 50 µg/m ³ more than 35 times a year
	Annual mean concentration should not exceed 40 µg/m ³

Ecological Criteria

- 5.3.2. The EU has set a critical level for annual mean concentrations of nitrogen oxides (NO_x) to protect sensitive vegetation. This is included in the Air Quality Standards Regulations (SI 2010/1001). Assessment of compliance with this critical level is undertaken at locations more than 20 km from towns with more than 250,000 inhabitants or more than 5 km from other built-up areas, industrial installations or motorways or major roads with traffic counts of more than 50,000 vehicles per day. UK statutory nature conservation agencies' (Natural England) policy is to apply the limit value of 30 µg/m³, on a precautionary basis, as a benchmark only in all designated conservation sites, including 'Ramsar' sites, Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs).

National Planning Policy

- 5.3.3. The National Planning Policy Framework (NPPF) sets out the Government's requirements of the planning system. The NPPF requires local planning authorities (LPAs) to take account of air quality in plan making, stating at paragraph 124:

"Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."

National Policy Statement

- 5.3.4. The National Networks National Policy Statement (NN NPS), prepared by the Department for Transport (DfT), provides policy and guidance relating to the development of nationally significant infrastructure projects. NN NPS requires a judgement to be made as to the risk of a project affecting the UK's ability to

¹ <http://www.legislation.gov.uk/ukxi/2010/1001/contents/made>

² <http://www.legislation.gov.uk/ukxi/2000/928/contents/made>

³ <http://www.legislation.gov.uk/ukxi/2002/3043/contents>

comply with the Air Quality Directive (paragraph 5.11) of the NN NPS, which states:

“Air quality considerations are likely to be particularly relevant where schemes are proposed: within or adjacent to AQMAs; roads identified as being above Limit Values or nature conservation sites; and where changes are sufficient to bring about the need for a new AQMA or change the size of an existing AQMA; or bring about changes to exceedances of the Limit Values, or where they may have the potential to impact on nature conservation sites.”

5.3.5. Furthermore, paragraph 5.13 of the NN NPS, states:

“The Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will: result in a zone/agglomeration which is currently reported as being compliant; or affect the ability of a non-compliant area to achieve compliance with the most recent timescales reported to the European Commission at the time of the decision.”

Road Investment Strategy and Strategic Business Plan

5.3.6. The DfT RIS published in 2015 sets out the DfT’s aspirations for the Strategic Road Network (SRN) over the next 25 years. It states that by 2040 DfT aspires to a network that will be sustainable with “zero breaches of air quality regulations and major reductions in carbon emissions across the network”.

5.3.7. The Highways England Delivery Plan 2015-2020 identifies Highways England’s commitment to investing £75m “in a range of projects to reduce pollution and ensure the air around the network is clean and healthy”. The Highways England Delivery Plan 2017-2018 sets out indicators that will be used to measure performance, including of relevance to air quality, the number of air quality pilot studies completed.

Local Planning Policy

5.3.8. Appendix A provides details of local planning policies. The following policies are of relevance to air quality:

- Policy CS25 - Travel and Accessibility - within the Elmbridge Core Strategy;
- Policy DM5 - Pollution - within the Elmbridge Local Plan Development Management Plan;
- Policy G1 (3) - Protection of amenities enjoyed by occupants of buildings, and G1 (13) - mixed use of development - within the Guildford Borough Local Plan; and
- Policy DM6 - Air and water quality - within the Woking Development Plan Document.

Local Air Quality Action Plan

5.3.9. Following assessment of air quality in their area, local authorities are required to prepare Air Quality Action Plans (AQAPs) where the authority has declared an Air Quality Management Area (AQMA), describing the pollution reduction measures it will put in place.

- 5.3.10. The EBC AQAP details the council's proposed measures for improvement of air quality within the borough. The AQAP identifies the primary source of air pollution within the borough as road traffic and as such recognises the need to support sustainable travel options and the importance of raising public awareness on the issue of air quality. The AQAP also briefly details other key documents that address the use of air pollutants; these documents include the Surrey County Council Local Transport Plan (LTP3) and Elmbridge's Local Development Framework (LDF).
- 5.3.11. The RBC AQAP recognises road traffic as the major source of air pollution in the borough. The AQAP incorporates a number of measures for improving air quality both within the Air Quality Management Areas (AQMA) and the wider local authority area from development control, implementation of mitigation, including redesign and compensation/offsetting measures, proposals for continued air quality monitoring, and identification of a number of infrastructure projects to tackle congestion and benefit air quality, supplemented with actions to promote sustainable transport. The AQAP also references local strategies and policies, including Runneymede's LTP3 and LDF (now termed Local Development Scheme).
- 5.3.12. GBC and MVDC do not have an AQAP as there are no AQMA within their local authority areas. The AQAP for WBC is not currently considered to be relevant to the assessment, given that the AQMA are not within the study area. Further discussion on AQMA is provided in section 5.4 below.

5.4. Baseline conditions

- 5.4.1. Information on existing ambient air quality i.e. baseline conditions, and identification of potential air quality constraints to the Scheme have been determined through reference to the following sources:
- AQMA mapping⁴;
 - Department for Environment, Food and Rural Affairs (Defra) Pollution Climate Mapping (PCM) model data for the latest available year (2015)⁵;
 - Local Authority Local Air Quality Management (LAQM) Reports⁶;
 - Highways England project specific nitrogen dioxide (NO₂) diffusion tube survey data^{7,8};
 - Ordnance Survey base mapping to identify locations of sensitive receptors (residential properties, schools, hospitals and elderly care homes); and
 - Natural England (NE) MAGIC website to identify boundaries of designated ecological sites.
- 5.4.2. Figure 5.1 shows the air quality constraints within the Scheme study area.

⁴ <http://uk-air.defra.gov.uk/aqma/maps>

⁵ <http://uk-air.defra.gov.uk/data/gis-mapping>, accessed 04/09/17

⁶ Elmbridge Borough Council (2016) Air Quality Annual Status Report; Woking Borough Council (2016) Air Quality Annual Status Report; Guildford Borough Council (2016) Air Quality Annual Status Report

⁷ Atkins (2015) M25 DBFO Air Quality Monitoring (Quarter 4): Connect Plus Services

⁸ Atkins (2016) M25 DBFO Air Quality Monitoring 2014 - 2015 Annual Report: Connect Plus Services

Pollutants

- 5.4.3. The air pollutants of concern in the context of the local air quality assessment for the Scheme are NO₂ and fine particulate matter (PM₁₀). These pollutants are most likely to be present in ambient air at concentrations close to or above statutory limit values at receptors near to roads, and are hence the focus of the assessment of vehicle emissions associated with the Scheme. In addition, carbon dioxide (CO₂) is included within the regional air quality assessment. Further information on these pollutants is provided in Appendix A. Air quality criteria are provided in Table 5-1 above.
- 5.4.4. National assessments have demonstrated that there is no risk of exceedance of the air quality objectives set for 1,3-butadiene, benzene, carbon monoxide, lead or sulphur dioxide due to emissions from traffic anywhere in the UK. These pollutants are therefore not considered further as there is not considered to be a potential for significant effects associated with these pollutants.
- 5.4.5. Due to the close proximity of ecological sites with statutory designation to the air quality study area, it will be necessary to assess the effects of NO_x on vegetation.
- 5.4.6. In addition to these air pollutants, dust may be generated during the construction phase in areas adjacent to the Scheme. Dust per se is not considered as a local air pollutant but may cause a perceived loss of amenity and can give rise to soiling (dust deposition).

Local Air Quality Management

- 5.4.7. There are no AQMAs declared within the GBC and MVDC areas.
- 5.4.8. EBC has declared seven AQMAs for exceedances of the annual mean AQS objective for NO₂. Of these the Cobham High Street and Esher AQMAs are within 200 m of the ARN as defined at the Option Selection Stage.
- 5.4.9. RBC has declared two AQMAs: one along the M25 corridor within the RBC administrative area; and one in Addlestone Town Centre. The M25 AQMA was declared for exceedances of both the annual and 24-hour mean AQS objectives for PM₁₀ as well as the annual mean AQS objective for NO₂ and is within the air quality study area. At the Option Selection Stage, the Addlestone Town Centre AQMA was not within 200 m of the ARN, although this will be reviewed once traffic data for this Preliminary Design Stage is available, as it could potentially be affected.
- 5.4.10. WBC has declared two AQMAs for exceedances of the annual mean NO₂ AQS objective, neither of which are likely to be affected as they are not within 200 m of the ARN defined at the Option Selection Stage. This will be reviewed once the revised traffic data for the Preliminary Design Stage is available.
- 5.4.11. RBK has declared its entire borough an AQMA for exceeding the annual mean NO₂ AQS objective and the annual mean and daily mean PM₁₀ AQS objectives. This could potentially be affected as it is within 200 m of the ARN defined at Option Selection Stage.
- 5.4.12. The AQMAs noted above are described below in Table 5-2 and those closest to the Scheme illustrated in Figure 5.1.

Table 5-2: Description of AQMAs

Local Authority	Name	Air Quality Criteria Exceeded	Description
EBC	Cobham AQMA	NO ₂ annual mean	An area along the High Street, Cobham.
	Esher AQMA	NO ₂ annual mean	An area extending along the High Street, Church Street and including parts of Esher Green and Lammas Lane.
RBC	M25 AQMA	NO ₂ annual mean PM ₁₀ annual and 24-hour mean	AQMA combining 2 areas. Area 1 extending 70 m east and west of the centre line of the M25 between junction 11 and the southern boundary of the Borough at New Haw/Byfleet. Area 2 extending 55 m east and west of the centre line of the M25 between junctions 11 and 13.
RBK	Kingston Upon Thames AQMA	NO ₂ annual mean PM ₁₀ annual and 24-hour mean	The whole borough.

Defra Mapping

Pollution Climate Mapping (PCM)

- 5.4.13. Further information on areas exceeding the EU limit values is available from Defra's PCM model. This model provides estimates of roadside concentrations of pollutants, including annual mean NO₂ and PM₁₀, which are used in annual reporting to the EU regarding compliance with the limit values. The modelled roadside concentration comprises a background component together with a roadside increment.
- 5.4.14. Not all roads are included within the PCM model. In the vicinity of the air quality study area, Defra's PCM only includes parts of the A244, A245, A307 and A318. The PCM mapping shows that for the base year (2015) none of the roadside annual mean PM₁₀ or NO₂ concentrations for these roads exceeded the EU limit values of 40 µg/m³.
- 5.4.15. Defra PCM links are illustrated in Figure 5.1.

Background mapping

- 5.4.16. Estimates of current and future year background pollutant concentrations in the UK are available on the Defra UK Air Quality Information Resource (UK-AIR) website⁹. The background estimates, which are a combination of measured and modelled data, are available for each one kilometre grid square throughout the UK for a base year of 2013, which is the basis for the future year estimates up to 2030. These background estimates include contributions from all source sectors, e.g. road transport, industry, and domestic and commercial heating systems.
- 5.4.17. Estimated annual mean background concentrations for the grid squares covering the M25 junction 10 air quality study area for the base year used in the Option Selection Stage EAR (2015) for the pollutants NO₂ and PM₁₀ are presented in

⁹ <https://uk-air.defra.gov.uk/data/laqm-background-home>

Appendix A. Mapped background concentrations of NO₂ and PM₁₀ for 2015 were below relevant air quality criteria, and ranged from between 12.4 to 25.9 µg/m³ for NO₂ and 14.3 to 18.3 for PM₁₀, with higher concentrations for the grid squares covering the M25. This indicates that, as expected, concentrations at background locations near the Scheme and associated ARN are currently likely to meet relevant air quality criteria for these pollutants.

Air Quality Monitoring

- 5.4.18. Air quality monitoring data from continuous monitoring stations (CMS) and passive diffusion tubes in the air quality study area are presented in Table A.1 and Tables A.2 and A.3 in Appendix A and summarised below.

Highways England Monitoring

- 5.4.19. Connect Plus measure NO₂ concentrations using diffusion tubes at a number of sites around the M25 on behalf of Highways England. The three-year survey started in September 2013. Five of the sites (CP4, CP8, CP9, CP10 and CP27) are located in close proximity to the Scheme as shown in Figure 5.1. The annual mean NO₂ concentrations for these monitoring sites between September 2013 and 2016 are tabulated in Appendix A. The results show that there were no recorded exceedances of the NO₂ annual mean air quality criterion at any of these sites over the three-year survey period. Concentrations were highest at site CP4, located to the north-west of M25 junction 10, and lowest at site CP27, south-east of junction 10.
- 5.4.20. Highways England has also conducted a six-month diffusion tube survey for the purpose of informing the M25 junction 10 Improvements for six months in 2016. The survey consisted of 13 diffusion tubes located near to junction 10 at roadside or kerbside locations. Survey locations are illustrated in Figure 5.1. The results are provided in Table 9.3 in Appendix A. The results show that there were no recorded exceedances of the NO₂ annual mean air quality criterion at any site in 2015, as adjusted. The highest concentration was 33.7 µg/m³ at a site near the A3 south of Burnt Common (HE_7).

Local Authority Monitoring

- 5.4.21. All of the local authorities undertake air quality monitoring near the air quality study area for the Scheme as defined at Option Selection Stage.

Continuous Monitoring

- 5.4.22. None of the local authorities operate a CMS measuring concentrations of either NO₂ or PM₁₀ within the air quality study area. The closest CMS to the study area which measure NO₂ are located at roadside sites in Weybridge and Hampton Court in EBC's area, and at a kerbside site in Dorking in MVDC's area, which operated until 2014. Concentrations at the Weybridge site exceeded the annual mean NO₂ AQS objective between 2012 and 2014, but have been below the AQS objective since. Concentrations at the Hampton Court site have exceeded the AQS objective in all years, while concentrations at the Dorking site were well below the AQS objective in all years. The annual mean NO₂ concentrations at these sites are provided in Table 5-3.

Table 5-3: Annual mean NO₂ concentrations (µg/m³) from CMS near to the Scheme

Site ID	Local Authority	Site Type	X, Y	2011	2012	2013	2014	2015	2016
E1 (Weybridge)	EBC	Roadside	507480, 164923	36	43	43	40	38	38
E2 (Hampton Court)	EBC	Roadside	515338, 168292	51	41	47	47	40	44
Dorking	MVDC	Kerbside	517034, 149803	23	23	22	22	-	-

- = data not available/monitoring not undertaken Data have been sourced from local authority reports
Exceedances of annual mean NO₂ UK AQS objective are highlighted in bold AQS annual mean objective is 40 µg/m³

- 5.4.23. The Dorking kerbside site also measured PM₁₀ concentrations until 2014. Concentrations were well below both the annual mean and daily mean AQS objectives at this site, as shown in Table 5-4.

Table 5-4: Annual mean PM₁₀ concentrations (µg/m³) at CMS near to the Scheme

Site ID	Local Authority	Site Type	X, Y	2011	2012	2013	2014	2015	2016
Dorking	MVDC	Kerbside	517034, 149803	21	20	21	18	-	-

- = data not available/monitoring not undertaken AQS annual mean objective is 40 µg/m³
Data have been sourced from local authority reports

Table 5-5: Number of exceedances of 24-hour mean PM₁₀ objective and CMS near to the Scheme

Site ID	Local Authority	Site Type	X, Y	2011	2012	2013	2014	2015	2016
Dorking	MVDC	Kerbside	517034, 149803	11	10	2	2	-	-

- = data not available/monitoring not undertaken Data have been sourced from local authority reports
24-hour mean concentration should not exceed 50 µg/m³ more than 35 times a year

Passive Monitoring

- 5.4.24. Passive monitoring of NO₂ using diffusion tubes has been undertaken by all the local authorities. The monitoring results at sites near to the air quality study area for the period of 2011 to 2016, where available, are provided in Table 5-6. Local authority monitoring locations are also illustrated in Table 5.1, where thematic mapping is applied comparing annual mean measurements for 2015 with the annual mean objective of 40 µg/m³. Key areas and traffic corridors where exceedances of the annual mean AQS objective for NO₂ were measured in recent years within the air quality study area include:

- Near M25 junction 10 (G_6);
- Near the M25 west of junction 10 (Wk_3);
- Near the A3 junction with Copsem Lane, north-east of junction 10 (E_9); and

- Within Cobham and Esher AQMA (E_3, E_4, E_5, and E_7, E_8, E_10, E_11).

Table 5-6: Annual mean NO₂ diffusion tube monitoring results (µg/m³)

Site ID	Site Name	Grid Ref	Site Type	2011	2012	2013	2014	2015	2016
Guildford Borough Council									
G_6	GD5 Wisley	507947, 159099	Kerbside	44.0	44.0	45.0	40.0	46.0	^
G_28	RP1	505243, 156819	Roadside	-	-	-	-	-	32
G_29	RP2	505090, 156777	Kerbside	-	-	-	-	-	27
G_30	WS1	507346, 158005	Semi-rural	-	-	-	-	-	13
Elmbridge Borough Council									
E_3	Cobham 1	510828, 159996	Roadside	42	40	40	42	35	33
E_4	Cobham 6	510814, 160099	Roadside	31	34	33	33	28	29
E_5	Cobham 7	510861, 159906	Roadside	38	42	38	43	36	34
E_6	Downside 3	511429, 157606	Rural background	31	30	32	31	26	21
E_7	Esher 1	513840, 164693	Urban traffic	49	49	52	48	49	45
E_8	Esher 4	514058, 164855	Urban traffic	46	47	45	46	43	40
E_9	Esher 5	514150, 162470	Roadside	49	53	50	52	51	45
E_10	Esher 7	513982, 164750	Urban traffic	54	53	48	53	48	41
E_11	Esher 8	513832, 164684	Urban traffic	53	55	47	51	44	42
E_12	Esher 9	513821, 164712	Urban traffic	34	36	36	37	32	33
E_13	Esher 10	513886, 164767	Urban traffic	33	36	36	36	33	30
E_14	Esher 11	513893, 164607	Urban traffic	39	40	42	39	39	33
E_15	Esher 13	513736, 164489	Urban traffic	44	42	41	38	40	36
Woking Borough Council									
Wk_3	M25	505611, 161180	Roadside	66	50	52	50	61	51

Site ID	Site Name	Grid Ref	Site Type	2011	2012	2013	2014	2015	2016
Wk_4	Church Road	506401, 160504	Urban background	27	41	44	20	25	24
Wk_13	Lincoln Drive	503244, 159659	Roadside	22	22	20	16	21	19
Wk_18	Dartnell Avenue	504926, 161063	Roadside	26	26	27	23	28	26
Wk_29	TC	506731, 161229	Roadside	-	-	-	-	-	28
Runnymede Borough Council									
R_1	RY1	505095, 164623	Roadside	42	40	40	35	39	39
R_3	RY8	504325, 163940	Roadside	24	21	29	26	35	24
R_4	RY14	504993, 164600	Roadside	59	55	54	48	49	45
R_5	RY19	505227, 162701	Roadside	45	37	44	37	34	33
R_15	RY44	504621, 164434	Roadside	-	-	-	15	23	29
R_18	RY53	504959, 164778	Roadside	49	51	49	38	39	41
R_19	RY54	505036, 164554	Roadside	37	38	38	33	36	33
R_20	RY55	505589, 164844	Roadside	35	35	39	36	36	34
R_25	RY60	504966, 164834	Roadside	-	-	-	33	39	36
R_26	RY61	504920, 164564	Roadside	-	-	-	33	34	32
R_27	RY62	505084, 164425	Roadside	-	-	-	29	31	32
R_28	RY63	505247, 164402	Roadside	-	-	-	-	24	22
R_29	RY64	505251, 164519	Roadside	-	-	-	-	23	25
Mole Valley District Council									
MV6	SCC depot	517137, 157240	Kerbside	36	33	39	28	28	26
MV10	Green Lane	517712, 156743	Kerbside	41	32	34	34	31	31
MV11	Green Lane	517871, 156748	Kerbside	36	30	31	25	28	28

Site ID	Site Name	Grid Ref	Site Type	2011	2012	2013	2014	2015	2016
MV12	Green Lane	517674, 156840	Kerbside	33	32	30	26	25	25

^Decommissioned end of June 2016

Values in **bold** indicate an exceedance of the relevant AQS objective

Receptors

- 5.4.25. Sensitive human health receptors within 200 m of the Scheme and roads which form the ARN (as determined at the Option Selection Stage) are provided in Table 5-7 below and shown in Figure 5.1. There are no human health receptors within 200 m of M25 junction 10/A3 Wisley interchange, however there are several isolated residential properties located within 200 m of the A3 carriageway between junction 10 to the A245 Painshill interchange.
- 5.4.26. Adjacent to the northbound on-slip at Painshill interchange is Feltonfleet School. A number of isolated properties are located within 200 m of the Painshill interchange and the A245 Portsmouth Road, and on the Seven Hills Road.
- 5.4.27. In addition, designated ecological sites may contain features that are sensitive to air pollutants, whereby vegetation may be adversely affected by elevated pollutant concentrations. DMRB HA 207/07 (paragraph 3.13) requires assessment of air quality effects on sites designated for their ecological value (SACs, SPAs, SSSIs and Ramsar sites) within 200 m of any road affected by the Scheme.
- 5.4.28. The M25 junction 10/A3 Wisley interchange is surrounded on all sides by the Ockham and Wisley Commons SSSI designated for its heathland habitat. This SSSI incorporates the Thames Basin Heaths SPA, designated due to the presence of important populations of ground-nesting birds (within this SPA the principal habitats supporting the qualifying species are lowland heathland and rotationally managed coniferous plantation woodland). The Esher Commons SSSI, designated for its rich variety of habitats and importance for invertebrates, is within 200 m of the A3 north of the Painshill junction. In addition, the Papercourt SSSI, designated for its wetland habitats, lies within 200 m of the B367 Newark Lane.
- 5.4.29. Relevant receptors are summarised in Table 5-7 below and illustrated in Figure 5.1.

Table 5-7: Relevant receptors

Affected Road	Receptors
M25 junction 10/A3 Wisley interchange	Ockham and Wisley Commons SSSI. Thames Basin Heaths SPA.
A3 north of junction 10	Isolated residential properties between junction 10 and the Painshill interchange. Residential properties at the western end of Cobham. Esher Commons SSSI.
A3 south of junction 10	Residential properties to the east of Ripley village.
A245 Portsmouth Road between the Painshill	Feltonfleet School, St George's Nursing Home and properties on Seven Hills Road and Lingwood.

Affected Road	Receptors
interchange and Seven Hills Road	
M25 east of junction 10	Isolated properties along the M25 corridor including along Ockham Lane, Horsley Road, Bookham Road, Cobham Road, and the A245 Woodlands Road.
M25 west of junction 10	Residential properties at the west and south of Byfleet, including Winern Glebe, Bruce Close, Murray's Lane and Sanway Close, Kings Lodge Care Centre, West Hall Care Home, Anchor Care Home. The easternmost properties within West Byfleet. Residential properties within 200 m of the M25 within Row Town and Addlestone including Jubilee High School.
Wisley Lane	Residential properties in Wisley village.
Lock Lane	Pyrford Place Farm and nearby properties.
B2215 Portsmouth Road/High Street	Residential properties along the B2215 Portsmouth Road/High Street within Ripley.
B367 Newark Lane/Church Hill	Residential properties off Newark Lane and Church Hill adjacent to the River Wey. Residential properties along Papercourt Lane, Newark Close and Polesden Lane. Residential properties within Ripley village and Pyrford village. Papercourt SSSI.
A320 Guildford Road	Residential properties on Tringham Close, Fox Hills Road, Wilson Drive and Murray Road.
A245 Byfleet Road	Isolated residential properties along Byfleet road and residential properties at the easternmost edge of Byfleet.
Seven Hills Road	Residential properties along the Seven Hills Road corridor in Whitely Village.
A245 Stoke Road	Residential properties in the south of Cobham within 200 m of the A245 Stoke Road corridor and Oasis Child Care Centre and Springfield House Nursing Home.
A307 from Cobham Road to Copsem Lane	Residential properties in the north-east of Cobham as well as Cobham Health Centre, Oasis Family Centre and Cobham Free School.

5.5. Potential impacts

5.5.1. The Scheme has the potential to affect local air quality, both during construction and once in operation in the following ways:

- There could be increased emissions of dust during construction of the Scheme from dust-raising activities on site;
- Air quality could be affected by changes in traffic flows during construction, as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour;
- Once operational, air quality could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition); and

- Operationally, air quality could also be affected by any changes to the distance between sources of emissions and air quality sensitive receptors.

Construction

- 5.5.2. Demolition and construction activities can give rise to dust emissions under particular circumstances, if not effectively managed. Construction of the Scheme has the potential to affect nearby receptors either due to dust from demolition and construction activities, or the tracking out of dust from heavy goods vehicles (HGVs) onto the local road network. Implementation of best practice mitigation measures will generally control construction dust and minimise any short term adverse effects.
- 5.5.3. In addition, the local highway network may experience changes in traffic flows and speeds during construction as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour. However, any effects on air quality would be short term and temporary (i.e. during the period of construction works only).

Operation

- 5.5.4. Once operational, air quality could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition). Air quality could also be affected by any changes to the distance between emission sources and air quality sensitive receptors as a result of a change to road alignment for the operational Scheme.
- 5.5.5. The Option Selection Stage assessment showed that there were expected to be increases in pollutant concentrations with the Scheme at a number of receptors in the wider area including in Cobham, in and near to the M25 AQMA, near the Painshill interchange, near the A3, and in Ripley. There were also expected to be decreases in pollutant concentrations at receptors near the A307 in Cobham and Esher.
- 5.5.6. There were also expected to be increases in NO_x concentrations and nitrogen deposition rates at the designated ecological sites in the area.

5.6. Proposed level and scope of assessment

- 5.6.1. Construction effects will be assessed qualitatively in accordance with the DMRB (paragraph 3.45). Should information on proposed traffic management measures and/or volumes of construction traffic and a suitable traffic model be available, a quantitative assessment of vehicle emissions during construction could be undertaken in accordance with DMRB.
- 5.6.2. Potential effects on local air quality resulting from operation of the Scheme will be assessed in accordance with relevant guidance outlined in DMRB, associated IANs and where relevant Defra's Local Air Quality Management Technical Guidance (LAQM.TG(16)). Relevant guidance documents are listed in Chapter 17, References.
- 5.6.3. For the assessment of operational effects, DMRB provides methodologies for undertaking simple and/or detailed levels of assessment for local and regional air quality. For this Preliminary Design Stage, detailed dispersion modelling of the

Scheme will be used to determine potential effects on NO₂ and PM₁₀ concentrations at human health receptors, given the complex nature of the junction and the presence of AQMAs in the area which are likely to be affected by the Scheme. Outputs from the detailed dispersion modelling will also be used to determine potential effects of NO_x emissions and nitrogen deposition on identified designated ecological sites.

5.7. Proposed assessment methodology

5.7.1. The Preliminary Design Stage Environmental Assessment Report (EAR) air quality assessment for the Scheme will consist of:

- Discussion of existing baseline conditions;
- Production of constraints maps;
- Qualitative assessment of the likely effect on local air quality during construction;
- Quantitative assessment of the likely effect on local air quality from change in traffic during construction, if suitable information is available;
- Assessment of the likely changes in local air pollutant concentrations and nitrogen deposition rates during operation at a number of receptors;
- Assessment of the likely changes in regional emissions during operation; and
- Vulnerability to major accidents and disasters.

5.7.2. The Transport Analysis Guidance (TAG) assessment will be reported separately. Quantitative outputs for reporting within the Appraisal Summary Table will be generated where provision of suitable traffic data allows. The TAG assessment of regional pollutant emissions will use the local air quality study area, in line with the latest guidance from WebTAG.

Existing Air Quality Information

5.7.3. A summary of existing air quality will be provided based on information collated for the Scoping Report, supplemented with any further data available since that stage.

Additional Constraints Maps

5.7.4. A constraints map for the Scheme air quality study area will be produced, updating the information provided for this Scoping Report. The constraints maps will include: affected roads, 200 m boundary from affected roads, sensitive receptors, AQMA boundaries, designated ecological site boundaries, and exceedance areas of air quality criteria without and with the Scheme where known.

Construction Impacts

5.7.5. A qualitative assessment of impacts on air quality from construction will be undertaken in accordance with the DMRB. The assessment will take into account the nature of any proposed construction activities that have the potential to generate dust and the location of sensitive receptors within 200 m of the Scheme

construction works that could be at risk of being affected. Quantitative assessment of vehicle emissions during construction will be undertaken should sufficient information on traffic management measures, construction vehicle numbers and total traffic flows, composition and speeds be available.

Operational Impacts

- 5.7.6. The air quality assessment will be undertaken principally following the guidance given in the DMRB and associated IANs. The air quality assessment will use detailed dispersion modelling software to calculate potential impacts on NO₂ and PM₁₀ concentrations at selected human health receptors, and NO_x concentrations at designated ecological sites in the Scheme opening year. A simple level of assessment will be undertaken for regional emissions of NO_x, PM₁₀ and CO₂ for the opening and design years.
- 5.7.7. The key scenarios for assessment are:
- Base year for model verification purposes (2015);
 - Projected base year (2022);
 - Opening year for both the without (Do-Minimum (DM)) and with Scheme (Do-Something (DS)) (2022); and
 - Design year DM and DS (2037) - regional emissions only.
- 5.7.8. Traffic data will be provided for the Preliminary Design Stage EAR air quality assessment, which will enable the ARN for the Scheme to be determined. Traffic data will be provided from the strategic SATURN traffic model provided by Atkins transport planners.
- 5.7.9. The ARN for the Scheme will be determined for the local air quality assessment and regional assessments. An affected road for the purposes of a local air quality assessment is defined in DMRB HA 207/07 (Para 3.12) as a road that meets any of the following criteria:
- Road alignment will change by 5 m or more; or
 - Daily traffic flows (two way) will change by 1,000 annual average daily traffic (AADT) or more; or
 - Heavy Duty Vehicle (HDV) flows (two way) will change by 200 AADT or more; or
 - Daily average speed (two way) will change by 10 km/hr or more; or
 - Peak hour speed will change by 20 km/hr or more.
- 5.7.10. An affected road for the purposes of a regional air quality assessment is defined in DMRB HA 207/07 (Para 3.20) as a road that meets any of the following criteria:
- A change of more than 10% AADT; or
 - A change of more than 10% to the number of HDVs; or
 - A change in daily average speed of more than 20 km/hr.
- 5.7.11. The changes are applied to roads, rather than links, and so where relevant are determined under two-way traffic conditions.

Local Air Quality

- 5.7.12. The local air quality assessment will be undertaken using the dispersion model *Atmospheric Dispersion Modelling System (ADMS) Roads* software. Representative receptors will be selected for the local air quality assessment and will include those closest to the ARN. The traffic data required for input into the dispersion model will include: AADT, the percentage of HDV and speeds which will be input as a speed category, as determined in accordance with IAN 185/15 on speed banding.
- 5.7.13. The output from the model will provide estimates of the contribution from road traffic emissions to annual mean concentrations of NO_x and PM₁₀ at discrete receptors. These concentrations will be combined with estimates of background concentrations, to account for other sources of air pollution, to derive total annual mean concentrations. Background concentrations are expected to be derived from Defra's background maps, but these will be checked with monitored data at background sites in the area where available, to ensure the mapped estimated are appropriate.
- 5.7.14. Concentrations of NO₂ will be derived from NO_x concentrations using the most up to date version of Defra's NO_x to NO₂ calculator. The annual mean NO₂ and PM₁₀ concentrations will be verified where possible with comparison against available ratified monitoring data and adjusted where appropriate, with reference to Defra's LAQM.TG(16).
- 5.7.15. In addition, an assessment will be undertaken in accordance with IAN 170/12 v3 on the assessment of future NO_x and NO₂ projections on long term trends, to account for future year uncertainties in emissions.
- 5.7.16. Evaluation of compliance with EU limit values will be undertaken in accordance with IAN 175/13.
- 5.7.17. Assessment of potential effects on NO_x concentrations and nitrogen deposition rates will also be undertaken at identified sensitive ecological designations, in accordance with Annex F of the DMRB HA 207/07. The results will be interpreted by the Project Ecologist.
- 5.7.18. Evaluation of the significance of the effect of the Scheme on local air quality will be undertaken in accordance with IAN 174/13.

Regional Emissions

- 5.7.19. An assessment of regional emissions of NO_x, PM₁₀ and CO₂ will be undertaken in accordance with DMRB HA 207/07 to determine the annual pollutant emissions for the ARN. Emissions calculations will be undertaken using emission rates derived from IAN 185/15 on speed banding. The key scenarios for assessment are:
- Base year (2015);
 - Opening year (2022), for both the without (DM) and with Scheme (DS) cases; and
 - Design year (2037), for both the DM and DS cases.

Vulnerability to major accidents and disasters

- 5.7.20. Major accidents and disasters which could potentially affect air quality receptors include: events which could affect traffic in the area such as major road traffic accidents, terrorist attacks or plane/rail crashes; and other events such as fires or chemical explosions or releases which emit air pollutants. The potential for change in significance on air quality receptors will be discussed as part of the air quality assessment. However, it should be noted that in relation to the main air quality metric of concern in England (annual mean AQS objective for nitrogen dioxide) any effect would be temporary and considered unlikely to significantly affect local air quality findings in the context of the determination of significance using IAN 174/13. There is the potential for a more noticeable impact on shorter term air quality metrics (such as the maximum 1-hour mean AQS objective for nitrogen dioxide of 200 µg/m³), where this can be assessed reliably with the Scheme data available, and where the annual mean results suggest the shorter term metrics are of potential concern. Again the impact of accidents and disasters on this metric will depend on the duration of the event (18 exceedances per year are permissible).

5.8. Proposed consultation

- 5.8.1. Consultation with local authorities will be undertaken to obtain relevant air quality monitoring data, supplementary to that presented in this scoping report, and to ensure relevant receptors are included in the assessment.
- 5.8.2. Consultation with Natural England will also be undertaken by the Project Ecologist to discuss the approach to assessing impacts on designated sites.

5.9. Potential mitigation measures

Construction

- 5.9.1. Mitigation measures to control dust emissions during construction would be specified within contract documentation and incorporated in a Construction Environmental Management Plan (CEMP). The precise measures would depend on the intended construction methods and the potential degree of dust generation at each site. Such measures may include but not necessarily be limited to:
- Regular water-spraying and sweeping of unpaved and paved roads to minimise dust and remove mud and debris;
 - Using wheel washes, shaker bars or rotating bristles for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads;
 - Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;
 - Enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion;
 - Ensuring any temporary site roads are no wider than necessary to minimise their surface area;

- Damping down of surfaces prior to their being worked; and
- Storing dusty materials away from site boundaries and in appropriate containment (e.g. sheeting, sacks, barrels etc.).

Operation

- 5.9.2. The Option Selection Stage assessment indicated that there are not expected to be any significant adverse effects with the Scheme for the human health receptors. This will be confirmed at this Preliminary Design Stage. Hence mitigation measures for human health receptors are not thought to be necessary at this stage. However, it is likely that there could be potentially significant adverse effects on the designated ecological sites in the study area due to the Scheme. Further assessment work is required at this stage to investigate this and, if necessary, examine mitigation options.

5.10. Assumptions and limitations

- 5.10.1. Any air quality model has inherent areas of uncertainty, including:
- The traffic data used in the air quality model;
 - The suitability of emissions data;
 - Simplifications in model algorithms and empirical relationships that are used to simulate complex physical and chemical processes in the atmosphere;
 - The suitability of background concentrations; and
 - The suitability of meteorological data.
- 5.10.2. Uncertainty associated with traffic data for this Preliminary Design Stage will be minimised by using a validated traffic model.
- 5.10.3. Uncertainties associated with emissions data will be minimised by using the most up to date speed-band emission factors available and by applying IAN 170/12 v3 for long term trends.
- 5.10.4. Uncertainties associated with model algorithms and empirical relationships will be minimised by using algorithms and relationships that have been independently validated and judged as fit for purpose.
- 5.10.5. Another uncertainty is with using historical meteorological data to estimate future concentrations. The key limiting assumption is that conditions in the future will be the same as in the past; however, in reality no two years are the same. In line with best practice, the base year meteorology (as used in the model verification and adjustment process) will be used in future year modelling to allow any adjustments to be applied in future cases.

5.11. Conclusion

- 5.11.1. An air quality scoping assessment has been undertaken for the Scheme. A review of baseline conditions has indicated that there are three AQMAs within the air quality study area which are likely to be affected by the Scheme. These AQMAs are located on Cobham High Street and in Esher within the EBC administrative area, and on the M25 corridor within RBC administrative area. Air

quality monitoring data within the air quality study area has shown that the annual mean NO₂ AQS objective was exceeded in recent years at roadside and kerbside sites along the M25 and A3 corridors, adjacent to junction 10, as well as within the Cobham and Esher AQMAs. Concentrations at background sites however were found to be below relevant AQS objectives in the study area. There were no PCM links in the study area which were shown to exceed the EU limit value in 2015.

- 5.11.2. During construction, there is the potential for increased emissions of dust, however, with the application of appropriate mitigation significant adverse effects at nearby receptors would be unlikely. Additional traffic during construction could potentially affect air quality at receptors so cannot be ruled out. During operation, changes in traffic and road alignment have the potential to affect both human health and ecological receptors.

Table 5-8: Air quality topics scoped in and out of further assessment

Effects	Scoped in/out	Comment/Justification
Construction Dust	✓	Receptors within 200 m of potential dust raising activities.
Construction Traffic	✓	Numbers of additional construction vehicles not yet known so cannot rule out.
Operational Traffic	✓	Option Selection Stage assessment showed that local air quality at receptors within 200 m of the Scheme could be affected by changes in traffic.

6. Noise and Vibration

6.1. Introduction

- 6.1.1. This chapter identifies the study area for noise and vibration, and presents the baseline conditions therein. It identifies the potential noise and vibration impacts associated with the Scheme during construction and operation, and discusses mitigation measures that may be applied to mitigate any potentially significant adverse effects.
- 6.1.2. The chapter presents the proposed scope and methodology for the EIA. The noise and vibration assessment will identify the likely potential noise and vibration effects due to the Scheme during construction and operation.

6.2. Study area

- 6.2.1. The study area for the assessment of noise and vibration effects is defined in the DMRB Volume 11, Section 3, Part 7 HD 213/11 Noise and Vibration as 600 m from the carriageway edge of any proposed new routes or existing routes to be bypassed or improved, and 600 m from any other affected routes within 1 km of the proposed new routes or altered existing routes. An affected route is defined as where it is calculated that there is a possibility of a change of 1dB $L_{A10,18h}$ in the short term or 3dB $L_{A10,18h}$ in the long term (assessed between the opening year and the future year).
- 6.2.2. The DMRB 11:3:7 provides the following methodology for identifying the size and extents of the study area:
 - 1. Identify the start and end points of the physical works associated with the road project;
 - 2. Identify the existing routes that are being bypassed or improved and any proposed new routes between the start and end points (for each option);
 - 3. Define a boundary 1 km from the carriageway edge of each of the options identified in (2) above;
 - 4. Define a boundary 600 m from the carriageway edge around each of the options identified in (2) above and also 600 m from any other affected routes within the boundary defined in (3) above. The total area within these 600 m boundaries is termed the 'calculation area';
 - 5. Identify any affected routes beyond the boundary defined in (3) above; and
 - 6. Define a boundary 50 m from the carriageway edge of routes identified in (5) above.
- 6.2.3. Based on the above, the detailed noise calculation area (within 600 m of any affected route that is within 1 km of the Scheme) has been determined.
- 6.2.4. Determination of the affected routes, and consequently the study area, may be constrained by the geographical extent, and area of validity, of the traffic modelling made available for the Scheme appraisal. The study area for the noise impact assessment will be determined, once the strategic traffic model has been finalised.

6.3. Planning and policy context

- 6.3.1. Current noise policy in England is based on the Noise Policy Statement for England (NPSE)¹⁰, which through the effective management and control of environmental noise within the context of Government policy on sustainable development, aims to:
- avoid significant adverse impacts on health and quality of life;
 - mitigate and minimise other adverse impacts on health and quality of life; and
 - contribute to improvements to health and quality of life, where possible.
- 6.3.2. These aims are reflective of those contained in the National Planning Policy Framework (NPPF) and are further echoed in the National Policy Statement for National Networks (NPSNN)¹¹ and Planning Practice Guidance concerning noise¹²
- 6.3.3. The Explanatory Note to the NPSE assists in the definition of significant adverse and adverse with the following concepts:
- NOEL - no observed effect level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
 - LOAEL - lowest observed adverse effect level. This is the level above which adverse effects on health and quality of life can be detected; and
 - SOAEL - significant observed adverse effect level. This is the level above which significant adverse effects on health and quality of life occur.
- 6.3.4. In March 2014, the Department for Communities and Local Government (DCLG) released its *Planning Practice Guidance* (PPG) web-based resource to support the *NPPF*.
- 6.3.5. This guidance introduced the concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). NOAEL differs from NOEL in that it represents a situation where the acoustic character of an area can be slightly affected (but not such that there is a perceived change in the quality of life). UAEL represents a situation where noise is ‘noticeable’, ‘very disruptive’ and should be ‘prevented’ (as opposed to SOAEL, which represents a situation where noise is ‘noticeable’ and ‘disruptive’, and should be ‘avoided’).
- 6.3.6. The Government policy and guidance do not state values for the NOEL, LOAEL and SOAEL, rather, it considers that they are different for different noise sources, for different receptors and at different times and should be defined on a strategic or project basis taking into account the specific features of that area, source or project.
- 6.3.7. In line with this, the Department for Transport “Road Investment Strategy for the 2015/16 - 2019/20 Road Period”, aspires to the target that by 2040 over 90% fewer people are impacted by noise from the strategic road network. The target for the first Road Period 2015-2020, is to mitigate at least 1,150 noise Important

¹⁰ Defra (2010). Noise policy statement for England (NPSE)

¹¹ Department for Transport (Dec 2014). National Policy Statement for National Networks

¹² Department for Communities and Local Government, Planning Practice Guidance (<http://planningguidance.planningportal.gov.uk/>)

Areas expecting to reduce the number of people severely affected by noise from the strategic road network by at least 250,000.

- 6.3.8. The legislation and policies considered in undertaking this noise assessment are detailed in Table 6-1 and Table 6-2 for construction and operation respectively.

Table 6-1: Regulatory and policy framework for construction noise and vibration

Regulation/policy	Summary of requirements
NPSE NPPF Planning Practice Guidance Noise to NPPF (PPGN) National Policy Statement for National Networks (NPSNN)	Within the context of Government policy on sustainable development: • Avoid significant adverse effects as a result of the Scheme. • Mitigate and minimise adverse effects as a result of the Scheme. • Contribute to the enhancement of the acoustic environment.
Control of Pollution Act 1974 (as amended)	Section 60 - Control of noise on construction sites. Section 61 - Prior consent for work on construction sites. Section 71 - Codes of practice for minimising noise. Section 72 - Best practicable means.
Environmental Protection Act 1990 (as amended)	Section 79 (1) (ga) noise that is prejudicial to health or a nuisance and is emitted from or caused by a vehicle, machinery or equipment in a street is a statutory nuisance; (NB if so should be inspected by the local authority) (9) interpretation of “best practicable means”
The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015	Approves BS 5228:2009+A1:2014 Part 1 Noise and Part 2 Vibration for the purpose of giving guidance on appropriate methods for minimising noise and vibration.
Noise Insulation Regulations 1975 (as amended)	Regulation 5 provides relevant authorities with discretionary powers to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings with respect to construction noise. This is subject to meeting certain criteria given in the Regulation.

Table 6-2: Regulatory and policy framework for operational noise and vibration

Regulation/policy	Summary of requirements
Environmental Noise (England) Regulations 2006	Take into account Noise Action Plans.
NPSE NPPF PPGN NPSNN	Within the context of Government policy on sustainable development: • Avoid significant adverse effects as a result of the Scheme. • Mitigate and minimise adverse effects as a result of the Scheme. • Contribute to the enhancement of the acoustic environment.
Land Compensation Act 1973	Part I Compensation for depreciation caused by use of public works.
Noise Insulation Regulations 1975 (as amended)	Regulation 3 imposes a duty on authorities to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings. This is subject to meeting certain criteria given in

Regulation/policy	Summary of requirements
	the Regulation. Regulation 4 provides authorities with discretionary powers to undertake or make a grant in respect of the cost of undertaking noise insulation work in or to eligible buildings, subject to meeting certain criteria given in the Regulation.
The Highways Noise Payments and Movable Homes (England) Regulations 2000	Provide highway authorities with a discretionary power to provide a noise payment where new roads are to be constructed or existing ones altered. The relevant Regulations set out the criteria which should be applied in assessing eligibility for making such payments.

6.4. Baseline conditions

6.4.1. Information regarding the existing ambient noise climate i.e. baseline conditions, and identification of potential noise impact constraints to the Scheme has been determined through reference to the following sources:

- Ordnance Survey base mapping to identify locations of residential and non-residential noise sensitive receptors (residential properties, schools, hospitals and elderly care homes);
- Natural England's MAGIC website¹³ to identify boundaries of designated ecological sites that may be considered as sensitive to noise;
- Extrium Noise Map Viewer showing Defra Noise Important Area (NIA) mapping¹⁴; and
- Extrium Noise Map Viewer showing Defra Strategic Noise Mapping for Environmental Noise Directive (Directive 2002/49/EC) and the Environmental Noise (England) Regulations 2006 (as amended) (2015)¹⁵.

Noise Sensitive Receptors

6.4.2. The M25 junction 10/A3 Wisley interchange is located between the urban areas of Ockham and Cobham in Surrey. The land use within 600 m of the Scheme consists mostly of green space, including Chatley Wood, Ockham Common and Wisley Common. The majority of the noise sensitive receptors are located close to the Painshill interchange to the north-east of the study area.

6.4.3. The closest buildings to the M25 junction 10/A3 Wisley interchange are in proximity to the Painshill interchange and include Pains Hill Bungalow (45 m), Pains Hill (50 m), and Feltonfleet School (50 m). There is a mixed use development between the A3 and A245 within 300 m of the Painshill interchange, and further residential buildings located at Seven Hills Road, approximately 430 m from the Painshill interchange. The land south-west of the Painshill interchange towards the M25 and beyond, is sparsely populated with few noise sensitive receptors located within 600 m of the Scheme in this area.

6.4.4. A number of other notable noise sensitive receptors have been identified within 600 m of the M25, A3, and A245 Byfleet Road, including: Feltonfleet School, St George's Nursing Home, Hilton Hotel, Notre Dame Senior School, Notre Dame

¹³ <http://magic.defra.gov.uk/>

¹⁴ <http://extrium.co.uk/noiseviewer.html#>

¹⁵ <http://extrium.co.uk/noiseviewer.html#>

Preparatory School, Cobham Free School, Painshill Fire Station, Silvermere Equestrian Centre's Riding School, Elm Corner and RHS Gardens at Wisley.

- 6.4.5. In addition to the existing noise sensitive receptors located close to the Scheme, it is understood that there are proposals to develop the land occupied by the former Wisley Airfield into residential housing. The planning application for the development was rejected on several grounds in April 2016, a decision which is currently being appealed by the developer. If the appeal is successful and the planning application is approved, the development will include some mitigation as part of its design. The proposed Wisley Airfield development will be included in the traffic model and hence will be within the appraisal of the Scheme.
- 6.4.6. Ecological receptors are also present in proximity to the Scheme. In particular, there are three species of bird, nightjar, woodlark and Dartford warbler, inhabiting the Thames Basin Heath Special Protection Area (SPA) that could be adversely affected by changes to noise levels caused by the Scheme. The SPA partially falls within the Scheme, directly adjacent to the south-east and south-west of M25 junction 10. The location of the SPA is shown in the Chapter 19 Environmental Constraints Map. More details about the ecological receptors can be found in the Chapter 7, Biodiversity. The locations of the nearest noise sensitive receptors to the Scheme are shown in Figure B.1 and Figure B.2 in Appendix B.

Noise Climate

- 6.4.7. It is expected that road traffic noise from the M25 and the A3 are the main noise sources influencing noise levels in the study area. There is potential for aircraft noise to contribute to the noise climate as the study area is positioned between Heathrow and Gatwick airports. There are no railways or heavy industrial noise sources within 1 km of the Scheme.
- 6.4.8. A noise survey will be undertaken at Preliminary Design Stage to ascertain the baseline noise levels at noise sensitive receptors within the study area of the Scheme. The final design of the Scheme will be used to further inform the production of the Preliminary Design Stage noise model.
- 6.4.9. The measured noise levels obtained during the baseline noise survey will be supplemented with information from publicly available online mapping sources. Strategic noise maps were published during 2015 by Defra for both major road and railways sources to meet the requirements of the Environmental Noise Directive (Directive 2002/49/EC) and the Environmental Noise (England) Regulations 2006 (as amended). The strategic noise maps for road traffic noise during the daytime (07:00-23:00) and night-time (23:00-07:00) periods are shown in Appendix B Figure B.3 and Figure B.4.
- 6.4.10. The 'Important Areas' for noise (NIAs) were identified to highlight any particular constraints for the Scheme. NIAs are the locations where 1% of the population most affected by the highest noise levels from major roads and railways are located according to the strategic noise mapping undertaken by Defra. The summary of the NIAs are as follows:

Table 6-3: Location and distances of NIAs from the Scheme

NIA ID	Location	Source of noise	Distance in metres	Comment
5859	Pointers Road, Cobham	Road	150	Adjacent to M25
5858	Horsley Road, Cobham	Road	1615	Adjacent to M25
5868	Sanway Road, West Byfleet	Road	750	Adjacent to M25
1285	Glen Court, West Byfleet	Road	2260	Adjacent to M25
1015	Parvis Road, West Byfleet	Road	2450	Adjacent to A245
1281	Parvis Road, Byfleet	Road	2150	Adjacent to A245
1008	Byfleet Road, Cobham	Road	1620	Adjacent to A245
1009	Byfleet Road, Cobham	Road	1400	Adjacent to A245
5866	Byfleet Road, Cobham	Road	765	Adjacent to A245
5867	Byfleet Road, Cobham	Road	1100	Adjacent to A245
1004	Byfleet Road, Cobham	Road	65	Adjacent to A245
5864	Portsmouth Road, Cobham	Road	400	Adjacent to A245
13498	High Street, Cobham	Road	1200	Adjacent to A245
5861	Portsmouth Road, Cobham	Road	29	Adjacent to A3
5865	Portsmouth Road, Cobham	Road	7 to 21	Adjacent to A3 and A245
5863	Mossfield, Cobham	Road	730	Adjacent to A3
5862	Near Old Common Road, Cobham	Road	1380	Adjacent to A3
13499	Portsmouth Road, Cobham	Road	2660	Adjacent to A3/Portsmouth Road

6.4.11. The locations of the NIAs in proximity to the Scheme are shown in the Environmental Constraints Map in Chapter 19, and are also shown in Appendix B Figure B.1 and Figure B.2.

6.5. Potential impacts

6.5.1. The Scheme has the potential to affect the local noise climate, both during construction and once in operation, in the following ways:

- There could be a temporary increase in noise levels during construction of the Scheme from activities on site;
- The noise climate could be affected by changes in traffic flows during construction, as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour;
- Once operational, the noise climate could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition) as a result of the Scheme; and

- Operationally, the noise levels could also be affected by any changes to the distance between the carriageways and noise sensitive receptors, caused by changes to the horizontal and vertical alignment of the roads.

Construction

- 6.5.2. Demolition and construction activities can give rise to increases in local noise levels, if not effectively managed. Construction of the Scheme has the potential to affect nearby receptors either due to noise from demolition and construction activities themselves, or from additional construction associated HGVs onto the local road network. Implementation of best practice mitigation measures will generally minimise increases in noise and any short term adverse effects.
- 6.5.3. In addition, the local highway network may experience changes in traffic flows and speeds during construction as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour. It should be noted however that any effects on the noise climate would be short term and temporary (i.e. during the period of construction works only).

Operation

- 6.5.4. Once the Scheme is operational, the noise climate could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition). Additionally, noise levels at nearby receptors could also be affected by any changes to the distance between carriageways and noise sensitive receptors, as a result of changes to the horizontal and vertical road alignment for the operational Scheme.

6.6. Proposed level and scope of assessment

- 6.6.1. Traffic data is to be made available for noise assessment at this Preliminary Design Stage will be based upon the South East regional strategic traffic model (SERTM).
- 6.6.2. The potential for noise impact on nearby residential and non-residential noise sensitive receptors is scoped in for appraisal at this stage.
- 6.6.3. Assessment at this stage will be undertaken broadly in line with a “detailed” level of appraisal as defined within DMRB HD 213/11.

Table 6-4: Noise and vibration topics scoped in and out of further assessment

Effects	Scoped in/out	Comment/Justification
Construction	✓	Information regarding construction methodologies, plant itineraries, activity schedules, activity locations, and construction traffic etc. is expected to become available at this Preliminary Design Stage for the Scheme and this information will be appraised accordingly.
Operational traffic	✓	Simple noise modelling undertaken during the Option Selection Stage identified the requirement for the project to proceed to a “detailed” DMRB assessment during Preliminary Design Stage to confirm the level of impact for the Scheme. The detailed noise modelling will incorporate new traffic data obtained from a strategic traffic model and any new mitigation measures incorporated into the

Effects	Scoped in/out	Comment/Justification
		design. A further assessment of the impact significance is also required based on the Preliminary Design Stage results, particularly at locations where the baseline noise levels already exceed the significant adverse effect level.

6.7. Proposed assessment methodology

- 6.7.1. Baseline noise surveys will be undertaken at a number of noise sensitive receptors within the study area to establish the current noise climate. This will include monitoring positions at Painshill, where the majority of residential buildings in the project area are located, as well as sparsely populated locations between junction 10 and Ockham. The locations for baseline noise monitoring will be confirmed once suitable and accessible sites have been identified.
- 6.7.2. Noise modelling will be undertaken for the baseline conditions and for the Scheme, to permit an assessment in line with a “detailed” level of assessment as defined within the DMRB, which consists of the following elements:
- Prediction of daytime ($L_{A10,18h}$) noise levels in the short-term (Scheme opening) and the long-term (future assessment year);
 - Prediction of night-time noise levels in the long-term;
 - Noise contour plots showing the predicted changes in noise level throughout the study area;
 - Assessment of noise levels at traffic links located in the wider area; and
 - Assessment of traffic nuisance impacts.
- 6.7.3. Ordnance Survey base mapping and Addressbase data will be used to establish the relevant noise sensitive receptors within the appropriate calculation area. This will include residential noise sensitive receptors and non-residential noise sensitive receptors, such as schools, hospitals and places of worship. Prediction points will also be included in the noise modelling to determine how the Scheme will change noise levels with the Thames Basin Heath SPA. The impacts at the Thames Basin Heath SPA will be discussed in more detail in Chapter 7 Biodiversity.
- 6.7.4. The results of this quantitative assessment would then be used to inform the completion of WebTAG worksheets (including calculation of net present value for noise) and Appraisal Summary Tables, and would be reported in accordance with TAG Unit A3 Environmental Impact Appraisal, Chapter 2 Noise Impacts. The Transport Analysis Guidance (TAG) assessment will be reported separately, and quantitative outputs for reporting within the Appraisal Summary Table will be generated where provision of suitable traffic data allows.
- 6.7.5. In terms of road traffic noise, a recognised formal methodology has not yet been developed to establish impact significance. This is recognised in the DMRB 11:3:7 HD 213/11 and an alternate approach is stated:
- 6.7.6. *“In terms of road traffic noise, a methodology has not yet been developed to assign a significance according to both the value of a resource and the magnitude of an impact. However, the magnitude of traffic noise impact from a road project should be classified into levels of impact in order to assist with the*

interpretation of the road project. Therefore, for the assessment of traffic noise that is covered by this document, a classification is provided for the magnitude of impact."

- 6.7.7. In absence of a formal methodology for establishing impact significance, the magnitude of the impact will be reported in accordance with the DMRB, detailing the number of noise sensitive receptors predicted to experience given changes in noise levels in both the short-term, and long-term periods. The sensitivity of all noise sensitive receptors in the study area will be set out in the ES.
- 6.7.8. Furthermore, the absolute noise levels predicted at noise sensitive receptors in the opening year and future assessment year of the Scheme will be compared with the SOAEL and the LOAEL. The thresholds assigned to the LOAEL and the SOAEL will be set based upon prevailing guidance for environmental noise assessments and noise thresholds associated impacts to human health, including the WHO Community Noise Guidelines, the Department for Transport (DfT) Transport Analysis Guidance (TAG), the Noise Insulation Regulations (NIR) and other appropriate guidance. The assessment of absolute noise levels will establish the following:
- Locations where the LOAEL is exceeded;
 - Locations where the existing road traffic noise levels are below the SOAEL and are predicted to exceed the SOAEL as a result of the Scheme; and
 - Locations where existing road traffic noise levels are above the SOAEL and are increased by at least 1dB $L_{A10,18h}$ due to the Scheme.
- 6.7.9. Potential locations requiring noise mitigation based on the findings of the Option Selection Stage assessment will be reviewed at an early stage in this Preliminary Design Stage to allow mitigation measures to be incorporated in the design of the Scheme. Noise mitigation may be required under the following conditions:
- Noise sensitive receptors which are predicted noise increases as a result of the Scheme;
 - To mitigate noise levels in areas with existing high noise levels, such as NIAs, which is a stated objective of the overarching RIS scheme programme, and
 - To avoid adverse effects at ecologically sensitive areas.
- 6.7.10. Detailed noise modelling will be undertaken with potential noise mitigation in place at this stage, based on traffic projections from appropriate strategic traffic modelling to permit the degree of accuracy as would be required for such detailed mitigation design. This will include any existing noise mitigation measures that will be retained or replaced by the Scheme. The proposed mitigation measures will be reviewed based on the results of the detailed noise modelling.

Vulnerability to major accidents and disasters

- 6.7.11. Man-made incidents requiring the closure of roads within the project area, such as terrorist incidents, plane crashes or road traffic incidents, will cause a reduction of noise levels at properties most influenced by noise from the closed road sections. However, these properties may be subject to noise temporarily

from clean-up or repair and rebuilding works. Noise from alternate routes used during the road closure will increase noise levels from these routes during free-flow conditions or cause congestion, leading to lower noise levels. These impacts will last as long as the road closure and/or redirections are in place. Natural events causing road closures and the use of alternate routes, such as flooding or diseases (such as Foot and Mouth) will affect noise in the same way.

- 6.7.12. Road surfaces and noise barriers can be damaged from extreme heat, chemical spills, and seismic events/landslides, and this will affect their acoustic performance. This can lead to higher noise levels, especially if the damage has caused surface irregularities that can increase noise and vibration. Resurfacing the affected section of road would reverse the damage.
- 6.7.13. Noise barriers have the potential to be damaged during severe storms, pest infestations (e.g. rats, woodworm spring, etc.), road traffic accidents, malicious damage, and chemical spills, which will lead to degraded performance. This will cause a temporary noise increase until remedial works have been undertaken.
- 6.7.14. Weather conditions can affect sound propagation and it is possible that extreme conditions or temperature inversions will enable sound from the Scheme to be audible over greater distances.

6.8. Proposed consultation

- 6.8.1. The Local Authority will be contacted with regards to the Scheme in order to discuss the assessment approach, identify areas with existing noise and vibration concerns, and to establish the presence of any further noise sensitive receptors that should be included in the assessment from other proposed or committed developments.

6.9. Potential mitigation measures

- 6.9.1. There are two types of noise mitigation measures that can be used to reduce road traffic noise at noise sensitive receptors, which are:
 - Low noise road surfacing; and
 - Noise barriers or earth bunds.
- 6.9.2. It is understood that all new or modified roads proposed by the Scheme will be resurfaced with a low noise road surface. According to the DMRB, usage of a low noise road surface can reduce road traffic noise levels by up to 3.5dB LA10,18h. However, the M25 is a significant contributor to road traffic noise levels in the project area, so the full reduction of noise from low noise surfacing may not be fully realised in some areas unless the M25 is also resurfaced.
- 6.9.3. There are existing noise barriers located close to junction 10. It is likely that these will be replaced as part of the Scheme to accommodate the new junction layout. Use of further noise barriers will be considered based on the outcomes of the detailed noise modelling. This includes the possible requirement for noise barriers to reduce road traffic noise levels at the SPA for ecological receptors.

6.10. Assumptions and limitations

- 6.10.1. The findings of the Preliminary Design Stage assessment will be based on the following assumptions:

- The noise levels measured during the baseline noise surveys are representative of typical conditions. Any measurement periods known to represent atypical conditions will be excluded from the results;
- The location of all (human) noise sensitive receptors within the study area can be identified in OS Addressbase, and further informed through consultation with the local authorities;
- Baseline noise monitoring will be undertaken. The monitoring will be undertaken over a number of days to mitigate variations in weather conditions;
- All new or modified roads proposed by the Scheme will be resurfaced with a low noise road surface on Scheme opening. By the future assessment year, the A3 and all new road links will be resurfaced with a low noise road surface, undertaken during routine maintenance works; and
- Information is available regarding the existing noise barriers at the M25 junction 10, or elsewhere in the study area. If no information is available, suitable assumptions will be made based on Google Streetview images and site visits.

- 6.10.2. The results from the detailed noise modelling will be affected by limitations of the input data sources. Crucially, the results from the detailed noise modelling will be influenced by information the assumptions used to derive traffic flow, speed, and fleet composition data from the strategic traffic model for the Scheme.
- 6.10.3. Similarly, the resolution of the ground topography data imported into the road traffic noise model will influence the results as it affects sound propagation. For example, datasets with a 10 m resolution will not take into account small variations in ground level that might be accounted for in datasets with smaller interval spacing.
- 6.10.4. The construction noise and vibration assessment will be limited by the availability and quality of information provided by the construction contractor. In the absence of detailed enough information for the BS5228 assessment, suitable assumptions will be made based in order to complete the assessment. All assumptions will be clearly stated in the ES.

6.11. Conclusion

- 6.11.1. In order to meet the requirements for a Preliminary Design Stage noise and vibration assessment, baseline noise surveys will be undertaken at several locations within the study area to establish the prevailing noise climate. A construction noise and vibration assessment, using the BS 5228 methodology, will be completed to identify any impacts arising from the construction phase.
- 6.11.2. “Simple” noise modelling undertaken during the Option Selection Stage identified the requirement for the project to proceed to a “detailed” DMRB assessment during the Preliminary Design Stage to confirm the level of noise impact for the preferred option during the operation phase. The detailed noise modelling will incorporate new traffic data obtained from a strategic traffic model and any new mitigation measures incorporated into the design.
- 6.11.3. The results from the detailed noise modelling will be assessed against the impact magnitude thresholds stated in the DMRB, and significance criteria for impacts to

human health. Existing noise mitigation measures incorporated into the Scheme design and the need for additional mitigation measures will be reviewed based on these results.

7. Biodiversity

7.1. Introduction

- 7.1.1. This chapter summarises the baseline ecological data collected for the Scheme to date (between February 2016 and August 2017), outlines the additional ecological surveys to be carried out during this Preliminary Design Stage and also presents the methodology for assessment during this stage.

7.2. Study area

- 7.2.1. The study area defines the area that will be used to assess the impacts and potential effects of the Scheme on nature conservation features. The study area was defined by determining an Ecological Zone of Influence (EZoI) encompassing all of the predicted adverse ecological effects of the Scheme, including those that would occur as a result of habitat loss, and those that would occur through disturbance, such as noise. The extent of the EZoI was defined during the Option Selection Stage assessment, and is set out in the Option Selection Stage Scoping Report and EAR, for the options proposed at that stage.
- 7.2.2. For this Preliminary Design Stage, the study area will be revised to take into account the Scheme design, as described in section 2.4 of this report. The revised EZoI will be based on the proposed extent of the Scheme, with assumptions made of the potential construction and operation effects based on available information (using a worst-case scenario to ensure all effects have been incorporated).
- 7.2.3. The following desk study search areas (from the Scheme footprint) were selected based on current best practice guidance:
- Two kilometres for statutory designated sites of nature conservation importance: Special Areas of Conservation (SACs)¹⁶, SPAs¹⁷, Ramsar sites¹⁸, SSSIs, National Nature Reserves (NNRs) and LNR;
 - Two kilometres for non-statutory Sites of Nature Conservation Interest (SNCIs);
 - Thirty kilometres for SACs where bats are one of the qualifying species¹⁹;
 - Two kilometres for conservation verges;
 - One kilometre for notable habitats and notable or legally protected species²⁰;
 - Ten kilometres for bats²¹;
 - One kilometre for ancient woodlands; and

¹⁶ Including candidate SACs (cSACs)

¹⁷ Including proposed SPAs (pSPAs)

¹⁸ Including proposed Ramsar sites (pRamsars)

¹⁹ DMRB guidance on the Assessment of Implications on European Sites recommends this wide search area due to the mobility of bats

²⁰ Records of bats are for 10 km squares, so observations may not have occurred within 1 km of the Scheme

²¹ For larger projects, a search distance of up to 10 km for bats is recommended (Collins, J (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust. London).

- 50 m for veteran trees²².

7.3. Planning and policy context

7.3.1. This stage will consider the following planning policies:

National Policy Statement for National Networks 2014

- 7.3.2. The National Policy Statement of National Networks (NPSNN) sets out the government policies for nationally significant infrastructure rail and road projects for England. Within Chapter 5 of the NPSNN is a section on 'Biodiversity and ecological conservation'.
- 7.3.3. The relevant paragraphs within the Biodiversity and ecological conservation section are summarised below:
- 7.3.4. The most important sites for biodiversity are those identified through international conventions and European Directives.
- 7.3.5. Where a proposed development is likely to have a significant impact on a Site of Special Scientific Interest (SSSI), development consent should not normally be granted. Where an adverse effect on a site's notified special interest features is likely, an exception should be made only where the benefits of the development at this site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the wider network of SSSIs. The Secretary of State should ensure that the applicant's proposals to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest, are acceptable.
- 7.3.6. Sites of regional and local biodiversity have a fundamental role to play in meeting overall national biodiversity targets, in contributing to the quality of life and the well-being of the community, and in supporting research and education. The Secretary of State should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent.
- 7.3.7. Ancient woodland once lost cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss.
- 7.3.8. When considering proposals, the Secretary of State should consider whether the applicant has maximised opportunities for building in beneficial biodiversity features in and around other developments.
- 7.3.9. The Secretary of State should ensure that applicants have taken measures to ensure that statutory protected species, and species and habitats identified as being of principle importance for the conservation of biodiversity in England, are protected from adverse effects of development. The Secretary of State should refuse consent where harm to the habitats or species and their habitats would

²² As taken from the Woodland Trust website

(http://maps.woodlandtrust.org.uk/en/_layouts/woodlandtrust/FullScreenMap.aspx?mode=Wood&wood=&zoom=6&clat=54.502005&clon=-3.625488&ms=hm&layers=422212465066016&LegendGroups=ATH; accessed 06/10/17)

result, unless the benefits of the development (including need) clearly outweigh that harm.

7.3.10. Applicants should include appropriate mitigation measures as an integral part of their proposed development, including identifying where and how these will be secured. In particular, the applicant should demonstrate that:

- during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;
- during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised (including as a consequence of transport access arrangements);
- habitats will, where practicable, be restored after construction works have finished;
- developments will be designed and landscaped to provide green corridors and minimise habitat fragmentation where reasonable; and
- opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the 'greening' of existing network crossing points, the use of green bridges and the habitat improvement of the network verge.

National Planning Policy Framework 2012

7.3.11. The National Planning Policy Framework (NPPF)²³ sets out the Government's planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF). Chapter 11 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirements to consider biodiversity in planning decisions.

7.3.12. The paragraphs within Chapter 11 relevant are summarised below:

7.3.13. The planning system should contribute to and enhance the natural and local environment by:

- Protecting and enhancing valued landscapes, geological conservation interests and soils;
- Recognising the wider benefits of ecosystem services; and
- Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

7.3.14. Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and gives appropriate weight to

²³ Department of Communities and Local Government (March 2012). National Planning Policy Framework.

their importance and the contribution that they make to wider ecological networks.

7.3.15. Local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.

7.3.16. To minimise impacts on biodiversity and geodiversity, planning policies should:

- Plan for biodiversity at a landscape-scale across local authority boundaries; identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;
- Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan; and
- Aim to prevent harm to geological conservation interests; and where Nature Improvement Areas are identified in Local Plans, consider specifying the types of development that may be appropriate in these Areas.

7.3.17. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;
- Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- Opportunities to incorporate biodiversity in and around developments should be encouraged; and
- Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss.

7.3.18. The following wildlife sites should be given the same protection as European sites:

- potential Special Protection Areas and possible Special Areas of Conservation;
- listed or proposed Ramsar sites; and
- sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

7.3.19. The presumption in favour of sustainable development (paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.

Local Planning Policy

7.3.20. Table 7-1 below provides a summary of relevant local planning policy.

Table 7-1: Summary of relevant local policies

Planning Policies	Summary of Policy Content
Elmbridge Borough Council	Elmbridge Core Strategy (July 2011) and Elmbridge Local Plan - Development Management Plan (April 2015)
CS13 - Thames Basin Heaths Special Protection Area	New residential development which is likely to have a significant effect on the ecological integrity of the Thames Basin Heaths SPA will be required to demonstrate that adequate measures are put in place to avoid or mitigate any potential adverse effects. Further information in relation to zones of influence and provision of Suitable Accessible Natural Greenspace (SANG) is included in the policy.
CS15 - Biodiversity	The council will seek to avoid loss and contribute to a net gain in biodiversity across the region and the objective of the Surrey Biodiversity Action Plan (BAP) by: • Protecting and seeking to improve all sites designated for their biodiversity importance, as identified on the proposal map, in accordance to PPS9: Biodiversity and Geological Conservation and CS13-Thames Basin Heaths Special Protection Area (SPA), including those sites considered to be relevant to the integrity of the South West London Waterbodies SPA and Ramsar site. Criteria based policies against which proposals will be judged for any development on, or affecting, sites of regional or local significance will be brought forward through future DPD/s that address Development Management and Site Allocations; • Support the implementation of the Regional Forests and Woodland Framework by: – Protecting all woodland, including ancient woodland, as shown on the proposals map, from damaging development and land uses; – Promoting the effective management, and where appropriate, extension and creation of new woodland areas including, in association with areas of major development, where this helps to restore and enhance degraded landscapes, screen noise and pollution, provide recreational opportunities, help mitigate climate change, and contributes to floodplain management; – Replacing woodland unavoidably lost through development with new woodland on at the same scale;

Planning Policies	Summary of Policy Content
	– Promoting and encouraging the economic use of woodlands and wood resources, including wood fuels as renewable energy source; and – Promoting the growth and procurement of sustainable timber products. • Protecting and enhancing BAP priority habitats and species and seeking to expand their coverage by supporting the development of the Biodiversity Opportunity Areas; as shown on the proposals map; • Managing and maintaining a mosaic of habitats and rich variety of wildlife across the Council's landholdings in accordance with the Elmbridge Countryside Strategy; • Working in partnership to re-store and enhance: – the Thames Basin Heath SPA, in accordance with CS13-Thames Basin Heaths SPA, – which is an area of strategic opportunity for biodiversity improvement; and – Brooklands Community Park and Esher Commons Site of Special Scientific Interest (SSSI) in accordance with the Council's most up-to-date mitigation strategy for the Thames Basin Heath SPA and the Esher Commons SSSI Restoration and Management Plan. • Maximising the contribution of other green spaces and features (15), where appropriate, to the area's biodiversity resources including identifying and developing wildlife corridors to provide ecological 'stepping stones' and form a coherent local and regional biodiversity network in accordance with CS12-The River Thames and its tributaries and CS14-Green Infrastructure; • Directing development to previously developed land in accordance with CS1-Spatial Strategy, taking account of its existing biodiversity value; and • Ensuring new development does not result in a net loss of biodiversity and where feasible contributes to a net gain through the incorporation of biodiversity features.
DM6- Landscape and trees	Development proposals should be designed to include an integral scheme of landscape, tree retention, protection and/or planting that: • Reflects, conserves or enhances the existing landscape and integrates the development into its surroundings, adding scale, visual interest and amenity; • Contributes to biodiversity by conserving existing wildlife habitats, creating new habitats and providing links to green infrastructure network; • Encourages adaption to climate change, for instance by incorporating Sustainable Drainage Systems (SuDS), providing areas for flood mitigation, green roofs, green walls, tree planting for shade, shelter and cooling and a balance of hard and soft element; • Does not result in loss of, or damage to, trees and hedgerows that are, or are capable of, making a significant contribution to the character or amenity of the area, unless in exceptional circumstances, the benefits would outweigh the loss; • Adequately protects existing trees including their root systems prior to, during and after construction process; • Would not result in the loss or deterioration of irreplaceable habitats including ancient woodland and ancient or veteran trees, unless in exceptional circumstances the benefits would outweigh the loss, and

Planning Policies	Summary of Policy Content
	- Includes proposals for the successful implementation, maintenance and management of landscape and tree planting schemes. To ensure high quality landscape schemes and depending on the scale, nature and location of the development, the Council will seek appropriate considerations attached to planning permissions to secure various improvements. These may include tree retention and protection, the submission and implementation of a landscape or tree-planting scheme, surface materials, screen walls, fences and planting. Tree Preservation Orders (TPOs). In considering consent for works to trees protected by TPO, the council will: - Assess the amenity value of the tree or woodland and the likely impact of the proposal on the amenity of the area; and - In the light of this assessment consider whether or not the proposal is justified, having regards to the reason put forward in support of it.
DM21- Nature conservation and biodiversity	In accordance with Core Strategy policy CS15- Biodiversity, all new development will be expected to preserve, manage and where possible enhance existing habitats, protected species and biodiversity features. The Council will work in partnership to explore new opportunities for habitat creation and restoration. Support will be given to proposal that enhance existing and incorporate new biodiversity features, habitats and links to habitat network into the design of the buildings themselves as well as in appropriate design and landscape schemes of new developments with the aim of attracting wildlife and promoting biodiversity. Conditions will be used to secure the provision of mitigation measures, as appropriate. Development affecting designated international sites of biodiversity importance and compensatory sites will be considered against Core Strategy policies CS13- Thames Basin Heaths Special Protection Area, CS15- Biodiversity, the Framework and relevant legalisation. Development affecting national sites of biodiversity importance will not be permitted if it will have an adverse effect, directly or indirectly, individually or in combination, on the site or its features. IN exceptions circumstances, proposals that have an adverse effect on a national site may be permitted if the benefits of the development clearly outweigh the harm. If a development is approved under these circumstance, appropriate avoidance, mitigation and compensation will be sought wherever possible. Development affecting locally designated sites of biodiversity importance of sites falling outside these that support national priority habitats or priority species will not be permitted if it will result in significant harm to the nature conservation value of the site or feature. Sites identified on Policies Map as having potential to be designated in future as Suitable Accessible Natural Greenspace (SANG) will be protected from development that may compromise tis ability to serve that function, taking into account the level of existing SANG when the development is proposed and any wider benefits of the proposal.
Guildford Borough Council	Guildford Borough Local Plan (2003)
Policy NE1 Potential Special Protection Areas and Candidate	Planning permission will not be granted for proposals which are likely to destroy or have an adverse effect directly or indirectly on the nature conservation value of potential Special Protection Areas (pSPA) and candidate Special Areas of Conservation (cSAC), as shown the Proposals Map.

Planning Policies	Summary of Policy Content
Special Areas of Conservation	
Policy NE5 Development affecting trees, hedges and woodlands	Development will not be permitted if it would damage or destroy trees protected by a Tree Preservation Order or in a conservation area unless the removal would: • Be in the interests of good arboriculture practice; or • The need for the development outweighs the amenity value of the protected trees. If the removal of any trees is permitted as part of a development, a condition may require that an equivalent number (or more) of the new locally native trees be planted either on or near the site.
Policy NE6 Undesignated features of nature conservation interest	In considering proposals for development on undesignated sites where there is found to be a significant wildlife interest, the council will seek to preserve and enhance the features of ecological value.
Policy R1 Loss of land and facilities for sport and recreation	The Borough Council will resist the loss of land and buildings used for recreation purposes or with the potential for recreational use unless: • A suitable alternative is provided nearby; • There is an excess of recreation land and buildings in the area; and • Sports and recreation facilities can best be retained and enhanced through the redevelopment of a small part of the site.

7.4. Baseline conditions

7.4.1. The following sources have been used to identify ecological baseline conditions for the Scheme:

- Multi-Agency Geographic Information for the Countryside (MAGIC) website²⁴ was used to obtain information on statutory designated sites within 2 km of the Scheme boundary, SACs within 30 km of the Scheme boundary and ancient woodlands within 1 km of the Scheme boundary;
- Desk study records of non-statutory designated SNCIs and conservation verges within 2 km of the Scheme, and notable habitats, notable and legally protected species within 1 km of the Scheme, and bats within 10 km of the Scheme have been obtained from Surrey Biodiversity Information Centre (SBIC);
- Records of reptiles and amphibians within 1 km of the Scheme boundary have been obtained from Surrey Amphibian and Reptile Group (SARG);
- Records of veteran trees within 50 m of the Scheme have been obtained from the Woodland Trust's website;
- Ordnance Survey maps²⁵ and the Where's the Path website²⁶ were used to identify the presence of waterbodies within 500 m of the extent of the Scheme, in order to establish if great crested newts (*Triturus cristatus*) are

²⁴ <http://magic.defra.gov.uk>

²⁵ <https://www.ordnancesurvey.co.uk/osmaps/>

²⁶ <http://wtp2.appspot.com/wheresthepath.htm>

potentially present on land within and immediately surrounding the Scheme;

- An extended Phase 1 Habitat Survey was undertaken of the publicly accessible land on each of the four quadrants of junction 10, as well as the Scheme footprint at Wisley Airfield, Elm Corner SNCI and Painshill Park. This survey broadly followed the Phase 1 habitat survey methodology as set out in Joint Nature Conservation Committee guidance²⁷ to record information on the habitats within the survey area, and was 'extended' to include a search for evidence of presence, and an assessment of the potential of each habitat to support, notable and protected species, as recommended by the Chartered Institute for Ecology and Environmental Management (CIEEM)²⁸;
- The scoping survey also included a drive-by survey of the A3 between the A3 Ockham interchange and A3/A245 Painshill junction. This involved a high-level assessment of broad habitat types present with their potential to support legally protected and notable fauna. This was conducted instead of an Extended Phase 1 habitat survey due to the health and safety risks associated with surveying the verge of a major trunk road;
- A National Vegetation Classification (NVC) survey of notable habitats, and a search for notable plant species was undertaken of the publicly accessible land on each of the four quadrants of junction 10; and
- Initial species surveys which were commenced in 2016. The majority of these surveys will continue through the Preliminary Design Stage. These include:
 - breeding bird surveys: carried out during the 2016 and 2017 breeding seasons;
 - wintering bird surveys: carried out over winter 2016/17;
 - ground level tree assessments for bats: undertaken during spring and summer 2017;
 - bat activity transect surveys: carried out in autumn 2016, and during spring, summer and autumn 2017;
 - bat trapping surveys: carried out around junction 10 during summer 2017;
 - dormouse surveys: carried out in 2016 and 2017;
 - invertebrate surveys: carried out within Ockham and Wisley Commons SSSI in summer 2017;
 - great crested newt surveys: carried out in spring 2016 and spring 2017; and
 - reptile surveys: carried out in summer 2017.

7.4.2. The desk study, walkover survey and initial results from the ongoing habitat and species surveys is considered sufficient to identify the types of habitats present and their potential to support notable and protected species in order to give a

²⁷ Joint Nature Conservation Committee (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit

²⁸ Chartered Institute of Ecology and Environmental Management (2012). Guidelines for Preliminary Ecological Assessment

preliminary assessment of impacts and potential significance, and to identify any further ecology studies that may be required.

Designated Sites

- 7.4.3. There are five statutory designated sites within 2 km of the Scheme, as summarised in Table 7-2 below and on the Environmental Constraints Map in Chapter 19. These statutory sites include one European designated SPA²⁹, three nationally designated SSSIs³⁰ and one LNR³¹ (refer to Appendix C for relevant legislation).

Table 7-2: Summary of statutory designated sites within 2 km of the Scheme

Site name	Approximate distance and direction from the Scheme	Citation description	Area (ha.)	Grid reference
Thames Basin Heaths SPA	Partially falls within the Scheme. Directly adjacent to the south-east and south-west of M25 junction 10.	Regularly used by 1% or more of the Great Britain populations of the following species listed in Annex 1 of the EU Birds Directive in any season: nightjar (<i>Caprimulgus europaeus</i>); 7.8% GB population, woodlark (<i>Lullula arborea</i>); 9.9% GB population, Dartford warbler (<i>Sylvia undata</i>); 27.8% GB population.	8,275	TQ078590
Ockham and Wisley Commons SSSI	Partially falls within the Scheme. Directly adjacent to the south-east, south-west, north-east and north-west of M25 junction 10.	The site consists of a large tract of heathland lying between the Mole and Wey rivers near Cobham. The site is contains areas of heath, bog, open water, secondary woodland and scrub. The large variety of habitats allows for a rich community of heathland plants and animals, including a large number of rare and local insects.	269	TQ070585 TQ082585 TQ084592 TQ078595
Ockham and Wisley LNR	Partially falls within the Scheme. Directly adjacent to the south-east, south-west and north-west of M25 junction 10. 85 m to the north-east of M25 junction 10.	Declared a LNR in 2005.	332	TQ070585 TQ082585 TQ084592 TQ078595
Papercourt SSSI	1.5 km west of the southern extent of the Scheme.	This site consists of a complex of wetland habitats including unimproved meadows, marshes, streams and flooded gravel pits. These support a	70	TQ036566

²⁹ Designated under Article 4.1 of EC Directive 79/409 on the Conservation of Wild Birds (the Birds Directive)

³⁰ Sites of Special Scientific Interest (SSSIs) are protected under the Wildlife and Countryside Act 1981 (as amended) and The Countryside and Rights of Way Act 2000

³¹ LNRs are protected under the National Parks and Access to the Countryside Act 1949

Site name	Approximate distance and direction from the Scheme	Citation description	Area (ha.)	Grid reference
		number of local plants and a wide variety of breeding and wintering birds.		
Esher Common SSSI	1.8 km north-east of the northern extent of the Scheme.	Esher Common includes much of Arbrook, Esher, Oxshott, West End and Fairmile Commons and the Ledges, covers a large tract of land between the River Mole, Oxshott and Esher. The site lies partly on acidic soils, and partly on damp, clay soils. Heathland, grassland, scrub, woodland and areas of marsh, bog, and open water, present a rich variety of habitats supporting many species of plants and animals. This site is an important area for invertebrates.	361	TQ132622

7.4.4. Two SACs where bats are listed as one of the qualifying features of the designation were identified within 30 km of the Scheme, see Table 7-3.

Table 7-3: Summary of SACs within 30 km of the Scheme

Site name	Approximate distance and direction from the Scheme	Description	Area (ha.)	Grid reference
Mole Gap to Reigate Escarpment SAC	6.9 km, south-east of the Scheme.	The site is situated within the North Downs and extends 13 km from Leatherhead to Reigate. It is designated for its population of Bechstein's bat (<i>Myotis bechsteinii</i>). The site consists of chalk downs supporting the only stable area of box (<i>Buxus sempervirens</i>) scrub in the UK and priority orchid sites. The site also contains some sections of semi-natural woodland and is deemed important for great crested newts, hazel dormouse (<i>Muscardinus avellanarius</i>) and several bat species.	892	TQ199533
Ebernoe Common SAC	29.3 km south of the Scheme.	The site is situated within the South Downs. It is designated for its population of Bechstein's bat and barbastelle bat (<i>Barbastella barbastellus</i>). Ebernoe Common has an extensive block of beech (<i>Fagus sylvatica</i>) high forest and former wood-pasture over dense holly (<i>Ilex aquifolium</i>), and has a very rich epiphytic lichen flora. The beech woodland is associated with other woodland types, open glades and pools, which contribute to a high overall diversity. The woods are important for a number of bat species.	235	SU977273

- 7.4.5. Seventeen SNCIs were identified within 2 km of the Scheme boundary. Information on these sites is provided in Table 7-4 below.

Table 7-4: Summary of SNCI within 2 km of the Scheme

Site name	Approximate distance and direction from the Scheme	Description	Area (ha.)	Grid reference
Elm Corner Woods SNCI	Partially falls within the Scheme footprint.	The site contains a mixture of woodland with patches of associated wet drainage areas. The site has been identified as important due to its position in reference to other designated sites i.e. Ockham and Wisley Common SSSI, and Wisley Airfield SNCI.	10.2	TQ068579
Wisley Airfield SNCI	Partially falls within the Scheme footprint.	The site consists of a disused airfield surrounded by ancient hedgerows and rough grassland. The west of the site is important for a number of plant species and the east of the site is noted for amphibians and reptiles.	117	TQ076578
Hunts Copse SNCI	Immediately adjacent to the Scheme (proposed road improvements on Elm Lane).	The site is coppiced ancient woodland. Due to its location, the site is considered to act as a buffer to Ockham and Wisley Commons SSSI and an important as an ecological unit within the area.	5.2	TQ080580
River Wey Elmbridge SNCI	Approximately 115 m to the north of the western edge of the Scheme.	Approximately 7.5 km of the River Wey. The river supports a number of fish species including bullhead (<i>Cottus gobio</i>) and potentially brook lamprey (<i>Lampetra planeri</i>).	7.5	TQ074656; TQ072601
Manor Farm and Meadows (including Common Meadows Pond) SNCI	Approximately 120 m to the north of the western edge of the Scheme.	The site consists an area of wet meadow with value for both invertebrates and birds. Common Meadows pond has been identified as important due to its close proximity to other important sites and high diversity of aquatic species.	5.9	TQ068599
Field West of Old Common SNCI	Approximately 300 m to the north-east of the northern edge of the Scheme.	The site consists of rough grassland and an embankment. The site is considered suitable for reptiles and amphibians.	2.2	TQ103609
Ripley Green SNCI	Approximately 320 m to the west of the southern edge of the Scheme.	The site is located within the wider area of Ripley Green which consists of a cricket field, playground and car park. The part of the site designated as a SNCI site is composed of a variety of grassland, scrub and woodland communities and a shallow stream. The site contains over 250	25	TQ055573

Site name	Approximate distance and direction from the Scheme	Description	Area (ha.)	Grid reference
		species of plant including locally scarce species.		
Manor House SNCI	Approximately 380 m to the north of the western edge of the Scheme.	The site is located within the borough of Woking. The site consists of species-rich flood meadow.	3.2	TQ072602
St George's Hill Golf Course SNCI	Approximately 630 m to the north-west of the northern edge of the Scheme.	The site consists of a large golf course, with a mixture of semi-natural habitats including mixed and coniferous woodland, acid grassland and heath. The site is noted as important for invertebrates.	94	TQ080620
Wisley Bridge SNCI	Approximately 640 m to the west of the western edge of the Scheme.	The site has been selected for its population of vulnerable Copse Bindweed and species listed on the UK biodiversity action plan and principle importance under Section 41 of the NERC Act.	0.11	TQ060695
River Wey-Woking (not including Pyrford Place Lake) SNCI	Approximately 700 m to the north-west of the A3 at its closest point.	Approximately 16.8 km of the River Wey, supporting a wide variety of invertebrate species, amphibians, birds, and a population of water voles (<i>Arvicola amphibius</i>).	17	TQ008532; TQ072614 (TQ051583)
Old Common SNCI	Approximately 790 m to the north-east of the northern edge of the Scheme.	The site contains a mixture of acid grassland, wet and dry woodland, disused allotments and a pond. The site is considered important for several invertebrates including seven nationally scarce species.	9.1	TQ108610
Pyrford Place Lake SNCI (part of River Wey SNCI)	Approximately 1.2 km to the north-west of the southern edge of the Scheme.	No Citation Available	N/A	TQ008532- TQ072614 (TQ051583)
Warren Farm Wood, Hoe Valley SNCI	Approximately 1.5 km to the west of the southern edge of the Scheme.	The site is consists of broadleaved woodland, a species rich marsh for which it is designated for. In addition to this it is also known for its Alder woodland.	5	TQ046575
Clandon Woods SNCI	Approximately 1.5 km to the south of the southern edge of the Scheme.	The site is woodland (mostly semi-natural) and stretches across Clandon and Ripley. The woodland contains a range of community types and regionally important base-enriched Hornbeam.	175	TQ054523, TQ058535, TQ065530, TQ065547, TQ067537, TQ071525,

Site name	Approximate distance and direction from the Scheme	Description	Area (ha.)	Grid reference
				TQ071532
Wheeler's Meadow (South) SNCI	Approximately 1.8 km to the west of the southern edge of the Scheme.	The site is located beside the River Borune and forms part of the network of meadows along the river course. The site is primarily made up of unimproved wetland which is uncommon in Surrey.	1.1	TQ043579
Wheeler's Fields (Grayshott Fields, Hoe Valley) SNCI	Approximately 1.9 km to the west of the southern edge of the Scheme.	The site is made up of wet tussocky meadows, drains and marshes which are seasonally flooded. The site is considered important for its tall grassland habitat which provide suitable habitat for a variety of invertebrates, mammals and reptiles and birds with a Hobby recorded flying over the site.	3.7	TQ042581

7.4.6. There are four conservation verges within 2 km of the Scheme. Details of these are provided in Table 7-5.

Table 7-5: Summary of non-statutory conservation verges within 2 km of the Scheme

Ref	Site Name	Length (m)	Grid reference	Site description	Nature conservation interest
CV005	Bolder Mere	800	TQ079582	Both verges of Old Lane, approximately 200 m in either direction from central grid reference. Immediately adjacent to the proposed Elm Road improvements.	Significant population within the county of common toad.
CV058	Wisley Lane 2	172	TQ063592	Wisley Lane, Wisley. Southern side of the road opposite Deers Farm from TQ06235932 to TQ06345919. Approximately 500 m to the south-west of the western edge of the Scheme.	Supports County Scarce plants sheep's bit and royal fern.
CV057	Wisley Lane 1	611	TQ059591	Wisley Lane, Wisley. Both sides of the road from TQ05765964 to Wisley bridge (TQ06015945). Approximately 700 m to the west of the western extent of the Scheme.	Supports copse-bindweed (Nationally threatened: vulnerable) and bur chevil (Surrey scarce).
CV007	Bridge Road	804	TQ106595	Both verges of Old Lane, approximately 200 m in either direction from central grid reference. Approximately 1.4 km to	Significant population within the county of common toad.

Ref	Site Name	Length (m)	Grid reference	Site description	Nature conservation interest
				the south-east of the northern extent of the Scheme.	

Ancient Woodland and veteran trees outside of ancient woodland

- 7.4.7. There are 23 parcels of ancient woodland within 1 km of the Scheme. A summary of these is provided in Table 7-6 below.
- 7.4.8. The Woodland Trust website identified no veteran trees within 50 m of the Scheme boundary. However, an arboricultural assessment of the Scheme footprint has not yet been conducted. This survey may identify additional veteran trees.

Table 7-6: Summary of ancient woodland within 1 km of the Scheme

Site name	Approximate distance and direction from the Scheme	Area (ha)	Grid reference
Woodland adjacent to Heyswood Girl guide camp (SRY_6438 and SRY_6439)	Partially within Scheme boundary. Note this woodland is split into two areas and is dissected by a National Grid site.	2.0	TQ089602
Hatchford Wood (SRY_1646)	Partially within Scheme boundary.	14.7	TQ088583
Woodland south of Battleston Hill near Elm Lane (SRY_1649)	Directly adjacent to the Scheme boundary	1.4	TQ065576
Woodland to the east of The Bogs on Pointer's Road (SRY_1645)	10 m north, along Pointer's Road	0.6	TQ094585
Park Wood north of A3 (SRY_4509)	15 m south, near Ripley	4.1	TQ056567
The Bogs (SRY_1837)	25 m north, along Pointer's Road	3.9	TQ091587
Woodland to the east of Hatchford Manor (SRY_1648)	110 m south-east near Hatchford	0.5	TQ095581
Hunt's Copse (SRY_6007)	185 m south-east, near Hatchford End	1.9	TQ080578
Buckingham Lodge Wood (SRY_4503)	215 m east, near Ockham Park	1.4	TQ063570
Woodland adjacent to Hunt's Copse (SRY_6006)	290 m south-east, near Hatchford	0.4	TQ081578
Woodland adjacent to Ockham Mill Stream (SRY_1650)	340 m north-west, north of Ripley	0.4	TQ053577
Bramble Wood (SRY_1903)	415 m east near Pointers Green	4.2	TQ099584
Park Wood south of A3 (SRY_4502)	505 m south near Ripley and Ockham Park	9.3	TQ060563

Site name	Approximate distance and direction from the Scheme	Area (ha)	Grid reference
Queen Anne's Hills West(SRY_2644)	560 m north, near Byfleet	0.6	TQ075601
The Hangers (SRY_4499)	600 m north-west, near Byfleet	6.5	TQ076604
Queen Anne's Hills East(SRY_2643)	650 m north, near Byfleet	0.4	TQ076602
Brickfield Copse north of M25 (SRY_1653)	690 m north-east near Hatchford	1.7	TQ100581
Brickfield Copse south of M25 (SRY_1641b)	700 m south-east near Hatchford	0.1	TQ100579
Brickfield Copse south of M25 (SRY_1904)	775 m south-east near Hatchford	0.6	TQ100577
The Decoy (SRY_6300)	805 m south-west, near Wisely Golf Course	3.2	TQ059590
Woodland adjacent to Pyrford Place (SRY_3380)	955 m north-west, near Wisely Golf Course	0.6	TQ050583
Woodland adjacent to Halfpenny Cross (SRY_1652)	965 m east, near Pointers Green	0.6	TQ104585
Woodland adjacent to The Decoy (SRY_6299)	975 m south-west, near Wisely Golf Course	0.7	TQ058590

Habitats

- 7.4.9. The most abundant habitat within the Scheme, immediately surrounding M25 junction 10 is mixed woodland with Scot's pine (*Pinus sylvestris*), silver birch (*Betula pendula*) and pedunculate oak (*Quercus robur*) the most frequent species. Some areas of broadleaved woodland are present, such as to the north-west of junction 10, which is dominated by young silver birch trees. A line of veteran pedunculate oak trees is present in the woodland to the north-west of the Scheme.
- 7.4.10. The southern extent of the Scheme is within an area of lowland heathland on both sides of the A3.
- 7.4.11. Ponds, lakes and ditches are also present in various locations on all sides of the Scheme with Bolder Mere to the south-east of the Scheme being noted as having reed bed habitat around its margins.
- 7.4.12. There are six Habitats of Principal Importance (HPI)³² within 500 m of the Scheme. These are lowland heathland, lowland mixed deciduous woodland, woodpasture and parkland, rivers, ponds and reedbed.

Notable and Protected Species

Notable Plants

- 7.4.13. The desk study returned records for several notable plant species within 1 km of the Scheme, such as pillwort (*Pilularia globulifera*), lesser water-plantain

³² Habitat of Principal Importance for the Conservation of Biodiversity on the England Biodiversity List, refer to Appendix for further details

(*Baldellia ranunculoides*) and many-stalked spike-rush (*Eleocharis multicaulis*), all of which are considered scarce (or near threatened) in Surrey.

- 7.4.14. The notable plant species listed in the desk study (pillwort, lesser water-plantain and multi-stemmed spike-rush) were not recorded during the surveys. However, two notable species: royal fern (*Osmundia regalis*) and cross-leaved heath (*Erica tetralix*) were recorded. Royal fern is scarce in Surrey, and cross-leaved heath is near threatened in England.

Invertebrates

- 7.4.15. The desk study provided records of a number of invertebrate groups within 1 km of the Scheme, including a nationally scarce scavenger water beetle and various species listed as Nationally Notable A³³, including a brown ant and heath potter wasp (*Eumenes coarctatus*).
- 7.4.16. The Ockham Common and Wisley Common SSSI citation indicates that the open water surrounded by heathland presents an ideal habitat for many dragonflies and damselflies (Odonata), and over 20 species have been recorded within the SSSI, which is thus of national importance for this order. The site also supports many other local and rare invertebrates. It is of national importance for true flies (Diptera). A large number of locally scarce beetles (Coleoptera) are also found.
- 7.4.17. Invertebrate surveys have been carried out monthly (June to September) of the SSSI habitat within and adjacent to the Scheme footprint. A mixture of techniques were used, including sweep sampling, spot sampling, suction sampling and pitfall traps.
- 7.4.18. Initial results have identified a number of scarce invertebrates, thought to be present throughout the wider habitats in the SSSI.

Amphibians

- 7.4.19. The desk study returned eight records of great crested newts within 1 km of the Scheme. The desk study also identified aquatic habitat that could potentially be used by breeding great crested newts, including 65 waterbodies and 53 ditches within 500 m of the Scheme (although some of these waterbodies are separated from the Scheme by physical barriers, such as roads or rivers). Suitable terrestrial habitat, particularly woodland habitat, is also present. The terrestrial habitats provide habitat connectivity to nearby ponds and offer suitable foraging and hibernation opportunities for great crested newts.
- 7.4.20. Surrey Wildlife Trust confirmed an environmental DNA (eDNA)³⁴ record of great crested newts within the edge wetland features of Bolder Mere in 2016.
- 7.4.21. During spring 2017, eDNA surveys were carried out of 13 potentially suitable ponds and ditches, with access permission, within 500 m of the Scheme.). Of the 13 waterbodies assessed, a single pond was confirmed to contain great crested newt eDNA. This waterbody is located within the heathland area in the southwest quadrant, and is approximately 480 m from the western end of the Scheme.

³³ Taxa estimated to occur within 16-30 10-km squares of the National Grid System

³⁴ Natural England (2014),

(<http://webarchive.nationalarchives.gov.uk/20140605105717/http://www.naturalengland.org.uk/ourwork/regulation/wildlife/gcn-eDNA-feature.aspx>; accessed 12/09/17)

- 7.4.22. In addition, great crested newt population assessment surveys were carried out on Bolder Mere and two ponds in the southeast quadrant and a large pond in the southwest quadrant.
- 7.4.23. Great crested newts were recorded in the two ponds in the southeast quadrant, in low numbers (less than ten individuals), but not in Bolder Mere .
- 7.4.24. No great crested newts were recorded in the large pond in the southwest quadrant.
- 7.4.25. During a reptile survey on the 19 September 2017, a male great crested newt was recorded within Wisley Airfield, approximately 650 m to the south-west of Bolder Mere, and on the 28 September 2017 a male great crested newt was recorded at the northern edge of Bolder Mere (where great crested newts are known to occur).

Reptiles

- 7.4.26. The desk study identified records of common lizard (*Zootoca vivipara*), grass snake (*Natrix natrix*), slow worm (*Anguis fragilis*), adder (*Vipera berus*) and sand lizard (*Lacerta agilis*) within 1 km of the Scheme.
- 7.4.27. In addition, Wisley Airfield SNCI is identified in the desk study as being bounded by areas of long grass which is suitable habitat for common foraging reptiles. Grass snake, slow worm and common lizard have all been recorded in the east of this SNCI³⁵.
- 7.4.28. Areas of heathland are present at Ockham Common. This habitat has high suitability for reptiles, and is likely to support the common reptile species as well as sand lizard. Sand lizards were identified in the desk study and have been confirmed by Surrey Wildlife Trust and SARG as having established following a successful re-introduction in 1991 in the mature heathland in the south-east quadrant of Wisley and Ockham Commons Surrey Wildlife Trust nature reserve (i.e. Ockham Common). Sand lizards were only reintroduced to Ockham Common and are considered to be absent from the habitats within the south-west, north-east and north-west quadrants of habitat surrounding M25 junction 10.
- 7.4.29. The extended Phase 1 Habitat Survey identified that the main habitat within the footprint of the Scheme is woodland. Due to the heavy shading of woodland this habitat has low suitability for reptiles. However, log piles and gaps around tree roots could potentially be used as reptile hibernating sites, particularly where they are on located on the edge of a woodland.
- 7.4.30. Common lizards were recorded in the small heathland glade in the north-west quadrant during surveys undertaken by Atkins in 2016.
- 7.4.31. Reptile presence/likely absence surveys commenced in August 2017 and are currently ongoing until October 2017. Some further surveys will be carried out in spring 2018. A summary of the initial results can be found in Table 7-7.
- 7.4.32. In addition, a single sand lizard was recorded within the open wooded area between Ockham Bites café and the footbridge between the south-east and south-west quadrants during an invertebrate survey on the 19th June 2017.

³⁵ Savills (2015) Wisley Airfield: Environmental Statement: Appendix 8.8 Reptile survey results

Table 7-7: Summary of reptile survey results to date

Location	Reptile species recorded
North-west quadrant of junction 10	Slow worm, common lizard
North-east quadrant of junction 10	No reptiles recorded
South-west quadrant of junction 10 (Wisley Common and Wisley Lane)	Slow worm, grass snake, common lizard
South-east quadrant of junction 10 (Ockham Common)	Slow worm, grass snake, common lizard, adder, sand lizard
Elm Lane (Snakes Field)	Slow worm, grass snake, common lizard
Bolder Mere Lake	Grass snake
Wisley Airfield	Slow worm, grass snake
Painshill Park and associated areas	Slow worm, grass snake, common lizard

Birds

- 7.4.33. The desk study identified a number of protected and rare species of bird within 1 km of the Scheme, including woodlark, nightjar, Dartford warbler and nightingale.
- 7.4.34. The Thames Basin Heaths SPA supports important breeding populations of a number of birds of lowland heathland, especially nightjar and woodlark, both of which nest on the ground, often at the woodland/heathland edge, and Dartford warbler, which typically nests in gorse. There is potential for direct loss of heathland habitat as a result of the Scheme and there could be indirect impacts on heathland birds through increased noise.
- 7.4.35. The ecological scoping survey and drive-by habitat assessment also identified that the woodland and scrub within the survey area offers suitable nesting opportunities for birds. Swans and ducks were present on the larger waterbodies and the reedbed fringes to Bolder Mere may provide habitat for birds associated with reedbeds, such as reed bunting. The River Mole could provide suitable habitat for kingfisher.
- 7.4.36. An initial breeding bird survey was undertaken in spring/summer 2016. A total of 45 bird species were recorded within the survey area, of which 36 were thought to have bred within the survey area, based on breeding behaviour observed and/or habitats present. Of the 45 species recorded, 12 are notable for their Schedule 1, Annex 1 and/or their Red or Amber List Bird of Conservation Concern status. Breeding was confirmed for seven notable species: common tern, Dartford warbler, dunnoek, mute swan, nightjar, song thrush and spotted flycatcher. It is noted that the optimum survey window for woodlark was missed in 2016.
- 7.4.37. Four wintering bird surveys specifically focused on recording wintering woodlark within the heathland habitats within and adjacent to the Scheme were carried out between November 2016 and February 2017. No woodlarks were recorded.
- 7.4.38. Detailed breeding bird surveys were carried out in 2017, including species-specific surveys for Dartford warbler, nightjar and woodlark. A total of 66 species were recorded during the surveys, of which 53 were thought to probably have bred within or adjacent to the survey area, based on breeding behaviour observed and/or habitats present.

- 7.4.39. Of the 66 species recorded, 24 are notable for their Schedule 1, Annex 1 and/or their Red or Amber List Bird of Conservation Concern status.
- 7.4.40. Breeding was confirmed for 14 notable species: common tern, cuckoo, Dartford warbler, dunnoek, hobby, mallard, mistle thrush, mute swan, nightjar, reed bunting, song thrush, spotted flycatcher, stock dove and woodlark.
- 7.4.41. All three Thames Basin Heaths SPA qualifying bird species were recorded in the south-east and south-west quadrants:
- South-east quadrant (Wisley Common): two nightjar territories, two Dartford warbler territories, one woodlark territory; and
 - South-west quadrant (Ockham Common): four nightjar territories, four Dartford warbler territories, one woodlark territory.
- 7.4.42. In addition, a barn owl was observed hunting over the eastern edge of Ockham Common during a bat survey on the 25th July 2017. Barn owls are a Schedule 1 species and an Amber List BoCC. This isolated sighting on a single occasion does not indicate that barn owls bred within or adjacent to the survey area.

Mammals

Bats

- 7.4.43. The desk study returned 284 records from Surrey Bat Group which identified 12 bat species within 10 km of the Scheme in the past 10 years: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Natterer's (*Myotis nattereri*), brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), Daubenton's (*Myotis daubentonii*), Leisler's (*Nyctalus leisleri*), whiskered (*Myotis mystacinus*), Bechstein's (*Myotis bechsteinii*) and barbastelle (*Barbastella barbastellus*) bats.
- 7.4.44. Records include Natterer's and brown long eared bats at Hatchford Woods Ice House (presumed to be hibernating bats), soprano pipistrelle and noctule bats roosting in Ockham Common bat boxes and several roosts that are likely to be in houses.
- 7.4.45. In addition, Mole Gap to Reigate Escarpment SAC is located approximately 7.8 km south-east of the Scheme and Ebernoe Common SAC is located approximately 29.5 km south of the Scheme. Both of these SACs include Bechstein's bat as a qualifying species, and Ebernoe Common SAC also include barbastelle as a qualifying species.
- 7.4.46. Trees with features suitable for roosting bats, such as splits and cavities, were noted in the woodlands surrounding junction 10. Bat activity transect surveys are currently being undertaken in accordance with Bat Conservation Trusts Good Practice Guidelines³⁶, and will be completed in October 2017.
- 7.4.47. In addition, bat trapping surveys³⁷ were carried out within the four quadrants surrounding M25 junction 10, with two sessions conducted in each quadrant between July and August 2017.

³⁶ Bat Conservation Trust (2016). Bat Surveys for Professional Ecologists. Good Practice Guidelines

³⁷ Harp traps and bat call lures were used to attract and catch bats within the survey areas

- 7.4.48. The surveys to date have recorded nine species: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Daubenton's, noctule, serotine, Leisler's, brown long-eared and whiskered bats.

Dormouse

- 7.4.49. The desk study returned no records of hazel dormice within 1 km of the Scheme. The extended Phase 1 Habitat Survey identified conifer woodland, with occasional broadleaved species, as the main habitat present immediately surrounding junction 10. Much of the woodland is considered sub-optimal for dormice due to the dominance of conifers and absence of a scrub layer. However, there are patches of more diverse habitat, such as adjacent to the M25 to the south-east of junction 10, where species such as bramble, honeysuckle, holly, birch, gorse and sweet chestnut are present.
- 7.4.50. Dormouse surveys were undertaken in 2016 and 2017. No dormice were recorded.
- 7.4.51. The woodland at Elm Corner SNCI (including the adjacent ancient woodland), and the ancient woodland at the Girl Guides Camp at Painshill have not been surveyed to date for dormice. Surveys will commence in September 2017, continuing into 2018. Survey methods will consist of the setting up and checking of dormouse tubes, as well as an autumn search of fallen hazelnuts for dormouse teeth marks.

Otter and Water Vole

- 7.4.52. The desk study returned no records of otters (*Lutra lutra*) within 1 km of the M25 junction 10, and a single record of water vole from the River Wey (Woking) SNCI, located approximately 700 m to the north of the Scheme.
- 7.4.53. A survey of the wet ditch (connected to Ockham Mill Stream) which passes under Stratford Bridge to the east of the Ripley roundabout (central OS grid reference TQ0627957496) was carried out on the 21st September 2017. No evidence of otter or water vole was recorded along the wet ditch up to 500 m from the Ripley roundabout during the survey, and in addition, a mink was observed during the survey, thus reducing the suitability of the area for water voles. The wet ditch to the west of the Ripley roundabout will be surveyed for water vole and otter evidence during this stage, once access permissions have been agreed.

Badger

- 7.4.54. Badgers (*Meles meles*) have been confirmed as present by the desk study and field surveys. There is potential for a main sett to be directly impacted by the Scheme.
- 7.4.55. A detailed update survey of the Scheme footprint and immediate surrounds for badger evidence, will be carried out during this Preliminary Design Stage.

Non-native Invasive Plant Species

- 7.4.56. The desk study did not identify any records of non-native invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)³⁸.

³⁸ It is illegal to plant or otherwise cause these species to grow in the wild

However, the following species listed on Schedule 9 were recorded during the extended Phase 1 Habitat Survey:

- Rhododendron (*Rhododendron ponticum*) was noted as present in several of the woodlands;
- Indian balsam (*Impatiens glandulifera*) was noted as present in July 2016 close to the east end of the Scheme (near the bridge over the M25) to both the north and south of the M25; and
- Four ponds were all noted as supporting the non-native invasive New Zealand pygmy weed (*Crassula helmsii*).

7.4.57. During site visits in 2017, Indian balsam was noted within the wooded area immediately surrounding Ockham Bites café in August 2017. In addition, a small clump of Japanese knotweed was identified as being present within the wooded area of Wisley Common that runs northwards from RHS Wisley towards the M25 in June 2017.

7.5. Potential impacts

7.5.1. The potential impacts of the Scheme are identified for ecological features below prior to mitigation.

Designated sites

7.5.2. The Scheme will involve an approximate permanent land take of 25.7 ha (some land falls under several designations and therefore the following figures do not add up to the total of 25.7 ha) and an additional temporary land take of 32.8 ha.:

- 6.6 ha of the approximate permanent land take is designated as Thames Basin Heaths SPA (the land take from the SPA is also designated as SSSI and LNR). This equates to 0.08 % of the SPA (8,274.72 ha). An additional 6.7 ha of temporary land take is proposed (0.08 % of the SPA);
- 10.9 ha of the approximate permanent land take is designated as Ockham and Wisley Commons SSSI. This equates to 4.0 % of the SSSI (269.6 ha). An additional 11.3 ha of temporary land take is proposed (4.2 % of the SSSI);
- 12.6 ha of the approximate permanent land take is designated as Ockham and Wisley LNR. This equates to 3.8 % of the LNR (332 ha). An additional 11.0 ha of temporary land take is proposed (3.3 % of the LNR);
- 2.0 ha of the approximate permanent land take is designated as Elm Corner SNCI and an additional temporary land take of 0.7 ha is proposed;
- 2.9 ha of the approximate permanent land take is designated as Wisley Airfield SNCI and an additional temporary land take of 1.0 ha is proposed; and,

0.05 ha of the approximate temporary land take is designated as Hunts Copse SNCI. Ancient woodland and veteran trees outside of ancient woodland

7.5.3. The Scheme is adjacent to one ancient woodland and would currently cause the direct loss of habitat of approximately 1.0 ha within three ancient woodlands.

- 7.5.4. 0.71 ha of the approximate permanent land take is designated as ancient woodland, and 0.29 ha of temporary land take is proposed. However, although soils may be retained within temporary land take areas, it is assumed that all loss of trees etc within ancient woodland will count as permanent land take. Therefore, it is assumed that approximately 1.0 ha of ancient woodland will be permanently lost.
- 7.5.5. There were no veteran trees within 50 m of the Scheme on the Woodland Trust website. An arboricultural assessment of the Scheme footprint has not yet been conducted.

Notable habitats

- 7.5.6. The Scheme will cause the direct loss of approximately 22.4 ha of permanent land take of HPI habitat, and an additional 22.4 ha of temporary land take. HPis were taken from MAGIC.gov and consist of:
- Lowland heathland (approximately 0.5 ha of permanent land take and 0.5 ha of temporary land take);
 - Lowland mixed deciduous woodland (approximately 6.4 ha of permanent land take and 6.2 ha of temporary land take);
 - Woodpasture and parkland (approximately 17.4 ha of permanent land take and 15.7 ha of temporary land take)³⁹.
- 7.5.7. In addition, there are potentially areas of river, pond and reedbed HPis within the Scheme footprint.

Notable and legally protected species

- 7.5.8. Due to the presence of SPA qualifying species, there may potentially be impacts on populations of these species, as a result of impacts such as habitat loss and increased disturbance.
- 7.5.9. There is potential for the Scheme to have impacts on legally protected species (including European protected species) and notable species, including killing, injury or disturbance during construction; or disturbance, loss of foraging areas, population fragmentation, or disruption of migratory or commuting routes over the long term. Legally protected species that have been identified from the desk study and extended Phase 1 habitat survey within the Scheme boundary include great crested newts, reptiles, bats, breeding birds and badger.

7.6. Proposed level and scope of assessment

- 7.6.1. It is considered that the information being gathered for the nature conservation features will be sufficient to inform the ES.
- 7.6.2. An updated desk study, as well as habitat and protected species surveys conducted during 2016 and 2017 will inform the ES to characterise and assess the impacts of the Scheme on nature conservation features.
- 7.6.3. Consultation with key stakeholders, such as Natural England, Surrey Wildlife Trust, Forestry Commission and the Royal Society for the Protection of Birds, is

³⁹ Much of the lowland mixed deciduous woodland and woodpasture and parkland overlap, so the individual HPI areas do not add up to the total HPI land take area.

being carried out in order to determine appropriate mitigation and compensation measures to counteract any potential impacts on designated sites and ancient woodland. Potential mitigation measures are outlined in section 7.9.

- 7.6.4. The findings of the assessment will be used to identify appropriate mitigation that will avoid, reduce and/or compensate for significant effects due to the construction and operation phases of the Scheme.
- 7.6.5. Due to the potential for a likely significant effect on internationally designated sites as a result of the Scheme being identified during the Option Selection Stage, a Preliminary Design Stage Habitat Regulations Assessment (formerly the Assessment of Implications on European Sites) will be required. This would assess the potential for the Scheme to have an adverse effect on the integrity of any internationally designated sites.

Table 7-8: Nature conservation receptors that will be subject to further assessment

Receptors	Scoped in/out	Comment/Justification
Internationally designated statutory sites (SAC, SPA)	✓	Thames Basin Heaths SPA falls partially within the Scheme footprint. In addition, there are two internationally designated sites where bats are one of the qualifying features within 30 km of the Scheme. The Thames Basin Heaths SPA may be subject to impacts from changes in air quality and noise.
Nationally designated statutory sites (SSSI, NNR)	✓	Ockham and Wisley Common SSSI falls partially within the Scheme footprint. In addition, a further two SSSIs falls within 2 km of the Scheme. The Ockham and Wisley Common SSSI may be subject to impacts from changes in air quality.
Locally designated statutory sites (LNR)	✓	Ockham and Wisley LNR falls partially within the Scheme footprint.
Non-statutory designated sites (SNCIs)	✓	Twenty-three SNCIs fall within 2 km of the Scheme.
Ancient woodland	✓	There are three parcels of ancient woodland potentially subject to direct land take, and a parcel of ancient woodland immediately adjacent to the Scheme.
Notable habitats	✓	Lowland heathland, lowland mixed deciduous woodland, woodpasture and parkland, reedbeds, rivers and ponds may be subject to impacts from the Scheme, which are HPI.
Notable invertebrates	✓	There is potential for notable terrestrial invertebrates, such as those listed in the SSSI citations, to be affected by the Scheme. The Scheme may cross some rivers and tributaries. Therefore, there is potential for notable aquatic invertebrates to be affected by the Scheme.
Great crested newt	✓	The Scheme may affect potential suitable terrestrial habitat for great crested newts, a notable species, which is also legally protected.

Receptors	Scoped in/out	Comment/Justification
Reptiles	✓	The Scheme affects potential suitable habitat for reptiles, which are legally protected.
Breeding birds	✓	The Scheme affects potential habitat for notable birds. Nesting birds are also legally protected.
Bats	✓	The Scheme may impact on one or more features suitable for roosting bats, and affect bat foraging habitat and/or disrupt commuting routes. Bats are notable species that are legally protected.
Hazel dormouse	✓	The Scheme affects potential habitat for dormouse, a notable species that is legally protected.
Water vole	✓	The Scheme crosses a wet ditch (connected to Ockham Mill Stream) by Ripley roundabout. Therefore, there is potential for water voles to be affected by the Scheme.
Otter	✓	The Scheme crosses a wet ditch (connected to Ockham Mill Stream) by Ripley roundabout. Therefore, there is potential for otters to be affected by the Scheme.
Badger	✓	There is potential for sett destruction, disturbance or harm to badgers, which are legally protected, during construction.
Invasive plants	✓	There is potential to cause certain invasive plant species under Schedule 9 of the Wildlife and Countryside Act 1981 to spread (which is an offence) during construction if present. While invasive plants are not themselves a receptor of nature conservation value, they will be considered during surveys and assessment to inform working practices.

Value of the environmental resources and receptors

Valuation criteria

- 7.6.6. Nature conservation features have been valued following the framework provided in IAN 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment. This is presented in Table 7-9 below. The evaluation was based on the information available from scoping surveys, and used professional judgement, as well as accepted criteria⁴⁰ (e.g. diversity, rarity and naturalness) for valuing nature conservation features in a geographical context.

Table 7-9: Valuation of nature conservation features⁴¹

Examples of resource valuation based on geographical context
International or European Value
Natura 2000 sites including: Sites of Community Importance (SCIs); Special Protection Areas (SPAs); potential SPAs (pSPAs); Special Areas of Conservation (SACs); candidate or possible SACs (cSACs or pSACs ⁴²); and Wetlands of International Importance (Ramsar sites).

⁴⁰ Set out in Ratcliffe (1977) A Nature Conservation Review. Cambridge University Press

⁴¹ <http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian130.pdf>

⁴² pSACs are sites which have been formally advised to the UK government but have not yet been submitted to the European Commission. These sites should be valued at European level on the basis that they meet the relevant selection criteria for a SAC but are not yet designated as such.

Examples of resource valuation based on geographical context

Biogenetic Reserves, World Heritage Sites and Biosphere Reserves.

Areas which meet the published selection criteria for those sites listed above but are not themselves designated as such⁴³.

Resident, or regularly occurring, populations of species which may be considered at International or European level⁴⁴ where:

- The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; or
- The population forms a critical part⁴⁵ of a wider population at this scale; or
- The species is at a critical phase⁴⁶ of its life cycle at this scale.

UK or National Value

Designated sites including: Sites of Special Scientific Interest (SSSIs); Marine Protected Areas (MPAs) including Marine Conservation Zones (MCZs); and National Nature Reserves (NNRs).

Areas which meet the published selection criteria e.g. JNCC (1998) for those sites listed above but which are not themselves designated as such⁴³.

Areas of key/priority habitats identified in the UK Biodiversity Action Plan (BAP); including those published in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principle importance for the conservation of biodiversity⁴⁷.

Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory⁴⁸.

Resident, or regularly occurring, populations of species which may be considered at International, European, UK or National level⁴⁹ where:

- The loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or
- The population forms a critical part⁴² of a wider population at this scale, or
- The species is at a critical phase⁴³ of its life-cycle at this scale.

Regional Value

Areas of key/priority habitats identified in the Regional BAP (where available); areas of key/priority habitat identified as being of Regional value in the appropriate Natural Area Profile (or equivalent); areas that have been identified by regional plans or strategies as areas for restoration or re-creation of priority habitats (for example South West Nature Map); and areas of key/priority habitat listed within the Highways Agency's BAP.

Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level^{40,41} and key/priority species listed within the HABAP where:

- The loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or
- The population forms a critical part⁴² of a wider population; or

⁴³ Valuation to be made in consultation with the SEB.

⁴⁴ Valuation to be made in consultation with the SEB. Such species include those listed within Council Directive 79/409/EEC on the conservation of wild birds or animal/plant species listed within Council Directive 92/43/EEC.

⁴⁵ Valuation to be made in consultation with the SEB. Such population include sub-populations that are essential to maintenance of metapopulation dynamics e.g. critical emigration/immigration links between otherwise discrete populations.

⁴⁶ Seasonal activity or behaviour upon which survival or reproduction depends.

⁴⁷ Valuation to be made in consultation with the SEB as such listings do not in themselves indicate intrinsic value, but instead indicate a conservation priority.

⁴⁸ Valuation to be made in consultation with the SEB, and with use of professional judgement as listing does not in itself indicate intrinsic nature conservation value.

⁴⁹ Valuation to be made in consultation with the SEB as such listings do not in themselves indicate intrinsic value. Such species include those listed within Council Directive 79/409/EEC on the conservation of wild birds or animal/plant species listed within Council Directive 92/43/EEC. Species which may be considered at the UK or National level means: birds, other animals and plants which receive legal protection on the basis of their conservation interest (those listed in the Wildlife and Countryside Act 1981 (as amended), SCH 1, 5 and 8); species listed for their principle importance for biodiversity (in accordance with the Natural Environment and Rural Communities Act 2006 Section 41 [England]); and priority species listed within the UKBAP or species listed within Red Data Books.

Examples of resource valuation based on geographical context

- The species is at a critical phase⁴³ of its life cycle.

County or Unitary Authority Area Value

Designated sites including: Sites of Nature Conservation Interest (SNCIs); County Wildlife Sites (CWSSs); and Local Nature Reserves (LNRs) designated in the county or unitary authority area context⁵⁰.

Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such⁵¹.

Areas of key/priority habitats identified in the Local BAP; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent).

Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level^{40,41} where:

- The loss of these populations would adversely affect the conservation status or distribution of the species across the County or Unitary Authority Area; or
- The population forms a critical part⁴² of a wider population; or
- The species is at a critical phase⁴³ of its life cycle.

Local Value

Designated sites including Local Nature Reserves (LNRs) designated in the local context⁴⁷.

Trees that are protected by Tree Preservation Orders (TPOs).

Areas of habitat; or populations/communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of value for migration, dispersal or genetic exchange.

Table Source: IAN 130/10, Table 1

Designated sites

- 7.6.7. The Thames Basin Heaths SPA, Mole Gap to Reigate Escarpment SAC and Ebernoe Common SAC have *European* value.
- 7.6.8. Ockham and Wisley Commons SSSI, Esher Common SSSI and Papercourt SSSI have *National* value.
- 7.6.9. There is one LNR and 17 SNCIs within 2 km of the Scheme. These are considered to be of *County* value.

Ancient woodland

- 7.6.10. There are 23 parcels of Ancient Woodland within 1 km of the Scheme. Ancient woodland is an irreplaceable habitat, which, where not designated, should be valued in consultation with Natural England.

Habitats

- 7.6.11. There are six Habitats of Principal Importance (HPI)⁵² within 500 m of the Scheme. These are lowland heathland, lowland mixed deciduous woodland, woodpasture and parkland, rivers, ponds and reedbed.
- 7.6.12. All lowland heathland falls within a European designated site, but this is designated for its bird populations. The heathland is one of the reasons for

⁵⁰ Valuation to be made in consultation with county ecologist or equivalent, with reference made to the criteria for designation.

⁵¹ Valuation to be made in consultation with county ecologist or equivalent.

⁵² Habitat of Principal Importance for the Conservation of Biodiversity on the England Biodiversity List, refer to Appendix C for further details.

designation of the SSSI, and is therefore of *National* value for nature conservation.

- 7.6.13. Much of the lowland mixed deciduous woodland and woodpasture and parkland within the Scheme boundary falls within European or nationally designated sites. However, these were designated because of the species and heathland habitat they support. Valuation of these HPIs will be made depending on the results of surveys and consultation with Natural England.
- 7.6.14. Rivers, ponds and reedbed where present, and not within a designated site, will be valued depending on the results of surveys and consultation with the Natural England.
- 7.6.15. The habitats within the highway soft estate including semi-improved neutral grassland and species-poor grassland, often forming a mosaic with tall ruderal and scrub vegetation, are not more than of *Local* value for nature conservation.

Notable and legally protected species

- 7.6.16. Qualifying features of the Thames Basin Heaths SPA are known to be present within the heathland habitat surrounding the Scheme (nightjar, Dartford warbler and woodlark).
- 7.6.17. In addition, great crested newt, all reptile species, noctule, soprano pipistrelle, brown long-eared bat, hazel dormice, water vole and otter are Species of Principal Importance⁵³ and may occur within or near the Scheme. Valuation of these species will be made depending on the results of surveys.
- 7.6.18. Protected species that may be present within the Scheme are protected under the Wildlife and Countryside Act 1981 (as amended), Conservation of Habitats and Species Regulations 2010 (as amended) or the Protection of Badgers Act (1992). See Appendix C for details of relevant nature conservation legislation.

7.7. Proposed assessment methodology

- 7.7.1. A detailed assessment⁵⁴ will be undertaken with respect to nature conservation. This will include the assessment of the detailed field survey data being collected, as outlined in section 7.4, and will allow an in-depth appreciation of the beneficial and adverse environmental consequences of the Scheme.
- 7.7.2. Habitat and species surveys will continue into spring 2018, to allow the impacts on notable and legally protected species to be confirmed.
- 7.7.3. The ES will follow guidance from the Guidelines for Ecological Impact Assessment in the UK and Ireland and IAN 130/10, which supplements the earlier DMRB Volume 11, Section 3, Part 4 Ecology and Nature Conservation.
- 7.7.4. The assessment will characterise potential impacts on important nature conservation features, and take into account both on-site impacts and those that may occur to adjacent and more distant ecological features, including:
- Direct loss of habitats (including temporary loss);
 - Fragmentation or isolation of habitats;

⁵³ Species of Principal Importance for the Conservation of Biological Diversity in England are notified under Section 41 of the NERC Act 2006.

⁵⁴ According to DMRB Volume 11, Section 2, Part 1 General Principles and Guidance of Environmental Impact Assessment.

- Changes to the local hydrology, water quality and/or air quality;
- Direct mortality or injury to wildlife through construction activities, and
- Disturbance to species from noise, light or other visual stimuli.

- 7.7.5. An effect of impacts on nature conservation features would be determined as significant if those impacts change the structure and functions of designated sites, notable habitats, or ecosystems; or the conservation status of habitats and species.
- 7.7.6. Effects are identified at the geographic scale at which they become significant dependant on its value. The significance of effects takes into account any mitigation or compensation provided. Effects on nature conservation features are categorised on the five-point scale in line with IAN 130/10 summarised in Table 7-10 below, applied using professional judgement. An effect will be considered to be significant if it falls into the moderate category or above.

Table 7-10: Significance of effects on nature conservation feature

Significance category	Typical descriptors of effect
Very large	An impact on one or more feature(s) of international, European, UK or national value.
Large	An impact on one or more feature(s) of regional value.
Moderate	An impact on one or more feature(s) of county value.
Slight	An impact on one or more feature(s) of local value or features within the survey area.
Neutral	No significant impacts on important nature conservation features.

Table Source: IAN 130/10, Table 3

- 7.7.7. The significance of effects will be used to identify and determine the features that require mitigation and/or compensation, and to guide the type and scale of mitigation and/or compensation required, in consultation with key stakeholders.
- 7.7.8. Cumulative impacts will be considered as described in Chapter 15.

Vulnerability to major accidents and disasters

- 7.7.9. Major accidents and disasters that could potentially affect biodiversity receptors include:
- events that could result in direct damage of habitats, and injury or killing of individual animals or populations supported by those habitats, such as severe storms, spread of new plant diseases, terrorist attacks or plane/rail crashes; and
 - other events such as major road traffic accidents, fires or chemical explosions or releases that emit air pollutants.
- 7.7.10. The potential for change in significance of effects due to direct damage of habitats and harm to species will be discussed as part of the biodiversity assessment. If the assessments for water and noise identify vulnerabilities that could affect valuable biodiversity receptors these will also be discussed as part of the biodiversity assessment. The potential for change in significance of effects

on biodiversity receptors through release of pollutants to the air will be discussed as part of the air quality assessment.

Considerations for Preliminary Design Stage

- 7.7.11. As part of the detailed assessment, it is necessary to undertake desk-based and field-based surveys, in order to gain an understanding of the baseline environmental conditions within the Ezol of the Scheme.
- 7.7.12. A number of surveys have been undertaken to date, and are detailed in section 7.4. However, further survey is required to determine the presence or absence of notable or legally protected species that may be affected by the Scheme.
- 7.7.13. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, certain ecological surveys should be appropriately timed to coincide with the optimum survey period for the target species.
- 7.7.14. Surveys are required in order to determine the presence or absence, and population status, of the following species or groups of species in order to provide adequate information to assess the impacts of the Scheme.
- 7.7.15. The following surveys commenced in May 2017 and will continue during the Preliminary Design Stage:
- Extended Phase 1 Habitat survey of all areas of the Scheme footprint that have not already been surveyed;
 - NVC survey to determine the presence of HPI and notable plant species within all areas of the Scheme footprint that have not already been surveyed;
 - An assessment for invasive plants within all areas of the Scheme footprint that have not already been surveyed;
 - A survey of the wet ditch (connected to Ockham Mill Stream) which passes under Stratford Bridge at the Ripley roundabout (central OS grid reference TQ0627957496), will be carried out to identify if otters or water voles are present;
 - Surveys to determine the potential for notable aquatic species within ditches, ponds and rivers affected by the Scheme, including invertebrates and fish;
 - Bat surveys (transect and static detector surveys) are currently being carried out in 2017 to cover any potentially suitable habitat within the Scheme footprint that was not included in the 2016 surveys, or any gaps in the 2016 surveys. These are expected to be completed in October 2017;
 - Further dormouse surveys will be carried out in autumn 2017 and spring 2018 to confirm presence/likely absence within the woodland at Elm Corner SNCI (including the adjacent ancient woodland), and the ancient woodland at the Girl Guides Camp at Painshill that have not been surveyed to date for dormice;
 - An updated badger survey will be carried out of the Scheme footprint, to identify any unrecorded setts; and

- Reptile surveys are currently being carried out of potentially suitable habitat within the Scheme footprint that is not already monitored by SARG. Sand lizards were only reintroduced to Ockham Common and are considered to be absent from the habitats within the south-west, north-east and north-west quadrants of habitat surrounding M25 junction 10. The heathland habitat within the south-west quadrant will not be impacted by the Scheme and is already monitored by SARG. Therefore, it is not proposed to survey the heathland habitat within the south-west quadrant. However, a single sand lizard was recorded within the open wooded area in the south-east quadrant during an invertebrate survey on the 19th June 2017. Therefore, open sections within this wooded area are being surveyed for sand lizards. Reptile surveys will continue throughout September 2017, and some will be continued in spring 2018.

- 7.7.16. An arboricultural assessment of veteran trees within the Scheme footprint will be carried out during the Preliminary Design stage.
- 7.7.17. A data search will also be requested from West Surrey Badger Group for badger records within 1 km of the Scheme boundary.
- 7.7.18. Data from the above surveys will inform an assessment of the significance of impacts on designated sites, habitats and species, using guidance from the Guidelines for Ecological Impact Assessment in the UK and Ireland and IAN 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment, which supplements the earlier DMRB chapter in Volume 11, Section 3, Part 4 'Ecology and Nature Conservation' (dated 1993).
- 7.7.19. The findings of the assessment will be used to prescribe appropriate mitigation that will avoid, reduce and/or compensate for any significant impacts that have been identified during the construction and operation phases of the Scheme. Any residual impacts and their consequent effects will also be determined.

7.8. Proposed consultation

- 7.8.1. To date the following environmental organisations have been consulted with regards to aspects of the Scheme such as option selection and design, potential mitigation and compensation features, and species survey methodologies:
- Natural England (option selection and design, potential mitigation and compensation features, and species survey methodologies);
 - Environment Agency (option selection and design);
 - Surrey Wildlife Trust (option selection and design, potential mitigation and compensation features);
 - Royal Society for the Protection of Birds (option selection and design, potential mitigation and compensation features);
 - Surrey Amphibian and Reptile Group (species survey methodologies); and
 - Forestry Commission (option selection and design).
- 7.8.2. Consultation will continue with these organisations through this stage, in order to ensure their input is incorporated into the impact assessment, the final design of the Scheme and its associated mitigation and compensation.

7.9. Potential mitigation measures

7.9.1. Based on the current understanding of the nature conservation constraints and opportunities, the following design suggestions have been made, some of which may need to be undertaken in association with adjacent landowners:

- Construction works will be timed to minimise impacts on species, for example, avoiding disturbance of breeding Dartford warblers, woodlark and hobby (all of which are protected against disturbance during breeding under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended));
- A new multi-function 'green' bridge to replace the existing Cockrow bridge (which will need to be demolished to accommodate the A3 widening) linking the south-east (Ockham Common) and south-west (Wisley Common) quadrants. This green bridge will link two heathland areas of the SPA, and will be designed to encourage the movement of heathland species, including sand lizards (which are currently confined to Ockham Common);
- Opening up of the woodland either side of the new Cockrow bridge, in order to encourage heathland regeneration, and create a continuous connected belt of heathland habitat between the two quadrants;
- Restoration of heathland and sandy habitats within temporarily cleared areas of woodland within the SPA/SSSI. Cleared areas will be managed to allow heathland regeneration, and excess sandy soils will be used to create features, such as exposed banks to support key invertebrates, a qualifying feature of the SSSI;
- A multi-functional bridge linking the south-west and north-west quadrants. This bridge could be designed to support vegetation and provide connectivity between Wisley Common and the woodland and heathland within the north-west quadrant. This bridge may contain vegetation, connecting the habitats on either side of the bridge;
- Felling of some wooded areas within the north-west quadrant, in order to encourage heathland regeneration and increase the existing areas of heathland within this quadrant;
- Management of existing areas of Scots pine plantation within the north-east quadrant, in order to encourage a more diverse woodland structure, and enhance biodiversity;
- Purchase of land connected to the north-west quadrant, in order to revert back to mixed heathland and woodland, to increase the areas of continuous heathland and woodland to compensate for loss of habitat within the Thames Basin Heaths SPA, Ockham and Wisley Commons SSSI and Ockham and Wisley Common LNR;
- Provision of improved signage and preferred routes within Ockham Common and Wisley Common, to reduce pressure across the rest of this area of SPA;
- Provision of bird and bat boxes to mitigate for the loss of potential features within cleared areas of woodland;

- Improvement of existing noise barrier fencing around M25 junction 10, in order to reduce the levels of operational road noise within the SPA and the wider SSSI;
- Soil from any ancient woodland to be lost to be translocated to a compensation area for woodland planting;
- Removal of non-native invasive plant species from within the Scheme footprint; and
- Provision of a Construction Environmental Management Plan (CEMP) to ensure that all environmental objectives are adhered to during the construction phase. This will minimise the impact on ecological features (such as SPA qualifying breeding birds) and ensure that the Scheme does not contribute to the spread of non-native invasive plant species.

7.9.2. This assessment, and consultation with Natural England, will identify requirements for ecological monitoring during and after development. This may include monitoring for individual species, particularly if any European Protected Species licences are required, and will include monitoring of newly created habitats to inform decisions on their maintenance.

7.10. Assumptions and limitations

- 7.10.1. A full set of ecological surveys has not been carried out for the entire footprint of the Scheme. However, further surveys are ongoing and/or will be carried out in spring 2018 to fill gaps in survey coverage (see paragraph 7.7.15 for further surveys to be completed).
- 7.10.2. The scoping survey included a drive-by survey of the A3 between the A3 Ockham interchange and A3/A245 Painshill junction. This involved a high-level assessment of broad habitat types present with their potential to support legally protected and notable fauna. This was conducted instead of an Extended Phase 1 habitat survey due to the health and safety risks associated with surveying the verge of a major trunk road. However, it is considered that this is sufficient to establish the broad habitat types present along the verges. This knowledge of the habitat types, and knowledge from surveys of the surrounding area, has enabled the potential for protected species that may occur within the road verges to be identified.
- 7.10.3. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, the survey of the Scheme footprint will not have produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.
- 7.10.4. The search for water bodies within 500 m of the site was undertaken by using Ordnance Survey plans and aerial photographs only. These sources may not show all ponds and or water bodies within 500 m of the site boundary (for example, some garden ponds may not be shown on maps or aerial images) and therefore some water bodies may not have been identified. However, it is considered that the vast majority of established water bodies will have been identified as a result of this approach, and this should be sufficient to determine the approximate abundance of great crested newts within the Scheme footprint.

- 7.10.5. The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The walkover survey checked for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, rhododendron, cotoneaster species and Himalayan balsam. Other invasive species, in particular those associated with aquatic habitats may not have been recorded, but it is considered that this survey is sufficient to identify any constraints posed by invasive species.
- 7.10.6. It is considered that a thorough series of ecological surveys have been, or are being conducted for the Scheme, and therefore a sufficient baseline dataset in order to inform the Preliminary Design Stage ES is anticipated.

7.11. Conclusion

- 7.11.1. Much of the ecological baseline data within the Scheme footprint has already been gathered, or is currently ongoing and will be completed in spring 2018.
- 7.11.2. Consultation with key stakeholders is ongoing and will continue throughout this stage.
- 7.11.3. Based on the proposed scope of ecological assessment, it is considered that sufficient information will be gathered in order to inform the PEIR and identify the necessary mitigation and compensation required for the Scheme.

8. Road Drainage and the Water Environment

8.1. Introduction

- 8.1.1. This chapter scopes the information and activities necessary to complete the preliminary design stage for water and drainage, which includes the completion of surveys, stakeholder consultation and completion of the EIA. An overview of the knowledge on the existing water environment gathered to date, the potential constraints this poses for the Scheme and outlines the methodology for assessment. The following factors are considered:
- The importance of the receiving environment;
 - The potential significant effects of the construction and operation of the Scheme and, whether they are permanent or temporary and positive or negative impacts as a result of direct, and indirect effects; and
 - The likely scale of change following the implementation of potential mitigation measures.
- 8.1.2. Previous assessments of the options for a scheme at M25 junction 10/A3 Wisley interchange have been undertaken. These include:
- Road Investment Strategy M25 junction 10/A3 Wisley interchange Improvements Environmental Study Scoping Report. Highways England. July 2017;
 - Road Investment Strategy M25 junction 10/A3 Wisley interchange Improvements. Water Framework Directive Assessment (Options Selection Stage) Highways England. May 2017;
 - Road Investment Strategy M25 junction 10/A3 Wisley interchange Improvements Environmental Assessment Report. Highways England. April 2017; and
 - Regional Investment Programme M25 junction 10/A3 Wisley interchange Preliminary Sources Study Report. Highways England. April 2017.
- 8.1.3. These reports provide baseline information on the water environment.

8.2. Study area

- 8.2.1. The spatial scope of the assessment includes, features of the water environment within 1 km of Scheme. In line with the DMRB Volume 11, Section 3, Part 10 HD 45/09 Road Drainage and the Water Environment, a 1 km study area is also deemed appropriate as for the assessment of soluble pollutants, research indicates that beyond 1 km it is likely any impacts will be sufficiently diluted, thereby reducing any potential impact. Where appropriate, study area and collection of baseline data may be enlarged where potential effects may extend beyond 1 km (e.g. downstream flood risk or hydromorphological change). For groundwater, the potential zone of impact will be assessed on the underlying Water Framework groundwater body.

8.3. Planning and policy context

- 8.3.1. Relevant legislation is summarised in Table 8-1 this will be reviewed as the Scheme progresses in order to determine ongoing relevance.
- 8.3.2. Relevant policies will be assessed by identifying the degree of compliance or conflict with the Scheme.

Table 8-1: Legislation

Legislation	Description
European legislation	
Water Framework Directive (WFD) (2000/60/EC)	The WFD requires that all inland waters within defined river basin districts must reach at least good status by 2015 and defines how this should be achieved through the establishment of environmental objectives and ecological targets for surface waters. Any new scheme must not cause deterioration of the water environment or prevent the future attainment of good status.
Environmental Quality Standards Directive (2008/105/EC)	Lists environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of the Water Framework Directive 2000/60/EC (WFD), with the aim of achieving good surface water chemical status. It includes certain metals that are associated with runoff from highways.
Groundwater Directive (2006/118/EC)	Complements the WFD. It requires measures to prevent or limit inputs of pollutants into groundwater to be operational so that WFD environmental objectives can be achieved.
Habitats Directive (92/43/EEC)	To promote the maintenance of biodiversity by taking measures to maintain or restore natural habitats and wild species at a favourable conservation status, introducing robust protection for those habitats and species of European importance. Sites or species that come under this Directive will heighten the importance of water features that sustain them.
Floods Directive (2007/60/EC)	The aim of this Directive is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. It sets the strategic level for flood risk that any development will need to comply with.
National legislation	
Antipollution Works Regulations (1999)	Where pollution occurs, or is likely to occur the Environment Agency can serve a works notice under Section 161A of the Water Resources Act on any person who has caused or knowingly permitted the pollution (or risk of pollution) to a water course, requiring them to carry out anti-pollution/preventative works and operations. The Environment Agency can also recover the costs of any investigation and anti-pollution works carried out. The Anti-Pollution Works Regulations prescribe the content of anti-pollution works notices. They also prescribe the particulars of such matters as are required to be placed on the pollution control registers maintained by the Environment Agency.
Environment Act (1995)	The Act provides for the establishment of a body corporate to be known as the Environment Agency, the key regulator for the water environment.
Environmental Damage (Prevention and	The emphasis of these Regulations is proactively putting in place appropriate pollution prevention measures to reduce risks to the environment.

Legislation	Description
Remediation Regulations (2015)	
Environmental Protection Act (1990)	This act brings in a system of integrated pollution control for the disposal of wastes to land, water and air.
Flood Risk Regulations (2009) Amended SI2011/2880 transpose directive 2007/60/EC	The Flood Risk Regulations aim to provide a consistent approach to managing flood risk. The Environment Agency are responsible for managing flood risk from main rivers, the sea and reservoirs. LLFAs are responsible for local sources of flood risk, in particular surface water, groundwater and ordinary watercourses.
Flood and Water Management Act 2010 and Commencement Orders	The key areas covered by this Act are: • Roles and responsibilities for flood and coastal erosion risk management; and • Improving reservoir safety.
Groundwater (England and Wales) Regulations (2009)	These transpose of the Groundwater Directive (2006/118/EC) into law in England and Wales. These powers are implemented in though the Environmental Permitting Regulations (2016).
Highways Act 1980 (HA 1980)	The Act deals with the management and operation of the road network in England and Wales including the drainage of highways into environmental waters and sewers.
National Planning Policy Framework (NPPF) (DCLG, 2012)	The NPPF sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. It forms the basis of assessment of flood risk for schemes.
National Planning Practice Guidance (NPPG) 2014 Policy 10: Meeting the challenge of Climate Change, Flooding and Coastal Change Policy 11: Conserving and Enhancing the Natural Environment	In 2014, accompanying the NPPF, the National Planning Practice Guidance (NPPG) (DCLG, 2014) was published. This advises on how Local Planning Authorities can ensure water quality and the delivery of adequate water infrastructure and take account of the risks associated with flooding in the plan-making and the planning application process.
The Environmental Permitting (England and Wales) Regulations 2016	Provide a consolidated system of environmental permitting in England and Wales and transpose provisions of fifteen EU Directives which impose obligations requiring delivery through permits or which are capable of being delivered through permits. Covers Environment Agency permits for flood risk (on Main River) and certain discharges to watercourses.
The Water Resources (Environmental Impact Assessment) (England and Wales) Regulations 2003	Impose procedural requirements in relation to the consideration of applications or proposals for an abstraction or impounding licence under Chapter II of Part II of the Water Resources Act 1991 and require consent in other cases.
Water Act 2003 and Water Act 2014	Aims to improve water conservation, protect public health and the environment, and improve the service offered to consumers. The Act is in three parts relating to water resources, regulation of the water industry and other provisions.
Water Framework Directive (Standards and Classification)	These Directions set out the environmental standards to be used for the second cycle of river basin plans. They transpose Directive 2013/39/EC on environmental quality standards for priority substances.

Legislation	Description
Directions (England and Wales) 2015	
Water Industry Act (1991) (Amendment) (England and Wales) Regulations (2009)	Sets out the responsibilities of the Environment Agency of England and Wales in relation to water pollution, resource management, flood defence, fisheries, and in some areas, navigation. The Act regulates discharges to controlled waters, namely rivers, estuaries, coastal waters, lakes and groundwaters.
Water Resources Act 1991	Act to regulate water resources, water quality and pollution, and flood defence. Sets out standards for Controlled Waters.
Water Environment (Water Framework Directive) (England and Wales) Regulations 2003	Outline the duties of regulators (Environment Agency in England) in relation to environmental permitting, abstraction and impoundment of water.
The Land Drainage Act 1991	Requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The 1994 Act amends it in relation to the functions of internal drainage boards and local authorities.
The Control of Pollution (Oil Storage) (England) Regulations 2001	Applicable for storage of more than 200 litres of oil above ground at an industrial, commercial or institutional site, then these Regulations affect you. The sites they cover include; factories, shops, offices, hotels, schools, churches, public sector buildings and hospitals. The Regulations apply only in England.

8.4. Baseline conditions

- 8.4.1. This section sets out the baseline conditions of the water environment. At this stage, a high- level desk-based assessment has been undertaken using publicly available spatial data under the Open Government Licence⁵⁵ and from open sources including the EA⁵⁶. As no new information has become available since the Option Selection Stage, this chapter largely echoes that of the baseline reported in the previous stage. However, the baseline reported in the previous stage has been revisited in order to confirm any updates to baseline/existing conditions. WFD full walkover surveys of the affected watercourses and lakes will be undertaken as part of this stage.

Surface water

- 8.4.2. Waterbodies within the study area fall within the Thames River Basin District as set out within the River Basin Management Plan⁵⁷.
- 8.4.3. Four Water Framework Directive (WFD, 2000/60/EC) surface waterbodies have been identified across the study area. The current chemical and ecological status of these surface waterbodies is shown in Table 8-5. The WFD surface waterbodies identified are:
- River Wey - Shalford to River Thames Confluence at Weybridge (GB106039017630);

⁵⁵ <http://environment.data.gov.uk/ds/catalogue/#/catalogue>

⁵⁶ <http://apps.environment-agency.gov.uk/wiyby/default.aspx>

⁵⁷ <https://www.gov.uk/government/collections/river-basin-management-plans-2015>

- Stratford Brook (WFD ID GB106039017890);
- Guileshill Brook (WFD ID GB106039017880); and
- River Mole (Horley to Hersham) (WFD ID GB106039017621).

8.4.4. Table 8-2 provides details of the WFD surface waterbodies potentially impacted by components of the Scheme. Note, when there are no designated WFD reaches within the study area around the specific component, it is denoted as N/A. However, there may be other non-WFD watercourses that are important as they potentially contribute to the WFD water body overall quality and status. These non-WFD watercourses will be identified and assessed as part of the ES.

Table 8-2: Surface waterbodies

Receptor	Distance from receptor waterbodies		Waterbodies
	M25 works	A3 works	
River Wey - Shalford to River Thames Confluence at Weybridge (GB106039017630)	Existing crossing and 400 m north of works near Buxton Wood	N/A	The Scheme falls within the River Wey and River Mole catchments, with Stratford Brook and Guileshill Brook clipping the southern boundary of the works
Stratford Brook (GB106039017890)	N/A	Existing crossing and 260 m south of works near Stratford Bridge	
Guileshill Brook (GB106039017880)	N/A	700 m southwest of works on A3 near Stratford Bridge	
River Mole (Horley to Hersham) (GB106039017621)	320 m north of Hatchford Wood	Existing crossing and 350 m north of works near B365/A245 Cobham interchange	

8.4.5. As highlighted above, there are other surface watercourses that are not classified under the WFD within the study area. The exact number and status is unknown at the time of reporting due to the small-scale of these features and the dependence on only publicly available data for this stage in the assessment.

Lakes and other surface water features

8.4.6. There is one WFD designated lake within the study area, Bolder Mere (WFD ID GB30643218), which is located 840 m south-west from junction 10, adjacent to the A3.

8.4.7. There are ponds within the study area. The relationship and dependence these have with groundwater is unknown at the time of reporting. The feature will only be scoped in if there are potential affects due to changes in groundwater.

Groundwater

8.4.8. Based on geological open data (1:625k scale), the study area is underlain by sand, silt and clay, with a pocket of clay in the south. The study area is underlain by a Secondary A Superficial Aquifers and there are also Principal Aquifers to the east and west of the study area, adjacent to the courses of the River Wey and River Mole, indicating high groundwater sensitivity. The Principal Aquifer to the east of the study area lies approximately 500 m north-east of junction 10 and crosses the northern edge of the Scheme. The Principal Aquifer to the west of

the study area lies approximately 300 m west of junction 10 and crosses the western edge of the Scheme. Secondary A Aquifers are capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Principal Aquifers usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

8.4.9. One WFD groundwater body has been identified across the study area. This is the Cobham Bagshot Beds (WFD ID GB40602G601400).

8.4.10. There are no Source Protection Zones (SPZ) within the study area.

WFD compliance assessment

8.4.11. A WFD compliance assessment is required for new developments and schemes to demonstrate that the Scheme will not result in a deterioration in status (or potential status) of any water body, or prevent the water body from meeting good status (or potential good status) in the future (2017 or 2021).

8.4.12. The Environment Agency is the competent authority for WFD. However, as the Scheme has the potential to also affect other watercourses not designated as Main River, Surrey County Council (the lead local flood authority) also has a duty to ensure the Scheme complies with WFD legislation.

8.4.13. A WFD preliminary assessment was undertaken in May 2017. The preliminary assessment was based on the preliminary option drawings. This assessment has been updated and full details of this scoping WFD assessment are in Appendix D. The scoping WFD assessment concluded that the Scheme can be compliant with the requirements of the WFD. None of the options that make up the Scheme are anticipated to cause deterioration at the water body scale. All should also not prevent future attainment of Good Ecological Status or Good Ecological Potential. However, to achieve compliance with the Directive, the details of mitigation measures will need to be developed as part of future design phases; in particular, careful consideration will need to be given to mitigation needed to avoid deterioration in the Potential of the Bolder Mere WFD lake water body.

Abstractions and discharges

8.4.14. The EA website⁵⁸ indicates there are numerous surface water abstractions within the study area. Details of these abstractions are being obtained with a site specific Envirocheck report).

8.4.15. Based on the Highways Agency Drainage Data Management System⁵⁹ there are numerous highway outfalls across the Scheme study area. The status of these and the implications for the Scheme will be assessed during this stage.

8.4.16. The site specific Envirocheck report will provide details of discharge consents in the study area. This report is still to be received in full.

⁵⁸ http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683&y=355134&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=waters_abstractions

⁵⁹ <https://data.gov.uk/dataset/highways-agency-drainage-data-management-system-haddms>

Flood risk

- 8.4.17. Flood zones 2 and 3 are associated with the surface watercourses identified in Table 8-2 which are adjacent to the Scheme. These flood zones refer to the probability of river flooding, ignoring the presence of defences. Flood zone 2 is land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding. Flood zone 3 is land having a 1 in 100 or greater annual probability of river flooding. The location of flood zones in relation to the Scheme are shown on the Environmental Constraints plan in Chapter 19 of this document.
- 8.4.18. Other forms of flooding, including surface water (when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flow over the ground instead) and groundwater flooding (when levels of water in the ground rose above the surface) are unknown at the time of reporting. Surface water flooding issues/hot spots within the study area include Redhill Bottom and Sandpit Hill north and south of the junction 10 interchange respectively and areas on Wisley Common, Bolder Mere, Stratford Bridge and Guilehill Brook. Surface water flood risk ranges from high to low.
- 8.4.19. The hydrogeological character of the study area means that groundwater flood risk may be an issue.

Aquatic ecology

- 8.4.20. Aquatic ecology has been considered in Chapter 7 Biodiversity.

Designated sites

- 8.4.21. Designated sites within the study area are listed in Table 8-3. The hydraulic connectivity of these sites is unknown at the time of reporting. Potential ecological effects will be considered in Chapter 7 Biodiversity.

Table 8-3: Designated sites

Designated site	Distance (m)
Thames Basin Heaths SPA	Surrounds junction 10
Ockham and Wisley Commons SSSI	Surrounds junction 10
Esher Commons SSSI	Located adjacent to the A3 at the northern extent of the study area

8.5. Potential impacts

- 8.5.1. Potential effects during the construction phase (proportionate to the scale of the proposed works) include but are not limited to the following.
- 8.5.2. Risks to the surface water environment due to:
- Excavation, and the subsequent deposition of soils, sediment, or other construction materials to accommodate new watercourse crossings, new bridges, retaining walls, gantries;
 - Spillage of fuels or other contaminating liquids;
 - Mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site runoff; and

- Risks to groundwater environment (principally associated with cuttings) and potential contamination risks to the underlying Principle Aquifer and subsequent effects on existing abstractions.

8.5.3. These risks could result in sediment and/or other contaminants entering watercourses or groundwater affecting the quality of the water which could have implications for abstractions and WFD compliance.

8.5.4. Risk of an increase in flood risk both to the Scheme and surrounding land uses, arising from:

- Storage of materials and temporary impermeable areas at site compounds;
- The construction of the Wisley Lane access bridge over the Stratford Brook flood plain which may impinge on it depending on structure arrangement chosen.
- Interception of groundwater or changes to groundwater flows;
- Discharge of abstracted water during construction giving rise to increased flood risk, especially if discharged to smaller watercourses; and
- Potential effects on water dependent designated sites during construction.

8.5.5. Potential effects during the operation phase include:

- Effects on surface water arising from: pollutants (e.g. oils from fuel combustion/accidental spillages and salts or herbicides from road maintenance) and new areas of hard standing that could increase road runoff and affect the water quality in the river;
- Direct physical impacts of watercourse crossings with potential for direct effects on biological, chemical and physical WFD parameters for both surface waters and WFD groundwater bodies;
- Any discharges to ground may have implications for groundwater quality;
- Discharge from new sections of highway has the potential to increase flood risk for receptors downstream; and
- Any road structures or landscaping features constructed in the floodplain have the potential to alter flood flows and increase flood risk.

8.6. Proposed level and scope of assessment

8.6.1. Table 8-4 presents the scope of assessment which has been established using the baseline data, the water resource value and the potential construction and operation implications of the Scheme on the water environment.

Table 8-4: Water topics scoped into further assessment

Effects	Scoped in/out	Comment/Justification
Surface waterbodies	✓	Surface water quality tests to be undertaken using the Highways Agency Water Risk Assessment Tool (HAWRAT). Assessment of pollution impacts on surface waters from accidental spillages in line with HD45/09.

Effects	Scoped in/out	Comment/Justification
Lakes	✓	The assessment will consider the quality impacts in accordance with the requirements of the WFD. Consideration will be given to the potential changes to quality during both the construction and operation phases. Adequate mitigation needs to be put in place to avoid deterioration in the Potential of Bolder Mere WFD lake waterbody. This mitigation is necessary to avoid adverse impacts at a waterbody scale associated with the construction of a retaining wall along the western shore of the lake.
Groundwater	✓	The assessment will consider both groundwater level and quality impacts in accordance with the requirements of the WFD. Consideration will be given to the potential changes to water flow, volumes and quality during both the construction and operation phases. Further information on licenced and unlicensed private water supplies will be identified in consultation with the Environment Agency and the local authority.
Abstractions and discharges	✓	The assessment will consider the location of the abstraction points and the quality impacts from both the construction and operation phases.
Flood risk	✓	Possible issues with providing flood compensation storage relating to the proposals for the side roads. A Flood Risk Assessment (FRA) will be required in line with the National Planning Policy Framework (NPPF).
WFD detailed assessment	✓	Walkover surveys to record the current ecological and geomorphological assemblages, to understand the sensitivity of those assemblages to the Scheme and to identify the location and type of potential measures to mitigate the local adverse effects of the Scheme. The following data gaps need to be filled to inform future WFD compliance assessment: • River Habitat Survey for the affected river reaches (if available); • Fluvial audit of affected river reaches (if available); • Groundwater level data for the Bagshot Formation in the vicinity of the Scheme (this should be scoped into the intrusive ground investigation); and • Further information on measures that the Environment Agency and local catchment partnerships consider may improve WFD status of affected waterbodies.
Water-dependent designated sites	✓	It should be confirmed if there is any/will be any hydraulic connectivity.

Value of the environmental resources and receptors

- 8.6.2. Table 8-5 summaries the environmental receptors and their importance as identified in the baseline above. Should the study area change or more information become available, the baseline and subsequently the receptors may change.
- 8.6.3. To assist with assessment during the subsequent environmental assessment process, the sensitivity/importance criteria may be developed further based on

professional judgement and experience. At the time of reporting the method of assessing the importance/value, has been based on the Transport Appraisal Guidance (TAG) Unit A3 (DfT, December 2015) (Chapter 10 Tables 13 - 17).

Table 8-5: Environmental resources, receptors and importance

Resource	Features	Indicator of quality (taken from WebTAG table 13)	Measure (taken from WebTAG table 13)	Importance
Watercourses				
River Wey - Shalford to River Thames Confluence at Weybridge (GB106039017630)	Water supply	Chemical water quality	Current chemical water quality classification - Good	Medium
	Biodiversity	Biological water quality	Current ecological classification - Moderate	Low
Stratford Brook (WFD ID GB106039017890)	Water supply	Chemical water quality	Current chemical water quality classification - Good	Medium
	Biodiversity	Biological water quality	Current ecological classification - Moderate	Low
Guileshill Brook (GB106039017880)	Water supply	Chemical water quality	Current chemical water quality classification - Good	Medium
	Biodiversity	Biological water quality	Current ecological classification - Moderate	Low
River Mole (Horley to Hersham) (GB106039017621)	Water supply	Chemical water quality	Current chemical water quality classification - Good	Medium
	Biodiversity	Biological water quality	Current ecological classification - Moderate	Medium
Tributaries of WFD designated resources as stated in surface water	Water supply	Chemical water quality	On the assumption, these contribute to the WFD designated reaches all have been assigned a medium importance in line with the WFD reaches.	Medium
	Biodiversity	Biological water quality	On the assumption, these contribute to the WFD designated reaches all have been assigned a medium importance in line with the WFD reaches.	Medium
Floodplain				

Resource	Features	Indicator of quality (taken from WebTAG table 13)	Measure (taken from WebTAG table 13)	Importance
River Wey - Shalford to River Thames Confluence at Weybridge (GB106039017630) floodplain	Conveyance of flood flow	Presence of flood zones	Existing flood risk. River Wey has flood zone 2 and 3 areas. Floodplain with more than 100 residential properties.	Very High
Stratford Brook (WFD ID GB106039017890) floodplain			Existing flood risk. Stratford Brook has flood zone 2 and 3 areas. Floodplain with up to 100 residential properties or industrial premises.	High
Guileshill Brook (GB106039017880) floodplain			Existing flood risk. Guileshill Brook has flood zone 2 and 3 areas. Floodplain with up to 100 residential properties or industrial premises.	High
River Mole (Horley to Hersham) (GB106039017621) floodplain			Existing flood risk. River Mole has flood zone 2 and 3 areas. Floodplain with more than 100 residential properties.	Very High
Tributaries (of WFD designated resources as stated in surface water) floodplain			On the assumption, these contribute to the WFD designated reaches all have been assigned an importance in line with the WFD reaches they contribute to.	Medium, High and Very High
Lakes				
Bolder Mere (GB30643218)	Water supply	Chemical water quality	Current chemical water quality classification - Good	Medium
Groundwater				
Cobham Bagshot Beds (WFD ID GB40602G601400)	Water supply	Use of water supply	Agricultural abstraction licences	Medium
	Groundwater vulnerability	Source Protection zones	None	Low

Resource	Features	Indicator of quality (taken from WebTAG table 13)	Measure (taken from WebTAG table 13)	Importance
		Classification of aquifer vulnerability	Principal Aquifer	Very High
		Classification/ status and objective under WFD	Current chemical water quality classification - Good	Medium

Key* Importance is based on WEBTAG

8.7. Proposed assessment methodology

Surface water

- 8.7.1. The Highways Agency DMRB (HD 45/09) (HA, 2009) provides guidance on the assessment of likely significance of effects on the water environment associated with highway schemes. This guidance in conjunction the Department for Transport TAG guidance (WEBTAG) will be for assigning the importance and potential magnitude of impact.
- 8.7.2. The assessment will use drainage information and AADT data to establish potential impacts of the Scheme on the water environment within the study area and the requirement for mitigation measures to adequately reduce the risk.
- 8.7.3. The potential ecological impacts of routine runoff on surface water will be assessed using the water quality model HAWRAT as advised in the DMRB (HD 45/09). Spillage risk tests will also be undertaken in accordance with the DMRB (HD 45/09).

Groundwater

- 8.7.4. At the time of reporting, it is unknown if discharge to ground will be required and the suitability of this method. Once confirmed, the assessment of the potential pollution impacts from runoff to groundwater may be required. This will be in accordance with Method C as outlined in HD45/09.

Flood risk

- 8.7.5. The Flood Risk Assessment (FRA) will be carried out in accordance with the requirements of the NPPF (DCLG, 2012) and its accompanying Technical Guidance (DCLG, 2014), and the Environment Agency's 'Climate change allowances for planners' NPPF supporting guidance (EA, 2013).

WFD

- 8.7.6. The approach to the WFD compliance assessment will follow the Planning Inspectorate's guidance on preparation of WFD assessments for a Nationally Significant Infrastructure Project⁶⁰. It will be based on a format that was originally developed in close consultation with the Environment Agency for a large

⁶⁰ The Planning Inspectorate (2017) Advice Note 18, The Water Framework Directive

transport infrastructure scheme⁶¹. This format was subsequently promoted by the Environment Agency as an example of best practice, particularly for large schemes that affect many water bodies. It captures the core requirements of a compliance assessment whilst being transparent and simple to interpret. Assessment can be readily updated, creating a clear audit trail of WFD compliance as a scheme progresses through its lifecycle from options assessment to design and environmental permitting.

- 8.7.7. The WebTAG assessment will be carried out in accordance with TAG UNIT A3 Environmental Impact Appraisal Department for Transport May 2014 Transport Analysis Guidance.

Vulnerability to major accidents and disasters

- 8.7.8. Major accidents and disasters comprise man-made and natural risks which are considered likely, and anticipated to result in substantial harm that the normal functioning of the Scheme is unable to cope with/rectify - i.e. risks with the potential to have a significant effect.
- 8.7.9. Despite the limited nature of natural risks the UK is exposed to, the potential of natural circumstances such as extreme rainfall or major droughts impacting on groundwater for example, are considered to have the potential to have a direct, reductive effect on the future effectiveness of the drainage system of the Scheme and subsequent effects on the water environment. Assessment under this section would therefore consider storm events and the possibilities for extreme drought, the potential consequences for effects of the Scheme on drainage and the water environment.
- 8.7.10. In terms of man-made risks, the most pertinent for water would be the impacts of a major chemical spill and how this would affect the Scheme and pass through to the wider water environment.
- 8.7.11. Further assessment would be informed by other topics, as assessing the adverse effects of a major accident or disaster will require interaction with other sections of the formal ES.
- 8.7.12. The requirement for further baseline information as part of the vulnerability assessment will be reviewed as part of this preliminary design stage to inform the ES.

8.8. Proposed consultation

- 8.8.1. Consultation with regulators, in the form of introductory meetings and follow up specific technical meetings on site (principally with the Environment Agency, plus LLFAs and other interested parties) will continue regularly throughout the design process to ensure that the Scheme is designed to be compliant with the objectives of the WFD and to ensure sustainable drainage mitigation is incorporated into the design so as to not increase surface water flood risk in the areas highlighted.

⁶¹ HS2, 2016. Water Framework Directive Compliance Assessment Update (C453) Supplementary Information. London: HS2. C454-ATK-EV-REP-000-000001

8.9. Potential mitigation measures

- 8.9.1. Should the assessment undertaken using the above methodology identify any significant adverse effects, mitigation measures would to be implemented. These proposed mitigation measures would be in addition to the embedded mitigation within the project's design, such as sustainable drainage systems (SuDs) pollution control measures on outfalls (if appropriate, such as oil interceptors or downstream defenders) and measures within the Construction Environmental Management Plan (CEMP) to control and prevent polluted run-off.
- 8.9.2. Key considerations/principles guiding WFD compliant design include but are not limited to the following:
- Single span bridges are the preferred type of crossing because they minimise impact on the water environment if designed appropriately; and
 - Culverts are, however, generally cheaper and easier to build than single span structures because their construction process tends to be less complex. Key considerations in environmentally sensitive culvert design include; minimising the length, adopting an open arc structure that avoids disturbing the natural bed of the river is preferred to a box culvert and incorporating a natural bed substrate.

8.10. Assumptions and limitations

- 8.10.1. The assumptions and limitations at the time of reporting are as follows:
- Data quality - desk study, using mainly web-based data and previous assessment reports only has been reported;
 - Data quantity - as per quality, only open, freely licensed data has been reported at this stage and therefore the amount of detail on certain topics is limited;
 - Site visits - no site visits have been undertaken at the time of reporting so site specific, ground truth data is limited (targeted site visits for walkover surveys are planned as part of this stage); and
 - Where impacts are uncertain a conservative approach has been adopted.
- 8.10.2. For this Preliminary Design Stage assessment, assumptions include:
- Environmental data will be up to date and available from accessible sources (mainly web-based);
 - Data for the Scheme will be available including traffic and road catchment data to allow water quality modelling assessments to be made and the flood risk and WFD assessments; and
 - Access will be acquired to enable site visits to be undertaken.

8.11. Conclusion

- 8.11.1. In line with the DMRB, an assessment will be required where there is a potential for any road project to adversely affect the water environment.
- 8.11.2. The Scheme does have this potential and further assessment is required. This will use appropriate methodology to assess the likely effects upon the water

environment as a result of the Scheme whilst also proposing appropriate mitigation measures that are proportionate to the likely impacts.

- 8.11.3. Road drainage and the water environment is scoped in to this stage of assessment and all aspects should be included (flood risk, groundwater and surface water). This is summarised in Table 8-6 below. In addition standalone Flood Risk Assessment and WFD compliance assessment will be undertaken.

Table 8-6: Value of water resources and their features

Effects	Construction	Operation	Comments
Surface water	✓	✓	To consider the potential effects from construction activities (largely sedimentation and spillage risk) and operational changes to receiving water shape and quality (changes to profile at watercourse crossings and discharge outfalls). Includes assessment against WFD criteria.
Groundwater	✓	✓	To assess potential effects on groundwater levels and quality (from cuttings and infiltration from the drainage system) and whether this would impact other water users local to the Scheme. Includes assessment against WFD criteria.
Flood risk	✓	✓	To assess the potential effects from flood risk, both to the Scheme itself and wider land uses. Flood risk can manifest in many forms, including for example, storage of material in floodplains, intercepting groundwater or permeant alterations of a watercourse and its floodplain from the structure itself. Includes a formal Flood Risk Assessment.

9. Landscape

9.1. Introduction

- 9.1.1. This chapter sets out the approach and methodologies to be used in the assessment of the likely effects upon landscape and visual receptors as a consequence of the Scheme.

9.2. Study area

Landscape

- 9.2.1. The desk top study and site visits undertaken during the Option Identification Stage and the Option Selection Stage informed the extent of the study area for both the landscape and visual effects.
- 9.2.2. It is expected that potentially significant landscape effects would be restricted to the land directly adjacent to the Scheme, however consideration of landscape effects will be given to the wider area within 1.5 km from the perimeter of the Scheme. The boundary of the study area would combine the 1.5 km offset from the perimeter of the Scheme resulting in a study area that extends at least 1.5 km or further from the edge of the Scheme where necessary. Any effects upon landscape receptors located outside the study area are unlikely to be significant and have been scoped out from further assessments.
- 9.2.3. Should the Scheme substantially change during this assessment stage, the extent of the landscape study area will be reviewed to ensure it remains appropriate to the assessment.

Visual

- 9.2.4. The visibility towards the Scheme is restricted predominantly by coniferous and birch woodland that surrounds the junction. Whilst the junction is slightly elevated above the surrounding area, the slopes are relatively shallow which, combined with presence of the existing mature coniferous and birch woodlands, creates a dense screen.
- 9.2.5. When considering the scale of the Scheme in the context of the natural and man-made screening elements present around the junction it is envisaged that a study area of 1.5 km from the edge of the Scheme would be sufficient to identify potentially significant visual effects. For the purpose of the assessment the study area would be combined resulting in an offset of at least 1.5 km from the edge of the Scheme. Any effects on visual receptors beyond the study area are unlikely to be significant and have been scoped out from further assessment.
- 9.2.6. Should the Scheme substantially change during assessment stage, the extent of the study area will be reviewed to ensure it remains appropriate and proportionate to the Scheme.

9.3. Planning and policy context

Landscape Designations

- 9.3.1. There are no statutory designated landscapes within the study area that have the potential to be directly and indirectly affected by the Scheme. However, there are other designations (listed below) within the study area, that will be affected by the Scheme.
- 9.3.2. Painshill Park is a Grade I Registered Park and Gardens which is located approximately 800 m to the north-east of the M25 junction 10 and immediately adjacent to the A3. The main purpose for designation of Registered Park and Gardens is to “*celebrate designed landscapes of note, and encourage appropriate protection.*”
- 9.3.3. The RHS Wisley Grade II* Registered Park and Gardens is located to the south-west (approximately 1.6 km from the centre of the M25 junction 10 junction). The designated area includes the RHS Gardens at Wisley, formal and informal decorative gardens, several glasshouses and an extensive arboretum and small scale gardens. The RHS Gardens at Wisley is also a visitor attraction of national importance.
- 9.3.4. This report will report in detail the potential effects to be expected, taking into consideration the environmental design and/or proposed mitigation measures.

National Planning Policy Framework (NPPF) March 2012

- 9.3.5. The NPPF establishes national planning policy to achieve sustainable development, through themes which include promoting sustainable transport, supporting a prosperous rural economy and promoting healthy communities, with a presumption in favour of sustainable development.
- 9.3.6. To support a prosperous rural economy, planning should promote the sustainable growth and expansion of businesses and enterprise in rural areas, the diversification of agricultural and land-based rural businesses, and the retention and development of local services and community facilities (paragraph 28).
- 9.3.7. Paragraph 75 states policies should protect and enhance public rights of way (PRoW) and access. Local authorities should seek opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails.

Countryside and Rights of Way Act 2000

- 9.3.8. The Countryside and Rights of Way Act 2000 (CRoW) regulates all Public Rights of Way (PRoW) and ensures access to them. It requires local highway authorities to publish a Rights of Way Improvement Plan (RoWIP), which should be reviewed every 10 years. The Act also obliges the highway authority to recognise the needs of the mobility impaired when undertaking improvements.
- 9.3.9. There is guidance within the Surrey County Council Rights of Way Improvement Plan (2014) which sets out how PRoW meet the present and likely needs of the public; the opportunities provided by local rights of way for exercise and other forms of recreation and enjoyment; and the accessibility of local rights of way to blind or partially sighted person and others with mobility issues.

- 9.3.10. The document also identifies that built development can be a threat to the rights of way network but it also offers opportunities for enhancements and creation of new routes. The document also states that high levels of road traffic have had negative impacts on users across RoW across Surrey and that the County Council will use its powers under the Highways Act to create and divert public rights of way to improve connectivity.

The Commons Act 2006

- 9.3.11. The Commons Act 2006 (the Act) protects Common Land and town or village greens. This includes reinforcing existing protections against abuse, encroachment and unauthorised development. It recognises that the protection of Common Land has to be proportionate to the harm caused and that some specified works can be carried out without the need for consent. The Act provides for the release of land providing there is a provision of suitable “replacement land”.

Local Policy

- 9.3.12. Local policy which has indirect relevance for people, community use and enjoyment are set within adopted local planning policy for Elmbridge Borough Council and the Borough of Guildford.

Elmbridge Borough Council

- 9.3.13. The Elmbridge Core Strategy (2011) include spatial policy CS14 ‘Green Infrastructure’ the Council will protect, enhance and manage a diverse network of accessible multi-functional green infrastructure by:
- 2. Ensuring new development protects and enhances local landscape character, strategic views and key landmarks as shown on the proposals map, and takes account of their setting, intrinsic character and amenity value.
- 9.3.14. Green Infrastructure Assets; The following areas can form part of networks of Green Infrastructure:
- Parks and gardens - including urban parks, country parks and formal gardens; and
 - Natural and semi-natural urban greenspaces - including woodlands, urban forestry, scrub, grasslands (e.g. downlands, commons and meadows) wetlands, open and running water, wastelands and derelict open land and rock areas (e.g. cliffs, quarries and pits).
- 9.3.15. Spatial policy CS17- Local Character, Density and Design Elmbridge's unique environment is characterised by its green infrastructure, river corridors, historic assets and distinctive town and village settlements. Particular attention should be given to the design of development which could have an effect on heritage assets which include conservation areas, historic buildings, scheduled monuments, and the Borough's three historic parks and gardens.

Borough of Guildford

- 9.3.16. In the Borough of Guildford saved policies Local Plan (2003) policy HE11 scheduled ancient monuments and other sites and monuments of national importance.
- 9.3.17. Policy RE2 development within the Green Belt.
- 2. Essential facilities for outdoor sport and outdoor recreation, cemeteries and other uses of land which preserve the openness of the Green Belt and which do not conflict with the purposes of including land within it.
- 9.3.18. Policy HE12 Historic Parks and Gardens, Planning permission will not be granted for development which would detract from the character or appearance of a park or garden of special historic interest, or its setting. Permission will not be granted for unsympathetic subdivision.

9.4. Baseline conditions

Landscape Features

- 9.4.1. The M25 junction 10/A3 Wisley interchange is located within an area of Registered Common Land (Wisley Common and Chatley Heath), between Cobham and Ripley to the south-west of London. The landscape around the junction consists of a large scale coniferous and birch woodland with areas of open heathland incorporating large areas of clearings. Further afield is a mosaic of agricultural fields with linear or dispersed hamlets and isolated properties. These areas contain numerous woodland areas, copses and tree belts and hedgerows forming field boundaries.

Landscape Character

- 9.4.2. The study area is located close to the border of the National Character Area (NCA) No.129 - Thames Basin Heaths and NCA No.115 - Thames Valley. Due to the localised nature and scale of the proposals, the effects on the NCA will not be considered and the assessment will focus on local landscape character areas identified within Landscape Character Assessment at Local Authority level.
- 9.4.3. The Scheme is located on the boundary between Guildford Borough Council (GBC) and Elmbridge Borough Council (EBC).
- 9.4.4. The landscape character of Guildford Borough has been described in Guildford Landscape Character Assessment and Guidance (January 2007), prepared by Land Use Consultants. The Scheme is located wholly within Wisley Wooded and Settled Heath (G2) Landscape Character Area that forms part of Wooded and Settled Heath Landscape Character Type. The key characteristic and attributes of this Landscape character area are summarised below.

Table 9-1: Summary of attributes and key characteristics of relevant landscape character areas within Guildford Borough Council

Guildford Borough Council		
Landscape Character Types	Landscape Character Areas	Key attributes and qualities of landscape character
Woodland and Settled Heath	G2: Wisley Wooded and Settled Heath	• A secluded, enclosed landscape of heathland commons lying between the Mole and Wey Rivers, now largely overgrown by secondary woodland; • Substantial areas of mixed woodland and scrub are interspersed with heathland, open water bodies, pasture, parkland and gardens; • Wisley and Ockham Commons are Open Access Land with a network of footpaths and rides through the woodland; • There are few rural roads but the major transport corridors of the A3 and M25 cross the area fragmenting the Commons and bringing noise and views of moving traffic; • Sparse settlement pattern of a few farmsteads and cottages plus large houses at Wisley and Foxwarren; • Presence of designed landscapes of RHS Gardens at Wisley and Foxwarren Park to the north; • Intermittent views into and through the woodland to pastures, and • Presence of heathland.

9.4.5. The landscape character of EBC is described in the Surrey Landscape Character Assessment (April 2015), prepared by Hankinson Duckett Associates (HDA). As this landscape character assessment covers the entire Surrey County, the boundaries of landscape character areas extend beyond Borough or District Councils boundaries. The assessment distinguishes between landscape types reflecting the dominant influences on landscape character and landscape character areas which are discrete geographic areas that possess the common characteristics described for the landscape type. Three relevant landscape character areas were identified to inform the baseline of landscape character for the Scheme:

- RF10 Lower Mole River Floodplain;
- SS9 Weybridge South Settled and Wooded Sandy Farmland, and
- SW5 Wisley Sandy Woodland.

9.4.6. The key characteristic and attributes of these landscape character areas are summarised below.

Table 9-2: Summary of attributes and key characteristics of relevant landscape character areas within Elmbridge Borough Council

Elmbridge Borough Council	
Landscape Character Areas	Key attributes and qualities of landscape character
RF10 Lower Mole River Floodplain	• Flat, low lying flood plain of the River Mole; • River forms wide meanders, and multiple channels. The valley floor also contains small watercourses, streams, lakes and water bodies often linked to the river; • Consists of a mixture of pastoral and arable fields, with riparian vegetation and occasional blocks of woodland. Incorporates occasional remnant parkland, including areas of large individual mature trees within fields; • Limited areas of ancient woodland; • Irregular, medium scale fields, with moderate hedgerow network (particularly to the south), ditches and tree lines; • The sense of enclosure varies along the character area, although vegetation helps reduce views of urban influence from adjacent settlements; • Major roads, including the M25, A3 and A244, the Waterloo to Woking railway line, and the Waterloo to Guildford via Cobham railway line, cut across the character area; • Public access into the character area and to the river are relatively limited, with only a small number of rights of way crossing the character area; • Settlement within the character area is also limited, mainly consisting of the occasional farmstead, and • Limited settlement and public access aid the sense of tranquillity, although the sense of remoteness is reduced by surrounding urban influence to the north.
SS9 Weybridge South Settled and Wooded Sandy Farmland	• A largely wooded area, but with significant areas of golf course cut from the woodland to the north-west, north-east, and south-east; • In between the golf courses is a pattern of small, mainly pastoral, rectilinear fields with thick boundary vegetation. A number of these fields are subdivided for paddocks or horticultural uses; • There are a few small areas of ancient woodland, mainly towards the west of the character area, in particular to the north of Foxwarren Park; • Views across this relatively low-lying landscape are highly constrained by woodland and vegetation along boundaries and roads; • The A3 dual carriageway and A245 main road cross through the character area; • Painshill Park is located above the Mole Valley to the south, at the south-eastern end of the character area, and • Limited public access limits opportunity for public appreciation of the intimate landscape.
SW5 Wisley Sandy Woodland	• The character area consists of extensive tracts of mixed woodland and scrub, some areas of Common Land, open water bodies, and a pocket of small pastoral fields; • Includes a relatively large block of ancient woodland at the south-east corner of the character area; • The RHS Gardens at Wisley are within the south-west corner of the character area, and Foxwarren Park is to the north;

Elmbridge Borough Council	
Landscape Character Areas	Key attributes and qualities of landscape character
	• Tree cover confines views generally, however there are distinctive views through the woodland along tracks, clearings within the woodland and across Bolder Mere ; • Views of moving vehicles are possible within the vicinity of road corridors through the woodland; • The M25 motorway and A3 cut through the woodland, and form junction 10 of the M25 where they meet, towards the centre on the character area; • Wisley and Ockham Commons are Open Access Land, with a number of informal tracks through the woodland connecting to a network of PRoW, there are small car parks and other basic facilities for recreational use of the woodlands; • There are a very limited number of isolated dwellings, including a few farmsteads, cottages and large houses at Wisley and Foxwarren, but the character area is mostly unsettled; • Large tracts of the character area are registered as Common Land and Wisley is noted as a historic garden and centre of horticulture, and • Busy roads, including the M25 motorway, fragment the character area and disturb the peace locally. But away from detracting activity, the majority of the wooded character area is peaceful, intimate, and has a sense of remoteness.

9.4.7. The impact of the Scheme on these characteristics will be considered in the ES.

Visual

9.4.8. Visual receptors are the people who live in or visit the landscape, and who will experience views of the Scheme.

9.4.9. The main receptors include the users of PRoW's and Wisley and Chatley Heath Commons. Other visual receptors include people in Painshill Park and RHS Wisley together with other receptors identified at earlier stages.

9.4.10. The receptors identified in earlier stages will be verified through further site visits during the Preliminary Design Stage. It is expected that most of the receptors will be of high sensitivity. The receptors have been identified having consideration to the elements of the Scheme and the presence of screening elements that could restrict views from the Scheme.

9.4.11. The following groups of people are considered to be visual receptors:

- Local communities (e.g. residents to the north of the A3 between Redhill Road and Seven Hills Road) or isolated residential properties (e.g., Elm Corner or Hut Hill Cottage);
- People using nationally designated or regionally promoted footpaths, cycle routes, bridleways, the local public rights of way network and areas of Open Access Land (e.g. network of footpaths within Commons);
- Visitors of publicly accessible sites including Registered Park and Gardens, historic sites and other visitor attractions (e.g. Painshill Park and RHS Gardens Wisley);

- Schools and other institutional buildings, and their outdoor areas (e.g. Feltonfleet School);
- People engaged in the outdoor sport activity at playing fields or pitches (e.g. Silver Mere Golf Club);
- People in their places of work (e.g. Seven Hills Hotel); and
- Road users (e.g. users of the A3, M25 and local roads).

9.5. Potential impacts

- 9.5.1. It is likely that the Scheme would cause adverse landscape and visual impacts, due to the extent and scale of proposed changes to the highway and associated infrastructure such as lighting and gantries.

Landscape

- 9.5.2. An assessment of landscape effects deals with the effects of change and development on a landscape resource. The key landscape effects expected as a result of the Scheme are a loss of vegetation, alteration to the landform as well as the introduction of man-made features. The nature of effects on landscape character and landscape designations will be assessed for both construction and operational phase of the Scheme.
- 9.5.3. It is expected that potentially significant landscape effects would be restricted to the land required or directly adjacent to the Scheme. Clearance of vegetation along the existing road corridors is also expected along the A3 will be necessary.
- 9.5.4. The landform around the junction is gently sloping and therefore the introduction of new slip roads would require some earthworks, resulting in alterations to the existing landform as well as an extension to the road network.
- 9.5.5. The Scheme would also affect the existing levels of tranquillity within the wider local area. These changes combined may potentially affect the local landscape character.
- 9.5.6. The introduction of additional gantries and associated road infrastructure will increase the prominence of the road corridor within the wider landscape.
- 9.5.7. It is expected that the relatively small scale of the Scheme would not result in significant effects for landscape character at the national level. The effects of the Scheme on the local landscape character including identified mitigation/environmental design measures will be considered.

Visual

- 9.5.8. Visual effects will occur during both the construction and operational stage. During construction, effects are likely to occur as a result of the introduction of construction machinery, compounds and vegetation removal with the potential to create new sightlines and views of the M25 junction 10.
- 9.5.9. The visual receptors will also be affected by views of HGVs and other tall machinery used within the construction site. However, the potential effects of construction activities would be temporary, short term and reversible.
- 9.5.10. It is expected that the greatest construction impact will occur close to the M25 junction 10 as a result of the construction operations associated with the

reconfigured junction works. Other improvements are centered on the existing road corridors that currently benefit from a high level of vegetation screening, however during construction activities new gaps in the existing vegetation will be created resulting in increased visibility.

9.5.11. Construction operations associated with proposed overbridges would also be prominent. Alteration of views during the construction stage would also occur further away from the junction where despite the main construction works associated with the M25 junction 10 junction being potentially screened, the views of works along the local access roads will be available.

9.5.12. The change in the views during construction is likely to include:

- Earthmoving operations;
- The formation of temporary spoil areas;
- Road formation/construction;
- The creation of new earthworks;
- Creation of site compounds and
- Proposed overbridges/structures.

9.5.13. The introduction of additional gantries, signs and additional infrastructure would increase the visibility of the road corridor particularly to road users and receptors when using overbridges.

9.5.14. The operational effects will be long term and permanent although it is expected that the proposed mitigation planting will mature gradually following the construction. The Scheme will provide an opportunity to introduce environmental design measures or/and mitigation measures to help reduce the effects and provide landscape and visual enhancements where possible.

9.6. Proposed level and scope of assessment

9.6.1. Detailed assessment of potentially significant effects associated with landscape and visual impacts of the Scheme are anticipated, a Detailed assessment will be carried out at this Preliminary Design Stage.

9.6.2. As a result, further studies are required to assess the significance of effects on landscape and visual receptors. Further detailed desk and fieldwork studies will be undertaken to identify the character of the landscape, including its condition and value, and the nature and sensitivity of the visual receptors that may be affected by the Scheme. The assessment of landscape and visual effects will take into consideration any mitigation/environmental design measures to avoid, reduce or remedy the changes of the Scheme.

9.6.3. The landscape and visual assessment will consist of an introduction outlining the Scheme, context and background, followed by a section outlining the assessment methodology. It will be divided between landscape and visual effects with distinct sections covering policy, baseline, potential magnitude of impact, and significance of effect and mitigation measures.

9.6.4. The assessment at this Preliminary Design Stage will be extended to explain any additional evaluation methodologies with differentiation of construction and

operational stages. Winter photographs will also be provided to illustrate key viewpoints.

9.6.5. The nature of effects on each receptor will be assessed for both the construction and operational phase of the Scheme.

9.6.6. The assessment will be accompanied by illustrative plans typically showing:

- Topography (1:25000);
- Landscape Character, Local Designations and Tranquillity (1:25000);
- Public Rights of Way including National Cycle Routes (1:25000);
- Viewpoint location plans (1:25000);
- Representative Photographic Viewpoints (1:25000); and
- Outline Landscape Design Plans including landscape and environmental mitigation measures (1:2500).

Landscape Scope

9.6.7. Main landscape receptors will include:

- Existing coniferous woodland areas around M25 junction 10;
- Areas of vegetation including semi mature and mature trees, hedgerows along the road corridors approaches to the M25 junction 10 junction;
- Effects on landscape aspect of the following designations: Ockham Common, Wisley Common, Painshill Park Grade I Registered Park and Garden and RHS Gardens Wisley - Grade II* Registered Park and Garden;
- Landscape designations; and
- Effects on landscape character based on relevant attributes of identified landscape character areas.

9.6.8. Table 9-3 lists landscape resource receptors as proposed for further consideration at the Option Selection Stage assessment (scoped in receptors) or scoped out from further assessment. This was informed by the Option Identification Stage Assessment.

Table 9-3: Landscape resources scoped in and out for further assessment

Resources	Scoped in/out	Comment/Justification
Areas of vegetation including coniferous woodland, semi mature and mature planting.	✓	The Scheme is likely to affect existing vegetation, particularly the coniferous woodland and semi mature and mature planting along the road corridor approaches to M25 junction 10 and local access roads.
Local landscape character features i.e. landform, landscape pattern.	✓	These landscape features are likely to be affected by the Scheme through introduction of earthworks and loss of landscape links in the form of boundary vegetation and change of land use.
Effects on identified landscape character	✓	Effects on landscape character requires further assessment. The effects would take into consideration key

Resources	Scoped in/out	Comment/Justification
based on key attributes of identified landscape character areas.		attributes of landscape character areas and above listed effects on loss of vegetation, land form, land use and landscape pattern.
Effects on Ockham, Wisley and Chatley Heath Common.	✓	Landscape effects on Ockham, Wisley and Chatley Heath Commons will likely be effected as a consequence of the encroachment of the Scheme on the area of Commons and transformation of their character.
Painshill Park Grade I Registered Park and Garden.	✓	Landscape effects on Painshill Grade I Registered Park and Garden require further assessment as some of the Scheme adjoins the A3 and the boundary of Painshill Park.
RHS Gardens Wisley - Grade II* Registered Park and Garden.	✓	Landscape effects on RHS Gardens Wisley - Grade II* Registered Park and Garden require further assessment as the Scheme are located close to the A3 and the entrance road to the RHS Gardens Wisley.
Landscape character at regional and national level.	✗	The Scheme would not give rise to the alteration of key characteristics of landscape character at the regional and national level.

Visual Scope

- 9.6.9. Table 9-4 lists visual receptors as proposed for further consideration at the Preliminary Design Stage Assessment (scoped in receptors) or scoped out from further assessment. This was informed by the Option Identification Stage Assessment.

Table 9-4: Visual receptors scoped in and out for further assessment

Resources	Scoped in/out	Comment/Justification
Painshill Park Grade I Registered Park and Garden (located within 1500 m)	✓	Visual effects on this receptor require further assessment as some of the Scheme will be located within the environs of Painshill Park.
Wisley and Chatley Heath Common (located within 1500 m)	✓	Commons are frequently used by people for enjoyment of outdoor activities and therefore their views are of high sensitivity.
Views from the network of PRoW's within the study area (varied distance)	✓	Views from PRoW's are particularly sensitive and the potential effects on their users requires further assessment.
Views from Chatley Farm (located within 1000 m)	✓	Chatley Farm is located at a considerable distance from the Scheme, however partial views of some of the Scheme particularly compounds may be available.
Views from RHS Wisley Grade II* Registered Park and Garden (located within 2000 m)	✓	RHS Gardens Wisley adjoins the Scheme.

Resources	Scoped in/out	Comment/Justification
Views from Hurt Hill Cottage (located within 1000 m)	✓	Views from Hurt Hill Cottage may be affected by the introduction of some of the Scheme.
Views from San Domenico - restaurant (located within 500 m)	✓	The restaurant adjoins the A3 and therefore the views of users will be affected.
Views from Feltonfleet School (located within 500 m)	✓	The views from the School are likely to be affected by the Scheme, particularly compounds.
Views from residential properties at the junction of Seven Hills Road (South)/B365 and A245	✓	The views from these receptors may be altered by the introduction of some of the Scheme.
Elm Corner, Bridge End, Ockham and Church End (located within 2500 m)	✓	There is a number of residential receptors in the village that could be potentially affected by the introduction of some of the Scheme.
Views from Pond Farm (located within 1000 m)	✓	Views from residential property at Pond Farm may be altered by the Scheme.
Bramley Hedge Farm, Long Orchard Farm, Firtree Cottage (located within 1500 m)	✓	Views from these residential properties are likely to be altered by some of the Scheme.
Little Foxwarren, Katz Castle, Queen Annes Cottage (located within 1000 m)	✓	Some views of the Scheme may be available from these receptors.
Views from Sainsbury's site at the junction of Bridge Way and the A245 Portsmouth Road (located within 500 m)	✓	Partial views of some of the Scheme are likely to be available for users of the Sainsbury's.
Views residential properties at Seven Hills Road (located within 500 m)	✓	A change of the view is expected for receptors along the road with partial views of some of the Scheme.
Views from residential properties at the peripheries of Church End and Ockham village (located within 1500 m)	✓	Visual effects on these receptors require further assessment as views of the Scheme along the A3 are likely to be available.
Views from Seven Hills Hotel (located within 500 m)	✗	Views from the Hotel are screened by the existing woodland that wraps around the hotel.

9.7. Proposed assessment methodology

9.7.1. The landscape and visual assessment shall be carried out following published guidance including IAN 135/10 Landscape and Visual Effects Assessment and DMRB Volume 11, Section 2, Part 2 HA 202/08 Environmental Impact Assessment but also with a consideration to the published GLVIA 3rd edition.

9.7.2. The GLVIA 3rd edition state that:

“...landscape and visual considerations may play a part in identifying opportunities and constraints relating to site selection and making comparative assessments of the options in order to identify those with least adverse (or indeed most beneficial) effects and greatest potential for possible mitigation and enhancement. It is then important to:

- *Demonstrate how landscape and visual effects have been taken into consideration.*
- *Explain the reasoning behind any decisions to reject and of the sites selected and alternatives considered in terms of their landscape and visual effects.”*

9.7.3. The assessment of significant effects for both landscape and visual effects will be based on a combination of magnitude with sensitivity using assessment matrix included in the guidance IAN 135/10 Landscape and Visual Effects Assessment and DMRB Volume 11 Environmental Impact Assessment.

9.7.4. At the Preliminary Design Stage the Scheme will be compared in the context of landscape and visual effects. The report will follow the format of a detailed assessment, stating the reasons for the decision.

Landscape receptors

9.7.5. The sensitivity of landscape resources/receptors combines judgements of their susceptibility to the type of change or development proposed with the value attached to the landscape (as per the Guidelines for Landscape and Visual Impact Assessment (GLVIA) 3rd edition.

9.7.6. For the purposes of this assessment, and in accordance with the relevant guidance contained in Highways England IAN 135/10, the landscape sensitivity is divided into three categories: High, Moderate and Low.

Table 9-5: Landscape sensitivity and typical examples

Sensitivity	Typical descriptors and examples
High	Landscapes which by nature of their character would be unable to accommodate change of the type proposed. Typically these would be: • Of high quality with distinctive elements and features making a positive contribution to character and sense of place; • Likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale; • Areas of special recognised value through use, perception or historic and cultural associations; and • Likely to contain features and elements that are rare and could not be replaced.

Sensitivity	Typical descriptors and examples
Moderate	Landscapes which by nature of their character would be able to partly accommodate change of the type proposed. Typically these would be: • Comprised of commonplace elements and features creating generally unremarkable character but with some sense of place. locally designated, or their value may be expressed through non-statutory local publications; • Containing some features of value through use, perception or historic and cultural associations; and • Likely to contain some features and elements that could not be replaced.
Low	Landscapes which by nature of their character would be able to accommodate change of the type proposed. Typically these would be: • Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place; • Not designated; • Containing few, if any, features of value through use, perception or historic and cultural associations; and • Likely to contain few, if any, features and elements that could not be replaced.

Table Source: IAN 135/10, Annex 1, Table 2

Visual receptors

- 9.7.7. Visual receptors are the people who live in or visit the landscape, and who will experience views of the Scheme. The sensitivity of the visual receptors (people) combines judgements of their susceptibility to the type of change in views and visual amenity with the value attached to particular views (as per IAN 135/10 and GLVIA).
- 9.7.8. The following groups of people are considered to be visual receptors:
- Local communities (e.g. villages and settlements) and isolated residential properties - these receptors are generally considered to be High sensitivity; views of residents are particularly susceptible to changes in visual amenity;
 - Visitors at publicly accessible sites including for example registered park and gardens, historic sites, and other visitor attractions - these receptors are generally considered to be High sensitivity; visitors are likely to consider views as part of their experience whilst visiting publicly accessible site. Views are likely also to be associated with historic setting of particular visitor attraction;
 - Schools and other institutional buildings, and their outdoor areas - these receptors are generally considered to be Moderate sensitivity; views of pupils and staff are generally focused on indoor activities and therefore are less susceptible to change;
 - People engaged in the outdoor sport activity at playing fields or pitches - these receptors are generally considered to be Moderate sensitivity as views of people engaged in outdoor sports activities are usually focused on the sports activity which usually does not depend upon appreciation of views into adjacent landscape;

- People using nationally designated or regionally promoted footpaths, cycle routes, bridleways, the local rights of way network and areas of Open Access Land - these receptors are generally considered to be High sensitivity; the enjoyment of views from these routes is one other key attributes. is one of their key attributes;
- Road users - these receptors are generally considered to be Low sensitivity as their views are focused mainly on the road corridor whilst views into adjacent landscape are usually transient and glimpsed, and
- People in their places of work - these receptors are generally considered to be Low sensitivity as they are orientated primarily on the work activities.

Magnitude and significance of effects

- 9.7.9. Landscape and visual impact significance will be determined by combining the sensitivity of the landscape and visual receptor, in conjunction with the magnitude of change. The magnitude of impact can be either adverse or beneficial.
- 9.7.10. The following tables describe the magnitude and significance categories and descriptors for landscape and visual receptors.

Table 9-6: Landscape - magnitude and nature of impact and typical descriptors

Magnitude of impact	Typical criteria descriptors
Major adverse	Total loss or large scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features and elements.
Moderate adverse	Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements.
Minor adverse	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
Negligible adverse	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
No change	No noticeable loss, damage or alteration to character or features or elements.
Negligible beneficial	Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Minor beneficial	Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Moderate beneficial	Partial or noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic and noticeable features and elements, or by the addition of new characteristic features.

Magnitude of impact	Typical criteria descriptors
Major beneficial	Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features.

Table Source: IAN 135/10, Annex 1, Table 1

Table 9-7: Landscape and Visual - significance of effects categories

Landscape Value (Sensitivity)	Magnitude of impact (degree of change)				
	Major	Moderate	Minor	Negligible	No change
High	Large or very large	Moderate or large	Slight or moderate	Slight	Neutral
Moderate	Moderate or large	Moderate	Slight	Neutral or slight	Neutral
Low	Slight or moderate	Slight	Neutral or slight	Neutral or slight	Neutral

Table Source: adapted from IAN 135/10, Annex 1, Table 3

Table 9-8: Landscape - typical descriptors of significance of effect categories

Significance category	Typical descriptors of effect
Very Large Beneficial (Positive) Effect	The project would: - Greatly enhance the character (including quality and value) of the landscape; - Create an iconic high quality feature and/or series of elements; and - Enable a sense of place to be created or greatly enhanced.
Large Beneficial (Positive) Effect	The project would: - Enhance the character (including quality and value) of the landscape; - Enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development; and - Enable a sense of place to be enhanced.
Moderate Beneficial (Positive) Effect	The project would: - Improve the character (including quality and value) of the landscape; - Enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development; and - Enable a sense of place to be restored.
Slight Beneficial (Positive) Effect	The project would: - Complement the character (including quality and value) of the landscape; - Maintain or enhance characteristic features and elements; and - Enable some sense of place to be restored.
Neutral Effect	The project would: - Maintain the character (including quality and value) of the landscape; - Blend in with characteristic features and elements; and

Significance category	Typical descriptors of effect
	• Enable a sense of place to be retained.
Slight Adverse (Negative) Effect	The project would: • Not quite fit the character (including quality and value) of the landscape; • Be at variance with characteristic features and elements; and • Detract from a sense of place.
Moderate Adverse (Negative) Effect	The project would: • Conflict with the character (including quality and value) of the landscape; • Have an adverse impact on characteristic features or elements; and • Diminish a sense of place.
Large Adverse (Negative) Effect	The project would: • Be at considerable variance with the character (including quality and value) of the landscape; • Degrade or diminish the integrity of a range of characteristic features and elements; and • Damage a sense of place.
Very Large Adverse (Negative) Effect	The project would: • Be at complete variance with the character (including quality and value) of the landscape; • Cause the integrity of characteristic features and elements to be lost; and • Cause a sense of place to be lost.

Table Source: IAN 135/10, Annex 1, Table 4

Table 9-9: Visual - magnitude of impact and typical descriptors

Magnitude of impact	Typical criteria descriptors
Major	The project, or a part of it, would become the dominant feature or focal point of the view.
Moderate	The project, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The project, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the project would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.
No change	No part of the project, or work or activity associated with it, is discernible.

Table Source: IAN 135/10, Annex 2, Table 2

Table 9-10: Typical descriptors of the significance of effect categories

Significance	Typical descriptors of effect
Very large beneficial	The project would create an iconic new feature that would greatly enhance the view.
Large beneficial	The project would lead to a major improvement in a view from a highly sensitive receptor.

Significance	Typical descriptors of effect
Moderate beneficial	The proposals would cause obvious improvement to a view from a moderately sensitive receptor, or perceptible improvement to a view from a more sensitive receptor.
Slight beneficial	The project would cause limited improvement to a view from a receptor of medium sensitivity, or would cause greater improvement to a view from a receptor of low sensitivity.
Neutral	No perceptible change in the view.
Slight adverse	The project would cause limited deterioration to a view from a receptor of medium sensitivity, or cause greater deterioration to a view from a receptor of low sensitivity.
Moderate adverse	The project would cause obvious deterioration to a view from a moderately sensitive receptor, or perceptible damage to a view from a more sensitive receptor.
Large adverse	The project would cause major deterioration to a view from a highly sensitive receptor, and would constitute a major discordant element in the view.
Very large adverse	The project would cause the loss of views from a highly sensitive receptor, and would constitute a dominant discordant feature in the view.

Table Source: IAN 135/10, Annex 2, Table 4

Vulnerability to major accidents and disasters

- 9.7.11. Major accidents and disasters comprise man-made and natural risks which are considered likely, and anticipated to result in substantial harm that the normal functioning of the Scheme is unable to cope with/rectify - i.e. risks with the potential to have a significant effect.
- 9.7.12. Natural circumstances such as high winds and/or species-specific diseases (such as Ash Dieback) could have a direct, reductive effect on the future effectiveness of existing planting in screening the Scheme. Climate change could cause additional system stress on vegetation, making it vulnerable to windblow, flooding or disease. Assessment under this section would therefore consider storm events and the spread of plant diseases, and the potential consequences for the effects of the Scheme on landscape character and visual amenity.
- 9.7.13. Further assessment would be informed by other topics, as assessing the adverse effects of a major accident or disaster on landscape and visual amenity will require interaction with other sections of the formal ES.
- 9.7.14. The requirement for further baseline information as part of the vulnerability assessment will be reviewed in this preliminary design stage to inform the ES.

9.8. Proposed consultation

- 9.8.1. Consultation with the appropriate stakeholders will be undertaken throughout the assessment process, this will ensure that the Scheme is designed with appropriate mitigation proposals that reflect the impacts and sensitivities of the respective receptors.

9.9. Potential mitigation measures

- 9.9.1. Should the assessment undertaken using the above methodology identify any significant adverse effects, mitigation measures would to be implemented. These proposed mitigation measures would be in addition to the embedded mitigation within the project's design.
- 9.9.2. Identified monitoring measures at the Option Selection stage will be reviewed to ensure that all relevant methods of reduction of effects in projects lifecycle have been considered and are relevant at this stage. As further information from additional surveys (e.g. arboricultural surveys) becomes available, the methods and techniques of monitoring will be more specific and detailed.
- 9.9.3. Due to the proposed scope of road infrastructure increasing, the siting and size of these proposed components will require careful consideration to minimise the potential impacts.

9.10. Assumptions and limitations

- 9.10.1. The assumptions and limitations at the time of reporting are as follows:
- Data quality - desk study, using mainly web-based data and previous assessment reports has only been reported;
 - Data quantity - only open, freely licensed data has been reported at this stage and therefore the amount of detail on certain topics is limited;
 - Site visits - site visits have been undertaken during the time of assessment periods; and
 - Where impacts are uncertain a conservative approach has been adopted.

9.11. Conclusion

- 9.11.1. The assessment through the use of appropriate methodology will assess the likely effects upon both landscape and visual receptors as a result of the Scheme whilst also proposing appropriate mitigation measures that are proportionate to the likely impacts.

10. Geology and Soils

10.1. Introduction

- 10.1.1. This chapter summarises the identified ground conditions, historical land uses and potential sources of land contamination relevant to the Scheme. It outlines where further assessment is required in order to ensure that the risks and effects associated with the geology and soils are fully understood and appropriately eliminated or mitigated where possible. Where applicable, relevant geological designated sites, active and historical landfill sites, and the quality of soils/agricultural land classification (ALC) within the study area have been identified.
- 10.1.2. A summary of the topics to be included in the ES and those scoped out of further assessment is presented in section 10.11 and Table 10-7.

10.2. Study Area

- 10.2.1. The assessment of geology and soils considers a study area extending 500 m from the extent of the red line boundary for the Scheme (see section 2.4 and Figure 2.1 for details). A study area of 500 m was chosen as it was deemed appropriate for a linear feature such as a highway. 'On site' within this chapter refers to the extent of the Scheme within the red line boundary and off site refers to locations within the study area but not within the extent of the red line boundary.

10.3. Planning and policy context

- 10.3.1. Relevant legislation and guidance documents include:
- The National Planning Policy Framework (NPPF) - states that local planning policies and decisions: should ensure that a site is suitable for its new use and should not be capable of being determined as Contaminated Land as defined under part 2A of the Environmental Protection Act (as amended); and that they take into account the economic and other benefits of best and most versatile (BMV) agricultural land (DCLG, 2012);
 - National Networks National Policy Statement (NN NPS) - sets out policy with regard to assessment of the environmental impacts of nationally significant transport infrastructure (DfT, 2014);
 - Technical Information Note 049 (TIN049), 'Agricultural Land Classification: protecting the best and most versatile agricultural land' - states that, for planning applications, specific consultations with Natural England are required under the Development Management Procedure Order in relation to BMV agricultural land (Natural England, 2012);
 - Borough of Elmbridge Local Plan - establishes planning policies for Elmbridge forward to 2019 including requirements for development on or near to land which is suspected to be contaminated (Borough of Elmbridge, 2016);
 - Borough of Guildford Local Plan - contains policies relating to environmental protection and enhancement. (Borough of Guildford, 2003);

- Surrey County Council – Surrey Mineral Plan 2011 Core Strategy Policy (MC6) contains policies to safeguard against sterilisation of mineral resources (Surrey County Council, 2011).
- Part 2A of the Environmental Protection Act 1990 - provides a statutory regime for the identification and remediation of 'Contaminated Land' (UK Parliament, 1990);
- Contaminated Land Report 11 (CLR11) - provides primary guidance for assessing and managing land contamination and provides a technical framework for the identification and remediation of contamination through the application of a risk management process (Environment Agency, 2004);
- Guiding principles for land contamination (GPLC) - provides primary guidance for assessing and managing land contamination (Environment Agency, 2010);
- Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D66) - provides technical guidance on the identification and assessment of land contamination development and the process of managing such land contamination (National House-Building Council, 2008);
- Environment Agency's approach to groundwater protection - contains position statements on groundwater Source Protection Zones (SPZs), areas identified as drinking water protected areas and aquifer designations (Environment Agency, 2017);
- Water Resources Act (WRA) 1991 (as amended) - regulates water resources, water quality and pollution, and flood defence (UK Government, 1991) Chapter 57 Part III;
- Water Framework Directive (WFD) - the purpose of the WFD is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater (European Parliament, 2000); and
- River Basin Management Plan (RBMP) - designed to protect and improve the quality of the water environment and discusses development proposal considerations, future plans that may affect the infrastructure sector and its obligations, and plans for the protection and improvement of the water environment (DEFRA, 2009).

10.4. Baseline conditions

Geology

- 10.4.1. The study area is located within the geological area known as the London Basin, with the north-east to south-west trending London Basin Syncline located north of the study area. Information taken from the BGS GeoIndex suggests the closest inferred faulting to the study area is approximately 7.5 km to the south-west.
- 10.4.2. BGS mapping suggests that superficial deposits are not expected over the entire study area, however where present superficial deposits consist of Head,

Alluvium, River Terrace Deposits (undifferentiated), Kempton Park Gravel Member, Taplow Gravel Member and Lynch Hill Gravel Member are anticipated. Bedrock geology is expected to comprise the Bagshot Formation, Claygate Member of the London Clay Formation and the London Clay Formation of the Thames Group.

- 10.4.3. Made Ground associated with the original construction of local roads (including the M25, A3, A245 and local side roads), infilled pits, infilled ponds, Wisley Airfield, historical landfill sites and other sites of existing infrastructure is anticipated to be present throughout the Scheme.
- 10.4.4. No geological SSSIs or Local Geological Sites (LGS) (also referred to as Regionally Important Geological Sites) are located within the study area.
- 10.4.5. Made Ground, Alluvium and London Clay Formation are anticipated to have elevated concentrations of pyrite, sulphates and sulphides which can have detrimental impacts on concrete structures.
- 10.4.6. The Scheme is located in an area that is not affected by mining, based upon a review of the Coal Authority Interactive Map viewer and Non-coal Mining Plans. The BGS Mineral Resources Map identifies that the western, southern and northern extents of the Scheme fall within sand and gravel mineral resource zones, associated with the River Wey and the River Mole. Three mineral safeguard zones are located within the study area: one situated to the south east of the M25 junction 10/A3 Wisley interchange, within an area of replacement land for the Scheme; and one adjacent to the scheme to the north of the M25 and east of the A3, and one north of the development to the west of the A3.
- 10.4.7. A generalised for potential for ground instability hazards to be present within the study area. A full assessment will be completed within the ES.
- 10.4.8. A review of the Highways Agency Geotechnical Data Management System (HAGDMS) undertaken on 30 November 2017 identified 96 No. earthworks and 21 No. geotechnical defects within the Scheme extents

Hydrogeology

- 10.4.9. The Alluvium, Lynch Hill Gravel Member, and River Terrace Deposits (undifferentiated) are classified as superficial Secondary A Aquifers. The Kempton Park Gravel and Taplow Gravel Formation as both classified as superficial Principal Aquifers.
- 10.4.10. The Bagshot Formation and Claygate Member are classified as bedrock Secondary A Aquifers. London Clay Formation is an unproductive stratum.
- 10.4.11. There are no groundwater abstractions or groundwater Source Protection Zones (SPZ) located within the study area. However, the Environment Agency indicates that sections of the Scheme are located within Groundwater Vulnerability Major Aquifer High, Major Aquifer Intermediate, Minor Aquifer High and Minor Aquifer Intermediate Zones.

Hydrology

- 10.4.12. The River Mole, Stratford Brook, Guilehill Brook, River Wey and Guildford Canal/River Wey Navigation as well as unnamed streams/drains cross the A3 or M25 within the study area.

- 10.4.13. The surface water features which have the greater potential to be impacted by the Scheme are those watercourses within the study area which cross the A3 and M25 carriageways: the River Mole - Horley to Hersham - passes beneath the A3 approximately 2 km northeast of M25 junction 10; Stratford Brook passes beneath the A3 at Ockham Park junction; Guilehill Brook passes under the A3 approximately 3.6 km southwest of M25 junction 10; and the River Wey passes beneath the M25/A3 to the west of the junction and south of Ockham junction and the Guildford canal/River Wey Navigation passes beneath the M25 at the western extent of the Scheme.
- 10.4.14. Other named surface water features present within the study area Oakham Mill Stream Bolder Mere lake, Pond Farm, Chatley Wood pond, Manor Pond and the Lake. These surface water features could be affected in the event that contaminated shallow groundwater migrates towards them. They could also be affected by surface water transport, such as runoff or flooding events.
- 10.4.15. Recorded water abstraction point (surface water) has been identified within the study area.
- 10.4.16. Further discussion on hydrological water resources is included within Chapter 8, Road Drainage and the Water Environment. The study area lies within a surface water Drinking Water Safeguard Zone. The southern and western extents of the Scheme fall within a surface water Drinking Water Protected Area⁶².

Agricultural soils

- 10.4.17. The land between Ockham junction and Cobham is shown as Grade 3 (good to moderate quality) and Grade 4 (poor quality); the heaths and woodlands are classed as non-agricultural.

Land Contamination

- 10.4.18. A number of potentially contaminative land uses have previously operated or currently operate within the study area. A full review of potentially contaminated land uses will be completed in the ES.
- 10.4.19. Historical landfill sites and a number of pollution incidents have been reordered within the study area.
- 10.4.20. In addition to the landfill materials deposited in the aforementioned historical landfills, there is potential for Made Ground and any related contamination to be present associated with the infilling of ponds and pits, road construction (including embankments) and the construction of Wisley Airfield.

Unexploded Ordnance

- 10.4.21. A UXO Pre Desk-Study Assessment (PDSA) has been carried out by Zetica. The PDSA identifies a low risk of encountering UXO within the Scheme extents, and suggests a specialist detailed desk study is not required. The Zetica unexploded bomb risk map confirms the low risk of encountering unexploded bombs within the Scheme extents.

⁶² Environment Agency, 2017b

10.5. Potential impacts

- 10.5.1. The environmental impacts are likely to be greatest during construction with reduced impacts likely during operation. Contamination risks identified during the ground investigation surveys will be assessed and where possible reduced during detailed design. Requirement for mitigation measures, should these be required, will be assessed during detailed design after the DCO examination.
- 10.5.2. There is potential that new sources of contamination may be introduced associated with the accidental loss/spillage of fuels and oils as well as the potential to disturb and mobilise existing sources of contamination.
- 10.5.3. There is potential to exacerbate existing areas or to create new areas of ground instability and compressible ground.
- 10.5.4. The Scheme will also introduce additional receptors in the form of construction workers, future site workers and proposed foundations. It is understood that there will be no buildings constructed as part of the Scheme, however there may be confined spaces, such as manholes and service chambers/ducts, within which ground gas has the potential to accumulate.
- 10.5.5. There is a risk that new piling or excavation during construction could create new pathways between any contaminated soils and the underlying groundwater.
- 10.5.6. Additionally, any dewatering activities associated with the construction phase have the potential to mobilise further potentially contaminated groundwater and enhance lateral migration of contamination within the superficial and bedrock aquifers and potentially into surface watercourses.
- 10.5.7. The Scheme will involve the loss of Common and Public Access Land and so exchange land will have to be created in the vicinity. Works to make the replacement land more suitable for habitat creation such as topsoil stripping may be required.

10.6. Proposed level and scope of assessment

- 10.6.1. Limited ground investigation information is currently available for the Scheme and assessment of potential impacts associated with the Scheme to date have been qualitative.
- 10.6.2. Ground investigation is required to characterise ground conditions and inform the Scheme design and determine appropriate mitigation measures. A ground investigation specification has been drafted and, at this stage, it is envisaged that the ground investigation will include:
- targeting areas of identified potential contamination sources or junction reconfiguration (including but not limited to bridges and earthworks);
 - providing an assessment of geological boundaries and thickness of stratum;
 - providing an assessment of the groundwater regime at the site;
 - determining the extent and nature of fill materials associated with Wisley Airfield and historic landfills/infilling;
 - determining the nature and potential contamination of Made Ground associated with the M25 and A3 carriageways (including embankments),

A245 Byfleet Road, local access roads, the construction of Wisley Airfield and Battleston Hill, RHS Garden Wisley, San Dominico site, Feltonfleet School, the infilling of ponds and the potential infilling of gravel and sand pits within the Scheme extent;

- determining the aggressivity of the ground towards buried concrete; and
- analysing surface water samples from identified potential surface water receptors for hardness, pH, calcium, and dissolved organic carbon concentrations to enable determination of pragmatic environmental quality standards.

10.6.3. The ES will review the soils and geology issues at baseline, albeit based on desk based information only in the absence of ground investigation data which will not be available in time to be reported in the ES. Potential impacts upon the existing ground conditions which construction and operation of the Scheme could bring about and in turn impact upon identified receptors will be identified cognisant of the government's Good Practice Guide to EIA.

10.6.4. Specifically, the following topics have been considered with respect to soils and geology:

- Direct impacts on geology as a valuable resource; i.e. mineral resource sterilisation, damage or loss of special protection areas (SPA) and geological sites of special scientific interest (SSSIs), or revealing new geological exposures of scientific interest;
- Direct impacts on groundwater as a valuable resource, such as the prevention of aquifer recharge or contamination of groundwater which is currently abstracted for potable supplies or act as baseflow for rivers;
- Direct impacts on agricultural soils as a valuable resource, including loss of Best and Most Versatile (BMV) agricultural land (excluding woodland) and deterioration of soil quality;
- Effects associated with pre-existing soil and groundwater contamination; i.e. mobilising contamination, introducing new or changing existing contamination migration pathways, or changing the types of contamination receptors;
- Effects associated with the potential for polluting substances used during the construction or operational phases, to cause new ground contamination issues on site - for example introducing/changing the source of contamination;
- Physical effects such as changes in topography, ground collapse, soil erosion compressible ground, aggressive ground and ground stability; and
- The expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters relevant to the Scheme.

10.6.5. The government good practice guides to EIA specifies that the effects associated with re-use of soils and waste soils is considered within soils and geology. However, the Chapter 12, Materials and Waste considers these effects and therefore this is not covered in this chapter.

10.7. Proposed assessment methodology

10.7.1. The assessment of the potential impacts of the Scheme on soils and geology will be undertaken over two stages, in consultation with the EA:

- Stage 1 - land contamination risk assessment; and
- Stage 2 - impact assessment.

Stage 1 - Land Contamination Risk Assessment

10.7.2. The approach adopted for the land contamination risk assessment is based on the guidance document CLR11 and the Good Practice Guide to EIA. These documents are considered as key guidance in the United Kingdom, and provide a technical framework for the application of a risk management process through the following steps:

- Develop a Preliminary Conceptual Site Model (PCSM). A desk study review of available documentary information will be undertaken to develop the PCSM, which describes the linkages between potential contamination hazards/sources, pathways and receptors relevant to the site. Where all three are present or considered likely to be present, these are described as potential contaminant linkages (PCLs) which can then be subject to the risk assessment process;
- Gather site specific information. Previous ground investigation and limited remediation have been undertaken at the site of the Scheme. The available information will be used to assess the potential for existing contamination at the site. Once these data have been reviewed, recommendations for further ground investigation will be made if required;
- Risk Assessment. Generic quantitative risk assessments (GQRAs) for human health and groundwater receptors to inform a judgement as to whether the concentrations of contaminants in soil, soil leachate and groundwater represent a potential risk to identified receptors. GQRA will be carried out through the comparison of the ground investigation results to appropriate generic assessment criteria (GAC). GAC are concentrations of a contaminant in soil or groundwater, below which the level of risk is considered acceptable. Using the information from the ground investigation and the GQRA, the PCSM will be updated to include an assessment of the level of risk associated with each PCL identified during the baseline, construction and operational phases. Where risks are identified, consideration will be given to whether these would be appropriately mitigated through design and/or the development of a remediation strategy and its subsequent validation, as necessary. The residual risks will be determined and assessed based on estimation of likelihood and consequence; and
- The risk assessment applies the principles given in the National House Building Council (NHBC) and Environment Agency report R&D66, which provides guidance on the development and application of the consequence and probability matrix (as presented in Table 10-1) for contaminated land risk assessment.

Table 10-1: Land Quality Estimation of the Level of Risk by Comparison of Consequence and Probability

Probability	Consequence			
	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table Source: NHBC and Environment Agency report R&D66, Table 1.8

- 10.7.3. The potential risk to a receptor is a function of the probability of, and the consequence of a PCL being realised. Probability (likelihood of an event occurring) takes into account both the presence of the hazard and the receptor and the integrity of the exposure pathway. Consequence takes into account both the potential severity of the hazard and the sensitivity of the receptor. Definitions for the classification of probability and consequence are provided in Tables D.1 and D.2 of Appendix D.
- 10.7.4. Based on R&D66, the descriptions of the classified risks are as follows:
- Very high risk: There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term;
 - High risk: Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term;
 - Moderate risk: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term;
 - Low risk: It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is

likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited;

- Very low risk: It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor; and
- No potential risk: There is no potential risk if no pollution linkage has been established.

Stage 2 - Impact Assessment

Land Contamination

- 10.7.5. The land contamination impact assessment requires comparison of the baseline with the potential impacts that the development will have during the construction phase and operational phase. This approach enables changes in the impact to receptors during the construction and operational phases to be identified, an assessment of the effect of the scheme to be made and appropriate mitigation measures specified. The changes in contamination status are described as either beneficial or adverse and consideration is made of whether they are major, moderate, minor or negligible, on the basis of the value of the receptor, the area over which the effect may occur, duration (short, medium or long term) and whether the effect is permanent or temporary.
- 10.7.6. A methodology for the assessment of significant effects using sensitivity and magnitude is presented below in Table 10-2 and Table 10-3. However, it should be noted that this assessment is built into the Stage 1 land contamination risk assessment process and the R&D66⁶³ assessment method integrates the sensitivity of the receptor into the assessment of the magnitude (defined as consequence in R&D66) of harm and then compares this against the likelihood of the harm occurring. However, as land contamination cannot be defined as a resource, the magnitude of impact on the resource is not assessed, rather the magnitude of impact on each receptor. Table 10-1 above shows how the interactions of consequence and likelihood associated with the PCLs results in the significance of a potential risk or impact.
- 10.7.7. For the purposes of informing the land contamination impact assessment, land contamination risk assessments need to be undertaken for each development phase.
- 10.7.8. The development phases to be considered include: construction without mitigation; construction with mitigation, based on the identified mitigation measures that would need to be implemented through the design and construction stages of the Scheme (see section 10.8); and operation of the Scheme (including maintenance) assuming all mitigation has been undertaken prior to and during construction.

Geology and Geomorphology

- 10.7.9. An impact assessment of the potential effects of the Scheme on ground conditions and geology as a valuable resource has been undertaken using a qualitative approach considering the effects on topography, soil compaction, soil

⁶³ National House-Building Council, 2008

erosion and ground stability, and loss, destruction or sterilisation of a valuable geological resource.

Assessing Effects and Defining Significance

- 10.7.10. The value of a receptor is considered when determining consequence of an effect in the impact assessment. The value and/or sensitivity of each of the receptors is determined using the classifications given in Table 10-2.
- 10.7.11. As mentioned above in section 10.4.12, the below criteria are not utilised in the assessment of land contamination impacts as the value of a receptor is considered when determining consequence of an effect in the risk assessment.

Table 10-2: Criteria for classifying the value and/or sensitivity of environmental resources/receptors

Value/ Sensitivity	Criteria	Examples
High	Attribute possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site/receptor. Attribute has a very low capacity to accommodate the proposed change.	Principal Aquifer providing potable water to a large population, within an inner or outer groundwater source protection zone (Source Protection Zone (SPZ) 1 or SPZ 2). WFD high status water body (surface water) providing potable water to a small population. Sensitive human health receptors, e.g. young children. Buildings, including services and foundations but of high historic value or other sensitivity e.g. statutory designations, schools, residential dwellings. Ecological statutory designations with high sensitivity e.g. SSSI, LNR, SPA, RAMSAR etc. Statutory geological sites e.g. Geological SSIs. Regionally important mineral resource. Major topographic, ground stability, soil compaction or erosion hazards present at the site. High potential for materials re-use.
Medium	Attribute possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site/receptor. Attribute has a low capacity to accommodate the proposed change.	Principal Aquifer beyond a SPZ, or secondary aquifer. Secondary aquifer providing abstraction water for agricultural or industrial use. WFD good status water body (surface water). Buildings, including services and foundations. Less sensitive human receptors, e.g. construction workers using PPE. Moderately economically viable mineral resource. Moderate topographic, ground stability, soil compaction or erosion hazards present at the site. Moderate potential for materials re-use.
Low	Attribute only possesses characteristics which are locally significant. Attribute has some tolerance to	Unproductive strata or Secondary Aquifer without abstraction. WFD moderate - poor status (surface water). Infrastructure (roads, bridges, railways).

Value/ Sensitivity	Criteria	Examples
	accommodate the proposed change.	Non-statutory designated sites of regional importance that are not highly sensitive to damage from coastal change. No economically viable minerals. No sensitive human receptors. No topographic, ground stability, soil compaction or erosion hazards present at the site. No opportunity for materials re-use.

10.7.12. Following determination of the value of receptors, the magnitude of potential construction phase and operational phase impacts is determined based on the criteria defined in Table 10-3. The magnitude of land contamination impacts is guided by comparison of baseline, construction phase and operational phase risks, determined in the Stage 1 assessment.

10.7.13. Again, as mentioned in section 10.4.12, the below criteria are not utilised in the assessment of land contamination impacts as the assessment of magnitude is considered when determining consequence of an effect in the risk assessment.

Table 10-3: Classification of Magnitude of Effect

Classification of Magnitude	Criteria
High	Total loss of major alterations to one of more of the key elements, features or characteristics of the baseline. The post-development situation will be fundamentally different.
Medium	Partial loss or alteration to one of more of the key elements or characteristics of the baseline. The post-development situation will be partially changed.
Low	Minor loss or alteration to one or more of the key elements, features or characteristics of the baseline. Post-development, the change will be discernible but the underlying situation will remain similar to the baseline.
Negligible	Very minor loss or alteration to one of more of the key elements, features or characteristics of the baseline, such that post-development, the change will be barely discernible, approximating to the “no change” situation.

10.7.14. The overall potential significance of effects is then defined using the matrix presented below in Table 10-4, which describes the relationship between the value of the resource (sensitivity) as defined in Table 10-2 and magnitude of the potential impact as defined in Table 10-3.

Table 10-4: Criterion for determining the impact significance of effects

Value/Sensitivity of receptor	Magnitude of impact			
	High	Medium	High	Negligible
High	Major	High	Major	High
Medium	Moderate/ Major	Medium	Moderate/ Major	Medium
Low	Moderate	Low	Moderate	Low

10.7.15. The classification of significance of effects has been based on the criteria defined in Table 10-5.

Table 10-5: Classification of Significance of Effects

Classification of Significance	Effect
Major adverse	Complete loss or destruction of an important geological site. Significant sterilisation of mineral resources. Complete permanent change in topography which impacts the local community. Significant soil erosion, soil compaction or ground instability that is permanent in nature. An increase in contamination risk from the existing baseline conditions of 4 or 5 risk levels in the risk matrix, e.g. land that has a very low contamination risk in the baseline becomes a high or very high risk. Land that does not meet the statutory definition of Contaminated Land in the existing baseline becomes capable of being determined under Part 2A. The generation of significant volumes of hazardous waste requiring off-site disposal to appropriate landfill.
Moderate adverse	Moderate damage of an important geological site. Moderate sterilisation of a mineral resource. Partial long term (> 10 years) change in topography which impacts the local community. Moderate soil erosion, soil compaction, or ground instability that is either permanent or long term in nature. An increase in contamination risk from the existing baseline conditions of 2 or 3 risk levels in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate or high risk. Land that does not meet the statutory definition of Contaminated Land in the existing baseline becomes capable of being determined under Part 2A. The generation of a moderate volume of waste requiring off site disposal
Minor adverse	Minor damage of an important geological site. Minor sterilisation of a mineral resource. Limited medium term (5 to 10 years) change in topography which impacts the local community. Limited medium term soil erosion, soil compaction, or ground instability. An increase in contamination risk from the existing baseline conditions of 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate/low risk. The generation of a minor amount of waste.
Negligible	No change to geological receptors. No measurable impact on topography, soil erosion, soil compaction, or ground instability or impacts that are only temporary in nature (< 5 years). Negligible change in contamination risks. No generation of waste as part of the development, materials are used sustainably.
Minor beneficial	Minor improvement of an important geological site. Minor improvement in access to a mineral resource. Limited medium term (5 to 10 years) change in topography which has a positive impact on the local community. Limited medium term reduction in existing soil erosion, soil compaction, or ground instability issues. A reduction in contamination risk from the existing baseline conditions of 1 risk level in the risk matrix, e.g. land that has a moderate/low contamination risk in the baseline becomes a low risk. A minor amount of materials reuse as part of the development limiting the off site disposal of waste.
Moderate beneficial	Moderate improvement of an important geological site. Moderate improvement in access to a mineral resource.

Classification of Significance	Effect
	Partial long term (> 10 years) change in topography which has a positive impact on the local community. Moderate permanent or long term reduction in existing soil erosion, soil compaction, or ground instability issues. A reduction in contamination risk from the existing baseline conditions of 2 or 3 risk levels in the risk matrix, e.g. land that has a high contamination risk in the baseline becomes a moderate/low or low risk. Land that meets the statutory definition of Contaminated Land in the existing baseline is no longer capable of being determined under Part 2A. A moderate amount of materials re-use as part of the development limiting the off site disposal of waste.
Major beneficial	Major improvement of an important geological site. Major improvement in access to a mineral resource. Complete permanent change in topography which has a positive impact on the local community. Significant permanent reduction in existing soil erosion, soil compaction or ground instability issues. A reduction in contamination risk from the existing baseline conditions of 4 or 5 risk levels in the risk matrix, e.g. land that has a very high contamination risk in the baseline becomes a low or very low risk. Land that meets the statutory definition of Contaminated Land in the existing baseline is no longer capable of being determined under Part 2A. Sustainable use of material including recycling/reusing on site material. No off site disposal of wastes to landfill.

10.7.16. Following the classification of an effect, as detailed in Table 10-3 and Table 10-5, a clear statement is made as to whether the effect is 'significant' or 'not significant'. As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is also applied, where appropriate.

10.7.17. The assessment will consider the effects of the proposed construction and operational phases of the Scheme on the following receptors:

- Potential human health:
 - Associated with nearby residential properties, school, commercial/industrial premises;
 - Construction workers and future site workers;
 - Members of the public using public rights of way (non-motorised users (NMU));
- Potential controlled waters receptors include:
 - Secondary A Aquifers and Principal Aquifers associated with the Superficial Deposits and Bedrock within the study area;
 - Surface water as identified in section 10.4; and
- Potential ecological receptors:
 - Thames Basin Heath SPA, Ockham Common and Wisley Common SSSI, Ockham and Wisley LNR and Ancient Woodland;
- Potential structural receptors:

- Piles and foundations, underground services, off-site property and off-site historical features.

Agricultural soils assessment methodology

- 10.7.18. The assessment of agricultural soils follows the approach of DMRB, Volume 11, Section 3, Part 6. This identifies six main areas that need to be covered in any assessment of effects on agricultural land. These are agricultural land quality, designated agricultural areas, land take, type of husbandry, severance and major accommodation works for access, water supply and drainage.
- 10.7.19. No fieldwork for agricultural soils have been completed at this stage, and soils and the presence of BMV land are assessed using data from a published soil map.
- 10.7.20. The significance criteria address both magnitude of impact and sensitivity of the resource and consideration of the characteristics of the impact and the receptor, namely:
- Type of impact - direct or indirect;
 - Nature of impact - beneficial, adverse or neutral;
 - Duration of impact - short or long term, reversible or not; and
 - Frequency of impact - continuous or intermittent, changing with time or constant.
- 10.7.21. There is no nationally recognised set of criteria for assessing the impact of infrastructure Schemes on loss of BMV land and so a bespoke system has been developed to reflect the issues significant to this project.
- 10.7.22. Agricultural land in ALC Grades 1, 2 and 3a is considered to be of high sensitivity, agricultural land in ALC Subgrade 3b is considered to be of medium sensitivity and land in ALC Grades 4 and 5 is considered to be of low sensitivity.
- 10.7.23. Magnitude of impact of the Scheme on agricultural soils is assessed on the scale presented in Table 10-6 below, based on likely loss of BMV land.
- 10.7.24. All Scheme effects are considered adverse.

Table 10-6: Assessment of Magnitude of Impact on Agricultural Land

Magnitude of impact	Criteria
Major	The identified impacts are predicted to result in a loss of >20 ha of BMV land
Moderate	The identified impacts are predicted to result in the loss of between 5 ha and 20 ha of BMV land
Minor	The identified impacts are predicted to result in a loss of between 1 ha and 5 ha of BMV land
Negligible	The identified impacts are predicted to result in the loss of <1 ha BMV land

Vulnerability to major accidents and disasters

- 10.7.25. Major accidents and disasters which have the potential to adversely affect human health, property and controlled waters receptors, where existing contamination is identified or where future contamination is introduced, include

both man-made and naturally occurring events which may occur during either construction or operation.

- 10.7.26. It is considered that the proposed level and scope of assessment detailed in section 10.5 will be sufficient to assess baseline ground conditions within the study area and no additional baseline surveys will be undertaken as part of the vulnerability assessment.
- 10.7.27. Mitigation with respect to geology and soils will rely on appropriate design and construction and also operational protocols and security measures put in place for the Scheme. Please refer to section 10.9.
- 10.7.28. The baseline assessment has identified potential PCLs and a potential to exacerbate existing areas or to create new areas of ground instability and compressible ground, which require further assessment through ground investigation. Assessment of potential impacts under this section will therefore consider:
- the potential for release of contamination as a result of major accidents and disasters including extreme weather events, flooding, major traffic accidents, major chemical spills or other incidents; and
 - soil erosion or ground collapse/settlement as a result of major accidents and disasters including seismic events, landslip, and earthquakes.
- 10.7.29. Further assessment will be informed by other topics, as assessing the adverse effects of a major accident or disaster will require interaction with other sections of the ES.

10.8. Proposed consultation

- 10.8.1. Consultations with the relevant statutory authorities (notably the Environment Agency Local Authorities, Mineral Planning Authority) are planned. Each relevant body will be consulted separately to discuss specific information, issues and concerns.
- 10.8.2. An initial meeting with the Environment Agency to discuss the scope of their input regarding the Scheme was carried out on the 28 June 2017 and letters have been sent, informing the statutory authorities of planned public consultation meetings.
- 10.8.3. In addition, the Environment Agency will be consulted prior to undertaking the proposed ground investigation and following the development of relevant risk assessments to agree the most appropriate construction method to protect controlled waters.
- 10.8.4. Consultation with Natural England in relation to BMV land is not deemed necessary as the land affected by the Scheme is considered to be of non-BMV quality.

10.9. Potential mitigation measures

- 10.9.1. Beyond completion of the ground investigation and those risk assessments appropriate to the Scheme, such as human health, controlled waters, piling and ground gas risk, mitigation measures to be incorporated into the construction process, include (but are not limited to):

- Health and safety risk assessments, method statements and appropriate Personal Protective Equipment (PPE) for the protection of construction workers in accordance with the Control of Substances Hazardous to Health Approved Code of Practice and guidance;
- Implementation of appropriate dust suppression measures to prevent migration of potential contaminated dust plus asbestos fibres;
- Working methods during construction to manage groundwater and surface water appropriately and ensure that there is no run-off from the works, any material/waste stockpiles and storage containers into adjacent surface watercourses in accordance with DEFRA and the Environment Agency's Pollution Prevention Guidance;
- Prioritising the reuse of mineral resources (sand and gravel) within the Scheme;
- Implementation of appropriate pollution incident control e.g. plant drip trays and spill kits;
- Implementation of appropriate and safe storage of fuel, oils and equipment during construction;
- If unexpected contamination is encountered during proposed earthworks, further assessment followed by appropriate mitigation will be undertaken. Following assessment further mitigation measures may be required;
- Land occupied or disturbed during the construction process, that is not permanently acquired for engineering and landscaping, should be restored to a condition equivalent to its original;
- If spoil is to be spread on land intended for farming, addition of topsoil will be required and the land will need an aftercare period of at least five years to rectify settlement and compaction;
- The quality and quantity of soil on site should be maintained by implementing appropriate techniques for stripping, stockpiling and reinstatement. Disturbed soils should be reinstated to their original quality using a Soil Handling and Management Strategy; and
- Mitigation measures relating to buried ordnance and munitions.

10.9.2. It has also been assumed that hardstanding will be placed across the majority of the proposed works associated with the carriageway, except for soft landscaping along embankments and cuttings, which post-construction will minimise the generation of dust, direct contact and ingestion pathways and minimise infiltration. If soil contamination is identified, laying of a clean capping layer and importation of suitable clean soils may be required in areas of proposed soft landscaping. Drainage design will consider the risks from any residual contamination and designers may be required to use lined drainage systems in areas of contamination that may be left in situ.

10.9.3. It is assumed that the Scheme will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention.

10.9.4. Furthermore, pollution prevention measures incorporated within drainage design will mitigate the risk of contamination to controlled waters. The principles of

drainage design for the proposed development are summarised in Chapter 8, Road Drainage and the Water Environment.

- 10.9.5. As detailed in section 10.6 a ground investigation is required for the Scheme to inform the Scheme design and appropriate mitigation measures. A ground investigation specification has been drafted and this allows for the installation of groundwater and ground gas monitoring wells and a subsequent preliminary monitoring programme to establish baseline conditions. The requirement for further monitoring will be reviewed upon completion of the assessments detailed in section 10.7.

10.10. Assumptions and limitations

- 10.10.1. Based on information available to date, assessment of baseline conditions within the study area has been largely qualitative, with only limited ground investigation data to assess ground conditions on site.
- 10.10.2. A phase of ground investigation is to be undertaken to inform the design and to confirm the appropriate mitigation measures. The ground investigation is currently being procured. Again, given the timescales associated with the procurement process and the scale of the ground investigation, which is expected to take five months to complete with a subsequent monitoring programme, laboratory analysis, and assessments and reporting, it is currently envisaged that the ground investigation works and subsequent reporting will not be included within the ES and Development Consent Order (DCO) submission. In light of this, the associated assessments and reporting will subsequently be made available during the examination stage of the DCO process.
- 10.10.3. It is currently assumed that the red line boundary for the Scheme includes the likely locations of any engineering features, such as construction compounds and engineering features such as attenuation ponds. Further assessment may be required following detailed design should amendments to the red line boundary be necessary.
- 10.10.4. For agricultural soils assessment, the requirement for exchange land created by the junction improvements may result in the loss of BMV land to farming in the vicinity of the Scheme but this cannot be known until sites of exchanged land have been confirmed.

10.11. Conclusion

- 10.11.1. Further assessment of geology and soils with respect to the Scheme is required and a phase of ground investigation is to be undertaken to inform the design and to confirm the appropriate mitigation measures.
- 10.11.2. A summary of the topics to be included in the ES and those scoped out of further assessment is presented in Table 10-7.

Table 10-7: Geology and soils topics scoped in and out of further assessment

Topic	Scoped in/out	Comment/Justification
Geology as a valuable resource	✓	Whilst no Geological SSSIs or LGS have been identified within the study area and will not be considered within the

Topic	Scoped in/out	Comment/Justification
		ES, effects on mineral resources will be assessed as the Scheme is situated within sand and gravel mineral resource zones, associated with the River Wey and River Mole, and mineral safeguard zones have been identified.
Soils and agricultural land	✓	The impact that the scheme has on agricultural land will be assessed.
Land contamination including human health, groundwater and surface water	✓	Potential impacts to human health, groundwater and surface water have been identified. Further assessment should be carried out including, but not limited to, production of a CSM and a ground investigation will be completed to ensure these are appropriately understood and mitigated.
Construction and operational phase pollution effects	✓	The Scheme has the potential to introduce new sources of contamination associated with the accidental loss/spillage of fuels and oils.
Physical effects	✓	Physical effects including ground instability and topography will be assessed.
Major accidents or disasters	✓	Significant effects arising from the vulnerability of the proposed development to major accidents or disasters relevant to the Scheme will be assessed.
Re-use of soils and waste soils	✗	Addressed in Chapter 12 Materials and Waste.

11. Cultural Heritage

11.1. Introduction

- 11.1.1. This report presents the scoping for the Preliminary Design Stage. This stage will include the completion of surveys, stakeholder consultation, and completion of the EIA. This chapter scopes the information and activities necessary to complete this stage for cultural heritage.

11.2. Study area

- 11.2.1. For this stage, a 500 m study area around the alignment of the Scheme has been defined. This distance was defined by reference to relevant guidance and professional judgement and is beyond the minimum distance recommended by DMRB Volume 11, Section 3, Part 2 HA 208/07 Cultural Heritage. There is a potential that the Scheme may be developed during this stage, and so the study area may be altered to reflect any changes. This will affect the baseline condition, potential impacts, resulting effects and potential mitigation and will be reflected in the environmental reporting and accompanying Gazetteer and Figures.

11.3. Planning and policy context

National Planning Policy Framework

- 11.3.1. The National Planning Policy Framework (NPPF) (DCLG 2012) sets out 12 Core Planning Principles of which the conservation of historic environment is one. One of the NPPF's core principles is that *"planning should conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations"* (DCLG 2012, Para 17).
- 11.3.2. The DCLG published Planning Practice Guidance online in 2014, to expand upon the NPPF. '18a: Conserving and Enhancing the Historic Environment' was published in April 2014. The Guidance notes that *"conservation is an active process of maintenance and managing change. It requires a flexible and thoughtful approach to get the best out of assets as diverse as listed buildings to as yet undiscovered, undesignated buried remains of archaeological interest"*.
- 11.3.3. The NPPF and the PPG identifies two categories of non-designated sites of archaeological interest:

"Those that are demonstrably of equivalent significance to scheduled monuments and are therefore considered subject to the same policies as those for designated heritage assets" (PPG citing National Planning Policy Framework Paragraph 139); and

"Other non-designated heritage assets of archaeological interest. By comparison this is a much larger category of lesser heritage significance, although still subject to the conservation objective. On occasion the understanding of a site may change following assessment and evaluation prior to a planning decision and move it from this category to the first" (PPG).

National Policy Statement for National Networks

- 11.3.4. In addition to the overarching regulatory and policy framework discussed above, the impacts and effects of the Scheme have been reviewed in light of relevant historic environment legislation and policy.
- 11.3.5. Policy with regard to assessment of the historic environment effects of nationally significant transport infrastructure is set out in the National Policy Statement for National Networks (NPSNN).
- 11.3.6. Historic Environment Policy is set out in paragraphs 5.120 to 5.142 of the NPSNN. The key aspects which should be addressed are as follows:
- The significance, setting and viability of the heritage assets likely to be affected by the proposed development should be considered;
 - When considering the impact of a proposed development on the significance of a designated heritage asset great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be; and
 - Harm or loss affecting any designated heritage asset should require clear and convincing justification - substantial harm to or loss of a grade II Listed building or grade II Registered Park or Garden should be exceptional; substantial harm to or loss of designated assets of the highest significance should be wholly exceptional.
- 11.3.7. There is no definition of what constitutes 'substantial harm' in the NPSNN or other published policy documents. However, guidance in National Planning Policy Guidance (NPPG), supporting policy advice and case law indicates that whilst clearly a step down from total loss, substantial harm still represents a considerable degree of change to the significance of an asset. This could, for example, be as the result of removal of significant elements of fabric or the degradation/removal of key aspects of an asset's setting that notably contribute to its significance.
- 11.3.8. When considering the consequences of substantial harm there is a strong presumption against development.
- 11.3.9. NPSNN embodies an underlying principle of balancing harm and benefit which places greater weight on the conservation of more important assets. Where less than substantial harm would occur, there is a need to ensure that harm is justified and minimised and that the wider public benefits of the proposed are appropriately articulated.

Local Policy

Guildford Borough Local Plan

- 11.3.10. The western portion, to the west of Painshill Park, of the Scheme boundary area is located within the local administrative area of Guildford Borough Council. The Council is expected to consult on the draft of a new local plan in summer 2017; but until its adoption the Guildford Borough Local Plan (2003) remains current. Policies HE4, HE6, HE10 and HE12 are relevant to this assessment. Policy HE11 Scheduled Ancient Monument and other Sites and Monuments of National

Importance has now expired and the NPPF should be considered when assessing impacts upon archaeological remains.

11.3.11. The Local Plan Policies which are relevant to this assessment state:

- Policy HE4: NEW DEVELOPMENT WHICH AFFECTS THE SETTING OF A LISTED BUILDING
 - Planning permission will not be granted for development that adversely affects the setting of a listed building by virtue of design, proximity or impact on significant views.
- Policy HE6: LOCALLY LISTED BUILDINGS
 - In considering applications for development affecting buildings included on the local list the council will have regard to the effects of the development on the architectural or historic interest of the buildings and its setting.
- Policy HE10: DEVELOPMENT WHICH AFFECTS THE SETTING OF A CONSERVATION AREA
 - The Borough Council will not grant permission for development which would harm the setting of conservation area, or views into or out of that area.
- Policy HE12: HISTORIC PARKS AND GARDENS
 - Planning permission will not be granted for development which would detract from the character or appearance of a park or garden of special historic interest, or its setting. Permission will not be granted for unsympathetic subdivision.

Elmbridge Borough Council Local Plan

11.3.12. The north-eastern portion of the Scheme boundary area, to the east of the western boundary of Painshill Park, is located within the administrative area of Elmbridge Borough Council. The Elmbridge Local Plan is made up of the Elmbridge Core Strategy (2011) and the Elmbridge Development Management Plan (2015). The Core Strategy does not provide specific policy for the historic environment, though historic assets are considered under Policy CS17 - Local Character, Density and Design. Policy DM12 - Heritage of the Development Management Plan deals specifically with the historic environment and states:

- Planning permission will be granted for developments that protect, conserve and enhance the Borough's historic environment. This includes the following heritage assets:
 - Listed Buildings and their settings;
 - Conservation Areas and their settings;
 - Parks and Gardens of Special Historic Interest and their settings;
 - Scheduled Monuments and their settings;
 - Areas of High Archaeological Potential and County Sites of Archaeological Importance (CSAIs); and

- Locally Listed Buildings and other identified or potential assets (including non-designated locally significant assets identified in the local lists compiled by the Council).
- Listed Buildings:
 - The Council will encourage appropriate development to maintain and restore Listed Buildings, particularly those identified as being most at risk;
 - Development to, or within the curtilage or vicinity of, a listed building or structure should preserve or enhance its setting and any features of special architectural or historical interest which it possesses;
 - A change of use of part, or the whole, of a Listed Building will be approved provided that its setting, character and features of special architectural or historic interest would be preserved or enhanced. Consideration will also be given to the long-term preservation that might be secured through a more viable use;
 - Development which would cause substantial harm to or loss of a listed building (including curtilage buildings), such as total or partial demolition, will be permitted only in exceptional circumstances. In such cases, consideration will be given to the asset's significance. Applicants will need to clearly demonstrate that either:
 - There are substantial public benefits outweighing any harm or loss; or;
 - All of the following apply:
 - The nature of the listed building prevents all reasonable use of the site;
 - No viable use of the listed building can be found in the medium term through appropriate marketing that will enable its conservation;
 - It can be demonstrated that charitable or public funding/ownership is not available to enable its conservation; and
 - Any harm or loss is outweighed by the benefit of bringing the site back into use.
- Conservation Areas:
 - Proposals for all new development, including alterations and extensions to buildings, their re-use and the incorporation of energy efficiency and renewable energy technologies, must have a sensitive and appropriate response to context and good attention to detail;
 - Development within or affecting the setting of a conservation area, including views in or out, should preserve or enhance the character and appearance of the area, taking account of the streetscape, plot and frontage sizes, materials and relationships between existing buildings and spaces;
 - Open spaces, trees and other hard and soft landscape features important to the character or appearance of the area should be retained or be in keeping with the character of the area; and
 - Proposals to demolish buildings and/or structures will be assessed against their contribution to the significance of the conservation area as a heritage

asset. Where substantial harm would be caused to a conservation area's significance, the proposal will be resisted unless exceptional circumstances, including substantial public benefits outweighing any harm to the conservation area, can be demonstrated. Where the harm would be less than substantial, it will be weighed against any public benefits of the proposal, including securing optimum viable use of the heritage asset and whether it would enhance or better reveal the significance of the conservation area.

- Parks and Gardens of Special Historic Interest:
 - Parks and gardens identified as being of special historic interest, including landscape features and buildings, and their setting, will be protected and their sensitive restoration encouraged; and
 - Any proposed development within or conspicuous from a historic park or garden will be permitted provided that it does not detract from the asset.
- Scheduled Monuments and County Sites of Archaeological Interest (CSAI):
 - Development that adversely affects the physical survival, setting or overall heritage significance of any element of a Scheduled Monument or CSAI will be resisted; and
 - Any new development should be sensitive to these criteria and positively act to enhance the monument or CSAI overall and ensure its continued survival.
- Areas of High Archaeological Potential:
 - Proposals for development should take account of the likelihood of heritage assets with archaeological significance being present on the site, provide for positive measures to assess the significance of any such assets, and enhance understanding of their value.
- Locally Listed Buildings and other non-designated heritage assets:
 - The Council will seek to retain these, where possible, and will assess proposals which would directly or indirectly impact on them in the light of their significance and the degree of harm or loss, if any, which would be caused.

Guidance

11.3.13. This chapter has been prepared has been undertaken with reference to the following standards and guidance:

- Ancient Monuments and Archaeological Areas Act (1979);
- Planning (Listed Buildings and Conservation Areas) Act (1990);
- Standards and guidance for archaeological evaluations and watching briefs: Chartered Institute for Archaeologists (CIfA) (2014);
- Standards and guidance for archaeological desk-based assessment: Chartered Institute for Archaeologists (CIfA) (2014, revised 2017);

- The Setting of Heritage Assets Historic Environment Good Practice Advice in Planning: 3, Historic England 2015; and
- DMRB Volume 11, Section 3, Part 2: Highways Agency (2007).

11.4. Baseline conditions

- 11.4.1. This report has identified both designated and non-designated heritage assets around the Scheme within the study area which could potentially be affected by the Scheme (Figure 2.1). Information on heritage assets was sourced in September 2017 from the Historic England National Heritage List for designated assets, and the local authorities for details of Conservation Areas and from Surrey Historic Environment Record (HER) for non-designated assets. This is an update of data which was considered for the Option Selection Stage Scoping Report and EAR. These updates include changes to the side roads elements of the scheme, and the upgrading of signage across the current overhead gantries along the M25. Due to the nature of works within the M25 corridor, new HER data has only been acquired within a 500m buffer of the scheme and side road elements, as no intrusive groundworks are associated with the gantry upgrades. However, designated assets within 500m of the M25 were included, in order to account for any setting impacts associated with this work. The data provides an overview of the historic environment in the area, to set out a suitable scope for more detailed assessment, impact reporting, and the identification of potential mitigation needed.
- 11.4.2. Heritage assets are identified by a unique ID, and these are provided in the gazetteer in Appendix D. Designated assets are referred to by their National Heritage List Entry (NHLE) numbers where relevant. Non-designated assets are referred to by their Surrey HER numbers (MSE), with Areas of High Archaeological Potential referenced by a unique Atkins Archaeological Notification Areas asset ID.
- 11.4.3. The study area contains fifty-five designated heritage assets. These comprise:
- Four Scheduled Monuments;
 - One Grade I registered park and garden;
 - One Grade II* registered park and garden;
 - One Grade I listed building;
 - Five Grade II* listed buildings;
 - Forty-one Grade II listed buildings; and
 - Two Conservation Areas.
- 11.4.4. Following assessment and site visits undertaken during production of the EAR for the Option Selection Stage and the assessment of additional elements associated with the scheme, twelve designated assets within the study area have been scoped out of further assessment. These assets were judged as being of sufficient distance from or with limited or no views of the Scheme and therefore have been scoped out as there will be no impacts on setting. The twelve designated asset which have been scoped out are all listed buildings as follows:
- 1030127 - The Chinese Bridge, Painshill Park, Grade II;

- 1189122 - Old School House, Grade II;
- 1029335 - Orchard Cottage, Grade II;
- 1030210 - Village Pump, Grade II;
- 1030060 - Chilbrook Farmhouse, Grade II;
- 1294555 - The Cricketers Inn, Grade II;
- 1030052 - St Matthews Church of England First School, Grade II;
- 1044723 - Cooper Tomb 20 Yards West of Church of St Mary The Virgin, Grade II;
- 1264426 – Hoodsfield, Grade II;
- 1392421 - The Old Fire Station, Grade II;
- 1236238 - Shrapnell Tomb 20 Yards North West of Church of St Mary The Virgin, Grade II;

11.4.5. Assets situated outside the study area, but within Painshill Grade I Park and Garden include:

- 1030124 - The Gothic Temple, Painshill Park, Grade II*;
- 1030131 - The Vermont Exchange, Grade II;
- 1030059 - Postboys Row, Grade II;
- 1192437 - Worlds End Cottage, Grade II;
- 1191715 - The Gardeners Cottage, Painshill Park, Grade II;
- 1286935 - The Walled Gardens, Painshill Park, Grade II;
- 1030128 - The Chapel Ruins, Painshill Park, Grade II;

11.4.6. Following assessment and site visits undertaken during production of the EAR for the Option Selection Stage no setting impacts were identified upon these assets, and they have been scoped out from further assessment.

11.4.7. Sixty non-designated heritage assets were also identified within the study area during the Option Selection Stage activities. These assets include possible prehistoric earthworks, the London to Winchester Roman Road, medieval or post-medieval enclosures, parish boundaries and earthworks, as well as post-medieval domestic, agricultural and industrial buildings, and post-medieval and modern gardens and parkland.

11.4.8. Data obtained from the Surrey HER in September 2017, following the Preliminary Design Stage, identified an additional four non-designated heritage assets within the study area:

- MSE487 - Romano British cremation and associated finds, discovered and excavated in 1911;
- MSE14773 - Settlement site, Henn's Enclosure, Ockham;
- MSE14770 - Medieval pond, Wemere; and
- MSE14772 - Ore Lane Trackway, Ockham medieval Holloway.

11.5. Potential impacts

- 11.5.1. As per the DMRB methodology, potential impacts on the cultural heritage resource are defined as changes to the resource caused by the Scheme.

The Scheme

- 11.5.2. The Scheme would result in direct impacts upon six known non-designated linear features in the vicinity of the junction, comprising: the London to Winchester Roman Road (SMR4619); Ockham Heath parish boundary bank (MSE14795); Pointer's Road (MSE14791); bank at Chatley Wood (MSE14785); boundary bank at Clearmount (MSE14782) and Red Hill Holloway or ditch feature (MSE14774).
- 11.5.3. These non-designated assets are all considered to be of low value. The Scheme would only impact upon small segments of the long linear features. At most minor adverse impacts are expected.
- 11.5.4. The Scheme also has the potential to impact upon significant hitherto unknown archaeological remains, given the proximity of the required works to a known prehistoric monument of national importance (Scheduled Monuments 1012204 and 1007905) and medieval landscape features. Impacts to these as-yet unknown assets may range from moderate to major adverse; further work would be required to ascertain their significance and therefore determine the significance of effect.
- 11.5.5. In addition to the elongation of the roundabout and the realignment of the slip roads, the Scheme includes other associated improvements. These would include the widening of A3 between Ockham and Painshill; an overbridge linking properties east of the A3 with Red Hill Road; changes to the access roads to the west of the A3, north of junction 10; the upgrading of the track to gain access to Hut Hill Farm, Park Barn Farm and the Birchmere Scouts campsite via the rebuilt Cockrow bridge; a local access route from the Ockham Road junction to RHS Wisley; and changes to the access to the BOAT to Elm Corner. Potential impacts resulting from each of these proposals on heritage assets are discussed below.

A3 Widening between Ockham and Painshill

- 11.5.6. The widening of the A3 has the potential to directly impact upon two known heritage assets in the vicinity of Bolder Mere to the west of junction 10. The Lord King's Ditch (MSE14783) is supposedly the ditch cut by Lord King to drain Wisley Pond c. 1800. It runs south from Wisley to the Bolder Mere and presumably a portion of it was cut previously by the A3, though the HER records it as terminating on the north side of the road. The widening of the A3 will potentially remove further c. 7 m of the ditch. Impacts are expected to be minor to moderate adverse.
- 11.5.7. Bolder Mere Dam (MSE14766) is located to the south of the A3 at Bolder Mere. The dam is located at the south-east edge of the Boldmere itself and at a slight angle to the A3. The earthworks making up the dam appear to have been previously disturbed by work associated with the A3, including cutting across its north-east terminus and inserting drainage channels into its northern side. The widening of the A3 at this point could remove a further c. 15 m of the north-east extent of the dam earthworks, with minor to moderate adverse impacts expected.

- 11.5.8. While the proposals indicate that the widening of the road will not impact upon the Ockham/Wisley Parish Boundary Marker (MSE3464), the proximity of works to the site mean that mitigation measures may be required to ensure there is no inadvertent damage to this asset.
- 11.5.9. There is some potential for the proposals to impact upon significant hitherto unknown archaeological remains, especially given that the areas have been subject to continual land management, since the early medieval period.

Access to Painshill properties

- 11.5.10. The proposal would affect the setting of the Grade II listed Foxwarren Cottage (1030053), and the Grade II* listed Gothic Tower (1191694) within Painshill Park although they would not be physically affected.
- 11.5.11. The setting of Painshill Park (1000125), a Grade I Registered Park and Garden, could also be affected as a result of construction of part of the overbridge within the designated parkland and other changes to its setting.
- 11.5.12. The proposal also has the potential to affect the hengi-form scheduled monument at Red Hill (1007905) as a result of changes to its setting, due to the proximity of the overbridge to the monument, along with the impacts resulting from the general A3 widening.
- 11.5.13. There is also the potential for encountering hitherto unknown buried archaeological remains. Effects may range from moderate to major adverse, and will require further investigations to ascertain their value and the potential for significant effects.

Access to Seven Hills Road, west of the A3

- 11.5.14. There are no known heritage assets within the area of this element and as such no direct impacts upon known heritage assets are expected. The nearest known heritage assets are Painshill Park (1000125), though this is located to the south-east of the existing A3, and a non-designated post-medieval farm at Long Orchard (MSE22158), c. 80 m to the north. The area appears to have been largely agricultural in the post-medieval period when it is shown on the 1872 six inch to the mile Ordnance Survey map (Sheet XVII) to comprise improved fields with mature trees along the Portsmouth Road (now the A3). Given this and the limited land take, the potential for impacts upon significant hitherto unknown archaeological remains is considered to be very limited, with possible impacts being minor to moderate.

Access via Cockrow Bridge

- 11.5.15. There are no known heritage assets within the area of the proposed bridge and access roads and as such no direct impacts upon known heritage assets are expected. There is some potential for impacts upon significant hitherto unknown archaeological remains, possibly of prehistoric date or related to the former post-medieval Oldpond House. Any impacts are expected to be minor to moderate, on low value assets, resulting in no significant effects.

Wisley Lane access

- 11.5.16. The access to Wisley Lane has the potential to impact the Royal Horticultural Society's Garden, Wisley (1000126) which is a Grade II* Registered Park and

Garden. While the impacts to RHS Wisley would only be to a part of the asset and will have a limited impact on the overall significance of the Park, this could constitute a moderate significant effect on the asset, due to the Grade II* status of the garden. Further assessment of the Scheme and the asset's setting, including identification of key elements and an assessment of the contribution of setting to the significance of the asset, are necessary to further inform the determination of overall effect, as well as to identify appropriate mitigation design.

Elm Lane access

- 11.5.17. There are no designated heritage assets in the vicinity of the proposals here. The only extant heritage asset is the non-designated boundary bank at Ockham Village Green (MSE14789). As the proposals are only for the upgrade of the existing byway, no impacts upon the setting of the bank are expected and are the anticipated effects are therefore neutral.

11.6. Proposed level and scope of assessment

- 11.6.1. As potential significant effects on the cultural heritage resource are anticipated, further assessment is required in relation to potential effects on designated and non-designated heritage assets during construction and operation of the Scheme. Further assessment will also be required in respect of potential effects in relation to previously undiscovered archaeological remains arising from construction of the Scheme.
- 11.6.2. Table 11-1 contains a summary of what is scoped in and out for the cultural heritage resource in this Preliminary Design Stage.

Table 11-1: Cultural heritage topics scoped in and out

Effects	Scoped in/out	Comment/Justification
Designated heritage asset	✓	Assessment of the potential effects on designated assets due to physical or setting impacts.
Non-designated heritage assets	✓	Assessment of the potential effects on non-designated assets due to physical or setting impacts.
Potential for undiscovered archaeology	✓ construction ✗ operation	Assessment of the potential for effects on previously undiscovered archaeological remains due to the Scheme construction.

- 11.6.3. To achieve a better understanding of the potential for archaeological remains to exist and to more accurately assess the risks posed by the Scheme, further assessment is required to identify and characterise the archaeological resource. Such assessment may take the form of a detailed assessment in accordance with DMRB guidance, and would include:
- Information relating to the results of previous archaeological investigations;
 - Assessments of the settings and significance of known heritage assets which will be suitably detailed for particularly sensitive assets; and
 - Geophysical surveys where appropriate to identify hitherto unknown archaeological assets.

- 11.6.4. Depending on the results of the further detailed assessment set out above, further assessment including intrusive archaeological fieldwork may be required. In addition, the results of the assessment will enable suitable mitigation to be proposed.

11.7. Proposed assessment methodology

- 11.7.1. The methodology outlined below refers to that of the desk-based evaluations made as part of this scoping report. Further archaeological evaluations, beginning with non-invasive geophysical survey and possibly including evaluation trenching, targeted excavation and additional archival and historic research, may be required to fully characterise the significance of the heritage assets impacted by the Scheme and to mitigate impacts. This would be done following detailed design and by means of an archaeological evaluation and mitigation programme agreed with statutory consultees.

DMRB Methodology

- 11.7.2. The assessment of potential effects on cultural heritage undertaken in the Preliminary Design Stage is outlined in DMRB Volume 11, Section 3, Part 2 HA 208/07 Cultural Heritage.
- 11.7.3. The methodology is essentially a three-step process. The first stage is establishing the value of the heritage assets. The value, or significance, of each heritage asset will be assessed, and determined in accordance with guidance provided in DMRB. This provides a score ranging from Very High to Negligible. Heritage value is determined by professional judgement, grounded in established criteria. These criteria are set out in English Heritage's (now Historic England) Conservation Principles (2008), which sets out four values: evidential, historical, aesthetic and communal. These encapsulate architectural, historic and archaeological interest and are consistent with the DMRB methodology. Table 11-2 sets out the criteria for assessing the value of heritage assets, as identified in the DMRB.

Table 11-2: Determining the value of heritage assets

Value	Description	Example
Very High	Internationally important or significant heritage assets.	World Heritage Sites, or buildings recognised as being of international importance.
High	Nationally important heritage assets generally recognised through designation as being of exceptional interest and value.	Grade I and II* Listed Buildings, Grade I and II* Registered Parks and Gardens, Scheduled Monuments, Protected Wreck Sites, Registered Historic Battlefields, Conservation Areas with notable concentrations of heritage assets and undesignated assets of national or international importance.
Medium	Nationally or regionally important heritage assets recognised as being of special interest, generally designated.	Grade II Listed Buildings, Grade II Registered Parks and Gardens, Conservation Areas and undesignated assets of regional or national importance, including archaeological remains, which relate to regional research objectives or can provide important information relating to particular historic events or trends that are of importance to the region.

Value	Description	Example
Low	Assets that are of interest at a local level primarily for the contribution to the local historic environment.	Undesignated heritage assets such as locally listed buildings, undesignated archaeological sites, undesignated historic parks and gardens etc. Can also include degraded designated assets that no longer warrant designation.
Negligible	Elements of the historic environment which are of insufficient significance to merit consideration in planning decisions and hence be classed as heritage assets.	Undesignated features with very limited or no historic interest. Can also include highly degraded designated assets that no longer warrant designation.
Unknown	The importance of an asset has not been ascertained.	

Table Source: DMRB, Volume 11, Section 3, Part 2, HA 208/07, Annex 5, Table 5.1 and Annex 7, Table 7.1

- 11.7.4. Once the value of each asset has been established using the criteria set out in Table 11-2 above, the magnitude of impact to a heritage asset is identified by the degree of change that would be experienced by the asset and its setting, if the Scheme was to be constructed, as compared with a 'do nothing' scenario. Table 11-3 identifies the criteria outlined by the DMRB process for establishing the magnitude of impacts on heritage assets.

Table 11-3: Identifying the magnitude of impact

Magnitude of Impact	Description of Nature of Change
Major Adverse	Substantial harm to, or loss of an asset's significance as a result of changes to its physical form or setting. For example, this would include demolition, removal of physical attributes critical to an asset, loss of all archaeological interest or the transformation of an asset's setting in a way that fundamentally compromises its ability to be understood or appreciated. The scale of change would be such that it could result in a designated asset being undesignated or having its level of designation lowered.
Moderate Adverse	Less than substantial harm to an asset's significance as a result of changes to its physical form or setting. For example, this could include: physical alterations that remove or alter some elements of significance, but do not substantially alter the overall significance of the asset; notable alterations to the setting of an asset that affect our appreciation of it and its significance; or the unrecorded loss of archaeological interest.
Minor Adverse	Limited harm to an asset's significance as a result of changes to its physical form or setting. For example, this could include: physical changes that alter some elements of significance but do not noticeably alter the overall significance of the asset; and small-scale alterations to the setting of an asset that hardly affect its significance.
Negligible	Very minor changes to setting or form of the asset.
No Change/ Neutral	No appreciable change to an asset's significance.
Minor Beneficial	Limited improvement of an asset's significance as a result of changes to its physical form or setting.

Magnitude of Impact	Description of Nature of Change
	For example, this could include: physical changes that reveal or conserve some elements of significance but do not noticeably alter the overall significance of the asset; or small-scale alterations to the setting of an asset that improve our ability to appreciate it.
Moderate Beneficial	Notable enhancement of an asset's significance as a result of changes to its physical form or setting. For example, this could include: physical alterations that conserve or restore elements of significance; notable alterations to the setting of an asset that improve our appreciation of it and its significance; or changes in use that help safeguard an asset.
Major Beneficial	Substantial enhancement of an asset's significance as a result of changes to its physical form or setting. For example, this could include: major changes that conserve or restore elements of high significance; alterations to the setting of an asset that very substantially improve our appreciation of it and its significance; or changes in use that safeguard an asset, e.g. by taking it off the At Risk Register.

Table Source: DMRB, Volume 11, Section 3, Part 2, HA208/07, Annex 5-7

- 11.7.5. The significance of effect is expressed in the manner set out in the matrix derived from DMRB (as shown in Table 11-4). The significance of effect is determined by consideration of a combination of the magnitude of impact and the value of each asset.

Table 11-4: Determining the significance of effect

Sensitivity of receptor	Magnitude of impact				
	Major	Moderate	Minor	Negligible	No change
Very high	Very large	Large or very large	Moderate or large	Slight	Neutral
High	Large or very large	Moderate or large	Slight or moderate	Slight	Neutral
Medium	Moderate or large	Moderate	Slight	Neutral or slight	Neutral
Low	Slight or moderate	Slight	Neutral or slight	Neutral or slight	Neutral
Negligible	Slight	Neutral or slight	Neutral or slight	Neutral	Neutral

Table Source: DMRB, Volume 11, Section 2, Part 2, HA 208/07, Table 5.1

EIA Methodology

- 11.7.6. Following the DMRB assessments carried out in the Option Selection Stage further assessments are required at the Preliminary Design Stage to characterise known heritage assets and identify and characterise hitherto unknown archaeological remains, as well as to identify specific impacts of the Scheme and proposed mitigation for those impacts. The following tasks would be undertaken to complete this process:

- An archaeological desk-based assessment (DBA) to review the known archaeology and the results of any archaeological investigations within the

study area to fully understand the archaeological potential of the area and guide non-invasive survey recommendations;

- Geophysical survey within the boundary of the Scheme to identify and characterise any previously unknown archaeological remains, and assess the Scheme's impact;
- Evaluation trenching where necessary to further assess the significance of archaeological remains where non-intrusive survey was insufficient to do so;
- Statements of significance for the Registered Parks and Gardens at Wisley and Painshill, to identify significant characteristics of the assets and their settings and assess the impacts of the Scheme on these characteristics; and
- Setting assessments of heritage assets where the Scheme is considered to impact setting.

Vulnerability to major accidents and disasters

- 11.7.7. There is potential for man-made major accidents to affect the Scheme, and thus potentially result in harm to the historic environment resource. Major accident events largely include, but are not restricted to, major road traffic accidents. Other man-made risk may include chemical spillages which could directly affect above ground archaeological remains by damaging their fabric or buried archaeology remains by altering their condition and state of preservation. Due to the nature of archaeological remains within the Study Area, and their distance to the Scheme, the harm as a result of such accidents is considered to be low at this stage.
- 11.7.8. Disasters, which for the purpose of this section are deemed to be 'natural' disasters, e.g. major flooding events, are possible within the Study Areas, and therefore have the potential to pose harm to the Scheme and its historic environment resource. Flooding events, high winds, storm events or extreme drought would be considered to have a direct impact on the Scheme, as these could contribute to the partial or full erosion of archaeological remains, or substantially alter the conditions surrounding it, thus affecting their level of preservation.
- 11.7.9. A more detailed assessment of major accidents and disasters shall be considered in more detail in the following stages in the EIA process. No additional baseline data is required as part of such an assessment.

11.8. Proposed consultation

- 11.8.1. Consultation with the local planning authorities and Historic England has already taken place to discuss the Scheme options at the Option Selection Stage and potential for mitigation and archaeological fieldwork. Now that a preferred option for the Scheme has been identified, the local authority archaeologists will be consulted with regards to understanding known and unknown heritage assets, including assets identified since the original data was requested, the potential for and likely significance of unknown archaeological remains, and recommendations for further evaluation and appropriate mitigation of impacts.

- 11.8.2. Historic England will be consulted regarding the Scheme's impacts to designated heritage assets, including registered parks and gardens, listed buildings, and scheduled monuments.

11.9. Potential mitigation measures

- 11.9.1. Further investigations are necessary to fully inform the nature of mitigation measures necessary for the Scheme. Some mitigation measures may be designed into the final Scheme, including landscaping to screen visual impacts and dampen noise intrusions. Impacts to known and unknown archaeological remains may be mitigated through investigations designed to take into account the nature of the impacts as well as the character of the archaeological asset. Such investigations may include a programme of strip, map and record, area excavation, and/or watching briefs during construction activities. Additional mitigation measures may be identified during detailed design and consultation activities.

11.10. Assumptions and limitations

- 11.10.1. For the purposes of scoping, the following assumptions have been made:

- The Scheme will not be substantially altered prior to the production of the EIA;
- Any additional heritage assets identified through an update of HER data will be of local to regional importance, thus having a low to negligible value, per the methodology described above;
- No HER data was acquired as part of the assessment of overhead gantries along the M25 due to the nature of associated works. Should gantry upgrades require sub-surface interventions, new HER data will be acquired;
- Any previously unidentified archaeological remains identified through consultations and/or surveys completed for the EIA will be of local or regional importance, and have a low to negligible value, per the methodology described above; and
- Any construction compounds, soil storage, flood alleviation, habitat mitigation or other auxiliary works necessary for the completion of the Scheme will be restricted to within the study area and will avoid heritage assets of medium to very high value and would have at most a neutral to negligible adverse impact.

- 11.10.2. Limitations to the EIA scoping include the following:

- The compound locations, as well as areas for ecological mitigation and water management, have not yet been definitively confirmed, but will be located within the red line boundary of the Scheme. These auxiliary works have the potential to have both direct and indirect impacts on heritage assets; and
- The requirements for land identified as being required for replacement Common and SPA land are yet to be fully resolved and are subject to change during Scheme development. At this stage, possible locations within the study area have been included, however as no works are

currently proposed, assessing potential impacts arising from the Scheme on the replacement Common and SPA land has not been possible.

11.11. Conclusion

- 11.11.1. This Scoping Report has identified the planning policy and guidance under which impacts to cultural heritage will be addressed in the EIA. At this stage, impacts to have been scoped out of the assessment are:
- Those operational impacts on archaeological remains, as any archaeological assets impacted by the Scheme are anticipated to be fully removed before operation; and
 - The ten listed buildings identified in section 11.4 as these are deemed to have no potential to be affected following the assessment work undertaken at the Option Selection Stage.
- 11.11.2. Previous stages of the PCF process have identified the possibility of significant adverse effects on cultural heritage as a result of the Scheme. Further assessment is required to fully characterise and evaluate the known and potential heritage assets. A complete desk-based assessment, along with geophysical survey to identified archaeological sites, and assessments of setting significance for built heritage should be completed to aid in the assessment of impacts for the EIA.
- 11.11.3. Consultations with the local planning authority and Historic England are necessary to further inform the understanding of the heritage assets and the effects of the Scheme. Once the further assessments and consultation have been completed, a full understanding of the impacts to cultural heritage can be reported and a programme of mitigation developed.

12. Materials and Waste

12.1. Introduction

- 12.1.1. This chapter outlines the methodology that will be used to assess and identify the likely impacts of material resources and waste associated with the Scheme, during construction, demolition and excavation (CD&E) and operation.
- 12.1.2. The Scoping Report has been written in accordance with IAN 153/11 which provides guidance on the identification and assessment of impacts associated with the use of material resources and waste arisings for construction and improvement schemes.

12.2. Study area

- 12.2.1. The Scheme lies to the south-west of the M25 London Orbital motorway, within the county of Surrey.
- 12.2.2. With regards to material resources and waste, the study area extends outside of the Scheme area. For material resources, the study area includes the demand for key construction materials nationally. For waste, the study area includes the waste arisings and waste infrastructure capacity within the county of Surrey (with the exception of hazardous waste which is considered on a national level).

12.3. Planning and policy context

European directives

- 12.3.1. All European directives applicable to the Scheme have been transposed into national legislation. However, a number of legislative proposals on waste have been adopted as part of the Circular Economy Package (as supported by the Circular Action Plan), which focuses on “closing the loop of product lifecycles through greater recycling and re-use, and bring benefits for both the environment and the economy”. Regarding the Scheme, the relevant legislative proposals include:
- Proposed directive on waste;
 - Proposed directive on packaging waste;
 - Proposed directive on landfill; and
 - Proposed directive on electrical and electronic waste, on end-of-life vehicles, and batteries and accumulators and waste batteries and accumulators.
- 12.3.2. The following sections provide a summary of the legislation relevant to material resources and waste for the Scheme.

National legislation and policy

- 12.3.3. It should be noted that The National Planning Policy Framework does not contain specific waste policies and so it is not included below. The Waste Management Plan for England 2013 is summarised below which is considered as most relevant to the Scheme.

Environmental Protection Act 1990 (c. 43)

- 12.3.4. The Environmental Protection Act 1990 (c. 43) as amended in 1996 and 1999 implements integrated pollution control for the disposal of waste to air, land and water, including solid waste disposal.
- 12.3.5. As part of this, under Section 34, the Act imposes Duty of Care on anyone who produces, imports, keeps, stores, transports, treats or disposes of waste.
- 12.3.6. This will mean that Highways England and all contractors must take all reasonably practical steps to ensure that:
- Waste is consigned only to a registered waste carrier, licensed waste contractor, local authority waste collector or person dealing with waste in ways that are exempt from licensing;
 - Waste that is disposed of is accompanied by a detailed written description of the waste to ensure its safe handling, treatment and disposal (waste transfer notes are to be kept for a minimum of two years and hazardous waste consignment notes are to be kept for a minimum of three years);
 - Waste is securely contained to prevent it escaping to the environment;
 - Appropriate measures are taken to ensure that others involved in the handling and disposal of waste do so in accordance with the all applicable Regulations;
 - Copies of registration certificates should be obtained for all waste contractors and waste carriers used as part of the Scheme and it should be ensured that they are on the Environment Agency's 'Public Register of Waste Carriers, Brokers and Dealers'; and
 - Checks should be made on the final destination of each waste, ensuring that each waste disposal facility is licensed to accept the waste. Duty of Care audits of carriers and waste disposal facilities are advisable.
- 12.3.7. The generation of waste from the Scheme shall be managed in accordance with the Environmental Protection Act 1990 (c. 43) as amended in 1996 and 1999 and in accordance with good practice.

Clean Neighbourhoods and Environment Act 2005 (c. 16)

- 12.3.8. Chapter 16 of the Clean Neighbourhoods and Environment Act 2005 (c. 16) prescribes the correct transportation, collection, disposal and management of waste and prohibits fly tipping.

Waste (England and Wales) Regulations 2011 (SI 2011/988)

- 12.3.9. The Regulations 2011 (SI 2011/988), as amended in 2012 (SI 2012/1889) and in 2014 (SI 2014/656), transpose the Revised EU Waste Framework Directive (2008/98/EC) into English law and require organisations to manage waste in alignment with the waste hierarchy (see Figure 12.1), in order to prevent waste going to landfill.
- 12.3.10. Waste management contractors working on the Scheme will be required to provide evidence that the waste hierarchy has been applied. This evidence can be in the form of waste transfer notes and hazardous waste consignment notes, which themselves must be kept for two and three years, respectively.

The Hazardous Waste (England and Wales) Regulations 2005 (SI 2005/894)

- 12.3.11. The Regulations, as amended in 2009 (SI 2009/507), 2015 (SI 2015/1360) and 2016 (SI 2016/336) applies to all wastes listed as hazardous in the European Waste Catalogue (2000/532/EC) and the CLP (Classification, Labelling and Packaging) Regulation (EC 1272/2008). Hazardous waste will be produced throughout all lifecycle stages of the Scheme. Hazardous waste should be disposed of in accordance with the Regulations. including a hazardous waste consignment note.

Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 (SI 2013/3113)

- 12.3.12. The Regulations revoke the previous WEEE Regulations (2006 (SI 2006/3289), 2007 (SI 2007/3454), 2009 (SI 2009/2957) and 2010 (SI 2010/1155)) and have a key objective to reduce the amount of WEEE that goes to landfill. This is to be achieved by making producers responsible for the collection, treatment and recovery of WEEE, including the associated costs.
- 12.3.13. For the Scheme, all WEEE produced in the CD&E and operational phases must be segregated and managed separately from other wastes, with relevant paperwork provided as described above.

The Waste Batteries and Accumulators Regulations 2009 (SI 2009/890)

- 12.3.14. The Regulations, as amended in 2015 (SI 2015/1935), main requirements are that producers of batteries and accumulators must either take back waste batteries and accumulators, or fund the collection and recycling of them. The 2015 amendment removed several additional requirements, inclusive of the provision of operational plans and independent audit reports.
- 12.3.15. For the Scheme, all batteries produced in the CD&E and operational phases must be segregated and managed separately from other wastes.

The CLP (Classification, Labelling and Packaging) Regulation (EC 1272/2008)

- 12.3.16. The CLP Regulation (within the UK and EU) was introduced in a staggered manner between 1999 and 2015. It should be noted that within the UK and EU, the CLP Regulation, has replaced the Dangerous Substances Directive (67/548/EEC) and the Dangerous Preparations Directive (1999/45/EC). To summarise, the Regulation provides guidance on the application of the CLP criteria for hazards (physical, health and environmental). With specific reference to the Scheme, the Regulation should be used to support the classification of both waste and materials. All waste should be classified by a six-digit code, which must be recorded on all waste transfer notes and hazardous waste consignment notes for the movement of waste from the CD&E and operational phases of the Scheme.

Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) Regulations 2000 (SI 2000/1043)

- 12.3.17. The Regulations, as amended in 2000 (SI 2000/3359), require the safe disposal or decontamination of all equipment that contains polychlorinated biphenyls

(PCBs). Contaminated equipment containing over 5 litres or more of PCB substance or mixture is also covered by the Regulations. PCBs are often present in areas of historical industrial use.

The Environmental Permitting (England and Wales) Regulations 2016 (SI 2016/1154)

- 12.3.18. The Environmental Permitting Regulations 2016 (SI 2016/1154) replace the 2010 Regulations (SI 2010/675) (as amended in 2011 (SI 2011/2043), 2012 (SI 2012/630) and 2014 (SI 2014/255)). The Regulations put in place requirements to ensure that sites that produce certain materials and undertake certain activities (such as the storage, use or treatment of waste) have a permit or exemption from the regulator (i.e. the Environment Agency).
- 12.3.19. Permit or exemption details of all sites that manage waste from the Scheme will be checked to ensure waste is being managed legally.

Environmental Damage (Prevention and Remediation) Regulations 2009 (SI 2009/153)

- 12.3.20. The Regulations, as amended in 2010 (SI 2010/587), introduce obligations to ensure the polluter pays for any environmental damage caused. The Regulations are applicable to all economic activities and therefore cover businesses. The Regulations require caution to be taken when managing sites in order to prevent damage to water, land and biodiversity. Such damage could be caused by poor waste management practices and as such the generation of waste from the Scheme must be managed in accordance with all applicable legislation and policies and in accordance with good practice.

The Control of Asbestos Regulations 2012 (SI 2012/632)

- 12.3.21. The Regulations require notification to the appropriate authority of all notifiable asbestos works (as specified in the Regulations), the medical surveillance (from April 2015) and health records for employers dealing with asbestos, the provision of the correct equipment and training for working with asbestos; and the documentation of the method, storage and disposal of asbestos waste. Any waste containing asbestos (e.g. insulation or lagging) must be stored and disposed of, in suitable packaging to prevent fibre release, in line with the Regulations. All asbestos must be removed by a licensed contractor who has undergone the appropriate training for the removal of asbestos and must wear the appropriate Personal Protective Equipment (PPE). Written records must be kept of the workers and the likely level of exposure. The asbestos must only be disposed of at an appropriately permitted disposal site.
- 12.3.22. These regulations will be adhered to during the construction of the Scheme in order to minimise harm to human health due to asbestos exposure.

Waste Management Plan for England 2013

- 12.3.23. Defra drew on issues from the previous Waste Strategy for England (WS2000), the Waste Strategy for England (WS2007), European Directives and Legislation to create the Waste Management Plan for England 2013. The Plan continues to focus on the importance of driving waste management up the waste hierarchy (see Figure 12.1) and states the importance of considering the Government's ambition of achieving a zero waste economy. The Plan puts a strong emphasis

on waste prevention through making products using fewer natural resources. The targets outlined in WS2007 remain relevant, including the target to recover 70% of construction and demolition waste by 2020. This target shall be considered a minimum requirement the Scheme.

National Planning Policy for Waste 2014

- 12.3.24. The National Planning Policy for Waste is the formal replacement for Planning Policy Statement 10 (PPS10). It follows the principles set out in PPS10, which states that waste should be managed in line with the principles of the waste hierarchy. It is important to ensure that, where possible, waste production is minimised to reduce environmental impacts and to ensure an assessment is made of the local waste infrastructure type and capacities, to include, but not be limited to, an assessment of the local policies.

Waste Planning Practice Guidance 2015

- 12.3.25. The Planning Practice Guidance website details how to adhere to the National Planning Policy for Waste 2014. The guidance should be followed in order to satisfy the local planning authority that impacts introduced by a proposed development on the existing waste management facilities are acceptable and do not prejudice the implementation of the waste hierarchy (see Figure 12.1).

National Policy Statement for National Networks 2014

- 12.3.26. The National Policy Statement outlines of the importance of managing resources and wastes in order to prevent and minimise environmental impacts. The resource and waste management measures outlined in the 'Waste Management' chapter should be adhered to and considered throughout all stages of the Scheme. Management measures are inclusive of but not limited to, the implementation of the waste hierarchy (see Figure 12.1), the correct management of waste both on-site and off-site and ensuring the appropriate waste infrastructure for waste treatment and disposal.

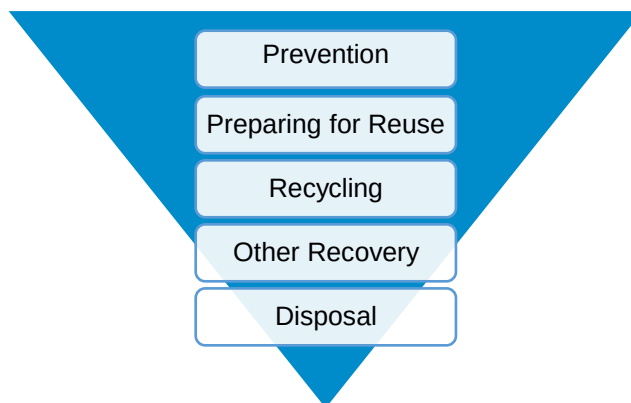
Regional policy

- 12.3.27. There are a number of overarching sustainability policies within the region of Surrey. The Surrey Waste Plan 2008, as amended in 2009, is most applicable to material resources and waste and consists of four development plan documents. The Plan, at the time of preparing this chapter, is being reviewed and updated in accordance with the requirements of the National Planning Policy Framework. The reviewed and updated Plan will cover the period 2018 - 2033.

12.4. Baseline conditions

- 12.4.1. The scoping report has been written in accordance with IAN 153/11 (2011), titled 'Guidance on the Environmental Assessment of Material Resources'. IAN 153/11 (2011) provides guidance on the identification and assessment of impacts associated with the use of material resources and waste arisings for construction and improvement schemes.
- 12.4.2. The Scheme will aim to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill as per the internationally recognised waste hierarchy, shown below in Figure 12.1.

Figure 12.1: Waste hierarchy



- 12.4.3. Desk based information will/has been gathered from the sources listed in Chapter 17 References in order to identify the existing baselines that may be impacted by the use of material resources and the generation of waste from the Scheme.
- 12.4.4. With regards to material resources associated with construction, demolition and excavation (CD&E), no baseline is available for material resources use on a regional level. As such, national demand for key construction materials has been collated which will be used as part of the PEIR and EIA to assess at a high-level, the impact of the Scheme on the national baseline.
- 12.4.5. With regards to CD&E waste associated with the Scheme, this will be primarily non-hazardous and inert, with small quantities of hazardous waste (e.g. associated with sealants, paints, solvents and contaminated soil). The baseline has been collated from regional data relating to the amount of waste that is produced/is estimated to be produced on a regional level. Surrey County Council issued a Scoping Statement in September 2016 which demonstrates their intent to calculate waste infrastructure capacity. This calculated capacity will be included as part of the baseline, if available at the time of assessment. As hazardous waste is often treated outside of the region within which it is produced (e.g. there are reported cases of hazardous waste produced in the south-east of England which has been transferred to the north-west of the country). The baseline has been collated from data relating to the amount of hazardous waste that is produced/is estimated to be produced and the infrastructure capacity at a national level. Both the baselines for waste that is produced/is estimated to be produced and the baseline for waste infrastructure capacity will be used as part of the PEIR and EIA to assess the impact of the Scheme.
- 12.4.6. Less impact is envisaged during the operational stage of the Scheme due to minimal material resource use (associated with planned/unplanned maintenance) and waste generation (through littering and planned/unplanned maintenance). Most of these wastes would likely be non-hazardous municipal type wastes (e.g. litter (paper, food, packaging, etc.)) and non-hazardous/inert and hazardous wastes from planned/unplanned maintenance (concrete, bituminous materials, waste electrical and electronic equipment (WEEE), oils, etc.). Data related to operational material resource use and waste generated by highway schemes is not readily available and as such will not be assessed quantitatively as part of the PEIR or EIA.

- 12.4.7. The baseline for materials resources and waste are presented in the following sections.

Material resources baseline

- 12.4.8. The national demand (baseline) will be estimated for the key construction materials associated with the development. Both the key construction materials and the national demand are shown below in Table 12-1. The national baseline has been sourced from data published by the Mineral Products Association, UK Steel and the Forestry Commission.
- 12.4.9. The key construction materials identified in the table are based on the main construction materials identified in the Bill of Quantities (or equivalent) from previous road improvement schemes. National demand data is drawn from data for both 2014 and 2015 (most readily available data). Given that the number, type and size of construction developments varies from year to year, the demands for construction materials also fluctuate. As such, this data should be considered representative.

Table 12-1: National Material Resources Baseline

Construction Material	National Baseline
	Tonnes per Annum (tpa)
Aggregate	225,000,000
Asphalt	24,000,000
Cement	13,000,000
Concrete*	81,000,000
Steel	10,448,200
Timber**	3,225,920

*Sum of concrete and other concrete related products.

**Converted from cubic meters (9,488,000 m³) using a conversion rate of 1 m³ to 0.34 tonnes.

Waste baseline

- 12.4.10. The amount of CD&E and hazardous waste arisings for Surrey will fluctuate year on year based on the number, type and size of construction projects underway. This in turn is heavily influenced by factors such as the economic situation, investment levels and legislative and policy variations. Thus, the representative baseline for CD&E waste arisings for the Scheme's construction period (2020 to 2022) has been calculated based on the estimated regional waste airings for 2015 (most recent available data), as shown in Table 12-2. The estimated regional waste arisings are presented in the Surrey County Council Planning Service: Annual Monitoring Report 2015/16.
- 12.4.11. The national baseline for hazardous waste arisings is taken from the Environment Agency Waste Integrator Tool (2017) filtered by hazardous construction waste. As with the non-hazardous/inert CD&E baseline this will fluctuate year on year based on the number, type and size of construction projects underway.

Table 12-2: Waste Arisings Baseline

Waste Stream	Tonnes per Annum (tpa)
CD&E (regional)	1,972,000
Hazardous (national)	197,710

Waste infrastructure baseline

- 12.4.12. As aforementioned, Surrey County Council have demonstrated their intent to calculate CD&E waste infrastructure capacity within the county. Once issued this will be included as part of the baseline, if available at the time of assessment.
- 12.4.13. The national hazardous waste infrastructure capacity, interpreted from the Environment Agency list of permitted facilities (2015), is presented below. It should be acknowledged that the hazardous waste infrastructure capacity baseline is not specifically for CD&E waste, as the facilities are likely to receive hazardous waste from multiple streams (i.e. municipal, commercial and industrial etc.) and therefore it is not possible to delineate this data further.

Table 12-3: National Hazardous Waste Infrastructure Baseline

Waste Stream	Tonnes per Annum (tpa)
Hazardous	9,521,042*

* Hazardous landfill capacity has been interpreted from the total capacity of permitted hazardous waste facilities nationally.

12.5. Potential impacts

- 12.5.1. Potential impacts are related to the potential impacts on the existing baseline (see section 12.4).
- 12.5.2. Receptors which have the potential to be impacted, with regards to material resources and waste, are defined as:
- The market for key construction materials, which are to be used throughout the Scheme, as shown in Table 12-1;
 - The waste arisings baseline - the amount of waste that is predicted to be produced during the CD&E phases of the Scheme, shown in Table 12-2; and
 - The predicted capacity of waste infrastructure - essentially the capacity of sites receiving, placing, treating, recycling, recovering and/or disposing of waste both regionally (non-hazardous and inert) and nationally (hazardous) which are anticipated to arise from the Scheme during the construction phase. As aforementioned, Surrey County Council issued a Scoping Statement in September 2016 which demonstrates their intent to calculate CD&E waste infrastructure capacity. Once issued this will be included as part of the baseline. The hazardous waste infrastructure capacity is shown in Table 12-3.
- 12.5.3. As aforementioned, less impact is envisaged during the operational stage of the Scheme (see section 12.4).

12.6. Proposed level and scope of assessment

- 12.6.1. A Detailed Assessment, as defined in IAN 153/11, is considered necessary to assess the impacts of material resources and waste arisings from the Scheme.
- 12.6.2. For the purposes of the assessment, material resources are defined as per the IAN 153/11 as *“the materials and construction products required for the construction, improvement and maintenance of the trunk road network. Material resources include primary raw materials such as aggregates and minerals, and manufactured construction products. Many material resources will originate off site, purchased as construction products, and some will arise on site such as excavated soils or recycled road planings.”* Whilst waste is defined in line with the Waste Framework Directive (2008/98/EC) as *“any substance or object which the holder discards or intends or is required to discard.”*
- 12.6.3. The following tasks are proposed to determine the impact of materials and waste from the Scheme:
- Ongoing review of relevant waste legislation, national, regional and local planning policies and guidance;
 - Review the proposed construction materials and materials quantities, and estimate the quantities and types wastes to be generated during CD&E. Operational wastes will be limited to ad hoc waste arisings and/or scheduled maintenance which cannot be quantified;
 - Identify and evaluate the impacts of the Scheme against the national demand for key construction materials, the regional CD&E waste arisings, the national hazardous waste arisings, the regional waste infrastructure capacity and the national hazardous waste infrastructure capacity; and
 - Identify opportunities to reduce, re-use, recover and/or recycle materials and wastes through a review of the proposed development (including proposed building materials, construction methods and design, where available) and in accordance with industry best practice.
- 12.6.4. Whilst not mandatory, it is best practice to produce a Site Waste Management Plan (SWMP) and a CEMP during each stage of the design. The SWMP should be updated throughout the Scheme development and include the anticipated types and quantities of waste generated on site, and actions undertaken to minimise waste generated on site. A CEMP is an overarching environmental management document. Its purpose is to identify stakeholder requirements, ensure compliance with legislation, and minimise potential adverse environmental impacts during construction via mitigation measures. It is proposed that both a SWMP and a CEMP be produced as part of the EIA.
- 12.6.5. Table 12-4 contains a summary of what is scoped in and out for materials resources and waste impacts in the EIA.

Table 12-4: Materials resources and waste topics scoped in and out of further assessment

Effects	Scoped in/out	Comment/Justification
Change in demand for key construction materials during the CD&E phases.	✓	Assessment required to identify and evaluate the impacts of the Scheme against the national demand for key construction materials during the CD&E phases.
Change in demand for key construction materials associated planned/unplanned maintenance with during the operational phase.	✗	Minimal impact is envisaged during the operational stage of the Scheme due to minimal material resource use (associated with planned/unplanned maintenance). Data related to operational material resource use by highway schemes is not readily available and as such will not be assessed quantitatively.
Change in baseline waste arisings during the CD&E phases.	✓	Assessment required to identify and evaluate the impacts of waste arisings from the Scheme against the waste arisings baseline during the CD&E phases. The baseline for CD&E waste will be on a regional level and the baseline for hazardous CD&E will be on a national level.
Change in baseline regional waste arisings during the operational phase.	✗	Minimal impact is envisaged during the operational stage of the Scheme due to minimal waste generation (through littering and planned/unplanned maintenance). Most of these wastes would likely be non-hazardous municipal type wastes during normal operation, and non-hazardous/inert and hazardous wastes from planned/unplanned maintenance. Data related to waste generated by highway schemes is not readily available and as such will not be assessed quantitatively.
Change in capacity of waste infrastructure during the CD&E phase.	✓	Assessment required to identify and evaluate the impacts of waste arisings from the Scheme against the regional waste infrastructure baseline during the CD&E phases. The baseline for CD&E waste will be on a regional level and the baseline for hazardous CD&E will be on a national level.
Change in capacity of regional waste infrastructure during the operational phase.	✗	Operational waste arisings from the Scheme will not be assessed as it is envisaged that this will be minimal and no data related to waste generated by highway schemes is readily available. Therefore, an assessment will not be made of the potential effect of the operational waste arisings on operational waste infrastructure.

12.7. Proposed assessment methodology

- 12.7.1. The general methodology and criteria described below will be applied during the EIA to determine the significance of the effects associated with material resources and wastes during the construction phase of the Scheme.
- 12.7.2. The magnitude of the anticipated material resources used and waste arisings generated by the Scheme will be determined by assessing the Bill of Quantities (or equivalent). The Bill of Quantities (or equivalent) will include (but is not limited to) information on the removal of excavated materials, and materials/equipment to be installed by sub-contractors.

- 12.7.3. There are a number of assumptions and limitations that will be applicable to the proposed assessment methodology as outlined below.
- 12.7.4. The results of the assessment will be tabulated and presented in the ES, as data will not be available within the timeframes of the PIER submission. Additional detail will be provided in the SWMP which will be prepared as an appendix to the ES, and will contain a breakdown of waste types.
- 12.7.5. The magnitude and sensitivity of the receptors affected by the Scheme based on sensitivity (waste infrastructure capacity) and magnitude (national demand for key construction materials and waste arisings) will be assessed. As noted above, operational material resource use and waste arisings cannot be estimated and as such a quantitative assessment will not be undertaken. Table 12-5 below summarises how magnitude and sensitivity effects have been defined with regard to material resources, waste arisings and infrastructure capacity. The criteria are based on Atkins' prior experience, given there is no specific industry assessment standard. Sensitivity of key construction materials cannot be assessed due to a lack of publicly available data. As baseline data relating to operational material resource use and waste generated by highway schemes is not readily available, it will not be assessed quantitatively for significance as part of the EIA.

Table 12-5: Criteria for classifying the magnitude of environmental effects

Level	Sensitivity Criteria	Magnitude Criteria
High	The Scheme meets one of more of the following criteria: - High volumes of waste generated such that it may have a high impact on estimated CD&E waste infrastructure within the regional study area (greater than 10% of the regional baseline); and - High volumes of hazardous waste generated such that it may have a high impact on estimated hazardous waste infrastructure within the national study area (greater than 1% of the national baseline).	The Scheme meets one of more of the following criteria: - Significant volumes of key construction materials required such that it has a high impact on current market demand, greater than 10% of the national baseline (for any one material); - Generation of large volumes of CD&E waste, greater than 10% of the regional baseline; and - Generation of large volumes of hazardous waste, greater than 1% of the national baseline.
Medium	The Scheme meets one of more of the following criteria: - Moderate volumes of waste generated such that it may have a moderate impact on estimated CD&E waste infrastructure within the regional study area (greater than or equal to 5% but less than 10% of the regional baseline); and - Moderate volumes of hazardous waste generated such that it may have a moderate impact on estimated hazardous waste infrastructure within the national study area (greater than or equal to 0.5% but less than 1% of the national baseline).	The Scheme meets one of more of the following criteria: - Moderate volumes of key construction materials required such that it has a moderate impact on current market demand, greater than or equal to 5% but less than 10% of the national baseline (for any one material); - Generation of medium volumes of CD&E waste, greater than or equal to 5% but less than 10% of the regional baseline; and - Generation of moderate volumes of hazardous waste, greater than or

Level	Sensitivity Criteria	Magnitude Criteria
		equal to 0.5% but less than 1% of the national baseline.
Low	The Scheme meets one of more of the following criteria: • Low volumes of waste generated such that it may have a low impact on estimated CD&E waste infrastructure within the regional study area (greater than or equal to 1% but less than 5% of the regional baseline); and • Low volumes of hazardous waste generated such that it may have a low impact on estimated hazardous waste infrastructure within the national study area (greater than or equal to 0.1% but less than 0.5% of the national baseline).	The Scheme meets one of more of the following criteria: • Low amounts of key construction materials required such that it has a moderate impact on current market demand, greater than or equal to 1% but less than 5% of the national baseline (for any one material); • Generation of low volumes of CD&E waste, greater than or equal to 1% but less than 5% of the regional baseline; and • Generation of low volumes of hazardous waste, greater than or equal to 0.1% but less than 0.5% of the national baseline.
Negligible	The Scheme meets one of more of the following criteria: • Negligible volumes of waste generated such that it may have a negligible impact on estimated CD&E waste infrastructure within the regional study area (less than 1% of the regional baseline); and • Negligible volumes of hazardous waste generated such that it may have a negligible impact on estimated hazardous waste infrastructure within the national study area (less than 0.1% of the national baseline).	The Scheme meets one of more of the following criteria: • Negligible amounts of key construction materials required such that it has a negligible impact on current market demand, less than 1% of the national baseline (for any one material); • Generation of negligible volumes of CD&E waste, less than 1% of the regional baseline; and • Generation of negligible volumes of hazardous waste, less than 0.1% of the national baseline.

12.7.6. The assessment of significance combines the magnitude and sensitivity of the environmental effects to determine whether the effects are major, moderate, minor, negligible or no change, as shown in Table 12-6. Very large to moderate effects are considered to have the potential to be significant, while slight and neutral effects are not considered significant.

12.7.7. Throughout the design process and following the assessment of significance, mitigation measures associated with material use and waste generation will be identified. It is likely that the mitigation measures will incorporate the following themes:

- Management of waste within the context of the waste hierarchy;
- Management of the waste in accordance with local and national policy and legislation and, where applicable, guidance documents;
- Safe management of the waste generated, as determined by its physical and chemical characteristics (e.g. bulky or hazardous wastes);
- Potential environmental effects or human health risks associated with the waste arisings throughout the lifecycle of the Scheme; and

- Use of materials and management of waste in accordance with the Proximity Principle, which promotes the procurement of materials and management of wastes locally.

12.7.8. The overall aim of the process of identifying mitigation measures is to achieve a high reuse, recycling and recovery rate throughout all phases of the Scheme. Achieving this will minimise environmental burdens in terms of:

- Impacts to the environment and human health;
- Energy and carbon impacts;
- The overall sustainability of the Scheme; and
- Reduce costs associated with excessive material procurement and waste storage, collection and disposal.

Vulnerability to major accidents and disasters

12.7.9. A review of major accidents and disasters that could affect the Scheme has been undertaken. These are not considered to have a significant effect on material resources and waste. Mitigation measures identified in Section 12.9 would be used to manage any impacts resulting from major accidents and disasters.

12.8. Proposed consultation

12.8.1. It proposed that Surrey County Council, as the author/owner of the Surrey Waste Plan 2008 (as amended in 2009) will be consulted on the proposed assessment methodology post submission of the PIER. Consultation is also proposed with the Environment Agency.

12.9. Potential mitigation measures

12.9.1. Although every effort will be made (through the design process) to maximise resource efficiency, it is inevitable that waste will be generated during each phase of the Scheme. This will have an impact on the regional waste infrastructure and the regional quantity of waste arisings.

12.9.2. The design of the development will ensure that wastage is minimised throughout its lifecycle. During the design stage, the potential effects will be addressed using the following mitigation measures which will then follow through to the construction phase:

- Waste will be designed out where possible;
- Opportunities to use waste as a resource will be sought where practicable; and
- Where waste re-use and recovery is not possible, waste will be disposed of in a way that is least damaging to the environment and to human health (i.e. in accordance with the waste hierarchy, shown in Figure 12.1).

12.9.3. Further details on mitigation measures will be provided as part of the PIER and the ES.

12.10. Assumptions and limitations

12.10.1. There are a number of assumptions that will be applicable to the proposed assessment methodology as outlined below:

- Should a detailed construction programme not be available, it will be assumed that material resource use and waste generation will be spread equally across the construction period;
- Any new/unused equipment will be fed back into the supply chain for use on alternative schemes and as such will be excluded;
- All material quantities will be converted into tonnes using industry standard conversion rates;
- All material resources will be grouped according to main material types, as shown in Table 12-1;
- Wastage rates, published by the Construction Resources and Waste Platform, will be applied to all material resource tonnages in order to determine the likely waste arisings (offcuts, damaged and surplus materials);
- An additional 1% will be added to the total waste arisings (excluding soil, aggregate and granular fill) to account for packaging waste, based on experience from previous projects. It will be assumed that 0.01% of all packaging waste arisings will be hazardous in nature (e.g. associated with sealants, paints and solvents); and
- Hazardous waste arisings will comprise of oils, sealants, paints, solvents and contaminated soil. Contaminated soil will be considered separately.

12.10.2. The key limitations that will be applicable to the proposed assessment methodology are outlined below:

- The availability of data within the timeframes of the PIER and ES submission (i.e. the availability of Bill of Quantities (or equivalent)); and
- The issue of waste infrastructure capacity by Surrey County Council in advance of the ES submission.

12.11. Conclusion

12.11.1. Table 12-6 below outlines the potential issues likely to occur as a result of the Scheme during the construction and operation phases for each topic. Where potential issues have been identified these have been scoped in.

12.11.2. As noted above, less impact is envisaged during the operational stage of the Scheme due to minimal material resource use (associated with planned/unplanned maintenance) and waste generation (through littering and planned/unplanned maintenance) and as such this has been scoped out and will not be assessed as part of the EIA.

12.11.3. As part of the ES, a Detailed Assessment, as defined in IAN 153/11 (2011), will be undertaken to assess the potential issues which have been scoped in.

Table 12-6: Potential issues

Effects	Construction	Operation	Comments
Waste	✓	✗	Design to ensure wastage is minimised throughout lifecycle. Waste to be used as a resource where practicable and designed out where possible.
Material resources	✓	✗	Assessment to identify and evaluate the impacts of the Scheme against national demand for key construction materials and raw material resources.

Key: ✓ = potential impact likely; ✗ = no potential impact likely

13. People and Communities

13.1. Introduction

13.1.1. As per the guidance set out in IAN 125/15 and in order to promote efficient reporting, DMRB Vol 11, Section 3, Parts 6 (Land Use), 8 (Pedestrians, Cyclists, Equestrians and Community Effects) and 9 (Vehicle Travellers) will be incorporated into this single chapter titled 'People and Communities'. The assessment reported in this chapter will identify the potential effects of the Scheme on:

- Private dwellings;
- Community assets;
- Local businesses;
- Agricultural land;
- Development land;
- Non-motorised users (NMU) - pedestrians, cyclists and equestrians; and
- Vehicle travellers (VT) - drivers and passengers of both public and private vehicles.

13.2. Study area

13.2.1. In the absence of prescriptive guidance for People and Communities assessments, it is proposed to assess likely effects within a study area comprising land within the Scheme's Red Line Boundary plus a 500m buffer extending beyond this boundary. Using professional judgement and knowledge of the scheme, this threshold is considered likely to capture all relevant effects resulting from the scheme. However, the extent of this study area may be increased during the assessment process subject to its findings and the findings of other environmental assessment topics which may inform the People and Communities assessment, such as landscape and visual impact, transport, noise and vibration and air quality.

13.3. Planning and policy context

National Planning Policy

13.3.1. There is no specific legislation or planning policy relating to 'people and communities' assessment, however national and local policy provides direction on relevant issues, particularly transport and land use.

National Policy Statement for National Networks (NPSNN) December 2014

13.3.2. The NPSNN sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks and the policy against which decisions on major road and rail projects will be made.

13.3.3. The Government's vision and strategic objectives for the national networks include improving overall quality of life, journey quality, reliability and safety and linking up communities. junction improvement is cited as a measure which will be

used to enhance the existing national road network towards this vision (paragraph 2.23).

- 13.3.4. The NPSNN establishes the expectation that delivery of new schemes will improve quality of life and avoid and mitigate environmental and social impacts in line with the principles set out in the NPPF and the Government's planning guidance (paragraph 3.3). Schemes will also be expected to improve accessibility and inclusivity and reduce community severance, to contribute to a network that provides a range of opportunities and choices for people to connect with jobs, services and friends and family (paragraph 3.19).
- 13.3.5. Although it does not provide specific guidance for people and communities impacts, the NPSNN outlines the approach to land use which is of relevance to this assessment. Applicants should identify existing and proposed land uses, including best and most versatile agricultural land, in the vicinity of the Scheme and the likely effects on these (paragraphs 5.165 and 5.168). Access to high quality open spaces, Public Rights of Way, the countryside and opportunities for sport and recreation can be a means of providing mitigation and/or compensation requirements for developments (paragraphs 5.162 and 5.184).

National Planning Policy Framework (NPPF) March 2012

- 13.3.6. The NPPF establishes national planning policy to achieve sustainable development, through themes which include promoting sustainable transport, supporting a prosperous rural economy and promoting healthy communities, with a presumption in favour of sustainable development.
- 13.3.7. To support a prosperous rural economy, planning should promote the sustainable growth and expansion of businesses and enterprise in rural areas, the diversification of agricultural and land-based rural businesses, and the retention and development of local services and community facilities (paragraph 28).
- 13.3.8. The NPPF states that the system needs to be balanced in favour of sustainable transport modes to give people 'a real choice about how they travel' (paragraph 29). Encouragement should also be given to solutions which reduce congestion (paragraph 30). Paragraph 75 includes a requirement that planning policies should protect and enhance Public Rights of Way (PRoWs) and access.
- 13.3.9. The NPPF emphasises the need to manage patterns of growth by making the fullest possible use of sustainable transport modes including public transport, walking and cycling. Chapter 4 of the NPPF sets out how transport should be considered within the context of planning decisions and sustainable development. This policy encourages solutions that seek to reduce congestion, greenhouse gas emissions and serve to facilitate the use of sustainable transport. Furthermore, local planning authorities (LPAs) are required to identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice.
- 13.3.10. Chapter 8 'Promoting Healthy Communities' describes how access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and wellbeing of communities.
- 13.3.11. Social interaction, health and inclusivity are priorities for communities. Planning should thus promote safe, accessible environments and use of public areas and

shared space, and protect valued facilities and services including open space, sports venues, public houses and local shops (Paragraphs 69-70).

- 13.3.12. Paragraph 75 states policies should protect and enhance public rights of way (PRoW) and access. Local authorities should seek opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails.
- 13.3.13. The National Planning Policy Framework (NPPF)¹³³ and National Planning Practice Guidance (NPPG)¹³⁴, 2014 do not deal with issues of farm viability, focusing instead on the protection of BMV land.

Planning Act 2008

- 13.3.14. The Planning Act 2008 sets out, inter alia, the DCO process and land acquisition procedures for NSIPs. This M25 project at junction 10 would require the acquisition of areas of Registered Common Land and other Access Land as defined under the Countryside and Rights of Way Act 2000. Such land is defined as Special Category Land.
- 13.3.15. The compulsory purchase of land is covered in Sections 122-132 of the Planning Act, of which Sections 122 and 131 are relevant to compulsory acquisition of Special Category Land. Section 132 covers the compulsory acquisition of rights over Special Category Land.
- 13.3.16. The identification and selection of appropriate locations for use as Replacement Land must satisfy the definition given in the 2008 Planning Act:

“replacement land” means land which is not less in area than the order land and which is no less advantageous to the persons, if any, entitled to rights of common or other rights, and to the public.”

Countryside and Rights of Way Act 2000

- 13.3.17. The Countryside and Rights of Way Act 2000 (CRoW) regulates all Public Rights of Way (PRoW) and ensures access to them. It requires local highway authorities to publish a Rights of Way Improvement Plan (RoWIP), which should be reviewed every 10 years. The Act also obliges the highway authority to recognise the needs of the mobility impaired when undertaking improvements.
- 13.3.18. There is guidance within the Surrey County Council Rights of Way Improvement Plan (2014) which sets out how PRoW meet the present and likely needs of the public; the opportunities provided by local rights of way for exercise and other forms of recreation and enjoyment; and the accessibility of local rights of way to blind or partially sighted person and others with mobility issues.
- 13.3.19. The document also identifies that built development can be a threat to the rights of way network but it also offers opportunities for enhancements and creation of new routes. The document also states that high levels of road traffic have had negative impacts on users across PRoW across Surrey and that the County Council will use its powers under the Highways Act to create and divert public rights of way to improve connectivity.

The Commons Act 2006

- 13.3.20. The Commons Act 2006 (the Act) protects Common Land and town or village greens. This includes reinforcing existing protections against abuse,

encroachment and unauthorised development. It recognises that the protection of Common Land has to be proportionate to the harm caused and that some specified works can be carried out without the need for consent. The Act provides for the release of land providing there is a provision of suitable “replacement land”.

Local Policy

- 13.3.21. Local policy which has indirect relevance for people, community use and enjoyment are set within adopted local planning policy for Elmbridge Borough Council and the Borough of Guildford.

Elmbridge Borough Council

- 13.3.22. The Elmbridge Core Strategy (2011) include spatial policy CS10 ‘Cobham, Oxshott, Stoke D'Abernon and Downside’ promotes improved access to and within the area for pedestrians and cyclists, public transport users and those with impaired mobility.
- 13.3.23. Policy CS16 ‘Social and Community Infrastructure’ resists the loss of existing social and community facilities or sites.
- 13.3.24. Policy CS25 ‘Travel and Accessibility’ seeks the protection of existing footpaths, cycleways and bridleways; and promotes the delivery of new cycling and walking schemes including development that increases permeability and connectivity within and outside the urban area.
- 13.3.25. The Elmbridge Local Plan Development Management Plan (2015) policy DM19 ‘Horse-related uses and development’ supports proposals to extend and or enhance the recreational value of the bridleway network. Policy DM20 ‘Open Space and views’ promotes the protection of these spaces.
- 13.3.26. Elmbridge have commenced reviewing their Local Plan and a Strategic Options Consultation took place from December 2016 to February 2017. The document set out in para 2.16 that they are aware of ‘hot-spots’ in the road network and at junctions across the Borough and this will be a key issue for any new Local Plan.
- 13.3.27. A Consultation on Preferred approach to Spatial Strategy Policies - including Site Allocations and Designations is expected shortly and it is anticipated that the Local Plan will be adopted in September 2018 after an Examination in Public.

Borough of Guildford

- 13.3.28. In the Borough of Guildford saved policies Local Plan (2003) policy M6 ‘Provision for cyclists and pedestrians’ promotes safe and accessible routes for pedestrians and cyclists and encourage increase use.
- 13.3.29. Policy R1 ‘Loss of Land and Facilities for Sport and Recreation’ resists the loss of land and buildings used for or potential for recreation purposes. Policy R5 ‘Protection of Open Space’ seeks to protect existing open spaces in the borough.
- 13.3.30. Policy CF2 ‘Loss of Community Facilities’ resists the loss of community buildings.
- 13.3.31. A new Local Plan for Guildford has been consulted on and a Proposed Submission Local Plan has been produced. A Proposed Submission Local Plan: strategy and sites 2017 consultation then took place from 9 June to 24 July 2017 and it is anticipated that an Examination in Public will be held between April and July 2018.

- 13.3.32. Traffic congestion and junction 10 of the A3/M25 is specifically referenced in the Borough of Guildford Proposed Submission Local Plan: strategy and sites June 2017, in paragraph 2.14a of the Transport and Accessibility section.

Woking Borough Council

- 13.3.33. Woking Borough Council's (WBC) Core Strategy was adopted in October 2012.
- 13.3.34. Policy CS17: 'Open space, green infrastructure, sport and recreation' identifies that development involving the loss of open space will not be permitted unless alternative and equivalent or better provision is made available in the vicinity or the development is directly related to the enhancement of the open space.
- 13.3.35. Policy CS18 'Transport and accessibility' sets out that WBC supports proposals that deliver improvements and increased accessibility to cycle, pedestrian and public transport networks and interchange facilities, ensuring that changes made to transport infrastructure or increase in road vehicle usage will not have an adverse effect on the integrity of an SPA, SAC or Ramsar site.
- 13.3.36. Policy CS19 'Social and community infrastructure' resists the loss of existing social and community facilities or sites unless the Council is satisfied that there is no identified need for its original purpose and that it is not viable for any other social or community use, or adequate alternative facilities will be provided in a location with equal (or greater) accessibility for the community it is intended to serve, there is no requirement from any other public service provider for an alternative facility that could be met through change of use or redevelopment.
- 13.3.37. Policy CS21 'Design' seeks proposals which should be designed in an inclusive way to be accessible to all members of the community, regardless of any disability and to encourage sustainable means of travel.
- 13.3.38. Within the Development Management Policies Development Plan Document (October 2016), Policy DM1 'Green Infrastructure Opportunities' identifies that the Council supports (i) the creation of footpaths and 'cycle greenways' and (ii) the provision of new green infrastructure assets within the Green Belt.
- 13.3.39. Policy DM3 'Facilities for outdoor sport and outdoor recreation' identifies that opportunities should be taken to connect to and enhance the surrounding Green Infrastructure Network.
- 13.3.40. Policy DM5 'Environmental pollution' seeks proposals should ensure that there will be no unacceptable impacts on (i) Air quality; (ii) Surface and ground water quality; (iii) Land quality and condition; and (iv) Health and safety of the public.
- 13.3.41. Policy DM17 'Public realm' seeks development which creates or contribute to a safe, attractive, high quality, inclusive and legible public realm which contributes to local character and which encourages appropriate levels of activity and social interaction.

13.4. Baseline conditions

Private Dwellings

- 13.4.1. In the vicinity of the Scheme, residential properties are found in the main settlement of Cobham and in the smaller hamlets of Elm Corner, Hatchford, Ockham, Ripley and Wisley. In addition, there are a number of isolated

properties and farms within 500m of the Scheme, including within Wisley Common, along Redhill Road, and to either side of the A3 north of the M25.

Community Assets

13.4.2. Within the study area there are community assets, including the following:

- Ockham and Wisley Commons;
- Open Access Land⁶⁴;
- Painshill Park (Grade I Listed);
- RHS Wisley Gardens (Grade II* Listed);
- Heyswood Girl Guide campsite;
- Birchmere Scout campsite; and
- Feltonfleet School.

Local Businesses

13.4.3. Initial desk based research has identified the following potential business receptors. This list is not intended to be exhaustive and will be refined as part of the assessment process:

- Surrey Wildlife Trust, Pond Farm;
- Ockham Bites Café; and
- Silvermere Equestrian Centre.

13.4.4. A range of organisations, institutions or charities with operational nature similar to that of businesses are known to operate in the area around the Scheme, including:

- Heyswood Girl Guide Campsite;
- Birchmere Scout campsite;
- Painshill Park;
- RHS Garden Wisley; and
- Feltonfleet School.

13.4.5. These facilities are in private ownership but are operated as charities. The principle function is to provide a public service and they are not for profit and therefore, they will be considered under the Community Assets assessment section.

13.4.6. It is also recognised that a number of farms which operate as businesses are located in the study area. These will be assessed within the agricultural land assessment section.

⁶⁴ The Countryside and Rights of Way Act 2000 (CROW Act) normally gives a public right of access to land mapped as 'open country' (mountain, moor, heath and down) or Registered Common Land.

Agricultural Land

- 13.4.7. The heaths and woodland around junction 10 are classified as 'other land primarily in non-agricultural use', in accordance with Natural England's Agricultural Land Classification (ALC)⁶⁵.
- 13.4.8. Land between Ockham junction and Cobham is shown as Grade 3 (good to moderate quality) and Grade 4 (poor quality).
- 13.4.9. It is considered that none of the affected land is likely to be of Best Most Versatile (BMV) quality.
- 13.4.10. There are a number of farms in the area, including Pond Farm, where the Surrey Wildlife Trust are based. Surrey Wildlife Trust graze cattle on Wisley Common.

Development Land

Borough of Guildford

- 13.4.11. M25 junction 10 is located within the Borough of Guildford, which extends to the south and west. Within the study area there is a relevant site allocation from the emerging Local Plan (Examination in Public will be held between April and July 2018), a planning consent in the village of Ripley and two planning consents at the RHS Wisley site as part of their Major Investment Programme. Details are provided in Table 13-1.

Table 13-1: Borough of Guildford Development Land

Application location and reference	Description of proposed development
Land at former Wisley Airfield (Site allocation A35 in the Proposed Submission Local Plan: strategy and sites 2016) A planning application was submitted for a development of this size (Planning ref. 15/P/00012) and refused on 8th April 2016. This application is currently at appeal and due to be determined in early 2018.	This is a residential led mixed use development, allocated for: Approximately 2000 homes (C3), including some specialist housing and self-build plots, approximately 100 sheltered/extra care homes (C3 use), 8 Traveller pitches, approximately 1,800 m2 of employment floor space (B1a), approximately 2,500 m2 of employment floor space (B2/B8), approximately 500 m2 of comparison retail (A1), approximately 600 m2 of convenience retail (A1), approximately 550 m2 services in a new local centre (A2 -A5), approximately 500 m2 of community uses in a new local centre (D1), a two form entry primary school (D1), and a secondary school (D1) (four form entry, of which two forms are needed for the housing on the site and two for the wider area).
Land to the East of South Cottage, White Horse Lane, Ripley, GU23 6BB Planning ref. 16/P/00608, refused on 22 June 2016 and appeal allowed subject to conditions 23 Aug 2017	Outline planning application for the demolition of existing petrol filling station, car sales buildings and dilapidated workshops and the construction of up to 26 residential units to the rear and 2 retail/commercial units on the High Street frontage (for flexible A1, A2, A3 or A4 use) and associated car parking and landscaping all matters reserved except access.
Royal Horticultural Society Gardens, Wisley Lane, Wisley, Woking, GU23 6QS	Erection of new part single-storey part two-storey building accommodating retail, entrance and visitor facilities and alterations to the car parking and hard

⁶⁵ NE. 2010. Agricultural Land Classification map London and the South East (ALC007). [ONLINE] Available at: <http://publications.naturalengland.org.uk/publication/141047?category=5954148537204736>. [Accessed 27th January 2016]

Application location and reference	Description of proposed development
Planning ref. 16/P/01080, granted 30 September 2016	and soft landscaping and following the demolition of the existing plant centre, the extensions to the Laboratory building, toilet blocks, Aberconway Cottage and part of Aberconway House.
Royal Horticultural Society Gardens, Wisley Lane, Wisley, Woking, GU23 6QS Planning ref. 16/P/000976, granted 30 September 2016	Demolition of existing buildings and erection of a two-storey building accommodating science, education, research and restaurant facilities, associated landscaping including a landscape bund and other works associated with the development.

Elmbridge Borough Council

- 13.4.12. The area to the north, east and south of junction 10 is within the Elmbridge Borough Council administrative area. Within Elmbridge there are some relevant planning applications, planning consents and a site identified in a site allocation document in an emerging Local Plan which has not been formally adopted. This adoption is likely to be in September 2018. Details are provided below in Table 13-2.

Table 13-2: Elmbridge Borough Council Development Land

Application location and reference	Description of proposed development
Former San Domenico Restaurant Planning Ref. 2017/0524 (validated 21st March 2017)	Demolition of existing main building and the construction of the new petrol filling station (Sui Generis) with ancillary convenience store (Use A1) and food to go outlet (Use Class A5), 4 no. pump islands, canopy, underground tanks, revisions to vehicular access, parking and circulation arrangements, landscaping and associated works.
Painshill Farm, Portsmouth Road, Cobham Surrey KT11 1DN Planning Ref. 2016/4204 (validated 27th February 2017)	Redevelopment of the site to provide a 70 bed care home with integrated communal and support facilities, landscaped residents' gardens, staff areas, refuse storage and parking following demolition of existing houses.

- 13.4.13. The tables will be updated as part of the assessment and will also include any relevant potential Development Land within Woking Borough Council to the north if applicable.

Non-Motorised Users

- 13.4.14. Non-Motorised Users (NMUs) include pedestrians, cyclists, and equestrians. There are numerous existing PRow and permissive or informal NMU routes within 1 km radius of junction 10, some of which cross or interact with the A3 and M25 corridors. In addition, people have the right to roam on the Common Land and Access Land. The impact assessment will, in particular, consider likely effects on formal PRow identified within the Surrey County Council Rights of Way interactive map.

Community Severance for Non-Motorised Users

- 13.4.15. Several existing PROW have crossing points via pedestrian overbridges that span the A3 and the M25. However, the A3 and the M25 are barriers to movement for NMUs and local journeys and as a result, severance issues are currently experienced. These include NMU routes on the junction 10 gyratory itself and the crossing of the A3 just to the north of the junction both which are unattractive for users. To the east of the junction the next crossing of the M25 is some way distant which deters people from accessing PROW and land on either side of the motorway.

Vehicle Travellers: View from the road

- 13.4.16. The M25 junction 10/A3 interchange Improvements are located within the Wisley and Ockham Commons, and are located close to the Grade I Listed Painshill and the Grade II* Listed RHS Wisley Registered Parks and Gardens.
- 13.4.17. The study area contains varying degrees of screening elements along the M25 and A3 that obscure or block the views completely, with junction 10 surrounded by mature vegetation consisting of heathland, scrub, hedgerows, trees and woodlands.

Vehicle Travellers: Driver stress

- 13.4.18. There are also two Strategic Roads in the vicinity of the Scheme:
- A3; and
 - M25.
- 13.4.19. The M25 provides a continuous orbital route around Greater London. It carries high volumes of traffic which can cause disruption and delays to the surrounding road network particularly when emergency closures and lane closures are imposed. The south-west quadrant of the M25 is one of the busiest sections of the motorway network and regularly experiences severe congestion.
- 13.4.20. The probability of experiencing congestion in the peak period is more than 80% in the south-west quadrant of the M25. Average speed at peak times on the M25 is as low as 31-40 mph west of junction 10 and 41-50 mph to the east. The south-west quadrant is in the top 10 percent nationally in terms of vehicle hour delay.
- 13.4.21. The A3 also supports a bus route and bus stops. The 715 Stagecoach bus route travels from Kingston to Guildford via Wisley, hourly, Monday–Saturday. On Sundays and public holidays the service run every 90 minutes.
- 13.4.22. There are a number of local roads in the vicinity of the Scheme, including but not limited to:
- Portsmouth Road;
 - Ockham Road;
 - Wisley Lane;
 - Elm Lane;
 - Hatch Lane;

- Old Lane;
- Pointers Road;
- Redhill Road;
- Byfleet Road; and
- A245.

13.5. Potential impacts

Private Dwellings: Land Take and Severance

- 13.5.1. It has been identified that the access to one or more private dwellings (subject to investigation) are within the Scheme boundary. The construction and operation of the Scheme, subject to design, has the potential to directly impact on private dwellings resulting in a land take effect or alterations to access which may result in a severance effect.

Private Dwellings: Amenity

- 13.5.2. The Scheme has the potential to result in nearby residential receptors experiencing a combination of amenity effects such as those relating to traffic, visual, air quality or noise during both construction and operation.

Community Assets: Land Take and Severance

- 13.5.3. Common Land from Ockham Common and Wisley Common and Access Land will be required to implement the Scheme, resulting in land take effects. Some of this land will be required temporarily during construction and then returned to public use. Some land will be required permanently.
- 13.5.4. Temporary and permanent land take will be required from Painshill Park and RHS Gardens Wisley.
- 13.5.5. The Scheme will also affect access arrangements to: RHS Gardens Wisley; Heyswood Girl Guide campsite; Birchmere Scout campsite; and Feltonfleet School, resulting in severance effects. These receptors may experience alteration to severance during construction and operation of the Scheme, due to changes in access arrangements.

Community Assets: Amenity

- 13.5.6. Users of community assets within the study area may experience changes in amenity linked to a combination of visual, noise, vibration, air quality, or traffic effects as a result of the Scheme during construction and operation. This section will report the likely impact on amenity for users of:
- Painshill Park (Grade I Listed);
 - RHS Wisley Gardens (Grade II* Listed);
 - Heyswood Girl Guide campsite;
 - Birchmere Scout campsite; and
 - Feltonfleet School.

- 13.5.7. Users of Painshill Park and Wisley Gardens may be expected to be ‘transitory’, not exposed to altered amenity for prolonged lengths of time, and may be less vulnerable to changes in amenity. User groups undertaking activities such as camping in the Heyswood Girl Guide campsite or Birchmere Scout campsite may experience changes in amenity for sustained periods. Schools are likely to be particularly sensitive to some amenity effects, such as noise.
- 13.5.8. The likely receptors for Common Land and Open Access Land community assets are NMUs. In order to avoid potential double counting, the impact of the Scheme on NMUs within the Common Land and Open Access Land will be assessed within the NMU impact assessment only.

Local Businesses

- 13.5.9. A range of business uses have been identified within 500m of the Scheme. Notable examples include the Ockham Bites Café which operates inside the Scheme boundary, which is likely to experience some land take, and Silvermere Equestrian Centre, which makes use of land within the Scheme boundary and study area.
- 13.5.10. Effects on the various not for profit organisations that are identified with the Baseline are considered in the Community Assets section and identified agricultural businesses are considered within the Agricultural Land section.

Agricultural Land

- 13.5.11. Agricultural land is potentially required either temporarily or permanently to enable the construction of the Scheme.
- 13.5.12. Construction and operation of the Scheme, particularly in respect of any replacement land provided and altered access arrangements, has the potential to affect the operation of farm businesses.

Development Land

- 13.5.13. The Scheme has the potential to impact on the pending planning applications at the former San Domenico Restaurant on the A3 and the Painshill Farm site which are within the Scheme boundary.
- 13.5.14. The Scheme has the potential to directly impact on the Guildford strategic proposed site allocation “A35 Land at former Wisley Airfield Ockham” and the associated proposed access, located at Ockham Park junction. A planning application for the site is currently at appeal.

Non-motorised users: Journey length & Local Travel Patterns

- 13.5.15. The Scheme has potential to temporarily or permanently affect a range of Common Land and Open Access land where members of the public are free to roam, and a number of Public Rights of Way, including existing crossings points over the A3 and M25 and footpaths associated with local roads. Existing routes may be subject to Land Take, resulting in temporary and/or permanent route stopping up or diversion.
- 13.5.16. In the wider study area, construction traffic associated with the Scheme has the potential to increase traffic volume, particularly HGV trip numbers, in the

surrounding local highway network. This has potential to make road crossing more difficult, dangerous, intimidating, or time consuming for NMUs.

- 13.5.17. Changes in journey time and journey distance resulting from closure and/or diversion of routes and increased difficulty in road crossing, either temporarily or permanently, may result in changes to travel patterns for NMUs.

Non-motorised users: Changes in Amenity

- 13.5.18. NMUs within the study area may be affected by traffic noise, air quality and the visual intrusion of the road network within the wider environment, giving rise to changes in amenity.

Non-motorised users: Severance

- 13.5.19. Changes in journey length or journey time and changes in amenity for pedestrians and others may be such that they affect the degree to which a locality is subject to 'community severance'.

Vehicle Travellers: View from the road

- 13.5.20. The Scheme is likely to alter the views experienced by users of the junction 10 junction, slip roads, M25, A3, A245 and local roads due to construction works, removal of vegetation, new structures and embankments.

Vehicle Travellers: Driver Stress

- 13.5.21. Increases in journey time or diversion routes for road users can have a severance effect for vehicle travellers and can result in driver stress. The Scheme has the potential to increase journey times during construction and to effect the existing bus route.
- 13.5.22. Driver stress is anticipated to be temporarily adversely affected by construction of the Scheme, but it is likely to be reduced or potentially beneficial once the Scheme is operational due to the enhanced capacity to cater for traffic, reduced queuing, congestion and risk of conflicts and collisions.

13.6. Proposed level and scope of assessment

- 13.6.1. The assessment will use published guidance provided in DMRB Volume 11 Section 3 to consider the potential effects of the Scheme on People and Communities.
- 13.6.2. There is no relevant guidance with regards to simple and detailed assessments for People and Communities and the assessments will be undertaken in line with the methodology in the DMRB and that identified in section 13.7.

13.7. Proposed assessment methodology

- 13.7.1. The assessment will include of a range of potential impacts. The method of assessment for these potential impacts will vary according to the nature of each impact and receptor type. Assessment criteria is presented below for the assessment of the following receptors:

- Private dwellings;

- Community assets;
- Local businesses;
- Agricultural land;
- Development land;
- Non-motorised users (NMU); and
- Vehicle travellers (VT).

13.7.2. In each case, the proposed methodology makes use of guidance provided in DMRB Volume 11 where applicable.

Sensitivity value of receptors

13.7.3. The value of each of the potential receptors varies according to the nature of the receptor. Value shall be considered on a case by case basis as part of the impact assessment process. Factors contributing to perceived value include issues such as level of use and available alternatives.

13.7.4. The proposed method for the assessment of receptor sensitivity is set out below.

Private Dwellings: Land Take and Severance

13.7.5. Advice on assessing impacts from the demolition of private property and associated land-take is provided in DMRB Section 3, Part 6 (Land Use), however this does not include sufficient detail upon which to base assessment criteria beyond approximate number of units that may be lost.

13.7.6. Subject to Scheme design, the Scheme may result in loss of land, or impairment of access to one or more private dwellings. The Scheme is not currently expected to result in demolition of any dwelling.

13.7.7. All dwellings, including their access and curtilage, are considered to be receptors of high sensitivity. Loss of access to a dwelling without the provision of an alternative access will be considered equivalent to demolition; re-provision of access via a longer or otherwise poorer route will be considered equivalent to large loss of curtilage; re-provision of access along a broadly equivalent route will be considered equivalent to small loss of curtilage.

13.7.8. Demolition, loss of land, and alterations to access will be considered as a Land Take effect. Land take effects may either result in temporary impacts during construction, or permanent impacts occurring during construction. No Land Take impact would occur during operation. Impact will be assessed according to the criteria set out in Table 13-3.

Table 13-3: Impact to Private Dwellings Assessment Criteria

Impact Description	Magnitude	Significance
Loss of access or substantially poorer replacement access to 5+ dwellings.	Major (adverse)	Large (adverse): Significant at a community level
Loss of access or substantially poorer replacement access to 1-4 dwellings; small loss of curtilage for 5+ dwellings or large loss of curtilage for 1-4 dwellings.	Moderate (adverse)	Moderate (adverse): Locally significant

Impact Description	Magnitude	Significance
Re-provided but less advantageous access for 1-4 dwellings or small loss of curtilage for 1-4 dwellings.	Moderate (adverse)	Moderate (adverse): Not significant
Negligible loss of curtilage or broadly comparable re-provided access for 1-4 dwellings.	Negligible (adverse)	Neutral adverse: Not significant

Private Dwellings: Amenity

- 13.7.9. Construction of the Scheme has the potential to adversely affect amenity for residents of properties in the vicinity of the Scheme. Amenity effects will be assessed elsewhere in the ES; however, where a property or properties are likely to receive a combination of two or more significant traffic or amenity effects, the People and Communities chapter will consider the likely impact of these effects on residents and the local community. Impact will be assessed according to the criteria set out in Table 13-4.

Table 13-4: In-combination Amenity Effect Impact Assessment Criteria

Impact Description	Magnitude	Significance
Adverse or beneficial alteration in amenity (including two or more significant amenity effects) for 5+ dwellings.	Major (adverse or beneficial)	Large (adverse or beneficial): Locally significant
Adverse or beneficial alteration in amenity (including two or more significant amenity effects) for 1-4 dwellings.	Minor (adverse or beneficial)	Slight (adverse or beneficial): Not significant

Community Assets: Land Take and Severance

- 13.7.10. Advice on assessing impacts from the loss land used by members of the public is included in Section 3 (Environmental Assessment Techniques), Part 6 (Land Use). DMRB guidance requires assessment of the impact of loss of land used by the community. It requires the undertaking of sufficient assessment to identify the location, status and importance of land used by the public.
- 13.7.11. In order to assess this, guidance requires assessors to obtain information about the number of users. It is suggested that in many cases it will be necessary to visit the site and, depending on its importance, either make an estimate of usage or undertake a formal count. The site visit should take place on one or more 'typical' days (for example, a weekday during the school term or at the weekend).
- 13.7.12. The Common Land and Access Land covers a significant area of land surrounding the existing M25/A3 road junction, particularly to the south and south-west of the junction. The public has right of access to all of this land. There are also distinct Public Rights of Way within the area, including Bridleways, a Byway, and Footpaths.
- 13.7.13. There are various potential access points into the Common Land and Access Land, including the Rights of Way and a number of roads.
- 13.7.14. Key highway approaches to the site include Old Lane, Wisley Lane, and Redhill Road. There are three public car parks within the Common Land and Access Land. These are:

- Ockham Common, Bolder Mere Car Park;
- Ockham Forest Old Lane Car Park; and
- Wisley Common Car Park.

- 13.7.15. Public usage is expected to vary according to holiday periods, weekdays and weekends. It is expected that there will be greater levels of public use during weekends and public holidays. During typical week days there may be spikes in usage during early mornings and evenings. Weather conditions are also likely to be influential in usage, with inclement weather discouraging weekend use in particular.
- 13.7.16. It is anticipated that the majority of visitors will travel to the area by vehicle and then park within one of the site's three public car parks. Non-motorised users may also be expected to visit the site from the surrounding settlements, including equestrian users travelling from Silvermere Equestrian Centre and Holly Bush Stables.
- 13.7.17. Given the importance of the land in question (designated Common Land) and the potential for the Scheme to impact upon users of the site, it is proposed to analyse user count data collected to establish typical user numbers and to test the usage assumptions outlined above. This will help to influence the design of the proposed mitigation replacement land. Re-providing replacement Common Land/PRoW is a legal requirement, regardless of the numbers using it.
- 13.7.18. Common Land and Access Land user surveys were undertaken in September 2017, comprising of one mid-week day and one weekend day survey in line with DMRB methodology. The size and nature of the Common Land and Access Land areas makes it difficult to comprehensively and quantitatively survey the entire area. Therefore, the survey were undertaken in a proportionate manner using a quantitative and qualitative approach. Findings of these surveys will inform the assessment of effects on users of the open space and Common Land. Survey teams in pairs visited specific points at set intervals in the day to observe whether anybody was in the areas affected by the Scheme. Interviews were also undertaken with users.
- 13.7.19. The sensitivity or value of land used by the community will be classified as either High, Medium, Low or Negligible. The value is determined by professional judgement and the criteria for assessing receptor value is set out in Table 13-5.

Table 13-5: Criteria for Assessing Receptor Sensitivity / Value

Sensitivity / Value	Criteria
High	Community facility or recreational asset that provides a valuable service to the community, a community group, or individual or is otherwise considered to be of high value to the community. Frequent or continuous use of a resource, no suitable equivalent alternative resources used by the receptor are reasonably available.
Medium	Community facility or recreational asset which is one of several facilities providing the same or similar service to the community, community group, or individual, or is otherwise considered to be of medium value to the community. Moderate or occasional use of a resource, limited equivalent alternative resources used by the receptor are reasonably available.

Sensitivity / Value	Criteria
Low	Community facility or recreational asset which is one of many providing the same of similar service to the community, community group, or individual, or is otherwise considered to be of low value to the community. Low or infrequent use of a resource, suitable alternative resources are readily available.
Negligible	Community facility or recreational asset which does not provide an essential service to the community, community group, or individual, or is otherwise considered to be of negligible value to the community. Very infrequent use of resource, multiple equivalent or better alternatives are freely and easily available.

13.7.20. The magnitude of impact will be assessed based upon professional judgement, taking into account any agreed mitigation. The criteria used to determine the magnitude of any change in baseline conditions is presented in Table 13-6 below. The magnitude of change is primarily derived from the following:

- Geographical scale of impact;
- Duration of impact; and
- Whether the impact is reversible or irreversible.

13.7.21. Professional judgement will be used to assign the correct level of impact.

Table 13-6: Criteria for Assessing Magnitude of Impact

Magnitude	Criteria
Major	A substantial part of the receptor will be lost. Loss is long term or irreversible.
Moderate	A substantial part of the receptor will be lost. Loss is short term. Or Some of the receptor will be lost. Loss is long term or irreversible.
Minor	A small part of the receptor will be lost. Loss is long term. Or A very small part of the receptor will be lost. Loss is irreversible.
Negligible	A small part of the receptor will be lost. Loss is short term. Or A very small part of the receptor will be lost. Loss is long term but reversible.

13.7.22. It is acknowledged in the NN NPS that new or enhanced national networks infrastructure can have direct (paragraph 4.79) and indirect impacts (paragraph 4.80) on health, well-being and the quality of life of the population.

13.7.23. The ES will develop and include significance criteria for assessing the effects on community facilities and land used by the community. In compliance with NN

NPS paragraphs 4.81 and 4.82, the ES will identify any likely significant adverse impacts and identify measures to reduce or compensate for adverse impacts and consider cumulative impacts.

Community Assets: Amenity

- 13.7.24. The Scheme may result in changes in amenity experienced at community facilities or land used by the community. Amenity and traffic effects (including air quality, noise, vibration, and visual impact caused either directly by the Scheme itself or by changes in traffic flows brought about by the Scheme) will be considered individually in detail elsewhere in the ES. The People and Communities chapter will consider instances where users of a community facility or land used by the community may experience a combination of such effects, leading to a cumulative detriment in amenity.
- 13.7.25. A qualitative assessment of the potential impact of the Scheme on the amenity of community facilities and land used by the community during construction and operation is proposed. This assessment will draw upon the conclusions of the traffic, air quality, noise, vibration and visual impact assessments.
- 13.7.26. The sensitivity or value of land used by the community will be classified as either High, Medium, Low or Negligible. The value is determined by professional judgement and the criteria for assessing receptor value is set out in Table 13-5 above.
- 13.7.27. The method for the assessment of significance is based on a bespoke set of assessment criteria, which have been developed using professional judgement to assign a level of significance to effects arising from the impacts, based on the criteria set out in Table 13-7.

Table 13-7: Community Facilities Assessment Criteria

Impact Description	Magnitude
Substantial and permanent changes in environmental amenity for a large number of people.	Major (adverse or beneficial)
A substantial change to a modest number of people's environmental amenity or a moderate change in many people's environmental amenity. Impacts can be temporary or permanent but do not significantly affect the overall functioning of the land use in the longer term.	Moderate (adverse or beneficial)
A detectable but non-material change to environmental amenity for a small or large number of people. Changes might be noticeable, but the beneficial or adverse impacts fall within the range of normal variation.	Minor (adverse or beneficial)
Changes that are unlikely to be noticeable (i.e. well within the scope of natural variation).	Negligible (adverse or beneficial)

- 13.7.28. Of the effects described in Table 13-7, moderate and major effects will be considered 'significant'.

Local businesses

- 13.7.29. The Scheme has potential to effect existing local businesses. Possible impacts include isolation or disruption to access and changes in local amenity, which may diminish trading conditions. In order to assess possible effects on local businesses, a schedule of properties that could reasonably be affected by the Scheme will be compiled based upon desktop research.

- 13.7.30. Having identified potential receptors, likely impact will be assessed according to a qualitative approach, evaluating the Scheme's potential impact (and the duration of any impact), during both construction and operation, on each receptor. The assessment will consider the likely effects arising from each impact, the magnitude of any identified effect, and the sensitivity of a receptor to each impact.
- 13.7.31. The relative sensitivity of local business receptors to potential impacts such as demolition, land take, and disruption to access is assessed in line with the definitions provided in Table 13-8 below.

Table 13-8: Sensitivity of Local Businesses

Receptor sensitivity	Definition
High	Business viability likely to be permanently jeopardised by a short disruption to access or worsening of trading conditions.
Medium	Business profitability may be harmed by a short or medium term disruption to access or worsening of trading conditions.
Low	Business could continue to operate without substantial injury if affected by a disruption to access or worsening of trading conditions.

- 13.7.32. Magnitude of impacts on local businesses will be classified as Major, Moderate, Minor, or Negligible, in line with the definitions provided in Table 13-9 below.

Table 13-9: Magnitude of Impact on Local Businesses

Impact magnitude	Definition
Major	The Scheme would have a very adverse/beneficial effect on the function or operation of the business for a prolonged period of time.
Moderate	The Scheme would have a very adverse/beneficial temporary effect on the function or operation of the business for a short period of time (e.g. <3 months during peak construction period); or The Scheme would have a modest adverse/beneficial effect on the function or operation of the business for a prolonged period of time.
Minor	The Scheme would have a modest adverse/beneficial temporary effect on the function or operation of the business for a short period of time (e.g. <3 months during peak construction period); or The Scheme would have a slight adverse/beneficial effect on the function or operation of the business for a prolonged period of time.
Negligible	The Scheme would have little or no adverse/beneficial effect on the function or operation of the business.

- 13.7.33. Significance is the product of and the sensitivity of receptors magnitude of impact. The significance of effects within this assessment is measured according to Table 13-10 below.

Table 13-10: Significance of Impact upon Local Businesses

Significance (sensitivity of receptor)	Impact magnitude		
	Major	Moderate	Minor
High	Large adverse/ beneficial - significant	Large adverse/ beneficial - significant	Moderate adverse/ beneficial - significant
Medium	Large adverse/ beneficial - significant	Moderate adverse/ beneficial - significant	Slight adverse/beneficial - not significant
Low	Moderate adverse/ beneficial - significant	Slight adverse/ beneficial - not significant	Negligible - not significant

Agricultural Land

- 13.7.34. Impact on agricultural holdings will be assessed as follows. The sensitivity of agricultural holdings can be assessed as 'High', 'Medium', 'Low' or 'Negligible' are shown in Table 13-11.
- 13.7.35. The magnitude of the predicted impact on agricultural holdings may be assessed as 'Major', 'Moderate', 'Minor' or 'Negligible' following the criteria given in Table 13-12 below. These criteria were used successfully in the EIA of HS2 Phase 1⁶⁶. The column headings/key issues follow the approach of 'other factors' in Annex B of the former Planning Policy Guidance Note 7 (1997)⁶⁷.
- 13.7.36. In general terms, larger farm holdings have a greater capacity to absorb impacts and are less sensitive. However, the scale of the land holding is reflected in the magnitude of impact and the percentage land-take from the farm. For example, the loss of 100 hectares from a 400-hectare (1,000 acre) farm would be a high impact (25%), whereas the same land-take from a 1,000-hectare farm would be low (10%).

Table 13-11: Sensitivity of Receptors - Agricultural Holdings

Value	Receptors
High	Farm types in which the operation of the enterprise is dependent on the spatial relationship of land to key infrastructure, and where there is a requirement for frequent and regular access between the two, or dependent on the existence of the infrastructure itself, e.g.: • Dairying, in which milking cows must travel between fields and the parlour at least twice a day; • Irrigated arable cropping and field-scale horticulture, which are dependent on irrigation water supplies; • Intensive livestock or horticultural production which is undertaken primarily within buildings, often in controlled environments; • Marginal agricultural holdings; • Horses; • Fruit crops;

⁶⁶ HS2 Ltd. Environmental Impact Assessment of HS2 Phase 1 (2013). Available online @ <https://www.gov.uk/government/collections/hs2-phase-one-environmental-statement-documents> Last viewed May 2016

⁶⁷ Planning Policy Guidance Note 7 'Countryside'. Available online @ <http://regulations.completepicture.co.uk/pdf/Planning/Planning%20Policy%20Guidance%207-%20Countryside.pdf> Last viewed May 2016

Value	Receptors
	- Land in agri-environmental schemes (Higher Level Stewardship); - Land in agri-environmental schemes (Organic Entry Level Stewardship); - Land with organic/organic conversion status; - Land with Notifiable Weeds; - Land with Notifiable Scheduled Diseases; - Land in woodland/forestry grant schemes; and - Statutory rural land designations, e.g. Nitrate Vulnerable Zones (re EU Nitrate Directive (91/676/EC)).
Medium	Farm types in which there is a degree of flexibility in the normal course of operations, e.g.: - Combinable arable farms; - Grazing livestock farms (other than dairying); - Unimproved pasture; - High value crops; and - Land in agri-environmental schemes (Entry Level Stewardship).
Low	Large agricultural holdings. Farm types and land uses undertaken on a non-commercial basis. Land farmed on an annual grazing licence or other short-term agreement, i.e. where the long term-tenure of the affected land is not secure.
Negligible	Non-agricultural land, including woodland, access tracks and hard-standing.

Table 13-12: Magnitude of Impact - Agricultural Holdings

Impact magnitude	Key Agricultural Issues			
	Land-take	Severance	Infrastructure	Nuisance (e.g. noise/dust)
Major	>20% of all land farmed.	No access available to severed land.	Direct loss of farm dwelling, building or structure.	Nuisance discontinues land use or enterprise.
Moderate	>10% to 20% of all land farmed.	Access available to severed land via the public highway.	Loss of or damage to infrastructure affecting land use.	Nuisance necessitates change to scale or nature of land use or enterprise.
Minor	> 5% to 10% of all land farmed.	Access available to severed land via private way.	Infrastructure loss/damage does not affect land use.	Nuisance does not affect land use or enterprise.
Negligible	5% or less of all land farmed.	No new severance.	No impact on farm infrastructure.	No nuisance on land use or enterprise.

13.7.37. Significance is the product of the sensitivity of receptors and magnitude of impact. The significance of effects within this assessment is measured according to Table 13-10 above.

Development Land

- 13.7.38. The Scheme is likely to result in effects on development land. Assessment of the effects of the Scheme on development land will be based upon guidance set out in DMRB, Volume 11, Section 3, Part 6, Chapter 5: Effects on Development Land.
- 13.7.39. This guidance suggests that the environmental assessment should take account of, as far as is practicable, future changes in land use due to new development which would be likely to occur in the absence of a scheme. This should be done by considering the impact of a scheme's land-take on any sites covered by local planning authorities' land use planning designations.
- 13.7.40. In addition, future changes in land use, for which planning permission has been granted may also be relevant to the assessment of a scheme. For example, where a proposed scheme would run close to an area reserved for housing development it should be recognised that more residences would be affected by noise, visual intrusion, etc. than the current assessment suggests. Alternatively, planned development could reduce the landscape quality of an area, for example.
- 13.7.41. In order to assess potential effects of the Scheme on development land, a desk based review of local planning policy and associated mapping and a search of planning consents will be undertaken in order to identify potential 'receptors'. The impact of the Scheme will then be assessed using a descriptive approach that considers potential 'land-take' from allocated or consented sites and the effect the Scheme may have on allocated or consented sites nearby. This assessment will consider the extent to which the Scheme would support, depart from, or hinder planning policy aims. The significance of impact on development land will be assessed according to Table 13-13 below.

Table 13-13: Development Land Impact Assessment Criteria

Assessment Score	Contribution to Achievement of Policy Objectives
Significant Beneficial	The Scheme substantially contributes to the achievement of or is consistent the intended use of identified development land.
Beneficial	The Scheme partially contributes to the achievement of or is consistent the intended use of identified development land.
Neutral	The Scheme does not affect the intended use of identified development land or equally benefits and hinders achievement of the intended use.
Adverse	The Scheme partially hinders or is inconsistent with the intended use of identified development land.
Significant Adverse	The Scheme substantially hinders or is inconsistent with the intended use of identified development land.

Non-motorised users: Journey length & Local Travel Patterns

- 13.7.42. The assessment for NMU impact will be undertaken in accordance with the guidance for a simple assessment in the Pedestrians, Cyclists and Equestrians component of DMRB Volume 11, Section 3, Part 8.
- 13.7.43. Existing and proposed routes and Rights of Way used by NMUs that may be affected by the Scheme will be identified through a desk based assessment,

supported where applicable by the findings of user surveys already undertaken in relation to the assessment of impacts on Community Assets.

- 13.7.44. The way in which the Scheme might affect the duration or distance of pedestrians' and others' journeys, existing local travel patterns will be established.
- 13.7.45. The routes likely to be affected and the number of NMUs likely to experience changes in journey times on these routes will be reported. Particular attention will be given to impacts on vulnerable groups.
- 13.7.46. It is considered likely that the majority of NMU trips in the study area are associated with recreation. Recreational trips are generally considered less sensitive to changes in journey length in that users are not necessarily seeking the fastest or most direct route from their location to a specific destination.
- 13.7.47. A schedule will be produced showing changes in typical journey lengths and likely changes in travel patterns, with an estimate of the number of people affected in each case.

Non-motorised users: Changes in Amenity

- 13.7.48. Amenity is defined as the relative pleasantness of a journey. In assessing amenity for the routes used by pedestrians and others, a descriptive approach will be employed which gives an overall indication of the change in amenity and the number of journeys affected. Reasoning behind this judgement will be provided.
- 13.7.49. Other factors will also be taken into account where applicable, such as footpath width and distance from traffic, barriers between pedestrians and traffic, and the quality of street furniture and planting. For ramblers, changes in the quality of landscape or townscape will also be relevant. For cyclists, they include positive factors, such as the clear signage of alternative routes for cyclists, and subways or cycle crossings, and negative factors such as junctions where cyclists and vehicles are not separated. For equestrians, landscape quality will generally be an important factor, as may some of those affecting cyclists, depending on the existing and proposed provision for riders. Safety for equestrians crossing a route is a particularly important consideration.

Non-motorised users: Severance

- 13.7.50. Changes in journey length and journey times and amenity for pedestrians and others may be such that they affect, adversely or beneficially, the degree to which a locality is subject to 'community severance'.
- 13.7.51. Community severance is defined here as the separation of residents travelling by non-motorised means from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows. In addition to changes in community severance caused by changes in pedestrians' and others' ability to travel in the locality of a scheme, severance may sometimes be caused by the demolition of a community facility or the loss of land used by members of the public.
- 13.7.52. In accordance with DMRB Volume 11 Section 3 Part 8, new severance will be described using a three point scale, viz, Slight, Moderate or Severe severance.

- 13.7.53. Generally, in cases of slight severance current journey pattern is likely to be maintained, but there will probably be some hindrance to movement.
- 13.7.54. In cases of moderate severance some residents, particularly children and elderly people, are likely to be dissuaded from making trips. Other trips will be made longer or less attractive.
- 13.7.55. In cases of severe severance, People are likely to be deterred from making trips to an extent sufficient to induce a re-organisation of their habits. This would lead to a change in the location of centres of activity or in some cases to a permanent loss of a particular community. Alternatively, considerable hindrance will be caused to people trying to make their existing journeys.
- 13.7.56. These descriptions will be coupled with an estimate of the numbers of people affected, their location and the community facilities from which they are severed. On this basis, no prescriptive tables for sensitivity, magnitude, or significance are proposed.

Vehicle Travellers: Views from the road

- 13.7.57. The assessment of travellers' views will be based on the guidance in DMRB 11.3.9 and TAG Unit 4.1 Social Impact Appraisal (November 2014) in the Department of Transport's TAG Guidance.
- 13.7.58. 'View from the road' is taken to be the extent to which travellers, including drivers, are exposed to the different types of scenery through which a route passes. Aspects to be considered are:
- The types of scenery or the landscape character;
 - The quality of the landscape;
 - Features of particular interest or prominence in the view; and
 - The extent to which travellers may be able to view the scene.
- 13.7.59. The extent to which travellers may be able to view landscape shall be considered according to the following categories in defining sensitivity:
- No View: road in steep cutting or contained by earth bunds, environmental barriers or adjacent structures;
 - Restricted View: frequent cuttings or structures blocking the view;
 - Intermittent View: road generally at ground level with shallow cuttings or barriers at intervals; and
 - Open View: view extending over many miles or only restricted by existing landscape features.
- 13.7.60. The effects of the Scheme on traveller's views from existing routes and from the carriageway of the Scheme itself will be assessed according to the TAG Social Impact Appraisal guidance. The effect on traveller's views shall be categorised in one of the following three ways:
- Neutral: little or no effect for most views from the road or improvements on some views are generally balanced by deterioration in others;
 - Beneficial: views from the road would be, on balance, a change for the better; and

- Adverse: views from the road would be, on balance, a change for the worse.

13.7.61. In terms of significance, using the seven-point scale, the significance of effect upon traveller's views will also be assessed according to the TAG Social Impact Appraisal guidance:

- *"the assessment is likely to be slight (beneficial or adverse) where the numbers of travellers affected is low (less than 500 a day, say);*
- *the assessment is likely to be large (beneficial or adverse) where the numbers of travellers affected is high (more than 10,000, say);*
- *the assessment is likely to be moderate (beneficial or adverse) in all other cases."*

Vehicle Travellers: Driver Stress

13.7.62. Driver stress is defined in the DMRB as the adverse mental and psychological effects experienced by a driver traversing a road network. The level of stress experienced by a driver may be affected by a number of factors including; road layout and geometry, surface riding characteristics, junction frequency and speed and flow per lane. Reduction in achievable vehicle speeds resulting from congestion may result in substantially increased journey times, introducing a degree of severance and increasing driver stress.

13.7.63. There are three main components of driver stress: frustration; fear of potential accidents; and uncertainty relating to the route being followed:

- Driver frustration - caused by an inability to drive at a speed consistent with the standard of the road, and increases as speed falls in relation to expectations;
- Driver fear - the main factors are the presence of other vehicles, inadequate sight distances and the likelihood of pedestrians, particularly children, stepping into the road. Fear is highest when speeds, flows and the proportion of heavy vehicles are all high, becoming more important in adverse weather conditions; and
- Driver uncertainty - caused primarily by signing that is inadequate for the individual's purposes.

13.7.64. The measurable aspect of driver stress is associated with frustration due to delays. The level of driver stress has been determined through a qualitative assessment of the above factors, under a three-point descriptive scale, as recommended under DMRB guidance, as Low, Moderate or High.

13.7.65. As per the DMRB guidance, the following tables will be used to guide the assessment of stress in the ES.

Table 13-14: Driver Stress - Motorways

Average peak hourly flow per lane, in flow Units/1 hour	Average Journey Speed Km/hr		
	Under 75	75-95	Over 95
Under 1200	High	Moderate	Low
1200-1600	High	Moderate	Moderate

Over 1600	High	High	High

Table 13-15: Driver Stress - Dual-Carriageway Roads

Average peak hourly flow per lane, in flow Units/1 hour	Average Journey Speed Km/hr		
	Under 60	60-80	Over 80
Under 1200	High*	Moderate	Low
1200-1600	High	Moderate	Moderate
Over 1600	High	High	High

* "Moderate in urban areas"

Table 13-16: Driver Stress – Single Carriageway Roads

Average peak hourly flow per lane, in flow Units/1 hour	Average Journey Speed Km/hr		
	Under 50	50-70	Over 70
Under 600	High*	Moderate	Low
600-800	High	Moderate	Moderate
Over 800	High	High	High

* "Moderate in urban areas"

Vulnerability to major accidents and disasters

- 13.7.66. This section considers the expected effects of the development on people and communities deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned.
- 13.7.67. Disasters, accidents and incidents are not clearly quantified or defined by EIA regulations. It is currently a matter for professional judgement as to whether a potential event may be classified as major and therefore whether there is a need for assessment within EIA.
- 13.7.68. Guidance suggests that risk assessment pursuant to EU legislation such as Directive 2012/18/EU or Council Directive 2009/71/Euratom may be appropriate. These directives concern safety of nuclear installations and the prevention of major accidents which involve dangerous substances (such as those that have previously occurred at Seveso, Bhopal, Schweizerhalle, Enschede, Toulouse and Buncefield), and the limitation of their consequences for human health and the environment.
- 13.7.69. Guidance also suggests that further assessment of this topic within EIA could only be justified if the level of risk at the Scoping stage concludes that an event could be major and that there was a reasonable doubt over the likelihood of the event (e.g. greater than 1% probability of occurrence), although it might be concluded that no one threshold, criteria or guidance will address all types of potential accidents or disasters.
- 13.7.70. The probability of a major accident, incident or disaster occurring as a result of the Scheme has been assessed. The proposed development would not include any potentially dangerous operation, such as the use of nuclear or dangerous chemical materials or processes. Some chemicals may be present on site during construction, though risks associated with such materials would be adequately managed using ordinary construction site management practices.

- 13.7.71. There is a risk that the Scheme may increase the likelihood of road traffic accidents during construction. This risk will be mitigated using appropriate traffic management measures. It is assumed that correct design will ensure that the proposed junction revision will not result in any increase in the likelihood of accidents during operation. Traffic incidents are a typical consideration of the operation of any highway. This accident risk is not considered to be of the magnitude targeted by the EIA Regulations. Chemicals and hazardous materials may be transported by road (subject to appropriate licences). The probability of a major accident involving the transportation of such materials occurring as a result of the Scheme is considered sufficiently low to not warrant further assessment.
- 13.7.72. Some types of civil infrastructure may be considered vulnerable to malicious incident. The Scheme comprises an upgrade to existing infrastructure. It is not considered likely to increase the risk or vulnerability of the infrastructure to attack. The probability of any attack on this element of infrastructure occurring is considered to be of sufficiently low probability to not warrant further assessment.
- 13.7.73. No significant adverse effects relating to people and communities deriving from the vulnerability of the development to risks of major accidents and/or disasters are expected and therefore this topic has been scoped out from future assessment.

13.8. Proposed consultation

- 13.8.1. In accordance with DMRB Volume 11 Section 3 guidance, consultation will be undertaken with the Local Authorities (Elmbridge Borough Council, Guildford Borough Council, Woking Borough Council and Surrey County Council), business owners (including agricultural tenants) and managers of community facilities likely to be affected by the Scheme, including RHS Wisley and Painshill Park.
- 13.8.2. Consultation will also be undertaken with the British Horse Society, Open Space Society and NMUs encountered during Common Land and Access Land site surveys and at a workshop targeted to include groups that use this land for leisure or as part of their business or charitable function.
- 13.8.3. The aim of consultation will be to confirm the community and private assets identified within the study area baseline, to ascertain their level of usage by members of the community and obtain more information on anticipated impacts of the Scheme.

13.9. Potential mitigation measures

- 13.9.1. Mitigation will be implemented where significant adverse effects are identified. This will likely involve consultation with landowners and other stakeholders to discuss the Scheme and agree on suitable compensation measures for instances of land take or where business viability is significantly affected.
- 13.9.2. Replacement land will be required and identified. The Common Act 2006 provides for the release of Common Land providing there is a provision of suitable “replacement land”.

13.10. Assumptions and limitations

13.10.1. The assessment will provide a broad, high level indication of effects based on best practice and professional judgement. Further details concerning the construction and design of the Scheme will help to inform the subsequent assessment stages.

13.11. Conclusion

13.11.1. The likely effects of the Scheme have been identified for the following receptors and all are scoped in to the assessment:

- Private dwellings at Elm Corner, on Wisley Common, Redhill Road and currently accessed via the A3 within the study area will be affected by alterations to access arrangements and changes to amenity during the construction and operation of the Scheme;
- Community assets including Common Land and Access Lane, RHS Wisley Gardens and Painshill Park will be affected by land take, changes to access arrangements and changes to amenity during the construction and operation of the Scheme;
- Local business Ockham Bites café will be affected by land take and along with Silvermere Equestrian Centre will be affected by changes to access arrangements and changes to amenity during the construction and operation of the Scheme;
- Agricultural land will be affected by land take and changes to access arrangements which will affect the operation of farm businesses;
- Development land at the former San Domenico Restaurant, Painshill Farm and the former Wisley Airfield will be affected by land take and changes to access arrangements during the construction and operation of the Scheme;
- Non-motorised users (NMU) - pedestrians, cyclists and equestrians will be affected by land take, changes to access arrangements and changes to amenity during the construction and operation of the Scheme; and
- Vehicle travellers (VT) - drivers and passengers of both public and private vehicles will be affected by changes to the views from the road during construction and operation of the Scheme and increased driver stress during construction.

13.11.2. Vulnerability to major accidents and disasters as a result of the Scheme is considered to be sufficiently low to not warrant further consideration and has been scoped out of this assessment.

13.11.3. Table 13-17 outlines the receptors to be scoped in/out of further assessment, based on the above identification of potential effects.

13.11.4. The outcome of the Scheme in relation to People and Communities is also likely to be affected by significant effects from other environmental topics as well as the effects from any concurrent development in the study area not identified in the baseline. This will be assessed in the Cumulative Effects chapter.

Table 13-17: People and Communities topics for assessment

Effects	Scoped in/out	Comment/Justification
Private dwellings	✓	Assessment of potential land take. Assessment of access arrangements. Assessment of the potential amenity related effects on residents of private dwellings.
Community assets	✓	Assessment of potential land take. Assessment of access arrangements. Assessment of the potential amenity related effects on community assets.
Local business	✓	Assessment of potential land take. Assessment of access arrangements. Assessment of the potential effects on other businesses.
Agricultural land	✓	Assessment of potential land take. Assessment of access arrangements. Assessment of the potential effects on agricultural uses.
Development land	✓	Assessment of the potential effects on development land. Assessment of potential land take. Assessment of access arrangements.
Non-motorised users	✓	Assessment of the potential amenity related effects on users of community land and facilities, including Public Rights of Way. The potential for any severance of or between communities, or decreasing access to community services and facilities.
Vehicle travellers	✓	Assessment of the potential effects on views from the road based on landscape and visual impact. Assessment of the potential effects on driver stress due to decreased delays, changes in journey lengths and times or improved road safety.
Vulnerability to major accidents and disasters	✗	Vulnerability to major accidents and disasters as a result of the Scheme is considered to be sufficiently low to not warrant further consideration.

14. Climate

14.1. Introduction

- 14.1.1. This chapter outlines the methodology that will be used to identify and assess the likely effects of the Scheme on climate change, and the vulnerability of the Scheme to climate change, during construction and operation.
- 14.1.2. This chapter has been divided into two sections in order to address the climate change requirements outlined in The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 2015/517) (herein referred to as the 'EIA Regulations 2017'), which states that the assessment should consider both:
- the potential effects of the Scheme on climate change, in particular the magnitude of greenhouse gases emitted from the scheme during construction and operation; and
 - the vulnerability of the Scheme to climate change, in particular the impacts of extreme weather scenarios on the Scheme during operation.

14.2. Study area

Effects of the Scheme on climate study area

- 14.2.1. The study area is defined in terms of the lifecycle stages of Section 7 of PAS 2080:2016 Carbon Management in Infrastructure technical standard. This has been considered appropriate as it is the technical standard applicable to infrastructure projects.
- 14.2.2. In summary, the study area will cover:
- Use of materials for construction (including temporary works and permanent structures) (A1-3);
 - Transportation of construction materials to site (A4);
 - Construction plant use (A5);
 - Construction use of mains water (A5);
 - construction waste transportation (A5);
 - Construction waste off-site processing (A-5);
 - Replacement cycles (B2-5);
 - Operational energy (B6); and
 - In-use traffic (B9).
- 14.2.3. Further details of the lifecycle stages that will be included within the assessment are set out in Table 14-1.

Table 14-1: Effect on Climate study area

Lifecycle Scope	Study Area
Temporary and permanent	The study area will cover the use of temporary and permanent construction materials within the construction site boundary, and the supply chain GHG emissions associated with these, as captured in the

Lifecycle Scope	Study Area
construction materials (A1-3):	relevant materials carbon factor values. Consumables are excluded as they are small, and plant is excluded on the basis of shared use across projects.
Materials Transportation (A4):	The study area will cover transportation of the temporary and permanent construction materials and the distances travelled from the primary site of manufacturing, not the supply depot, including international freight transportation, where relevant. The primary site of manufacturing is used because transportation from a local supply depot does not represent the realistic transportation carbon emissions, so can lead to significant under reporting. The GHG emissions scope will consider both the direct vehicle emission, but also the fuel supply chain emissions, as captured in the vehicle emissions carbon factor values covering fuel supply (well-to-tank) and use.
Construction Plant (A5):	The study area for quantification of emissions for construction plant considers the same plant quantities, sizes and operating hours as that to be used for the noise assessment (Chapter 6) for construction of the Scheme only. The emissions scope will consider only the direct plant emission, where only plant specification data is available. If direct fuel consumption data is available, the emissions scope will consider direct plant emissions, but also the fuel supply chain emissions, as captured in the fuel emissions factor values covering fuel supply (well-to-tank) and use.
Construction Water Use (A5):	This study area covers mains water use only within the construction site boundary. The emissions scope will consider emissions from all activities for supply of water, as captured in the water supply carbon factor values.
Construction Waste Transportation (A5):	The study area will cover transportation of bulk construction waste and the distances travelled from the construction site to the primary processing site. The GHG emissions scope will consider both the direct vehicle emission, but also the fuel supply chain emissions, as captured in the vehicle emissions carbon factor values covering fuel supply (well-to-tank) and use.
Construction Waste Off-Site Processing (A5):	The study area will cover primary processing of bulk construction waste as available and quantified and in the waste assessment (Chapter 12). The emissions scope will consider emissions from all activities for waste processing, as captured in the waste management carbon factor values.
Replacement (B2-5):	The study area for replacement includes the inspection works and planned replacement cycles of bulk items, e.g. road surface, over the planned operational life-time of the project, within the original construction site boundary. The emissions scope will consider materials use, transportation, and construction works, as defined by A1 - 5 above.
Operational Energy (B6):	The study area for operational energy will include the electricity and direct fossil fuel consumption for operation of the infrastructure within the original construction site boundary, over the planned operational life-time of the project. The emissions scope will cover direct emissions from consumption of fossil fuels, and supply chain emissions from primary electricity generation, fuel and electricity supply chain (well-to-tank), and transmission and distribution losses, as captured in the carbon factor values for electricity and fuels.
In-use Traffic (B9):	The study area for traffic use of the infrastructure is identical to that for the air quality assessment for operational traffic use. The full definition for the study area is specified in the Air Quality chapter (Chapter 5), on

Lifecycle Scope	Study Area
	the basis it is the source for the data used to quantify greenhouse gas emissions for this life-cycle stage.

- 14.2.4. Preliminary studies and consultations (A0), direct operational GHG emissions (B1), operational water use (B7), other processes (B8), and end of life (C1-4) will be excluded from the study areas on the basis that either:
- the emissions are likely to be minimal/negligible, or
 - the lifecycle stage is not applicable to the Scheme.
- 14.2.5. The study area, as set out above is dependent upon the availability of design and construction information. If such data is not available, part or all of the affected lifecycles are excluded from the assessment.

14.3. Planning and policy context

Table 14-2: Relevant Legislation, regulation and policies

Scale	Legislation/Regulation	Summary of Requirements
National	National Planning Policy Framework (NPPF) 2012	Chapter 10 Meeting the challenge of climate change, flooding and coastal change considers the role of development in mitigating and increasing resilience to climate change. Where development is being brought forward in a vulnerable area, the NPPF stipulates that suitable adaption measures such as green infrastructure can be used to make the development acceptable in planning terms.
	National Networks National Policy Statement (NN NPS)	In line with the objectives and provisions of the Climate Change Act (2008), the NPPF states that local authorities should adopt proactive strategies to mitigate and adapt to climate change. Paragraph 2.7 notes that network improvements can be used to improve resilience and adapt to climate change and extreme weather events as well as reducing congestion. Paragraph 5.15 reiterates the EIA directive for climate to be considered within the Environmental Statement. Paragraph 4.39 states that “new development should be planned to avoid increased vulnerability to the range of impacts arising from climate change”. Paragraph 4.42 requires the applicant to take into account the potential impacts of climate change using latest UK climate Projections available at that time. The NPS states that, “the annual CO₂ impacts from delivering a programme of investment on the Strategic Road Network of the scale envisaged in Investing in Britain's Future amount to well below 0.1% of average annual carbon emissions allowed in the fourth carbon budget”. However, the IEMA, Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (2017), and the NPS requires that an assessment of emissions is carried out and mitigation measures are implemented. The NPS assessment also has to include evidence of

Scale	Legislation/Regulation	Summary of Requirements
		the emissions impacts of a Scheme and comparison of them against Government budgets.
	Town and Country Planning (Environmental Impact Assessment) Regulations 2017	The requirement to consider a project's vulnerability to climate change has resulted from the 2014 amendment to the EIA Directive (2014/52). The Directive has been fully transposed into UK law in the Town and Country Planning (Environmental Impact Assessment) Regulations and came into force in the UK on the 16th May 2017. The Directive requires: "A description of the likely significant effects of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change."
	Road Investment Strategy (RIS) and Strategic Business Plan 2015	The Government's Road Investment Strategy will see £15.2 billion invested in over 100 road schemes between 2015 and 2021 (DfT, 2014b). Of this total, some £300 million has been allocated to address issues including flooding, carbon emissions, landscape and biodiversity.
	Highways Agency Climate Change Adaptation Strategy and Framework (2009)	The Highways Agency Climate Change Adaptation Strategy and Framework has led to modifications in existing standards on the national network. Local roads are maintained by upper tier and unitary local authorities in Great Britain. For local roads, the UK Roads Liaison Group Code of Practice for Well Maintained Highways sets out a regularly updated set of recommendations for dealing with climate change by local authorities.
	Highways Agency Carbon Routemap: opportunities for a national low carbon transportation system (2014)	The Highways Agency Routemap covers the direct and indirect greenhouse gas emissions associated with the Agency's organisational activity, the highway asset base and associated supply chain, and those arising from the use of the network by customers.
	Climate Change Act 2008	The Climate Change Act (2008) strengthened the institutional framework in respect of planning policy and managing the impact of climate change. The Government has established legally binding carbon reduction targets through the Climate Change Act 2008 to drive the reduction requirements required by the Kyoto Protocol. The overall objective is to reduce emissions by at least 80% of the 1990 base level year by 2050 (UK Government, 2008). Additionally, as set out in Table 14-3, total emissions limits (carbon budgets) and interim targets have been specified to drive intermediate emissions reductions, and to enable progress tracking.
	The Carbon Plan (Department of Energy and Climate Change (DECC), 2011)	The Carbon Plan sets out how the UK will achieve the necessary decarbonisation. The Plan advises that emissions from domestic transport and industry (which produces the materials and products for transport infrastructure) make up nearly half of the UK's total emissions.
	Construction 2025 (July 2013) HM Government	Construction 2025 sets out how efficiency improvements for construction and operation of new buildings and

Scale	Legislation/Regulation	Summary of Requirements
		infrastructure will be achieved, including a target to reduce emissions by 50%.
	Infrastructure Carbon Review (2013) HM Treasury	The Infrastructure Carbon Review sets out carbon reduction action required by infrastructure organisations that have formally endorsed the review; this includes Highways England. The Review shows that the infrastructure industry controls 16% of the UK's total carbon emissions, covering construction (A1-5), and operation and maintenance of assets (B1-8). It also highlights that a further 37% of carbon emissions are related to the use of infrastructure assets (B9), over which the industry can have some influence.
Local	Surrey County Council Carbon and Energy Policy 2015 to 2019	1.3.17. The Surrey County Council Carbon and Energy Policy 2015 to 2019 sets out its objectives for Managing energy and carbon emissions across its estate and activities, including for street lighting. It also requires full lifecycle carbon implications of major projects to be considered. 1.3.18. The Scheme should apply the carbon policy requirements relevant to infrastructure schemes, should carbon reduction be required.
	Surrey Transport Plan: Climate Change Strategy	The aim of the Surrey Transport Plan: Climate Change Strategy (April 2011) is to reduce carbon dioxide emissions from transport in Surrey, including street lighting and maintenance activities. The Scheme should apply the carbon policy requirements relevant to infrastructure schemes, should carbon reduction be required.

Table 14-3: UK carbon reduction targets

Carbon Budget	Carbon Budget Level	Reduction Below 1990 Levels
3rd carbon budget (2018 to 2022)	2,544 MtCO ₂ e	37% by 2020
4th carbon budget (2023 to 2027)	1,950 MtCO ₂ e	51% by 2025
5th carbon budget (2028 to 2032)	1,725 MtCO ₂ e	57% by 2030

Table Source: UK Government Carbon Reduction Targets 2008

14.3.1. Relevant information and guidance include:

- Highways England (2016) Major Projects' Instructions: Environmental Impact Assessment: Implementing the Requirements of 2011/92/EU as amended by 2014/52/EU (EIA Directive);
- IEMA Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation (IEMA, 2015);
- UK Climate Projections 2009 (UKCP09) (Murphy et al., 2009);
- UK Climate Change Risk Assessment (2017) (ASC, 2016a);
- National Adaptation Programme (HM Government, 2013); and

- European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013).

14.3.2. Climate resilience and climate change adaptation is fast becoming an established issue in EIA policy, practice and organisational and planning policies. This is in response to legislative and regulatory drivers, but also in response to the nature of the risks and associated costs presented to projects and programmes. The consideration of climate resilience issues for the Scheme is therefore not only important to demonstrate compliance with these legislative and regulatory requirements, but to also demonstrate and respond to the Scheme's long-term resilience for planning effective and efficient operation.

14.4. Baseline conditions

Effects of the Scheme on climate baseline conditions

14.4.1. The baseline conditions for effects on climate are defined by the national background emissions and informed by emissions estimations for other highways schemes.

National Emissions Baseline

14.4.2. It is acknowledged that total global emissions from all sources amount to approximately 50 billion tonnes of CO₂e. However, it is not considered representative to compare any UK scheme against this, as any scheme will always be negligible. Instead, it is considered most appropriate to use the national baseline for comparison as its magnitude is more relevant, and UK specific. The total background UK emissions for 2015 (the last reported year) is 495.7 million tonnes of CO₂e. The breakdown of this by sector, by final user is shown in Table 14-4.

Table 14-4: National Emissions

Sector (by final user)	GHG Emissions (Million tonnes of CO ₂)	% of total
Business	147	29.66%
Transport	134.9	27.21%
Public	14.6	2.95%
Residential	112.1	22.61%
Agriculture	51.1	10.31%
Industrial processes	13.3	2.68%
Land use, land use change and forestry	-7.4	-1.49%
Waste management	18.2	3.67%
Exports	12.1	2.44%
Grand Total	495.7	n/a

Table Source: www.UK.gov 2017 Final UK greenhouse gas emissions national statistics

Scheme Emissions Baseline

- 14.4.3. Emissions baselines from other highways schemes, as set out in Table 14-5, provides appropriate data to act as both a baseline and a proxy for the M25 junction 10 Improvement Scheme. These have been obtained from the M4 Corridor around Newport, Environmental Statement (Welsh Government, 2016) as the best available source of such baseline data.

Table 14-5: Scheme Emissions Baseline

	Project/Length and width Component							
	M4CaN	A14	A465	HA project A	HA project B	HA project C	HA project D	HA Project E
Carbon Footprint Lifecycle Stages	23km New relief road	37km improvement scheme	7.8km embankment section	26.6km widening of A road	6.5km single to 2 lane dual carriageway	4km upgrade of existing junction	0.7km Refurbished existing viaduct	22.1km Upgrade from dual to 3 lanes
CapCO₂								
Material	436,600	740,100	44,300	74,500	77,300	36,100	5,800	213,700
Labour + Plant	42,800	243,800	5,800	38,500	27,500	8,200	4,000	20,900
Earthworks	43,200		2,500					
Construction tCO ₂ e/km	21,800	26,600	6,700	4,300	16,100	11,100	13,900	10,600
OpCO₂								
Operation + Maintenance/annum	1,600	2,400	2,600	n/a	n/a	n/a	n/a	n/a
UseCO₂								
Use/annum	2,268,700	4,386,400	882,000	n/a	n/a	n/a	n/a	n/a

Table Source: Welsh Government, M4 Corridor around Newport, Environmental Statement: Volume 3, Appendix 2.4 Carbon Report, March 2016, Table 6: Comparison of the M4CaN carbon with other road infrastructure projects - expressed in tCO₂e

14.5. Potential impacts

Potential impacts of the Scheme on climate

- 14.5.1. As stated in section 14.4, effects on climate is a wide-ranging and complex topic as it covers the whole project life-cycle and emissions from sources that could be on an international scale. In comparison, the receptor and impact of effects on climate are very specific, as follows:
- there is only one receptor, the atmosphere, which is entirely non-site specific; and
 - there is only one impact, global warming, which occurs with the same level of effect per unit of emissions and is also entirely non-site specific.
- 14.5.2. These characteristics place the focus of the potential impacts on the sources and the quantity of emissions that they generate, because it is the magnitude of emissions from each source, and in total, that define the overall impact. Given this, the impacts are taken as the quantities of emissions occurring from each life-cycle or sub-activity thereof, as listed in Table 14-1. Further, the level of impact will be considered by comparison of the Scheme against, the different lifecycle stages, the national baseline and other highways schemes.
- 14.5.3. Overall positive impacts of the Scheme will potentially arise from reductions in emissions resulting from improved energy efficiency, and reduced vehicle idling/congestion/journey times. The reduced operational energy (B6) and traffic (B9) emissions once operational, relative to the baseline emissions will be calculated based on the data available in the ES.

14.6. Proposed level and scope of assessment

Effects of the Scheme on climate

- 14.6.1. Using DMRB terminology, a 'simple' assessment of the Scheme's effects on climate will be undertaken using a desk based assessment to quantify the magnitude of emissions and determine the significance of effect. The level of detail will be determined by the data available to inform the assessment.
- 14.6.2. The scope of assessment for effects on climate comprises the study area as defined in section 14.2.

14.7. Proposed assessment methodology

Effects of the Scheme on climate

- 14.7.1. The GHG emissions will be quantified according to PAS 2080 and the IEMA guide, Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (2017).
- 14.7.2. The assessment methodology will use design and construction data available within the timeframes of the assessment. All information will be taken at face-value. If data is not available within the timeframes of the assessment the scope of the assessment will be reduced.

- 14.7.3. It is proposed that emissions estimates and emissions calculations will be undertaken in Atkins Carbon Knowledgebase (CKB) and succinctly presented in tabular format in the ES. The CKB will be structured in accordance with the study area as defined in section 14.2.
- 14.7.4. The CKB is an in-house, web-based carbon calculation and analysis software tool for the building and construction industry that can be used to calculate and assess footprints using an extensive database of emissions data. Using the tool's 'Project Tree' functionality each item, activity, or process for the lifecycle stages will be defined as a line item, in tiers according to the various project areas and lifecycle stages. The associated project data is then entered using pre-defined calculation formulas (defined specifically to enable direct use of project data) and the associated carbon conversions factors, both of which are provided in a library in the tool. The tool then automatically generates the GHG emissions inventory according to the project data entered and the associated carbon conversions factors used.
- 14.7.5. The CKB has a proven track record on infrastructure schemes, including NSIPs (e.g., Thames Tideway Tunnel), and was considered to be the most effective means to undertake the assessment.
- 14.7.6. Once the emissions from the Scheme have been estimated from the baseline traffic data these will be compared against the baseline to determine whether the effects are positive or negative and major, moderate, minor, negligible or no change, as shown in the matrix Table 14-1 and defined in Table 14-2. Very large to moderate effects are considered to have the potential to be significant, while slight and neutral effects are not considered significant.

14.8. Vulnerably to major accident and disasters

Effects of the Scheme on climate

- 14.8.1. Major accidents and disasters which could potentially cause emissions include: events which could affect traffic in the area such as major road traffic accidents, terrorist attacks or plane crashes; and other events such as fires or chemical explosions which cause release of emissions. The potential for change in significance on emissions will be discussed as part of the assessment in the ES. However, it should be noted that any effect would be temporary and considered unlikely to significantly affect total emissions.

14.9. Proposed consultation

Effects of the Scheme on climate

- 14.9.1. Consultation will be undertaken with the project design team, to collect the project specific data necessary to undertake the assessment.
- 14.9.2. Consultation will be undertaken with the following:
- Surrey County Council Air Quality Department; and
 - Surrey County Council.

14.10. Potential mitigation measures

Effects of the Scheme on climate

14.10.1. Strategically, GHG emissions are mitigated by applying the carbon reduction hierarchy specified in PAS 2080, covering:

- Build nothing - challenge the root cause of the need; explore alternative approaches to achieve the desired outcome;
- Build less - maximise the use of existing assets; optimise asset operation and management to reduce the extent of new construction required;
- Build clever - design in the use of low carbon materials, streamline delivery processes, minimise resource consumption; and
- Build efficiently - embrace new construction technologies; eliminate waste.

14.10.2. These are applied at overall scheme and/or the various structures and equipment within it. Interpretation of these measures by life-cycle stage is provided in Table 14-6.

Table 14-6: GHG Emissions Mitigation Measures

Lifecycle Scope	Mitigation Measures
Temporary and permanent construction materials (A1-3):	Reduction of materials use will be carried out as specified for in the Materials and Waste chapter (Chapter 12). In addition, consideration will be given to designing in alternative low carbon (emission) materials, where practicable.
Materials Transportation (A4):	Materials transportation distances will be avoided by minimising the quantity of materials required, as per A1-3. Additionally, where possible designs will be specified to minimise the necessity to source materials from long distances.
Construction Plant (A5):	Construction plant emissions will be minimised by designing for efficient construction processes as part of design development. During construction plant emissions will be inherently managed via the measures outlined in the Construction Environmental Management Plan, which should specify plant operator efficiency requirements.
Construction Water Use (A5):	Construction mains water consumption will be minimised by designing for efficient construction processes as part of design development. During construction, mains water consumption will be inherently managed via the Construction Environmental Management Plan, which should specify reduction and reuse measures, and possibly avoidance through use of water from rain water harvesting.
Construction Waste Transportation (A5):	Reduction of waste will be carried out as specified in the Materials and Waste chapter (Chapter 12).
Construction Waste Off-Site Processing (A5):	Reduction of waste will be carried out as specified in the Materials and Waste chapter (Chapter 12).
Replacement (B2-5):	Replacement cycles will be mitigated through design by designing for long-life and ease of deconstruction and recycling, scheduled maintenance.

Lifecycle Scope	Mitigation Measures
Operational Energy (B6):	Subject to practicability, operational energy use will be minimised by designing for use of low energy lighting, and specification on controls that minimise on-time.
In-use Traffic (B9):	Mitigation of in-use traffic emissions will be as specified in the Air Quality chapter (Chapter 5), where relevant.

14.11. Assumptions and limitations

Effects of the Scheme on climate

14.11.1. The key limitation to the proposed assessment methodology is the availability of data within the timeframes of the assessment. It is assumed:

- For the purposes of consultation, a detailed emissions assessment is not required; and
- Where project specific data is not available, suitable proxy data can be applied, where sufficient engineering and construction expertise can be obtained to generate the such data.

14.12. Conclusion

Effects of the Scheme on climate

14.12.1. Based on the inconclusive determination of the impact of the emissions, and the requirement of the NPS for an emission assessment to be carried out, an assessment is deemed to be required, as set out in Table 14-7 and subject to availability of necessary design and construction information.

Table 14-7: GHG emission scoped in and out of further assessment

Lifecycle Scope	Scoped in/out	Comment/Justification
Temporary and permanent construction materials (A1-3):	✓	Currently no calculated data.
Materials Transportation (A4):	✓	Currently no calculated data.
Construction Plant (A5):	✓	Currently no calculated data.
Construction Water Use (A5):	✓	Currently no calculated data.
Construction Waste Transportation (A5):	✓	Currently no calculated data.
Construction Waste Off-Site Processing (A5):	✓	Currently no calculated data.
Replacement (B2-5):	✓	Currently no calculated data.
Operational Energy (B6):	✓	Currently no calculated data.

Chapter 15

15. Assessment of Cumulative Effects

15.1. Introduction

- 15.1.1. This chapter of the Scoping Report will bring together the principal findings of each of the above identified topic areas in order to identify and assess the combined effects of the Scheme and the anticipated cumulative effects of the Scheme when considered with other existing or future significant development projects with the study area.
- 15.1.2. In accordance with the DMRB Volume 11, Section 2, Part 5 HA 205/08 Assessment and Management of Environmental Effects requires that Cumulative Effects are assessed as part of the assessment process.
- 15.1.3. Cumulative effects *“result from multiple actions on receptors and resources and over time and are generally additive or interactive (synergistic) in nature. Cumulative impacts can also be considered as impacts resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”* (Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interaction, European Commission, May 1999). Cumulative effects are broadly effects that result from the accumulation of a number of individual effects that may also have synergistic aspects.

15.2. Baseline

- 15.2.1. In order to carry out the assessment it is necessary to define the location and timing of nearby potential developments. The ‘study area’ will encompass schemes which are supported by site specific extant planning policy/allocation, benefit from extant but unimplemented planning permission, or are planning applications currently under determination, including (but not necessarily limited to):
- Trunk road and motorway projects which have been confirmed (i.e. gone through the statutory processes);
 - Development projects with valid planning permissions as granted by the Local Planning Authority, and for which formal EIA is a requirement or for which non-statutory EIA has been undertaken;
 - Applications for consent which have been made, but which have not yet been determined (see thresholds below);
 - Allocated sites in emerging or adopted Local Plans; and
 - Other types of application which could have implications for the Scheme.
- 15.2.2. The proposed thresholds and spatial area are as follows:
- Nationally Significant Infrastructure Projects - 10 km from the red line boundary;
 - Regionally Significant Projects - 3 km from the red line boundary;
 - Major development - within and 1.5 km from the red line boundary; and
 - Minor development - within the red line boundary.

- 15.2.3. These thresholds are considered, based upon professional judgement and taking into account the nature and location of the Scheme, appropriate to the Scheme's likely zone of influence. This approach is congruent with guidance provided within PINS Advice Note 17.
- 15.2.4. Although the assessment will primarily include developments that are likely to occur and have some form of planning/land use approval, speculative developments will also be mentioned, specifically when their approval is fairly certain and if they are likely to have significant impacts.

Interaction with other projects

- 15.2.5. The traffic model will take account of the operational effects of major developments in the area and the wider surrounding region.

Trunk Road projects

- 15.2.6. The following Highways England road improvement schemes are also planned close to or within the Scheme area and will be considered in the cumulative effects assessment:
- junction 10 - 16 Smart Motorway Programme (SMP) - M25 junction 10 to junction 16 includes upgrading the M25 between junction 10 (A3) and junction 16 (M40) through a mixture of enhancements, including hard shoulder running between junctions 15 and 16, as well as four-lane through-junction running between junction 10 and junction 12; and
 - A3 Guildford - focuses on improving the A3 in Guildford from the A320 to the Hogs Back junction with the A31, with associated safety improvements.

Development projects

- 15.2.7. A major development that could cause cumulative effects is the former Wisley Airfield, which is a 92.8 ha site located to the south of Ockham Park junction.
- 15.2.8. There is a relevant site allocation for a residential led mixed use development including approximately 2000 new homes on the former airfield (Site allocation A35 in the Proposed Submission Local Plan: strategy and sites 2016).
- 15.2.9. The site was also included in the Guildford Borough Land Availability Assessment (LAA) and 2017 Addendum in the Housing Trajectory as a proposed new settlement, to be delivered between 2021/2022 to 2032/2033. This document forms part of the evidence base of the emerging Local Plan. An Examination in Public of the Local Plan is due to be held between April and July 2018.
- 15.2.10. A planning application was submitted for a major development approximately of this size (Planning ref. 15/P/00012) and refused on 8th April 2016. This application is currently at appeal and an inquiry is being held, with the final decision expected in early 2018.
- 15.2.11. Other provisional developments in Guildford Borough Council for inclusion in the assessment are:

- Land to the East of South Cottage, White Horse Lane, Ripley, GU23 6BB (Planning ref. 16/P/00608, refused on 22 June 2016 and appeal allowed subject to conditions 23 Aug 2017):
 - Outline planning application for the demolition of existing petrol filling station, car sales buildings and dilapidated workshops and the construction of up to 26 residential units to the rear and 2 retail/commercial units on the High Street frontage (for flexible A1, A2, A3 or A4 use) and associated car parking and landscaping all matters reserved except access.
- Royal Horticultural Society Gardens, Wisley Lane, Wisley, Woking, GU23 6QS (Planning ref. 16/P/01080, granted 30 September 2016):

Erection of new part single-storey part two-storey building accommodating retail, entrance and visitor facilities and alterations to the car parking and hard and soft landscaping and following the demolition of the existing plant centre, the extensions to the Laboratory building, toilet blocks, Aberconway Cottage and part of Aberconway House.
- Horticultural Society Gardens, Wisley Lane, Wisley, Woking, GU23 6QS (Planning ref. 16/P/000976, granted 30 September 2016):

Demolition of existing buildings and erection of a two-storey building accommodating science, education, research and restaurant facilities, associated landscaping including a landscape bund and other works associated with the development.

15.2.12. Within Elmbridge Borough Council the following are considered relevant:

- Former San Domenico Restaurant (Planning Ref. 2017/0524) (validated 21st March 2017):
 - Demolition of existing main building and the construction of the new petrol filling station (Sui Generis) with ancillary convenience store (Use A1) and food to go outlet (Use Class A5), 4 no. pump islands, canopy, underground tanks, revisions to vehicular access, parking and circulation arrangements, landscaping and associated works.
- Painshill Farm, Portsmouth Road, Cobham Surrey KT11 1DN (Planning Ref. 2016/4204) (validated 27th February 2017):
 - Redevelopment of the site to provide a 70 bed care home with integrated communal and support facilities, landscaped residents' gardens, staff areas, refuse storage and parking following demolition of existing houses.
- Site of 46 Portsmouth Road, Cobham, Surrey, KT11 1HY (Planning Ref. 2015/1997) (approved 17 September 2015):
 - Redevelopment of the site comprising of 4 two/three storey buildings with rooms in the roofspace, dormer windows and balconies to provide 44 retirement flats; conversion of the White Lion building to provide a further 6 flats; along with associated parking, landscaping and access from Between Streets and Portsmouth Road.
- Holly Parade, High Street, Cobham, Surrey KT11 3EE (Planning Ref. 2016/2185) (approved 19th January 2017):

- Development comprising 4 units for A1 Shop/A2 Financial use and 1 unit for A1 Shop/A3 Cafe use at ground floor level (790 sqm) and 24 residential units including communal facilities and parking following demolition of existing buildings.
- Land alongside A3 adjacent to Sainsbury Car Park (Site allocation DEV/COB9 in the Draft Settlement Investment and Development (ID) Plans-Cobham, Oxshott, Stoke D'Abernon, Downside) (consulted on between 8 April 2013 and 20 May 2013). The Local Plan is likely to be adopted in September 2018:
- A largely level vacant site between a housing development/supermarket car park and the A3. The site is currently a greenfield site but is not part of the Green Belt. To the south lie the Sainsbury's supermarket and car park and a residential housing estate of two-storey terraced properties. To the north is the A3, which rises on an embankment above the site level and, beyond that, open agricultural Green Belt.

15.3. Proposed level and scope of assessment

- 15.3.1. The DMRB identifies two types of cumulative impact in environmental assessment:
- Cumulative effects from a single scheme (acknowledging the outcomes of each of the environmental topics assessed for the Scheme); and
 - Cumulative effects from different schemes (assessed in combination with the Scheme).
- 15.3.2. The main source of data for the cumulative effects assessment will be the outcomes and information obtained from the individual environmental topic assessments. The assessment of cumulative effects arising from the Scheme in combination with other schemes will primarily constitute a desk-top study of planning documents broadly covering the location of schemes (if any are identified) considered relevant to the assessment.

15.4. Proposed assessment methodology

- 15.4.1. The focus of the desk-top study will be the collection of information relating to the background of relevant projects, their expected timelines and likely environmental impacts.
- 15.4.2. The ES will include an assessment of the potential for cumulative impacts. This assessment will include consideration of the following three dimensions to cumulative effects:
- Multiple effects on a single receptor (e.g. noise, air quality and visual effects on a single property);
 - Multiple effects on a resource distributed throughout the corridor (e.g. multiple losses of ponds); and
 - The interaction of the Scheme with other proposed developments (e.g. the Wisley Airfield development).

- 15.4.3. The potential for cumulation of impacts arising from the Scheme and the above projects will also be considered as part of the assessment within each topic chapter of the ES.
- 15.4.4. The Zone of Influence/Study Area proposed for each of the environmental topic areas is identified in Table 15-1 below. These are subject to change and will be confirmed in the ES.

Table 15-1: Zone of Influence/Study Area

Environmental topic	Zone of influence
Air Quality	Within 200 m of the construction site boundary.
Noise and Vibration	600 m from the carriageway edge of any proposed new routes or existing routes to be bypassed or improved, and 600 m from any other affected routes within 1 km of the proposed new routes or altered existing routes.
Biodiversity	• 2 km for statutory designated sites of nature conservation importance: SACs, SPAs, Ramsar sites, SSSIs, and NNRs and LNR; • 2 km for non-statutory SNCIs; • 30 km for SACs where bats are one of the qualifying species; • 5 km for bat records; • 1 km for notable habitats and notable or legally protected species; and • 1 km for ancient woodlands.
Road Drainage and the Water Environment	Within 1 km of the Scheme.
Landscape	• Visual effects within 1.5 km from the edge of the Scheme; and • Landscape effects within 1.5 km from the perimeter of the Scheme.
Geology and Soils	500 m from the extent of the red line boundary
Cultural Heritage	500 m around the alignment of the Scheme.
Materials and Waste	• Material resources study area includes the demand for key construction materials nationally; and • Waste study area includes the waste arisings and waste infrastructure capacity within the county of Surrey.
People and Communities	• Within 500 m of the Scheme.

- 15.4.5. In line with DMRB Volume 11, Section 2, Part 5, liaison will also be undertaken with the relevant Local Planning Authorities Guildford Borough Council, Elmbridge Borough Council, Woking Borough Council and Mole Valley District Council to determine and agree whether any other schemes in the vicinity of the Scheme should be taken into consideration and when they believe these to be likely to come forward.
- 15.4.6. Effects will be identified as short term or long term and temporary or permanent. The following categories in Table 15-2, which are presented in the DMRB, Volume 11, Section 2, Chapter 5 will be used as a framework for determining significance of cumulative effects.

Table 15-2: Determining Significance of Cumulative Effects

Significance	Effect
Severe	Effects that the decision-maker must take into account as the receptor/resource is irretrievably compromised.
Major	Effects that may become a key decision-making issue.
Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on current performance.
Minor	Effects that are locally significant.
Not significant	Effects that are beyond the current forecasting ability or are within the ability to absorb such change.

Table Source: DMRB, Volume 11, Section 2, Part 5, HA 205/08, Table 2.6

15.5. Potential mitigation measures

- 15.5.1. Under each of the topic areas, where significant cumulative effects are identified, beyond those identified as residual effects, additional mitigation measures will be proposed or recommended.
- 15.5.2. The mitigation measures across all topic areas will be presented in this chapter of the ES.

15.6. Assumptions and limitations

- 15.6.1. The list of development projects will be updated as part of the assessment and will also include any potential sites within Woking Borough Council to the north west and Mole Valley District Council to the south east.
- 15.6.2. The updated information will be obtained either by a request to the Local Planning Authorities or by interrogating the planning web pages.
- 15.6.3. A limitation of the assessment is that the development projects list is speculative and whilst the Local Planning Authorities and potentially developers will have been consulted on phasing, the developments may not be delivered in line with the assumptions.

15.7. Conclusion

- 15.7.1. This chapter of the ES will bring together and present the findings of each of the topic chapters to identify and assess the combined effects of the Scheme and the cumulative effects of the Scheme in association with other development projects within the study area, including details of proposed mitigation.
- 15.7.2. It has been reported in this Scoping Report that some receptors have the potential to experience effects from the Scheme relating to multiple environmental assessment areas. In particular, it is acknowledged that effects reported within the Air Quality, Noise and Vibration, Road Drainage and the Water Environment and People and Communities assessments may have cumulative effects on Population and Health. These potential in-combination effects will be identified and reported for all receptors and mitigation proposed.
- 15.7.3. The main developments that could cause combined and cumulative effects are the highway intervention schemes the M25 junction 10 - 16 Smart Motorway

Programme (SMP) and the A3 Guildford scheme, the RHS Wisley improvement works and the former Wisley Airfield site adjacent to the Scheme.

Chapter 16

16. Summary

- 16.1.1. This Scoping Report represents the first stage in the EIA process and sets out the proposed methodology for the assessment of the environmental impacts which have potential to arise due to construction and operation of the Scheme. This report also sets out the basis for a comprehensive assessment of the environmental impacts of construction and operation of the Scheme, the results of which will be presented in the ES.
- 16.1.2. A summary of the potential impacts for each environmental topic scoped into the ES for further assessment and scoped out are presented in Table 16-1.

Table 16-1: Summary of environmental topics scoped in and out of the EIA and their potential impacts

Effects	Scoped in/out	Potential impacts
Air Quality		
Construction Dust	✓	Increased emissions of dust during construction from dust-raising activities on site.
Construction Traffic	✓	Air quality could be affected by changes in traffic flows during construction, as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour.
Operational Traffic	✓	Air quality could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition) and by any changes to the distance between sources of emissions and air quality sensitive receptors.
Noise and Vibration		
Construction	✓	A temporary increase in noise levels during construction from activities on site. The noise climate could be affected by changes in traffic flows during construction, as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour.
Operational Traffic	✓	The noise climate could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition) and by any changes to the distance between the carriageways and noise sensitive receptors, caused by changes to the horizontal and vertical alignment of the roads.
Biodiversity		
Internationally designated statutory sites (SAC, SPA, Ramsar)	✓	Thames Basin Heaths SPA falls within the Scheme footprint. In addition, there are two internationally designated sites where bats are one of the qualifying features within 30 km of the Scheme. The Thames Basin Heaths SPA may also be subject to impacts from changes in air quality.
Nationally designated statutory sites (SSSI, NNR)	✓	Ockham and Wisley Common SSSI falls within the Scheme footprint. In addition, a further two SSSIs falls within 2 km of the Scheme. The Ockham and Wisley Common SSSI may also be subject to impacts from changes in air quality.
Locally designated statutory sites (LNR)	✓	Ockham and Wisley LNR falls within the Scheme footprint. A further three LNRs also fall within 2 km of the Scheme.
Non-statutory designated sites (SNCIs)	✓	Eight SNCIs fall within 2 km of the Scheme.

Effects	Scoped in/out	Potential impacts
Ancient woodland	✓	There are five parcels of ancient woodland subject to direct land take or immediately adjacent to the Scheme.
Notable habitats	✓	Broadleaved woodland, lowland heathland, rivers and ponds may be subject to impacts from the Scheme, which are HPI.
Notable terrestrial invertebrates	✓	There is potential for notable terrestrial invertebrates, such as those listed in the SSSI citations, to be affected by the Scheme.
Aquatic invertebrates	✓	The Scheme may cross some rivers and tributaries. Therefore, there is potential for notable aquatic invertebrates to be affected by the Scheme.
Great crested-newt	✓	The Scheme may affect potential suitable terrestrial habitat for great crested newts, a notable species, which is also legally protected.
Reptiles	✓	The Scheme affects potential suitable habitat for reptiles, notable species which are legally protected.
Breeding birds	✓	The Scheme affects potential habitat for notable birds. Nesting birds are also legally protected.
Bats	✓	The Scheme may impact on one or more features suitable for roosting bats, and affect bat foraging habitat and/or disrupt commuting routes. Bats are notable species that are legally protected.
Hazel dormouse	✓	The Scheme affects potential dormouse habitat, a notable species that is legally protected.
Water vole	✓	The Scheme may cross some rivers and tributaries. Therefore, there is potential for water voles to be affected by the Scheme.
Otter	✓	The Scheme may cross some rivers and tributaries. Therefore, there is potential for otters to be affected by the Scheme.
Badger	✓	There is potential for sett destruction, disturbance or harm to badgers, which are legally protected, during construction.
Invasive plants	✓	There is potential to cause certain invasive plant species under Schedule 9 of the Wildlife and Countryside Act 1981 to spread (which is an offence) during construction if present.
Road Drainage and the Water Environment		
Surface Water	✓	Risks to the surface water environment could occur from excavation and the subsequent deposition of soils, sediment or other construction materials; spillage of fuels or other contaminating liquids; and mobilisation of contaminated following disturbance of contaminated ground or groundwater.

Effects	Scoped in/out	Potential impacts
		Pollutants and new areas of hard standing could increase road runoff and affect water quality in the river.
Groundwater	✓	Risks to the groundwater environment could occur from cuttings and potential contamination risks to the underlying Principal Aquifer and subsequent effects on existing abstractions.
Flood Risk	✓	The increase in flood risk could occur from the storage of materials; interception of groundwater or changes to groundwater flows; and discharge of abstracted water during construction, especially if discharged to smaller watercourses. Discharge from new sections of the junction has the potential to increase flood risk for downstream receptors, and any road structures or landscaping features constructed in the floodplain have the potential to alter flood flows and increase flood risk downstream.
WFD detailed assessment	✓	Direct physical impacts of watercourse crossings with the potential for direct effects on biological, chemical and physical WFD parameters for both surface waters and WFD groundwater bodies.
Water-dependent designated sites	✓	Water dependent sites could be affected during construction if there is any hydraulic connectivity.
Landscape		
Areas of vegetation including coniferous woodland, semi mature and mature planting	✓	Likely to affect existing vegetation, particularly the coniferous woodland and semi mature and mature planting along the road corridor approaches to M25 junction 10 and local access roads.
Local landscape character features i.e. landform, landscape pattern	✓	These landscape features are likely to be affected through introduction of earthworks and loss of landscape links in the form of boundary vegetation and change of land use.
Effects on identified landscape character based on key attributes of identified landscape character areas	✓	Effects on landscape character would take into consideration the key attributes of landscape character areas and effects on the loss of vegetation, land form, land use and landscape pattern.
Landscape character at regional and national level	✗	The Scheme would not give rise to the alteration of key characteristics of landscape character at the regional and national level.
Effects on Ockham, Wisley and Chatley Heath Common	✓	Landscape effects on Ockham, Wisley and Chatley Heath Commons will likely be effected as a consequence of the encroachment of the Scheme on the area of Commons and transformation of their character. The Commons are frequently used by people for enjoyment of outdoor activities and therefore their views are of high sensitivity.

Effects	Scoped in/out	Potential impacts
Painshill Park Grade I Registered Park and Garden	✓	Landscape and visual effects on Painshill Grade I Registered Park and Garden require further assessment as some of the Scheme adjoins the A3 and the boundary of Painshill Park.
RHS Gardens Wisley - Grade II* Registered Park and Garden	✓	Landscape and visual effects on RHS Gardens Wisley - Grade II* Registered Park and Garden require further assessment as the Scheme are located close to the A3 and the entrance road to the RHS Gardens Wisley.
Views from the network of PRow's within the study area	✓	Views from PRow's are particularly sensitive and the potential effects on their users requires further assessment.
Views from residential properties within the study area	✓	Those that are located a considerable distance from the Scheme may experience partial views of some of the Scheme. Those that are located closer to the Scheme or adjacent to the Scheme are likely to be affected by some elements of the Scheme.
Views from commercial properties within the study area	✓	Views of users of commercial properties located within the study area are likely to be affected by the Scheme.
Geology and Soils		
Soils and agricultural land	✓	The Scheme will involve the loss of Common and Public Access Land and so exchange land will have to be created in the vicinity. Works to make the replacement land more suitable for habitat creation such as topsoil stripping may be required.
Land contamination including human health, groundwater and surface water	✓	Contamination risks identified during the ground investigation surveys will be assessed and where possible reduced during detailed design. Requirement for mitigation measures, should these be required, will be assessed during detailed design in PCF Stage 5. New piling or excavation during construction could create new pathways between any contaminated soils and the underlying groundwater. Any dewatering activities associated with the construction phase have the potential to mobilise further potentially contaminated groundwater and enhance lateral migration of contamination within the superficial and bedrock aquifers and potentially into surface watercourses.
Construction and operational phase pollution effects	✓	The Scheme has the potential to introduce new sources of contamination associated with the accidental loss/spillage of fuels and oils as well as the potential to disturb and mobilise existing sources of contamination.
Physical effects	✓	There is potential to exacerbate existing areas or to create new areas of ground instability and compressible ground.

Effects	Scoped in/out	Potential impacts
		Any new confined spaces, such as manholes and service chambers/ducts, within which ground gas has the potential to accumulate, could affect the additional receptors of construction workers, future site workers and proposed foundations.
Major accidents or disasters	✓	Significant effects arising from the vulnerability of the Scheme to major accidents or disasters relevant to the Scheme will be assessed.
Cultural Heritage		
Designated heritage asset	✓	The widening of the A3 has the potential to directly impact upon two known heritage assets in the vicinity of Bolder Mere to the west of junction 10, with the impacts expected to be minor to moderate adverse. The setting of Painshill Park, a Grade I Registered Park and Garden, could also be affected as a result of construction of part of the overbridge within the designated parkland and other changes to its setting. The Scheme has the potential to affect the hengi-form scheduled monument at Red Hill (1007905) as a result of changes to its setting, due to the proximity of the overbridge to the monument, along with the impacts resulting from the general A3 widening. The access to Wisley Lane has the potential to impact the Royal Horticultural Society's Garden, Wisley which is a Grade II* Registered Park and Garden. While the impacts to RHS Wisley would only be to a part of the asset and will have a limited impact on the overall significance of the Park, this could constitute a moderate to large significant effect on the asset.
Non-designated heritage assets	✓	Likely to result in direct impacts upon six known non-designated linear features in the vicinity of the junction, although as these assets are considered to be of low value, minor adverse impacts are expected.
Potential for undiscovered archaeology	✓	The Scheme has the potential to impact upon significant unknown archaeological remains during construction only, given the proximity of the required works to a known prehistoric monument of national importance and medieval landscape features. Impacts to these as-yet unknown assets may range from moderate to major adverse; further work would be required to ascertain their significance and therefore determine the significance of effect.
Materials and Waste		
Change in demand for key construction materials during the CD&E phases	✓	The impacts of the Scheme against the national demand for key construction materials during the CD&E phases is to be assessed and evaluated.

Effects	Scoped in/out	Potential impacts
Change in demand for key construction materials associated planned/unplanned maintenance with during the operational phase	x	Minimal impact is envisaged during the operational stage of the Scheme due to minimal material resource use (associated with planned/unplanned maintenance).
Change in baseline waste arisings during the CD&E phases	✓	The impacts of waste arisings from the Scheme against the waste arisings baseline during the CD&E phases is to be assessed and evaluated. The baseline for CD&E waste will be on a regional level and the baseline for hazardous CD&E will be on a national level.
Change in baseline regional waste arisings during the operational phase	x	Minimal impact is envisaged during the operational stage of the Scheme due to minimal waste generation (through littering and planned/unplanned maintenance). Most of these wastes would likely be non-hazardous municipal type wastes during normal operation, and non-hazardous/inert and hazardous wastes from planned/unplanned maintenance.
Change in capacity of waste infrastructure during the CD&E phase	✓	The impacts of waste arisings from the Scheme against the regional waste infrastructure baseline during the CD&E phases is to be assessed and evaluated. The baseline for CD&E waste will be on a regional level and the baseline for hazardous CD&E will be on a national level.
Change in capacity of regional waste infrastructure during the operational phase	x	Operational waste arisings from the Scheme will not be assessed as it is envisaged that this will be minimal and no data related to waste generated by highway schemes is readily available. Therefore, an assessment will not be made of the potential effect of the operational waste arisings on operational waste infrastructure.
Waste	✓	The Scheme will be designed to ensure wastage is minimised throughout lifecycle. Waste to be used as a resource where practicable and designed out where possible.
Material resources	✓	The impacts of the Scheme against national demand for key construction materials and raw material resources will be assessed and evaluated.
People and Communities		
Direct effects on Physical Assets, Public and Private	✓	Construction of the Scheme, subject to design, has potential to directly impact on private property through demolition, land take or alterations to access. The Scheme will directly affect Ockham Common, Wisley Common, and other 'Open Access Land' and will also affect Painshill Park and RHS Gardens Wisley. The Scheme has potential to temporarily or permanently affect a number of PRowWs, including existing crossings points over the A3 and M25 and footpaths associated with local roads.

Effects	Scoped in/out	Potential impacts
Amenity effects on Public and Private Receptors	✓	The Scheme has potential to result in nearby residential receptors experiencing a combination of effects such as those relating to traffic, visual, air quality or noise during both construction and operation. The Scheme is likely to noticeably alter the views experienced by users of the junction 10 junction, slip roads, M25, A3, A245 and local roads. The magnitude of change will depend on final Scheme alignments, elevations, and structure types, but the potential for significant effects on road user amenity is likely to be low. Users of Common Land, Open Access Land, and the various Public Rights of Way in and around the Scheme boundary are likely to experience changes in amenity during construction and operation of the Scheme.
Community severance	✓	Construction of the Scheme has the potential to cause increased delays, increased construction traffic on the road network, which would have a temporary effect. Temporary or permanent closure or diversion of footpaths has the potential to sever communities from services and facilities. During operation, the Scheme is expected to improve the experience of vehicle travellers currently using the M25, particularly junction 10 and associated slip roads, the A3, the A245, and other areas of the local highway network that currently experience congestion during times of heavy traffic and emergency closures of the motorway.
Local economy and Employment Opportunities	✓	Some BMV agricultural land is potentially required either temporarily or permanently to enable the construction of the Scheme. Construction and operation of the Scheme, particularly in respect of any replacement land provided and altered access arrangements, has potential to affect the operation of farm businesses. Other businesses within and around the limit of land potentially required for the construction or operation of the Scheme may be impacted by altered access arrangements.
Development land	✓	The proposed development sites in Elmbridge at Cobham are unlikely to be directly impacted by the Scheme with the exception of the unallocated land next to Sainsbury's which is adjacent to the A3 north of Painshill interchange and the former San Domenico Restaurant on the A3. The Scheme has potential to directly impact the Guildford strategic proposed site allocation "A35 Land at former Wisley Airfield Ockham" and the associated proposed access, located at Wisley junction.
Climate		

Effects	Scoped in/out	Potential impacts
Road infrastructure, including bridges, embankments and earthworks	✓	These are susceptible to damage or disruption from climate-related hazards, and have the following potential impacts: • Increased damage to roads, flooding of infrastructure, road submersion, earthworks failures, landslides, undercutting and bridge scour from increased heavy precipitation; • Poor driving conditions, increased accidents and prevention of road repairs from increased frequency of high precipitation events; • Increased thermal loading on road pavements from increased number of hot days; • Increased subsidence from increased average temperature/decreased rainfall; • Overheating of equipment, more demand for air conditioning, increased heat exhaustion from increased frequency of high or extreme temperature episodes; • Decreased number of cold days could lead to reduced winter maintenance costs for roads and changes to timing for winter maintenance regimes, improved working conditions for personnel, less need for heating on transport, reduced winter protection (gritting), reduction in cold weather disruptions and improved road safety; • Increased road rutting and changes in travel demand from an increase in average summer temperatures; • Impact on maintenance regimes due to degradation, soil shrinkage/subsidence from seasonal temperatures; • A reduction in winter travel problems could lead to inadequate preparation for extreme events; • Winds above 30 knots could lead to increased problems for suspension bridges and high sided vehicles; • High wind speeds and low temperatures could increase the interference to asphalting and concreting as wind chill cools the surface too quickly; • Increased incidence of fog could change road speeds; and • Changes to insurance premiums as a result of all climates and subsequent risks.
Sea level rise	✗	Scoped out due to geography of the Scheme.

Chapter 17

17. References

17.1. References

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Chapter 18

18. Abbreviations and Glossary

18.1. Abbreviations

Abbreviation	Definition
AADT	Annual Average Daily Traffic
ALC	Agricultural Land Classification
AONB	Area of Outstanding Natural Beauty
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ARN	Affected Road Network
bgl	below ground level
BGS	British Geological Survey
BMV	Best and Most Versatile
CD&E	Construction, Demolition and Excavation
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute for Ecology and Environmental Management
CLR11	Contaminated Land Report 11
CMS	Continuous Monitoring Station
COSHH	Control of Substances Hazardous to Health
CPRE	Campaign to Protect Rural England
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
CSR	Client Scheme Requirements
CWS	County Wildlife Site
D3AP	Dual 3 lane All Purpose
D4	Dual 4
D4AP	Dual 4 lane All Purpose
dB	Decibel
DBFO	Design, Build, Finance and Operate
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do-Something

Abbreviation	Definition
EA	Environment Agency
EAR	Environmental Assessment Report
EAST	Early Assessment and Sifting Tool
EBC	Elmbridge Borough Council
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESR	Environmental Study Report
EZoI	Ecological Zone of Influence
GBC	Guildford Borough Council
GLVIA	Guidelines for Landscape and Visual Impact Assessment
HAGDMS	Highways Agency Geotechnical Data Management System
HDV	Heavy Duty Vehicle
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HPI	Habitats of Principal Importance
HRA	Habitat Regulations Assessment
IAN	Interim Advice Note
IAQM	Institute of Air Quality Management
LAQM.TG	Local Air Quality Management Technical Guidance
LEP	Local Enterprise Partnership
LGS	Local Geological Sites
LNR	Local Nature Reserves
LV	Limit Values
MAFF	Ministry of Agriculture, Fisheries and Food
MAGIC	Multi-Agency Geographic Information for the Countryside
MCA	Mineral Consultation Area
MP	Member of Parliament
MPI	Major Project Instructions
MSA	Mineral Safeguarding Area
MVDC	Mole Valley District Council
NCA	National Character Area
NE	Natural England
NHLE	National Heritage List Entry
NIA	Noise Important Area
NIR	Noise Insulation Regulations
NMU	Non-Motorised User

Abbreviation	Definition
NNR	National Nature Reserves
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide
NSIP	Nationally Significant Infrastructure Project
NVC	National Vegetation Classification
PCF	Project Control Framework
PCM	Pollution Climate Mapping
PM ₁₀	Particulate Matter with a diameter of 10 micrometres or less
PPG	Planning Practice Guidance
PRoW	Public Rights of Way
PSSR	Preliminary Sources Study Report
PTS	Professional and Technical Solutions, a directorate within Highways England (formerly NetServ)
RHS	Royal Horticultural Society
RIS	Road Investment Strategy
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SARG	Surrey Amphibian and Reptile Group
SBIC	Surrey Biodiversity Information Centre
SNCI	Sites of Nature Conservation Interest
SPA	Special Protection Areas
SPZ	Source Protection Zone
SRN	Strategic Road Network
SSSI	Sites of Special Scientific Interest
SWMP	Site Waste Management Plan
TAG	Transport Analysis Guidance
TPO	Tree Preservation Order
UXO	Unexploded Ordnance
WBC	Woking Borough Council
WFD	Water Framework Directive
WHO	World Health Organisation

18.2. Glossary

Term	Description
Access Land	Open Access Land or Access Land is land you can access in England without having to use paths. Access Land includes mountains, moors, heaths and downs that are privately owned. It also includes Common Land registered with the local council and some land around the England Coast Path. Your right to access this land is called the 'right to roam', or 'freedom to roam'. Access Land can be used for walking, running, watching wildlife and climbing.
ADMS Roads	A comprehensive software tool for investigating air pollution problems due to networks of roads that may be in combination with industrial sites
Affected Road Network	The parts of the road network that would be affected by a change in traffic levels as the result of a transport scheme
Agricultural Land Classification	A framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on agricultural use. Agricultural land is classified into five categories according to versatility and suitability for growing crops. The top three grades, Grade 1, 2 and 3a, are referred to as 'Best and Most Versatile' land.
Air Quality Management Area	An area identified where the National Air Quality Objectives are not likely to be achieved. The Local Authority is required to produce a Local Air Quality Action Plan to plan how air quality in the area is to be improved.
Air Quality Strategy	The UK government's Air Quality Strategy sets air pollution standards and objectives to protect people's health and the environment.
Annual Average Daily Traffic	The number of vehicles travelling on a particular stretch of road on an average day.
Appraisal Summary Table	A table that appraises the performance of each option against economic, environmental, social and distributional sub-impacts and is used to directly inform the Value for Money assessment for the Economic Case.
Archaeological Priority Area	An area where there is significant known archaeological interest or potential for new discoveries. They are used to highlight where development may affect heritage assets.
Area of Outstanding Natural Beauty	An area outside a National Park designated for conservation due to its natural beauty.
At grade	On the same level, for example, an at grade junction is two or more roads meeting or crossing on the same level.
Best and Most Versatile	Defined as Grades 1, 2 and 3a of the Agricultural Land Classification as land which is most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non-food uses such as biomass, fibres and pharmaceuticals.
Biodiversity Action Plan	An internationally recognized program addressing threatened species and habitats and is designed to protect and restore biological systems. The original impetus for these plans derives from the 1992 Convention on Biological Diversity.

Term	Description
British Geological Survey	A partly publicly-funded body which aims to advance geoscientific knowledge of the United Kingdom landmass and its continental shelf by means of systematic surveying, monitoring and research.
Calculation of Road Traffic Noise	A UK Technical Memorandum for calculating road traffic noise using measurement or prediction methods for the noise index $L_{A10,18\text{hours}}$.
Campaign to Protect Rural England	A national charity dedicated to the protection of rural England, protecting the local countryside where there is threat and enhancing it where there is opportunity. They aim to limit urban sprawl and ribbon development.
Client Scheme Requirements	The objectives of the M25 junction 10 Improvements Scheme.
Congestion Reference Flow	The maximum achievable hourly throughput of traffic on a particular stretch of road, expressed in terms of AADT.
Conservation Area	An area of special environmental or historic interest or importance, of which the character or appearance is protected by law against undesirable changes (Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990).
Construction Environmental Management Plan	A plan by the contractor describing how the environmental impacts of construction activities of a project will be minimised and mitigated.
Contaminated Land Report 11	The Model Procedures for the Management of Land Contamination (CLR 11) have been developed to provide the technical framework for applying a risk management process when dealing with land affected by contamination. The process involves identifying, making decisions on, and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the UK.
Continuous Monitoring Station	A monitoring site which measures air pollutant concentrations continuously using automatic analysers.
Control of Substances Hazardous to Health	Under the Control of Substances Hazardous to Health Regulations 2002, employers need to either prevent or reduce their workers' exposure to substances that are hazardous to their health.
County Wildlife Site	A non-statutory conservation designation in the UK which affirms a site's importance and value for wildlife in its county context. The designation is classified by Natural England as being a 'Local Site' designation, though sites can also be of a regional and national importance.
Defence Infrastructure Organisation	The arm of the Ministry of Defence (MoD) responsible for building, maintaining and servicing the MoD estate.
Defra	Defra is the government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom of Great Britain and Northern Ireland. Defra is a ministerial department, supported by 33 agencies and public bodies.
Department for Transport	Government department responsible for the transport network in England, and for aspects of the transport network in the devolved administrations.
Design, Build, Finance and Operate	A single contractor is appointed to design and build a project and then to operate it for a period of time. The contractor finances the

Term	Description
	project and leases it to the client for an agreed period (perhaps 30 years) after which the development reverts to the client.
Design Manual for Roads and Bridges	A series of 15 volumes that provide standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads, including motorways in the United Kingdom, and, with some amendments, the Republic of Ireland.
Development Consent Order	The means of applying for consent to undertake a Nationally Significant Infrastructure Project (NSIP). NSIPs include, for example, major energy and transport projects.
Early Assessment and Sifting Tool	A decision support tool that has been developed to quickly summarise and present evidence on options in a clear and consistent format. It provides decision makers with relevant, high level, information to help them form an early view of how options perform and compare. The tool itself does not make recommendations and is not intended to be used for making final funding decisions.
Ecological Zone of Influence	The area encompassing all the predicted adverse ecological effects of the Scheme, including those that would occur as a result of habitat loss, increased emissions, and those that would occur through disturbance, such as noise.
English Heritage	Charity that cares for the National Heritage Collection of state-owned historic sites and monuments across England, under licence from Historic England.
Environment Agency	A non-departmental public body with responsibilities relating to the protection and enhancement of the environment in England.
Expressway/Expressway Standard	A road with high quality performance and safety standards, as described in the July 2013 Action for Roads report.
Habitats of Principal Importance	Under Section 41 of the Natural Environment and Rural Communities (NERC) Act, the Secretary of State is required to publish a list of habitats which are of principal importance for the conservation of biodiversity in England. Fifty-six habitats of principal importance are included on the S41 list. These are all the habitats in England that were identified as requiring action in the UK Biodiversity Action Plan and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.
Historic England	Publicly funded body that champions and protects England's historic places, including Stonehenge and Avebury; also known as the Historic Buildings and Monuments Commission for England.
Interim Advice Note	Issued by Highways England and contain specific guidance, which shall only be used in connection with works on motorways and trunk roads in England, subject to any specific implementation instructions contained within an IAN. While IANs must be read together with the DMRB and the Manual of Contract Documents for Highway Works (MCHW) for the above works, and may incorporate amendments or additions to documents in these publications, they are not part of the DMRB or MCHW.
Local Air Quality Management Technical Guidance	A technical guidance document designed to support local authorities in carrying out their duties under the Environment Act 1995 and subsequent Regulations. These duties require local

Term	Description
	authorities to review and assess air quality in their area from time to time.
Local Geological Site	Formally known as Regionally Important Geological Sites (RIGS). Sites within the county that are considered worthy of protection for their Earth Science or landscape importance, but are not already protected as SSSIs.
Local Nature Reserve	A statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the Natural Environment and Rural Communities Act 2006, by principal local authorities. A Local Nature Reserve must be of importance for wildlife, geology, education or public enjoyment.
Local Enterprise Partnership	A voluntary partnership set up between local authorities and businesses to drive local economic growth and job creation activities. There are 39 LEPs across England.
Mineral Consultation Area	An area identified in order to ensure consultation between the relevant minerals planning authority, the minerals industry and others before certain non-mineral planning applications made within the area are determined.
Mineral Safeguarding Area	An area designated by Minerals Planning Authorities which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.
Ministry of Agriculture, Fisheries and Food	A UK government department created by the Board of Agriculture Act 1889. The Ministry was dissolved in 2002, at which point its responsibilities were merged into the Department for Environment, Food and Rural Affairs (Defra).
Multi-Agency Geographic Information for the Countryside	A web-based interactive map to bring together information on key environmental schemes and designations in one place. Multi-Agency Geographic Information for the Countryside (MAGIC) is a partnership project involving six government organisations who have responsibilities for rural policy-making and management.
National Character Area	The subdivision of England into 159 distinct natural areas. Each area is defined by a unique combination of landscape, biodiversity, geodiversity, history, and cultural and economic activity. Their boundaries follow natural lines in the landscape rather than administrative boundaries.
National Infrastructure Plan	Document published by the UK Government, setting out its strategy for meeting the infrastructure needs of the UK economy.
National Nature Reserve	Reserves established to protect some of the most important habitats, species and geology in the United Kingdom, and to provide 'outdoor laboratories' for research. There are currently 224 NNRs in England with a total area of over 94,400 hectares - approximately 0.7% of the country's land surface. Natural England manages about two thirds of England's NNRs. The remaining reserves are managed by organisations approved by Natural England, for example, the National Trust, Forestry Commission, RSPB, Wildlife Trusts and local authorities.
National Vegetation Classification	The National Vegetation Classification was commissioned in 1975 by the Nature Conservancy Council (NCC) to provide a comprehensive and systematic catalogue and description of the plant communities of Britain. It has now been accepted as a

Term	Description
	standard, not only by the nature conservation and countryside organisations, but also by forestry, agriculture and water agencies, local authorities, nongovernmental organisations, major industries and universities.
Nationally Significant Infrastructure Project	A project of a type and scale defined under the Planning Act 2008 and by order of the Secretary of State relating to energy, transport, water, waste water and waste generally. These projects require a single development consent. Planning permission, listed building consent and scheduled monument consent amongst others are not required for Nationally Significant Infrastructure Projects.
National Trust	Charity that cares for historic houses, gardens, ancient monuments, countryside and other sites across England, Wales and Northern Ireland, including the Stonehenge landscape.
Natural England	Executive non-departmental public body responsible for the natural environment.
Non-Motorised User	Cyclists, pedestrians (including wheelchair users), and equestrians using the public highway.
Noise Important Area	Areas where the 1% of the population that are affected by the highest noise levels from major roads are located according to the results of Defra's strategic noise maps.
Pollution Climate Mapping	A collection of models designed to fulfil part of the United Kingdom's EU Directive (2008/50/EC) on ambient air quality and cleaner air for Europe, requirements to report on the concentrations of particular pollutants in the atmosphere. There is one model per pollutant, each with two parts: a base year model and a projections model. The Pollution Climate Mapping model provides outputs on a 1x1 km grid of background conditions plus around 9,000 representative road side values. The Mapping is also used for scenario assessment and population exposure calculations to assist policy developments and provides model runs to support the writing of Time Extension Notification applications for PM ₁₀ and NO _x .
Project Control Framework	A joint Department for Transport and Highways England approach to managing major projects. The Framework comprises a standard project lifecycle; standard project deliverables; project control processes and governance arrangements.
Public Right of Way	A way over which the public have a right to pass and repass. The route may be used on foot, on (or leading) a horse, on a pedal cycle or with a motor vehicle, depending on its status. Although the land may be owned by a private individual, the public may still gain access across that land along a specific route. Public rights of way are all highways in law.
Publicly Funded Structure	A structure in which the initial capital costs of the scheme are (principally) met through sources from government funding.
Road Investment Strategy	The long-term strategy to improve England's motorways and major A roads. The first RIS (known as RIS1) was published in 2014 and covers the period 2015-2020. A second RIS (RIS2) was published in 2015, and covers the post-2020 period.
Royal Horticultural Society	The UK's leading gardening charity dedicated to advancing horticulture and promoting gardening.

Term	Description
Royal Society for the Protection of Birds	A charitable organisation that works to promote conservation and protection of birds and the wider environment through public awareness campaigns, petitions and through the operation of nature reserves throughout the UK.
Scheduled monument	A 'nationally important' archaeological site or historic building, given protection against unauthorised change and included in the Schedule of Monuments kept by the Secretary of State for Culture, Media and Sport. The protection given to scheduled monuments is given under the Ancient Monuments and Archaeological Areas Act 1979.
The Scheme	The M25 junction 10 Improvements Scheme.
Sites of Nature Conservation Importance	Locally important sites of nature conservation adopted by local authorities for planning purposes.
Site of Special Scientific Interest	A conservation designation denoting to a protected area in the United Kingdom. The Sites are protected by law to conserve their wildlife or geology.
Site Waste Management Plan	A Site Waste Management Plan should describe how materials will be managed efficiently and disposed of legally during the construction of the works, explaining how the re-use and recycling of materials will be maximised. This involves estimating how much of each type of waste is likely to be produced and the proportion of this that will be re-used or recycled on site, or removed from the site for re-use, recycling, recovery or disposal. It is the joint responsibility of the client and the principal contractor to ensure that a Site Waste Management Plan is in place before construction begins and to ensure that it is enforced.
Source Protection Zone	Areas of land around over 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. The zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. There are three main zones (inner, outer and total catchment) and a fourth zone of special interest, which is occasionally applied to a groundwater source. The zones are used in conjunction with the Groundwater Protection Policy to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby.
Special Area of Conservation	Areas of strictly protected sites designated under the EC Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora. The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).
Special Protection Area	Areas of strictly protected sites classified in accordance with Article 4 of the EC Birds Directive (2009/147/EC) on the conservation of wild birds. They are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species.
Strategic Economic Plan	A document produced by a Local Enterprise Partnership setting out its plans for the future and the funding that will be required to deliver these plans.
Strategic Road Network	The network of approximately 4,300 miles of motorways and major 'trunk' A roads across England, managed by Highways England.

Term	Description
Transport Analysis Guidance	Guidance produced by DfT on the process of appraisal of transport interventions.
Tree Preservation Order	A Tree Preservation Order is made by a Local Planning Authority to protect specific trees or a particular area, group or woodland from deliberate damage and destruction. TPOs can prevent the felling, lopping, topping, uprooting or otherwise wilful damaging of trees without the permission of the Local Planning Authority.
Unexploded Ordnance	An explosive weapon (bombs, shells, grenades, land mines, naval mines, cluster munition, etc.) that did not explode when they were employed and still pose a risk of detonation, sometimes many decades after they were used or discarded.
Water Framework Directive	The Water Framework Directive (2000/60/EC) is a EU directive which aims to achieve good status of all water bodies (surface waters, groundwaters and the sites that depend on them, estuaries and near-shore coastal waters) and the prevent any deterioration. It has introduced a comprehensive river basin management planning system to protect and improve the ecological quality of the water environment. It is underpinned by the use of environmental standards.
World Heritage Site	A site listed by UNESCO because of its special natural or cultural value.
Zone of Theoretical Visibility	A map, usually digitally produced, showing areas of land within which a development is theoretically visible.

Chapter 19

19. Location and Design Plans (incl. locations plan showing red line boundary)

Figures

Appendices

Appendix A. Air Quality

A.1. Local Planning Policy

- A.1.1. The EBC Local Plan Core Strategy⁶⁸ notes that *“air pollution will need to be tackled through a combination of measures to reduce the need to travel; promote walking and cycling; and increase the attraction of travelling by rail in order that their negative effect on the area is reduced over time.”* Core Strategy 25 (CS25 - Travel and Accessibility) also states that the council *“will seek to mitigate the detrimental environmental effects caused by transport, particularly with regards to HGVs, through a variety of measures, which may include...improving air quality...Support will be given to schemes that help to meet the commitments contained in the Elmbridge Air Quality Strategy.”*
- A.1.2. The EBC Air Quality Action Plan (AQAP) details the council’s proposed measures for improvement of air quality within the borough. The AQAP identifies the primary source of air pollution within the borough as road traffic and as such recognises the need to support sustainable travel options and the importance of raising public awareness on the issue of air pollutants; these documents include the Surrey County Council Local Transport Plan (LTP3) and Elmbridge’s Local Development Framework (LDF).
- A.1.3. The GBC Local Plan⁶⁹ was adopted in 2003 as the appropriate planning framework. Similarly to EBC it identifies road traffic as the primary source of air pollution within the borough.
- A.1.4. The Guildford Borough Transport Strategy 2016⁷⁰ recognises the M25 junction 10/A3 Wisley interchange as a site of significant, recurrent traffic congestion during peak hours and has committed to its improvement. Within this document the air quality strategy details the borough’s pollutants of concern as particulate matter and NO₂. The Road Investment Strategy is a committed improvement of GBC as well as plans for improvements on the bus and rail networks, GBC also aspires to install a network of electrical vehicle charging points.
- A.1.5. The Woking Core Strategy⁷¹ also recognises in Core Strategy Objective 7, the need to *“maintain and improve air [quality]”*, supported by policies CS1 (spatial strategy) and CS18 (transport). Woking first declared an AQMA in Knaphill in 2014 and a site-specific AQAP was published in July 2015, focussing on upgrading and rephrasing traffic signals at the junction. A second AQMA to the south of Woking town centre was declared in May 2017. Actions to assess air quality in this second AQMA are yet to be published.
- A.1.6. The Woking Local Action 21 (LA21)⁷² is a community-led initiative supported by WBC which has pledged to achieve a *“healthy environment with clean air”* through establishing an air quality information helpline, raising public awareness of air pollution sources and an individual’s responsibility.
- A.1.7. The Surrey Transport Plan (LTP3): Air Quality Strategy⁷³ also identifies road traffic as one of the main contributors to air pollution in Surrey’s AQMAs. This document proposes

⁶⁸ Elmbridge Borough Council (2011) Elmbridge Core Strategy. Elmbridge Borough Council: Esher. Retrieved 2017, from <http://www.elmbridge.gov.uk/planning/local-plan/>

⁶⁹ Guildford Borough Council (2013) Local Plan. Retrieved 2017, from <http://www.guildford.gov.uk/newlocalplan/CHttpHandler.ashx?id=1068&p=0>

⁷⁰ Guildford Borough Council (2016) Transport Strategy 2016. Retrieved 2017, from <http://www2.guildford.gov.uk/councilmeetings/documents/s4930/Item%2004%20-%20Guildford%20Borough%20Transport%20Strategy.pdf>

⁷¹ Woking Borough Council (2012) Woking Local Development Framework: Woking Core Strategy. Retrieved 2017, from <http://www.woking2027.info/corestrategy/adoptedcorestrategy.pdf>

⁷² <https://wokingla21.wordpress.com/>

⁷³ Surrey County Council (2011) Surrey Transport Plan: Air Quality Strategy. Retrieved 2017, from https://www.surreycc.gov.uk/_data/assets/pdf_file/0004/29974/Surrey-Transport-Plan-Air-Quality-Strategy.pdf

the identification and enforcement of parking and loading regulations, supporting travel choices that are beneficial for air quality and the consideration of air quality issues in planning.

A.2. Pollutants

Nitrogen Dioxide

- A.2.1. NO₂ is a secondary pollutant produced by the oxidation of nitric oxide (NO). NO and NO₂ are collectively termed NO_x. Almost a third of the UK NO_x emissions are from road transport. The majority of NO_x emitted from vehicles is in the form of NO, which oxidises rapidly in the presence of ozone (O₃) to form NO₂. In high concentrations, NO₂ can affect the respiratory system and can also enhance the response to allergens in sensitive individuals, whereas NO does not have any observable effect on human health at the range of concentrations found in ambient air. Elevated concentrations of oxides of nitrogen can have an adverse effect on vegetation, including leaf or needle damage and reduced growth. Deposition of pollutants derived from oxides of nitrogen emission contribute to acidification and/or eutrophication of sensitive habitats.

Particulate Matter

- A.2.2. The principal sources of 'primary' polluting particles are combustion processes, which include traffic and industry. Diesel engines produce the majority of particulate emissions from the vehicle fleets. Approximately a fifth of primary PM₁₀ emissions in the UK are derived from road transport. Finer fractions of particulate matter appear to be associated with a range of symptoms of ill health including effects on the respiratory and cardiovascular systems, on asthma and on mortality.

Carbon dioxide

- A.2.3. Carbon dioxide (CO₂) is a greenhouse gas and is used as an indicator of the wider scale, non-local effects of transport schemes. CO₂ does not affect human health at ambient levels and so is not significant as a local pollutant but is important for its national and international role in climate change.

A.3. Defra Background Mapping

- A.3.1. Background concentrations in the study area for 2015 are provided in Table A.1.

Table A.1: Defra background air quality mapping pollutant concentrations for 2015 (µg/m³)

Grid Square x, y	2015	
	NO ₂	PM ₁₀
499500, 162500	14.9	14.4
500500, 163500	15.0	14.4
500500, 162500	15.3	14.8
501500, 163500	16.0	14.8
501500, 162500	15.6	15.0
501500, 161500	16.7	16.7
501500, 160500	15.7	15.0

Grid Square x, y	2015	
	NO ₂	PM ₁₀
502500, 166500	25.9	18.2
502500, 165500	19.3	15.6
502500, 164500	18.6	15.6
502500, 163500	17.5	15.6
502500, 161500	14.6	14.8
502500, 160500	16.0	15.3
502500, 159500	15.7	14.8
503500, 166500	22.6	17.8
503500, 165500	25.5	18.2
503500, 164500	20.4	17.1
503500, 163500	16.4	15.0
503500, 161500	15.8	14.8
503500, 160500	16.1	14.9
503500, 159500	15.0	14.7
503500, 158500	13.1	14.5
503500, 154500	17.3	16.0
504500, 166500	20.7	16.3
504500, 165500	20.0	16.5
504500, 164500	23.1	18.0
504500, 163500	23.7	17.8
504500, 162500	17.5	15.4
504500, 161500	17.2	15.2
504500, 160500	16.3	15.1
504500, 159500	14.2	14.8
504500, 158500	13.0	14.8
504500, 157500	12.4	14.3
504500, 156500	13.9	14.5
504500, 155500	15.7	15.2
505500, 165500	18.6	16.9
505500, 164500	19.1	16.1
505500, 163500	18.2	16.1
505500, 162500	24.7	18.3
505500, 161500	23.9	18.2
505500, 160500	20.8	17.4
505500, 158500	14.0	14.5

Grid Square x, y	2015	
	NO ₂	PM ₁₀
505500, 157500	14.0	14.8
505500, 156500	17.5	16.0
506500, 161500	19.4	16.2
506500, 159500	22.3	17.6
506500, 158500	15.6	14.9
506500, 157500	18.2	16.3
506500, 156500	13.9	15.2
507500, 163500	17.1	15.2
507500, 162500	16.9	15.1
507500, 161500	16.5	15.2
507500, 159500	23.9	18.0
507500, 158500	19.5	16.5
507500, 156500	13.2	15.0
507500, 155500	12.4	14.5
508500, 161500	15.1	14.7
508500, 160500	17.5	16.0
508500, 159500	24.1	17.9
508500, 158500	18.3	16.7
508500, 155500	12.5	14.4
509500, 163500	15.7	14.7
509500, 162500	14.9	14.5
509500, 161500	15.2	14.7
509500, 160500	19.4	16.5
509500, 158500	21.4	17.4
510500, 161500	17.3	16.2
510500, 160500	18.4	15.9
510500, 159500	15.3	15.7
510500, 158500	15.6	15.7
510500, 157500	18.7	17.0
510500, 156500	13.5	14.8
511500, 162500	15.0	15.2
511500, 161500	18.3	15.9
511500, 159500	15.2	15.2
511500, 157500	19.4	17.6
512500, 163500	15.8	15.1

Grid Square x, y	2015	
	NO ₂	PM ₁₀
512500, 162500	15.4	14.8
512500, 161500	17.6	15.6
512500, 159500	15.4	15.0
512500, 158500	15.2	15.3
512500, 157500	19.1	17.7
513500, 164500	18.5	15.7
513500, 163500	16.1	14.9
513500, 162500	17.1	15.3
513500, 161500	15.5	14.7
513500, 158500	20.0	17.8
513500, 157500	14.2	15.0
514500, 162500	18.2	15.9
514500, 161500	16.0	14.9
514500, 160500	15.8	14.9
514500, 158500	20.4	17.3
514500, 156500	14.1	14.6
515500, 163500	17.3	15.3
515500, 161500	15.1	14.8
515500, 159500	15.3	14.9
515500, 158500	20.8	17.4
515500, 157500	15.9	15.0
516500, 164500	17.0	15.2
516500, 161500	15.0	14.8
516500, 159500	15.6	15.1
516500, 158500	23.0	18.0
516500, 157500	19.1	16.6
516500, 156500	17.8	15.5

Air Quality Monitoring

Connect Plus Services NO₂ Diffusion Tube Data

- A.3.2. The annual mean NO₂ concentrations for the Connect Plus Services monitoring sites within the air quality study area are shown below in Table A.2.

Table A.2: Connect Plus annual mean diffusion tube monitoring results ($\mu\text{g}/\text{m}^3$)^{74,75}

Site ID	Grid Ref	Sept 2013 - Sept 2014	Sept 2014 - Sept 2015	Sept 2015 - Sept 2016
CP4	506191,159955	32.8	33.4	28.6
CP8	508378,159814	21.3	21.7	28.8
CP9	510561,161143	25.1	28.6	27.3
CP10	505578,161229	22.5	23.9	22.6
CP27	509892,158070	18.5	21.0	20.5

Highways England NO₂ Diffusion Tube Data

- A.3.3. Highways England has undertaken a NO₂ diffusion tube survey within the air quality study area over a period of six months, between January and June 2016. The data for the six months in 2016 were annualised for 2015 for use in verification at the Option Selection Stage. The annualisation factor used was 0.97. The annualised mean results were then adjusted using a factor of 0.85 derived from Defra's bias adjustment spreadsheet for diffusion tubes prepared by Gradko using 20% triethanolamine (TEA) in water. The results showed that concentrations were all below the annual mean AQS objective, with the highest concentration of 33.7 $\mu\text{g}/\text{m}^3$ at a site near the A3 south of Burnt Common (HE_7).

Table A.3: Highways England NO₂ Diffusion Tube monitoring data ($\mu\text{g}/\text{m}^3$)

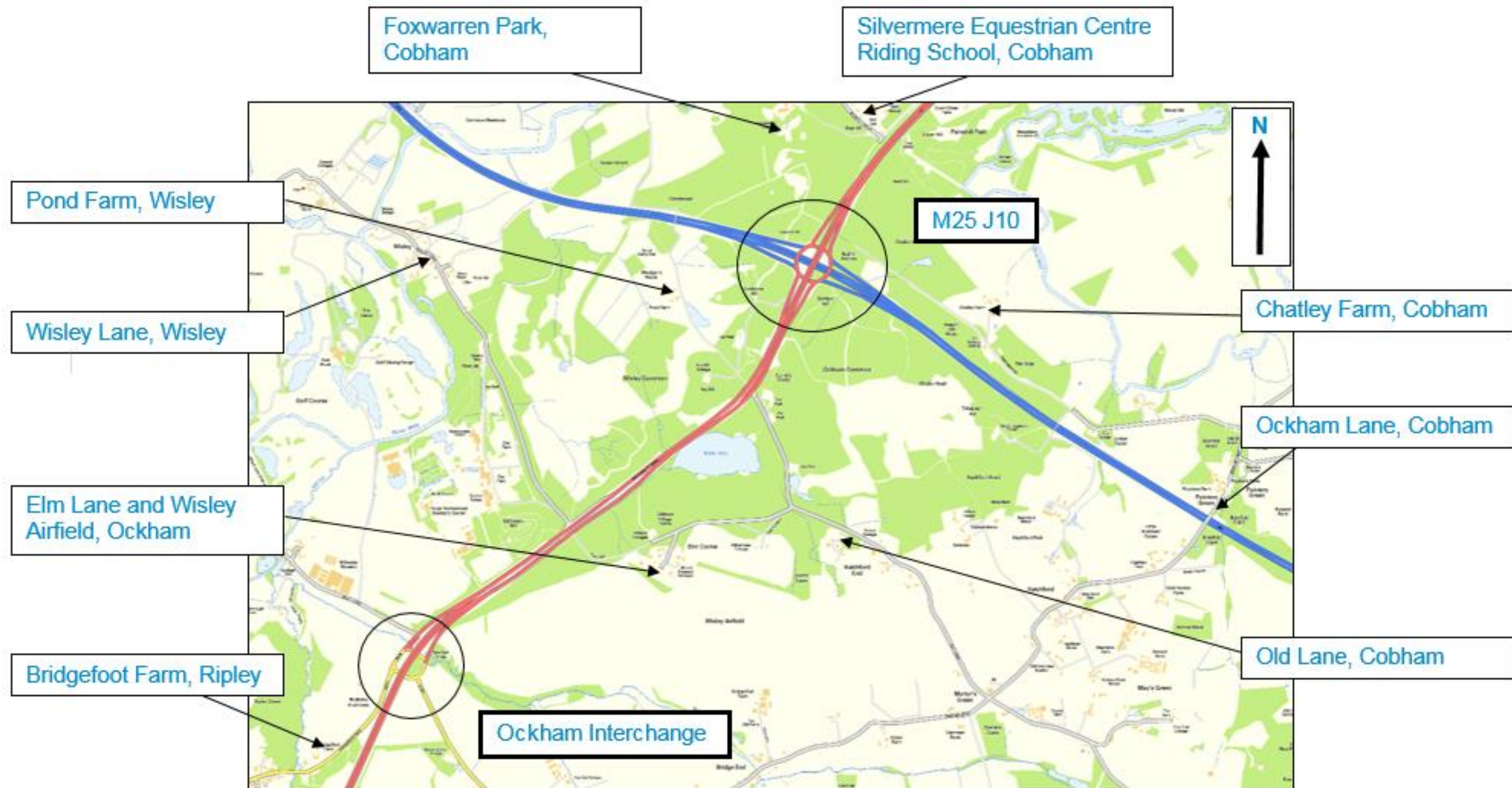
Site ID	HE Site ID	Site Type	X, Y	Unadjusted 2016 average (Jan-Jun)	Adjusted, Annualised 2015
HE_1	M25J10A3_003	Roadside	506541, 158842	19.3	15.9
HE_2	M25J10A3_007	Roadside	505870, 160652	28.8	23.8
HE_3	M25J10A3_002	Kerbside	507841, 158598	37.9	31.3
HE_4	M25J10J16_028	Kerbside	502386, 167101	27.9	23.1
HE_5	M25J10J16_002	Kerbside	503688, 165230	35.0	29.0
HE_6	A3Gui_022	Roadside	504001, 154442	38.0	30.9
HE_7	A3Gui_023	Roadside	504053, 154326	41.4	33.7
HE_8	M25J10J16_001	Roadside	504370, 164047	34.9	28.8
HE_9	M25J10A3_010	Roadside	505442, 161843	24.8	20.5
HE_10	M25J10A3_011	Roadside	505452, 162542	31.5	26.0
HE_11	M25J10A3_008	Roadside	505552, 161219	24.1	19.9
HE_12	M25J10A3_005	Kerbside	506335, 159238	26.7	22.0
HE_13	M25J10A3_006	Kerbside	506271, 160104	27.4	22.6

⁷⁴ Atkins: M25 DBFO: Air Quality Monitoring (Quarter 4). February 2015

⁷⁵ Atkins: M25 DBFO: Air Quality Monitoring, 2014-2015 Annual Report (draft). February 2016

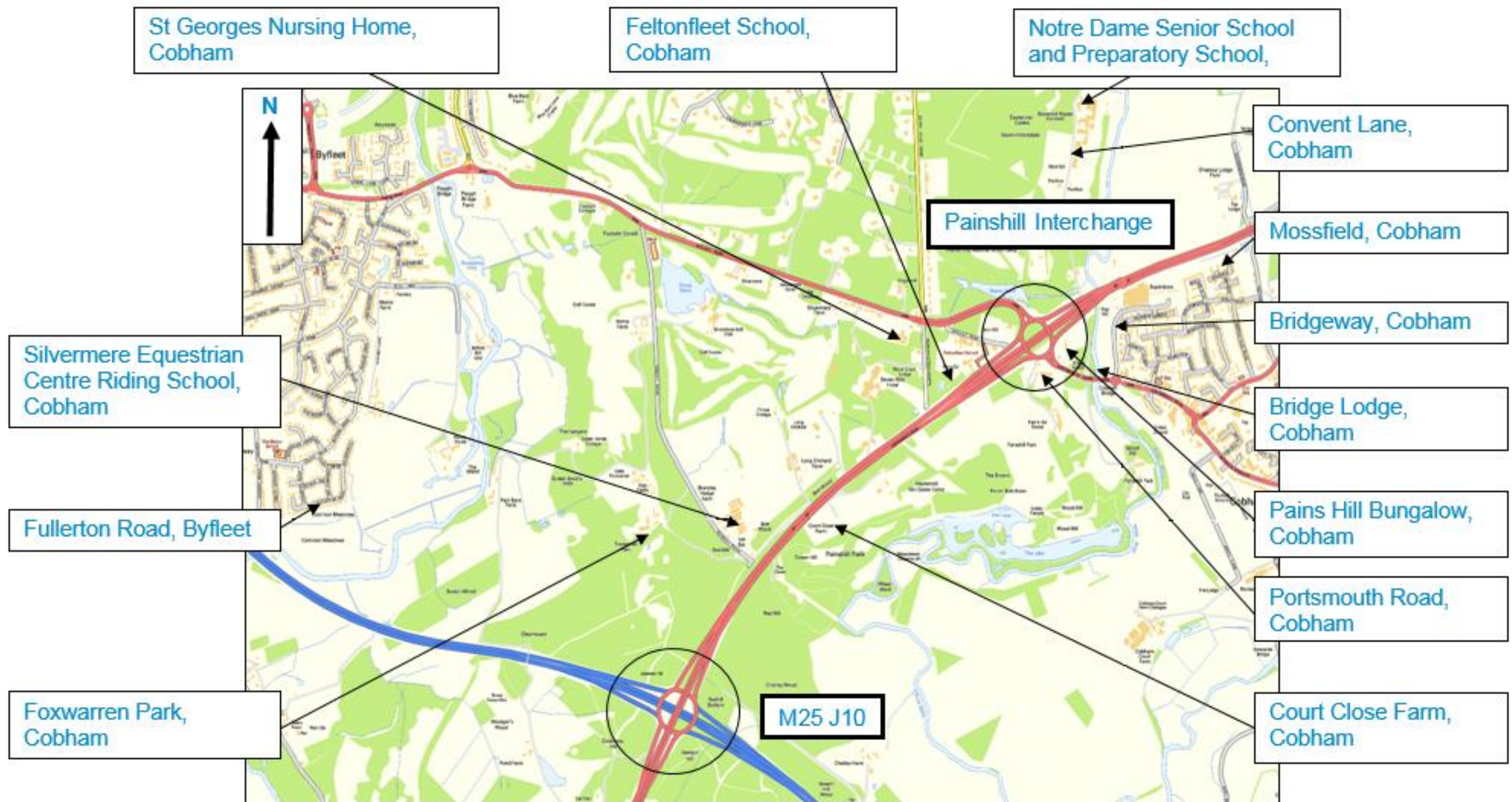
Appendix B. Noise and Vibration Data

Figure B.1: Noise sensitive receptors located south of M25 junction 10/A3 Wisley interchange



Contains Ordnance Survey data © Crown copyright and database right 2016

Figure B.2: Noise sensitive receptors located north of the M25 junction 10/A3 Wisley interchange



Contains Ordnance Survey data © Crown copyright and database right 2016

B.1. Baseline Noise Levels

- B.1.1. Strategic noise maps were published during 2015 by Defra for both major road and railways sources to meet the requirements of the Environmental Noise Directive (Directive 2002/49/EC) and the Environmental Noise (England) Regulations 2006 (as amended). The strategic noise maps for road traffic noise during the daytime (07:00-23:00) and night-time (23:00-07:00) periods are shown in below in Figure B.3 and Figure B.4.

Figure B.3: Defra Round 2 Environmental Noise Maps - Road Noise $L_{Aeq,16h}$ (07:00-23:00)

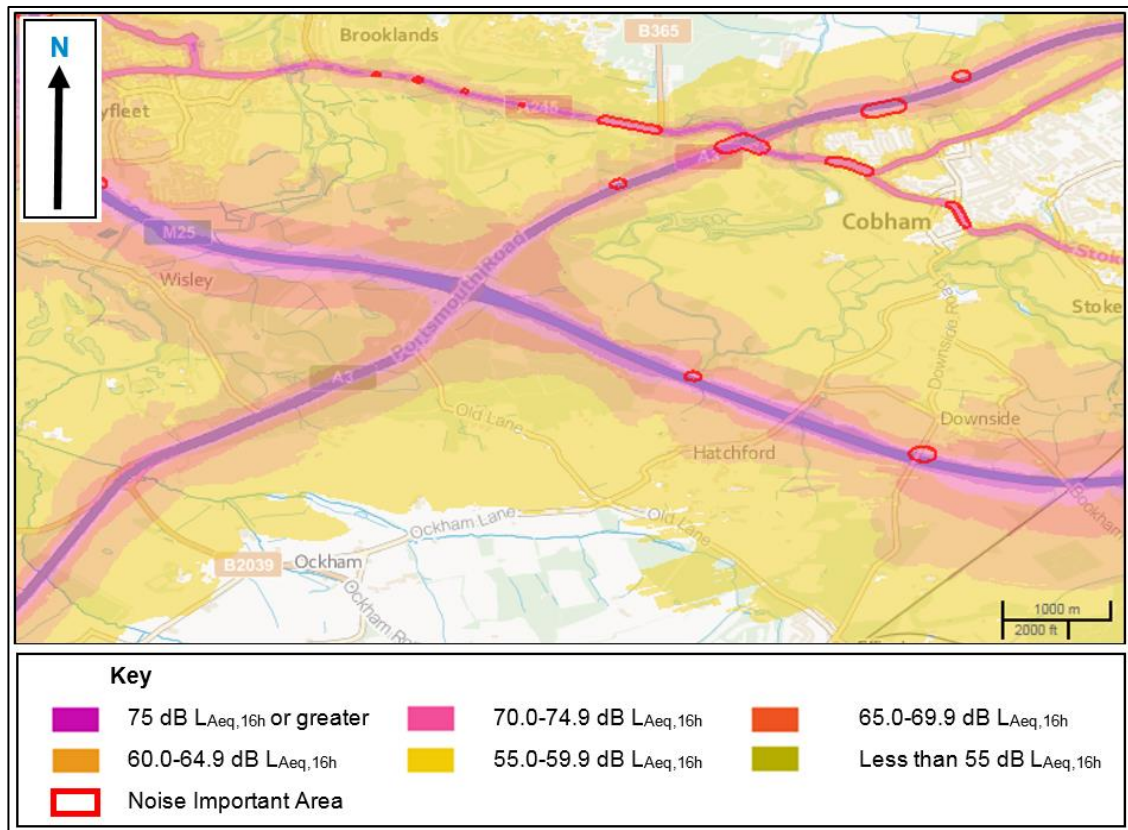
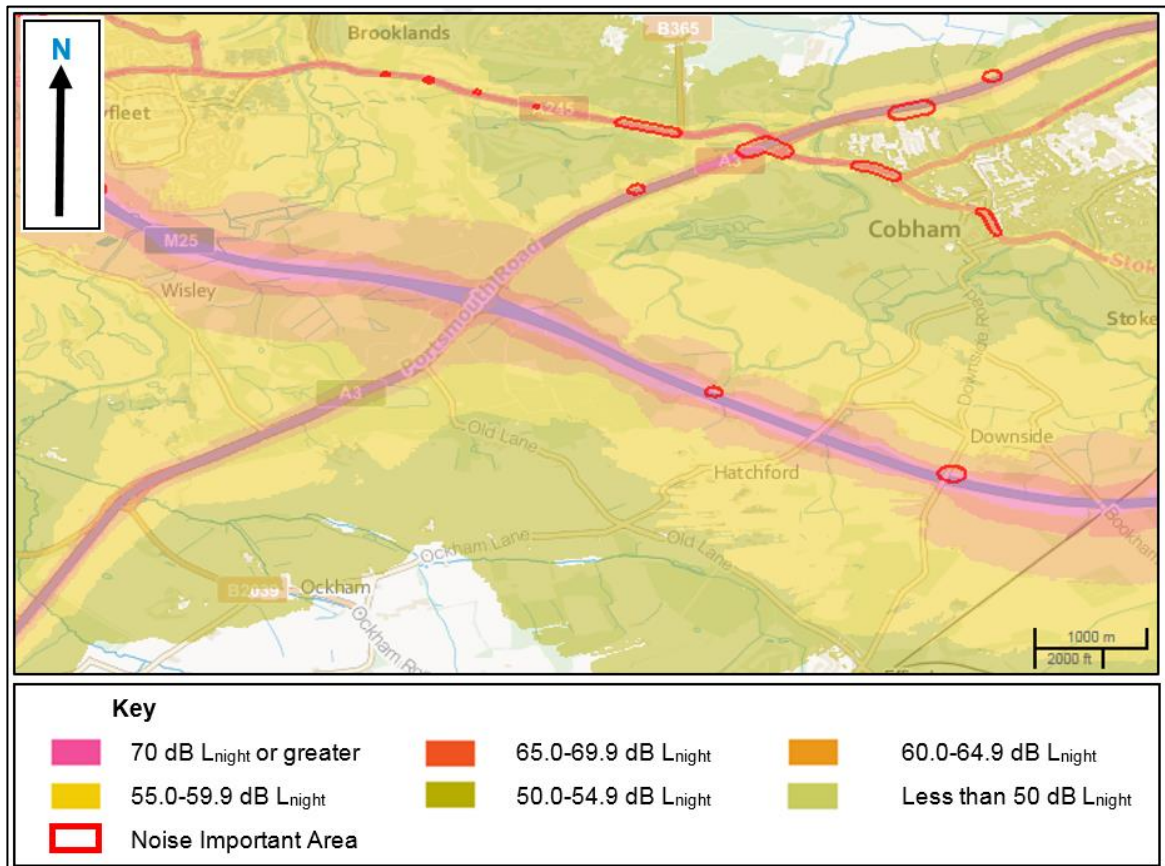


Figure B.4: Defra Round 2 Environmental Noise Maps - Road Noise L_{night} (23:00-07:00)



- B.1.2. The noise levels shown in the strategic noise maps above represent the annual average noise from road sources during 2012 within areas with populations of 100,000 people (agglomerations) and along major traffic routes. The noise levels shown were calculated for a receptor height of 4 m above ground level.
- B.1.3. Important Areas for noise were identified to highlight any particular constraints on the Scheme. Important Areas are the locations where the 1% of the population are affected by the highest noise levels from major roads and railways according to the strategic noise mapping undertaken by Defra.
- B.1.4. The strategic noise maps for road traffic noise indicate that the average noise levels exceed 60 dB $L_{Aeq,16h}$ during the daytime and 55 dB L_{night} at the majority of locations within 600 m of the extents of the Scheme. Areas with higher noise levels are close to the M25 junction 10/A3 Wisley interchange, where the land use is mainly rural with isolated buildings.

Appendix C. Ecological Legislation

Table C.1: Summary of relevant nature conservation legislation

Species	Legislation	Offences	Licensing procedures and guidance
Bats European protected species	Conservation of Habitats and Species Regulations 2010 (as amended) Reg 41	Deliberately ⁷⁶ capture, injure or kill a bat; deliberate disturbance ⁷⁷ of bats; or damage or destroy a breeding site or resting place used by a bat. [The protection of bat roosts is considered to apply regardless of whether bats are present.]	A Natural England (NE) licence in respect of development is required. Guidance documents: • NE Standing Advice for protected species 2013; • European Protected Species: Mitigation Licensing- How to get a licence (NE 2013); • Bat Mitigation Guidelines (English Nature 2004); and • Bat Workers Manual (JNCC 2004).
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁷⁸ a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Badger	Protection of Badgers Act 1992 (as amended)	Wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett. [It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied.]	Where required, licences for development activities involving disturbance or sett interference or closure are issued by Natural England (NE). Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process. Licences are normally not granted from December to June inclusive because cubs may be present within setts. Guidance documents: • NE Standing Advice for protected species 2013; and • Badgers and Development (NE 2007).

⁷⁶ Deliberate capture or killing is taken to include “accepting the possibility” of such capture or killing.

⁷⁷ Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

⁷⁸ Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2010 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Species	Legislation	Offences	Licensing procedures and guidance
Otter European protected species	Conservation of Habitats and Species Regulations 2010 (as amended) Reg 41	Deliberately ⁷⁶ capture, injure or kill an otter; deliberate disturbance ⁷⁷ of otters; or damage or destroy a breeding site or resting place used by an otter.	Licences issued for development by Natural England. Guidance documents: - NE Standing Advice for protected species 2013; and - European Protected Species: Mitigation Licensing- How to get a licence (NE 2013).
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁷⁸ an otter in such a place.	No licence is required for survey in England. However, a licence would be required if the survey methodology involved disturbance.
Hazel dormouse European protected species	Conservation of Habitats and Species Regulations 2010 (as amended) Reg 41	Deliberately ⁷⁶ capture, injure or kill a hazel dormouse; deliberate disturbance ⁷⁷ of a hazel dormouse; or damage or destroy a breeding site or resting place used by a hazel dormouse.	A Natural England licence in respect of development is required. Guidance documents: - NE Standing Advice for protected species 2013; - European Protected Species: Mitigation Licensing- How to get a licence (NE 2013); and - Dormouse Conservation Handbook (English Nature 2006).
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁷⁸ a hazel dormouse in such a place.	Licence issued for survey and conservation by Natural England.
Water vole	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally kill, injure or take water voles; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb a water vole in such a place.	No licence is required for survey in England, unless you are likely to commit an action that is otherwise illegal. There are currently no licensing purposes that explicitly cover development activities or activities associated with the improvement or maintenance of waterways. However when a proposed lawful activity has no opportunity to retain water voles within a development site and their translocation would result in a conservation benefit then a licence from Natural England may be obtained. Guidance documents: NE Standing Advice for protected species 2013;

Species	Legislation	Offences	Licensing procedures and guidance
			- The Water Vole Conservation Handbook (R. Strachan and T. Moorhouse, Wildlife Conservation Research Unit, 2nd Edition 2006); and - Water voles and development licensing policy - NE Technical Information Note TIN042 2008.
Birds	Wildlife and Countryside Act 1981 (as amended) S.1	Intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; intentionally take or destroy the nest or eggs of any wild bird. Intentionally or recklessly disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species [e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover].	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety. Guidance documents: NE Standing Advice for protected species 2013.
Great crested newt European protected species	Conservation of Habitats and Species Regulations 2010 (as amended) Reg 41	Deliberately ⁷⁶ capture, injure or kill a great crested newt; deliberate disturbance ⁷⁷ of a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by Natural England. Guidance documents: - NE Standing Advice for protected species 2013; - European Protected Species: Mitigation Licensing- How to get a licence (NE 2013); and - Great Crested Newt Mitigation Guidelines (English Nature 2001).
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁷⁸ a great crested newt in such a place.	Licences issued for science (survey), education and conservation by Natural England.
Natterjack toad Sand lizard	Conservation of Habitats and Species	Deliberately ⁷⁶ capture, injure or kill it; deliberate disturbance ⁷⁷ of it;	Licences issued for development by Natural England. Guidance documents:

Species	Legislation	Offences	Licensing procedures and guidance
Smooth snake European protected species	Regulations 2010 (as amended) Reg 41	deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by it.	- NE Standing Advice for protected species 2013; and - European Protected Species: Mitigation Licensing- How to get a licence (NE 2013).
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁷⁸ it in such a place.	A licence is required from Natural England for surveying and handling.
Adder Common lizard Grass snake Slow worm	Wildlife and Countryside Act 1981 S.9(1) and S.9(5)	Intentionally kill or injure any common reptile species.	No licence is required. However an assessment for the potential of a site to support reptiles should be undertaken prior to any development works which have potential to affect these animals. Guidance documents: NE Standing Advice for protected species 2013.
Rabbits, foxes and other wild mammals	Wild Mammals (Protection) Act 1996	Intentionally inflict unnecessary suffering to any wild mammal.	Natural England provides guidance in relation to rabbits, foxes (which are also protected under the Wildlife and Countryside Act 1981 from live baits and decoys) and other wild mammals, on their website. Lawful and humane pest control of these species is permitted.
Plants Invasive species e.g. Japanese knotweed, giant hogweed, Himalayan balsam	Wildlife and Countryside Act 1981 S.14	It is illegal to plant or otherwise cause these species to grow in the wild.	Any contaminated soil or plant material is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with section 34 of the Environmental Protection Act 1990. Guidance documents: - The Knotweed Code of Practice (Environment Agency, 2013 version 3); - Managing Invasive Non-native Plants (Environment Agency 2010); and - Guidance on Section 14 of the Wildlife and Countryside Act, 1981 (Defra 2010).

Site Designation	Legislation	Protection	Guidance
Special Area of Conservation (SAC) Special Protection Area (SPA) Wetland of International Importance (Ramsar site)	Conservation of Habitats and Species Regulations 2010 (as amended). EC Directive on the conservation of natural habitats and of wild fauna and flora (92/42/EEC). EC Directive on the conservation of wild birds (79/409/EEC). Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the Ramsar Convention).	Assessment of the implications of plans and projects is effected through Part 6 of the Conservation of Habitats and Species Regulations 2010 (in particular Regs 59 - 67). The legislation for the Site of Special Scientific Interest which will underpin each designation also applies. These sites are given protection through policies in the Local Development Plan.	Formal Appropriate Assessment is required to be undertaken by the competent authority before undertaking, or giving consent, permission or other authorisation for a plan or project which is likely to have a significant effect on such a site. Guidance documents: The National Planning Policy Framework (DCLG, March 2012), with particular reference to Policy 11. The Government Circular: Biodiversity and Geological Conservation - Statutory Obligations and their Impact within the Planning System (ODPM Circular 6/2005 and Defra Circular 01/2005) (the joint Circular).
Site of Special Scientific Interest (SSSI)	Wildlife and Countryside Act 1981 (as amended)	It is an offence to carry out or permit to be carried out any potentially damaging operation. SSSIs are given protection through policies in the Local Development Plan.	Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under S.28 before undertaking operations likely to damage a SSSI. S.28G places a duty on all public bodies to further the conservation and enhancement of SSSIs. Guidance documents: The National Planning Policy Framework (DCLG, March 2012), with particular reference to Policy 11, and the joint Circular.
Local Nature Reserve (LNR)	National Parks and Access to the Countryside Act 1949 S.21	LNRs are given protection through policies in the Local Development Plan.	LNRs are generally owned and managed by local authorities. Development proposals that would potentially affect a LNR would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Guidance documents: The National Planning Policy Framework (DCLG, March 2012), with particular reference to Policy 11, and the joint Circular.
Local Sites (e.g. Sites of Nature Conservation Interest,	There is no statutory designation for local sites.	Local sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a local site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged.

Site Designation	Legislation	Protection	Guidance
Conservation Verges)			Guidance documents: The National Planning Policy Framework (DCLG, March 2012), with particular reference to Policy 11, and the joint Circular.

Habitats and Species	Legislation	Guidance
Species and Habitats of Principal Importance for the Conservation of Biodiversity	Natural Environment and Rural Communities Act 2006 S.40	S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England. Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site. The 'England Biodiversity List' is used as a guide for decision makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006 to have regard to the conservation of biodiversity in England when carrying out their normal functions. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species.
Biodiversity Action Plan (BAP) Habitats and Species	No specific legislation, unless it is also a species or habitat of principal importance as described above.	The Biodiversity Action Plan (BAP) is the UK's initiative to maintain and enhance biodiversity in response to the Convention on Biological Diversity signed in 1992. The UK BAP was used to draw up the 'England Biodiversity List' and has been succeeded by the UK Post-2010 Biodiversity Framework in 2012, due to a change in government strategy by all UK countries, focussing on managing the environment as a whole rather than dealing with different aspects of biodiversity and environment separately. However, the UK BAP list of priority habitats and species continue to be regarded as conservation priorities in the UK Post-2010 Biodiversity Framework (JNCC and Defra 2012).
Hedgerows	The Hedgerows Regulations 1997	Under the regulations, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority in Wales. In general, permission will be required before removing hedges that are at least 20 m in length, over 30 years old and contain certain species of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.

Appendix D. Soils and Geology

Table D.1: Classification of Probability

Classification	Definition of the Probability of Harm/Pollution Occurring
High Likelihood	The contaminant linkage exists and it is very likely to be realised in the short term, and/or will almost inevitably be realised in the long term, and/or there is current evidence of it being realised.
Likely	The source, pathway and receptor exist for the contaminant linkage and it is probable that this linkage will be realised. Circumstances are such that realisation of the linkage is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	The source, pathway and receptor exist and it is possible that it could be realised. Circumstances are such that realisation of the linkage is by no means certain in the long term and less likely in the short term.
Unlikely	The source, pathway and receptor exist for the contaminant linkage but it is improbable that it will be realised even in the long term.

Table D.2: Classification of Consequence

Classification	Definition of Consequence
Human Health Receptors - Site End Users	
Severe	Acute damage to human health based on the potential effects on the critical human health receptor.
Medium	Chronic damage to human health based on the potential effects on the critical human health receptor.
Minor	Minimal short- term effects on human health based on the potential effects on the critical human health receptor.
Negligible	No appreciable impact on human health based on the potential effects on the critical human health receptor.
Controlled Water Receptors	
Severe	Pollution of a principal aquifer within a source protection zone (inner and outer) or potable supply characterised by a breach of drinking water standards. Pollution of a surface water course characterised by a breach of an EQS at a statutory monitoring location or resulting in a change in GQA grade of river reach. Discharge of a List I or List II substance to groundwater.
Medium	Pollution of a principal aquifer outside a source protection zone (inner and outer) or a secondary A aquifer characterised by a breach of drinking water standards. Pollution of an industrial groundwater abstraction or irrigation supply that impairs its function. Substantial pollution but insufficient to result in a change in the GQA grade of river reach.
Minor	Low levels of pollution of a principal aquifer outside a source protection zone or an industrial abstraction, or pollution of a secondary A or B aquifer. Low levels of pollution insufficient to result in a change in the GQA grade of river reach, pollution of a surface water course without a quality classification.
Negligible	No appreciable pollution, or pollution of a low sensitivity receptor such as a secondary (undifferentiated) aquifer or a surface water course without a quality classification.
Ecosystem Receptors	
Severe	For sites with designations as follows - Site of Special Scientific Interest, National Nature Reserve, Special Protection Area (and potential sites), Special Area of

Classification	Definition of Consequence
	Conservation (and candidate sites) or Ramsar. Irreversible adverse change in the functioning of the ecological system or any species of special interest that forms part of that system.
Medium	For sites with designations as follows - Site of Special Scientific Interest, National Nature Reserve, Special Protection Area (and potential sites), Special Area of Conservation (and candidate sites) or Ramsar. Substantial adverse change in the functioning of the ecological system or any species of special interest that forms part of that system.
Minor	Harm to ecosystems of a low sensitivity such as sites of local importance. No appreciable harm to ecosystems with statutory designations.
Negligible	Limited harm to ecosystems of low sensitivity such as sites of local importance.
Property Receptors - Buildings, Foundations and Services including the operational HS2 scheme	
Severe	Collapse of a building or structure including the services infrastructure from explosion.
Medium	Significant damage to a building or structure including the services infrastructure impairing their function.
Minor	Damage to buildings/structures and foundations but not resulting in them being unsafe for occupation. Damage to services but not sufficient to impair their function.
Negligible	No appreciable damage to buildings/structures, foundations and services.
Property Receptors - Grade 1 Agricultural land	
Severe	Substantial loss in the value of crops or domestically-grown produce resulting from disease, death or other physical damage. Death to livestock, domesticated animals or wild animals subject to shooting or fishing rights.
Medium	Substantial diminution in yield of crops or domestically-grown produce resulting from disease, death or other physical damage. Serious disease or other serious physical damage to livestock, domesticated animals or wild animals subject to shooting or fishing rights.
Minor	Harm to crops but not resulting in a substantial loss in value or diminution in yield. Limited harm in terms of disease or other physical damage to livestock, domesticated animals or wild animals subject to shooting or fishing rights.
Negligible	No appreciable harm, or harm to a low sensitivity receptor.

Appendix E. Gazetteer of Heritage Assets

Table E.1: Designated Heritage Assets

Reference (NHLE)	Name	Description
1005923	Late Roman bath house at Chatley Farm	Scheduled Monument. A Roman bath house, on the left bank of the River Mole at Chatley, 360-320 AD. Excavation by S S Frere in 1942 showed four rooms, a stoke hole and furnace. The remainder of the building had been destroyed by river erosion. A subsequent field survey by members of Surrey Archaeological Society revealed concentrations of Roman material originating from the bath house. There was no other indication of further buildings being present, thus confirming earlier conclusions that any villa is likely to have been washed away by the action of the nearby river. Apart from material of the Roman period, there were two concentrations of probable Mesolithic burnt and worked flint, a badly damaged barbed-and-tanged arrowhead, a few sherds of prehistoric pottery, one sherd of medieval pottery, and various post-medieval and modern finds.
1007905	Hengi-form monument at Red Hill	Scheduled Monument. The monument includes an oval enclosure, 40 m long by 35 m across, identified as a hengi-form monument, situated on the crest of a rise in an area of undulating Greensand. The enclosure has a flat interior, which is slightly lower than the surrounding ground level, 19 m long and 15 m wide and defined by a bank and inner ditch. The ditch, although partially infilled, survives 5 m wide and 0.5 m deep while the bank is 4.5 m wide and up to 0.5 m high. The entrance to the enclosure, situated in the north-eastern quadrant, is no longer visible as this area has been disturbed by later quarrying activity. Remote sensing surveys carried out since the 1970s have located a number of anomalies in the interior of the enclosure which have been interpreted as possible graves.
1012204	Bell barrow on Cockcrow Hill	Scheduled Monument. A large bell barrow, 42 m in diameter, 3.3 m high, is situated upon the top of a rise of ground on heathland. The mound is tree covered, and has been eroded away in part by footpaths, but is otherwise in fairly good condition. Excavation in 1911 yielded an unaccompanied cremation two feet below the top of the mound. The excavator reported: "<i>Last excavations at Cockcrow, my nephew and self who got down to 9ft depth, then came upon some charcoal and some disintegrated fragments of bone, were fainthearted after reaching that depth.</i>"
1012205	Bowl barrow west of Cockcrow Hill	Scheduled Monument. A possible round barrow, 30 m in diameter and 1 m in height, is situated upon a slightly elevated position on Wisley Common. Without excavation, there must remain some doubt about this feature as it occurs on sandy heathland, where such mounds are not common.
1029368	Elm Tree House	Grade II Listed Building. House. Late 16th century, extended to rear in 19th century and restored in 20th century. Timber framed clad in whitewashed render, with decorative incising. Plain tiled roof with band of fish scale tiles to eaves courses. 2 storeys and attic in gable to right. Leaded casement fenestration, 4 windows on first floor; and 4 on ground floor left, larger, two glazing bar sashes to ground floor right. Glazed door to right of centre in tent roofed porch, open, on

Reference (NHLE)	Name	Description
		wooden supports. Rear stack rebuilt, to left of centre and corbelled end stack to right. Interior: Substantial amounts of framing visible.
1029369	Ryde House	Grade II Listed Building. House. Circa 1774 extended to right and rear in 19th century. Dun coloured brick with red brick dressings and angle quoins to front, red brick return walling; hipped plain tiled roofs. Two storeys with stone-coped parapet obscuring part of the roof. Two end stacks to left and right. Symmetrical 3 bay façade with 3, 12-pane glazing bar sash windows under gauged brick heads and wooden canopies to first floor. Two ground floor casement doors. Fine central 6-panelled door under ogee tracery fanlight in pedimented porch. Acanthus leaf Adamesque capital to columns with paterae and fluted, dentilled entablature. 19th century extension in similar style set back to right with greenhouse to ground floor front. Right hand return front: dentilled eaves and 3 eaves dormers.
1029370	Foot Bridge House	Grade II Listed Building. House. 17th century with early 19th century extensions. Timber framed exposed to rear left with whitewashed brick infill, whitewashed roughcast cladding to front under plain tiled roofs. Originally Half -H shape house with centre recess filled in early 19th century. Outer gabled bays 2 storeys with attics, that are to the left blocked, false window painted in. Symmetrical façade with central bowed bay, arched glazing bar sashes to outer bays on first floor. Central first floor casement. Outer ground floor 12-pane glazing bar sash windows. Central half-glazed door with flanking casements on sides of bow in moulded wood surround with corner rosettes and flat roof over. End stacks to right set back, rear stacks to left.
1029371	Yew Tree House	Grade II Listed Building. House. Late 18th century, possibly with older core. Brick to rear, some blue headers on right hand return wall, with colour washed, incised stucco to centre of front, colour washed brick to left. Hipped slate roofs to front with hipped and gabled plain tiled roofs to rear. Two storeys on plinth with deep-bracketed eaves. Two end stacks to right and end stack to left at junction with extension. Two, 12- pane glazing bar sash windows in architrave frames to first floor, 2 below. 4-panel door in moulded surround with corner rosettes under braced flat hood. 1 sash window and further door to left hand extension. Single storey extension to right with one large sash window. Range to rear with replacement sash windows.
1029373	Sage Antiques The Green Cottage	Grade II Listed Building. House, now divided and part shop. Mid-18 th century. Colourwashes brick with hipped plain tiled roof. Two storeys with brick modillioned eaves. Larger stack to left on ridge, ridge stack to right of centre. Irregular front with one 19th century glazing bar sash window to first floor left, four 18th century glazing bar sash windows to first floor right. Two round, bowed, glazing bar shop windows to ground floor left and right of centre, casement window to right end. Half glazed door under transom light and flat wooden braces to right (The Green Cottage). Similar half-door under flat hood, in panelled strip surround to left (Sage Antiques).
1029402	Walls and Gates to Ockham Park	Grade II Listed Building. Walls and gates to Ockham Park. Late 19th century. Red and blue brick walls under stone finials and wrought iron gates between. Flanking walls on quadrant, curved, plan with square end piers, decorated with banded rustication under stone. Lion finials. Corbelled coping to walls which stand on offset plinth decorated with terracotta roundel bands, each wall contains a 22

Reference (NHLE)	Name	Description
		arch, round-arched, arcade. 9ft high, square, piers to centre topped with lions, flanking double iron gates with scroll decorations on standards. Spear decoration to double gates with roundel bands on top and bottom.
1029404	Bridgefoot Farmhouse	Grade II Listed Building. House. Mid-17 th century, extended in 19 th century and 20 th century. Timber core with red brick cladding under plain-tiled roofs. T-shaped plan with wing to rear at right angles to front. 2 storeys and attic under gabled dormer to left of centre, rear ridge stack to left and two diagonal, rear ridge stacks to right. Irregular fenestration with evidence of older, blocked, windows. Two windows to first floor and 3 windows below under cambered heads. Two storey, gabled porch projecting to centre with one first floor casement window and an arched, 4-centre, opening below to planked door. Further doors to right hand return front on rear wing.
1029405	Barn, 30 metres north-east of Bridgefoot Farm House	Grade II Listed Building. Barn. 17 th century, altered and restored in 19 th century and 20 th century. Timber framed on brick plinth with some weatherboard cladding to right and brick cladding to centre and left. Fine, plain-tiled roof, stepped on north side. Two, 3-bay barns end to end under common roof. The Western Barn (to the left) of 3 unequal bays with aisles and wain doors to both sides of centre bay, that to south (road) side, under hipped roof. Interior: Windbracing to end bay of western barn, Queen strut roof to end bay of eastern barn.
1030053	Foxwarren Cottage	Grade II Listed Building. Estate cottage. c. 1860 with late 20 th century additions. By and for Charles Buxton, supervising architect F. Barnes. Red brick in header bond with contrasting black brick headers forming diaper pattern; moulded terracotta dressings. Plain tile roof with decorative bands of pointed and fishscale tiles and crested ridge tiles. In Jacobethan style having chamfered plinth; pointed arched entrance; windows with moulded mullions, segmental-headed lights, vertical glazing bars, some diagonally-leaded lights, and hoodmoulds with decorative stops; brick corbels below coggled eaves; steeply-pitched gables with gabled crowsteps; large central chimney with coggled band below 6 clustered octagonal flues with cornices and replacement terracotta pots. The additions are in matching style. Irregular plan of one storey with attic. Entrance (south) elevation of 2 bays. Left-hand bay has porch on left and 3-light window with 2-light gabled dormer over; the porch and dormer have cusped bargeboards. On right is projecting gabled bay with a 4-light window to ground floor, 2-light window above, and quatrefoil in gable. On right of this projecting bay, in angle with spine range is added porch. Rear: as front, but the "porch" on left instead of a door has a pointed arched recess containing blind, stepped slits. Attached to right end is low single-storey L-shaped range (which returns parallel to the cottage). Right return: 6-light window with 3-light window above and quatrefoil to gable. The added porch has a decorative iron gate Left return: on ground floor, corbelled hipped-roofed 4-light oriel window with 2-light window above and quatrefoil in gable. Late 20 th century single-storey addition adjoins cottage on left.
1030122	Chestnut Lodge	Grade II Listed Building. House. c1830. Rendered with hipped slate roof and end stacks under moulded tops. Rectangular. 3 bays to

Reference (NHLE)	Name	Description
		front and 4 bays deep. Deep eaves with paired brackets and quoined ends. Tripartite sash windows in projecting architrave surrounds with cill brackets to first floor. Ground floor windows under flat hoods on scroll brackets. Central 4 panel door with upper, arched, panels glazed in flat roofed porch with Doric pilaster/piers to either side and gabled parapet above. 20th century flat roofed, 2 storey addition to right hand side with centre arch to ground floor. Left hand return front: 4 bays under pediment hoods to ground floor centre windows, angle bay to right. 20th century extension to rear.
1030125	The Mausoleum	Grade II Listed Building. Mausoleum. Mid-late 18th century. Brick, partly ashlar faced and partly rendered, originally on a triumphal arch design with centre arch, now collapsed, and side arches under round heads. In ruinous condition at time of re-survey.
1030126	The Water Wheel	Grade II Listed Building. Water wheel. c. 1830 by Bramer and Co. Timber frame on brick plinth with weatherboard wall and pentice roof to rear, now collapsed. Cast iron upright water wheel, c20 feet in diameter with spindle and gear wheels to rear including cast iron beams.
1030133	Belfry House Stable Cottage	Grade II Listed Building. Former stable block now divided. Early 19th century. Whitewashed brick with plain tiled roofs, hipped to right end. 2 storeys to the right, 1 storey and attic to the left under 7 hipped eaves dormers to left, projecting range to right. 5 windows across the first floor including 3 glazing bar sash windows to left and 2 20th century bow windows to ground floor left and casement window with flat hood on brackets over to right. 4-centred arched plank door to left side. 7 bay range set back to left with 6 panelled door to right of centre in pedimented porch with 2 Ionic columns. Square clock tower to centre of roof on rusticated podium with open cupola and weathervane above.
1030140	Hatchford Park School	Grade II Listed. House, now school for disabled. Original house of 1850 encased and remodelled in c1890 by Rowland Plumbe. Red brick with tile hanging and half-timbered gables with rendered infill above. Plain tiled roofs with tall star shaped stacks to ends and centre. Rectangular. 2 storeys over basement with 2 attics under hipped roofed, leaded casement dormers. Symmetrical 5 bay front with end and centre bays gabled. Mullioned and transomed leaded fenestration, 8 windows across the first floor with large stepped staircase window to left of centre and angle bay windows to outer bays of first floors. Stone surround to centre half-glazed doors with Jacobean style piers to either side. Large flat wooden hood over centre ground floor with 3 wrought iron hangers. Garden Front: similar but with central bowed bay rising to conical roof. Interior: some panelling remains, a little plasterwork of the older house survives. Large square Jacobean style staircase survives.
1030141	Entrance Wall, Pavilions and Gates to Hatchford Park School	Grade II Listed Building. Entrance walls, gates and pavilions. c. 1890. Rubblestone with dressed stone piers and iron gates. Square single storey end pavilions c40 yards apart under stone square, ogee dome roofs with finial corner Doric pilasters with obelisk finials above. Arched entrances to sides facing house. Stone balustrade on dado wall linking pavilions with central paired gate piers approximately 10 feet high. Square panelled armoured bust finials above with feathered crests on four-legged scroll feet. Central paired C-scroll iron gates c10 feet high.

Reference (NHLE)	Name	Description
1030254	Lodge, 15 yards east of Feltonfleet School	Grade II Listed Building. Lodge. Circa 1860 with 20th century extensions. Red and blue diaper pattern brick, plain tiled roof with ridge cresting. Large multiple ridge stack with 3 diagonally placed shafts. 1 storey, curved bargeboard gable-front to right with pentice roof angle bay casement window. Bay set back to left under pentice roof extension of main roof, planked door in right hand wall, similar bay set back to right.
1188416	Millstream House Ockham Mill	Grade II Listed Building. Mill house with mill attached. 19th century, mill, dated 1862, and built in a neo-Norman style. Red and brown brick with yellow brick dressings, glazed brick decorations to mill, brown brick to Millstream House. Slate roof under ridge cresting on mill, plain tiled roof over house.
1188497	Nos 1 and 2 Bridgefoot Farm Cottages	Grade II Listed Building. House, now divided. 17th century. Timber framed, underbuilt in red and blue brickwork in chequer work pattern, part colour washed, on rendered plinth, club pattern tile hanging above. Plain tiled, half -hipped roof. T-shaped plan with wings at right angles to rear. Two storeys with end stacks. Two 3-light casement windows on the first floor, part leaded with two, 2-light ground floor casements below. Central door under hipped hood on curved braces. (No. 2) with further door to right hand return front of rear wing (No. 1). Single storey brick stable wing extending to right of rear wing.
1188506	Gates and Gate Piers/Walls to Ockham Park	Grade II Listed Building. Gates and walls. Late 19th century. Brown brick walls with iron gates on half oval plan. Walls approx. 7-foot-high with plat band and brick corbel coping to top. Gates to centre of flanking rails with open standards approx. 7-foot-high under urn finials. Side gates with roundel band decoration to top and bottom, similar pattern on central, double gates with additional semi -circular pattern bracing. Included for group value.
1188563	Talbot Cottage	Grade II Listed Building. Cottage. Early 17th century (circa 1630) timber framed - exposed to right hand return front, clad in whitewashed brick to front, rendered cladding and infill to left hand return front; plain tiled roof. Two storeys on plinth with plat band over ground floor and brick dentilled eaves. Ridge stack. One 3-light, diamond-pane window on each floor with shutters. Wing at right angles to rear with one casement on each floor. 20th century single storey wing to rear with ribbed door to right on porch recess.
1188574	Barn across rear of The Talbot	Grade II Listed Building. Barn, now store. 17th century. Red brick in rat-trap bond with hipped plain tiled roof. Rectangular. One window to each end with open bay to centre. Wall extending to rear of barn in similar band with D shaped coping. Circa 70ft long.
1189118	Royal Horticultural Society Offices, Wisley Gardens	Grade II Listed Building. Offices. 1914 by Imrie and Angell in picturesque Vernacular style. Brown brick plinths, timber framed above with render infilling, some decorative brick and tile infilling and weatherboard cladding to projecting bays, plain tiled roofs, hipped and stepping down to ends. Two storeys and attics under two, hipped roof, leaded, casement dormers. Massive stacks; one square end stack to left, decorative half- octagonal end stacks flanking central square stack on ridge plinth to left of centre with further stack to centre and a fine front stack to right with offsets to right side and four round shafts under offset tops. One arched panel on shaft of stack. 2 casement windows to first floor right, one either side of stack, and one mullioned and transomed

Reference (NHLE)	Name	Description
		window to ground floor in wooden frame. Large, two storey, hipped roof projecting bay to right of centre with continuous mullioned and transomed glazing on the first and ground floors, the upper lights diamond-paned and continuing on return fronts of the first floor. Similar hipped bay projecting to left. Two first floor and one large, 7-light, ground floor windows between left hand bay and the central, gabled, entrance bay. Mullioned and transomed leaded casement on first floor over arched panelled door on ground floor in splay-sided brick surround under a 5-step, arched head. Lower range to left end with one 6-light and one tall, narrow, 9-light (3 x 3) window to first floor over two, 4-light, ground floor windows.
1191624	Old Cottage Post Boys	Grade II Listed Building. Cottage row. Early 18th century stack to right. 2 storeys with brick band over ground floor and brick dentil eaves. 5 casement windows across the first floor, ground floor windows to right under gauged brick heads, windows to left under cambered heads. Half-glazed door to left (Post Boys) under flat porch hood on scroll brackets. Half glazed double doors to right (Old Cottage) in 20th century gabled brick porch. 2 wing to rear at right angles to front. Wing to left, tile hung with hipped roof. Wing to right 20th century.
1191776	The Old House Vine House	Grade II Listed Building. Office terrace. Late 18th century. Yellow stock brick with plain tiled Mansard roof. End and centre stacks. 2 storeys and attic under flat roofed dormers. 8 bays, outer bay set back to ends, with dentilled eaves. Glazing bar sash windows under gauged brick heads, ground floor bow windows in 2nd, 4th, 5th and 7th bays. 12 panel door and fanlight in 3rd bay to left. (No.39) with deep panelled reveal and open pediment surround on Doric pilasters, approached up a flight of 4 stone steps. Similar 10 panel door with fanlight in 6th bay to right of centre (No.41). Further glazed office window and door to right end.
1191800	The Round House	Grade II Listed Building. Former outbuilding, now house. Late 18th century. Whitewashed brick with hipped slate roof and central ridge stack to front. Built around a near circular courtyard. Single storey with angle bay to left of centre on north side, and bay set back to left end. Six 4-centred arched windows to front with "Gothick" decorative glazing bars. 4-centred arched, planked door to left behind angled porch hood on 2 columns with fluted pilasters to walls. Glazed extension to right end. Around the inside is a veranda on wooden posts.
1191810	Westwood House (east) and West Lodge to Painshill House, including Gate Piers	Grade II Listed Building. Lodges. Circa 1800. Rendered with hipped slate roofs, rendered stacks to centre and front. T-shaped with outer gable front bays on left of east lodge and right of west lodge. 2 storeys with string course over ground floor and deep bracketed eaves. 2 sash windows across first floor of inner faces of lodges, glazing bar sash windows to the rear. Doors to lodges in centre of inner side facing each other in arched recess breaking up into centre of first floor. Street fronts: one arched niche to centre of front of each lodge containing garlanded urn on pedestal, apron moulding above with East and West lodge inscribed on them. Rusticated square gate piers attached and between lodges, c.8 feet high with oval paterae to frieze, cast iron railings and gates between.

Reference (NHLE)	Name	Description
1286910	Chatley Farm House	Grade II Listed Building. House. 16th century with 18th century front. Timber framed core, red and blue brick on rendered plinth to front, boarded eaves to plain tiled roof, hipped to left, with ridge stack to right end and multiple ridge stack and end stack to left. Oversailing gable to centre. 2 storeys with plat band over ground floor right, projecting wing to left end. 3 casement windows across the first floor to right, plank door to lobby entrance at right end. Further door under flat leaden porch hood on brackets to right of centre. Single weather boarded extension to right and containing further plank door. 2 gable front wings at right angles to rear. Interior: framing visible in ground floor rooms to left, mainly on the ceilings with stop chamfered centre joist.
1286954	Remains of Grotto and Rockwork Bridge on Grotto Island	Grade II Listed Building. Grotto and bridge. Late 18th century. Brick walls with boulder and shell covering, tufa and Derbyshire spa stone to interior. Circular, originally domed, roof now collapsed with 3 arched entrances to lake front. Tunnel to left leading to arched rockwork bridge over an arm of the lake, landing stage below.
1294963	Feltonfleet School	Grade II Listed Building. House, now school. Circa 1860 possibly designed by Charles Buxton and executed by Frederick Barnes. Red and blue diaper patterned brick, plain tiled roofs with tall multiple star shaped stacks with terracotta chimney pots. In Foxwarren style. 2 storeys and attic in 3 crow-stepped gables to front, diagonal brick string course on brick corbels over ground floor. Mixed fenestration with different window designs: arched casement windows to gables under hood mouldings, 3-light, cusped head windows in gauged and rubbed brick surrounds with flat drip moulds over to first floor, 5 and 4-light windows to ground floor. Arched plank door with strapwork hinges to left of centre in gabled brick porch with moulded bargeboards. Triangular transom light above the door. 20th century gabled bays to left end, arched porch recess to ground floor. Large 20th century wing to rear left with hipped roof dormers. Rear: 3 square and angle bays to ground floor, similar windows to front. 2-storey wing to right.
1365888	Service Courtyard to Hatchford Park School	Grade II Listed Building. Stable court. 1890 by Rowland Plumbe. Red brick and tile hung with plain tiled hipped roofs. Pavilion to right, tall stacks to ridges. Built around a courtyard with a screen wall to front, rear range and end wings. Single storey pavilion to right, 2 storeys to remainder. Leaded casement windows, 5 across the first floor of the rear range. Central door to rear and on side of pavilion. Square clock tower with obelisk roof and crowning weathervane to top of pavilion, two louvred ridge turrets to rear range. Screen wall across the front with quadrant end walls and arched, pedimented centre gateway. 1890 in brick cartouche to pediment.
1377487	Entrance Lodge to Chestnut Lodge	Grade II Listed Building. Entrance lodge. C.1830. Stucco with slate roof, stacks to rear right and to left side. T shaped plan. Single storey with 1 glazing bar sash window to each side. Part glazed door to left in slate roofed gabled porch. 20th century flat roofed additions to rear. Included for group value only.
1377488	Cobham Bridge	Grade II Listed Building. Bridge. 1792, parapets rebuilt in 1914. Red brick with stone coping and pontoons. 9 arches with blue brick edging and roundels in the spandrels. Stone string course above the arches with 2 circular squinches either side of the central arch on

Reference (NHLE)	Name	Description
		tapering supports with sphere corbels. 20th century parapets approximately 4 feet high with inscribed plaque on the south wall
1377829	Former Service Buildings to right of Ripley House and Little Ripley House	Grade II Listed Building. House, extended and divided. Early 18th century to centre, 19th century extensions to ends; 20th century to left. Original red brick now clad in colour washed roughcast. Hipped main roof obscured by parapet; lower slate roofs, hipped, over extensions. 2 storeys with plinth and plat band over ground floor and end piers; string course to base of parapet on centre, deep eaves to left hand extensions. Rendered stack to left of main block, stacks to rear. 7 bays to centre with outer windows on both floors blocked. 4, 12-pane glazing bar sash windows to first floor with gauged brick aprons below, now painted over. Central, smaller sash to first floor. Three glazing bar, ground floor, sashes. Half-glazed door to right. Central part-glazed door in projecting rendered surround and flat roofed dentilled porch with drum pillars. Former service buildings to right set back, 18th century and 19th century with hipped plain tiled roofs, parallel range. Mixed irregular fenestration of sashes and casements.
1377830	J Hartley Antiques Limited	Grade II Listed Building. House, now shop. Circa 1700 extended to left in late 20th century. Red and blue brick with plain tiled roof, hipped with red brick extensions. Two storeys. 7 "cross" leaded, mullion and transomed casements to first floor, large 19th century angle bay shop window to ground floor left. Smaller angle bay shop front to ground floor right. Half glazed panelled door under transome-light in moulded surround with corner paterae between shop windows. Further half-glazed door to left of centre. 20th century extension projecting to left end with garage doors and four "cross" windows above. Recessed porch to right end and one brick pier with pointed arched door.
1377855	Water Tower in Foxwarren Park	Grade II Listed Building. Water tower. C.1860 by Frederick Barnes of Ipswich for Charles Buxton. Polychrome brickwork, roof low pitched and obscured. Square, c.20 feet high with 3 stages, angle clasping buttressing to lower two stages. Elaborate terracotta string courses between stages and to top with two blind panels on top stage. Round arched door to centre of ground floor in stepped brick and terracotta surround.
1393787	Millwater	Grade II Listed Building. House, formerly farmhouse. Circa 1600 lobby entrance house refronted in 18th century. In the early 20th century after 1917 and before 1925, the architect Leonard Stokes (1858-1925) built a river room to the west and staircase tower for his brother Sir Wilfrid Scott Stokes (1860-1927). 21st century extensions to the north and attached 19th century open-fronted cart shed to the east are not of special interest.
1000125	Painshill Park	Grade I Registered Park and Garden. Landscaped pleasure grounds and park laid out between 1738 and 1773 by the Hon Charles Hamilton.
1000126	Royal Horticultural Society's Gardens, Wisley	Grade II* Registered Park and Garden. Experimental wild gardens laid out by G F Wilson from 1878 to 1902 and acquired by the Royal Horticultural Society in 1903, and further enlarged and developed since then.
N/A	Ockham Mill	Conservation Area.
N/A	Ripley	Conservation Area.

Table E.2: Non-Designated Heritage Assets

Reference (HER)	Name	Description
N/A	Ripley AHAP	AHAP. Ripley Historic Core
N/A	Buckingham Lodge AHAP	AHAP. No information given in HER
N/A	Ockham Common AHAP	AHAP. The area surrounds a possible round barrow (MSE495) and is located along the parish boundary.
N/A	Foxwarren AHAP	AHAP. The area surrounds a possible bowl barrow and is located along the possible route of the London to Winchester Roman Road.
N/A	Byfleet Park/Manor Farm Estate AHAP	AHAP. Cropmarks a visible within the area which is located west of the River Mole and downstream from Byfleet Mill.
MSE236	Romano-British Pottery, Cobham	Romano-British Pottery, Cobham.
MSE487	Romano-British cremation	An urned cremation dating to the 1 st century AD, found with empty accessory vessels and nearby four cremation pits. Excavated in 1911.
MSE488	Disputed Bowl Barrow, Foxwarren, Wisley	A probable bowl barrow was investigated in the 1970s, turning out to be a slight mound of modern origins. No evidence of a barrow was found during this archaeological investigation.
MSE494	Probable Natural Mound, Currie's Clump, Ockham Common	This mound could not positively be identified. Around the east side of Currie's Clump are several low mounds of varying size and height. By their very numbers and the fact that this is an area of sands and gravels, the features are without doubt natural. Numerous similar examples occur all over the Commons of Wisley and Ockham.
MSE495	Probable tree Planting Earthbank, Ockham Common	Circular earth ring with outer ditch, cut by a boundary trench of later date. A parish boundary bank obliterates the ditch and merges with the bank on the west side. It is disputably a round barrow, but may also be a fairly recent tree planting earth bank.
MSE496	Mesolithic or Neolithic Quartzite Mace, Wisley Common	Mesolithic or Neolithic Quartzite Mace, Wisley Common.
MSE503	Mesolithic Site, Ockham Common and Chatley Heath	Mesolithic site astride a sandy path on borders of Ockham Common and Chatley Heath. Covering a 2 ft ² area, there was evidence of a primitive flint industry mostly worked from pebbles on the site. There is a resemblance to the Mesolithic material from Ripley.
MSE746	Two Palaeolithic handaxes, Walton-On-Thames	Two Palaeolithic handaxes, Walton-On-Thames.
MSE2109	Early Bronze Age Flanged	Early Bronze Age Flanged Axe, Bolder Mere, Ockham.

Reference (HER)	Name	Description
	Axe, Bolder Mere, Ockham	
MSE2301	Undated Flakes	Undated Flakes.
MSE2451	Possible Late Bronze Age Pot	Possible Late Bronze Age Pot.
MSE2455	Flint Scraper	Flint Scraper.
MSE2456	Undated Flakes	Undated Flakes.
MSE2812	Possible medieval boundary bank, Wisley/Ockham parish boundary	Excavation on Wisley Common for Surrey Archaeological Society and Department of the Environment in 1977, sectioned the parish boundary bank. No finds were made. The site archive (plans and photos) were deposited in Guildford Museum.
MSE3182	Neolithic flint scraper, Cobham	Neolithic flint scraper, Cobham.
MSE3243	Possible field system or mineral extraction site of unknown date, Ockham/Wisley	An extensive system of large earth ridges or banks, often parallel to one another. These are often of exceptional size, being, on average, between 1.5 m and 2.7 m high over large areas near the centre of these earthworks. The intervening 'ditches' or hollows, are about 10 m across from top of bank to top of bank. The ridges appear to lead into a large sub-circular hollow up to 80 m in diameter. This latter feature is clearly a quarry hollow, and the edges seem to radiate out from this quarry, often following well-defined alignments, but sometimes forming different alignments. In some cases, the 'ditches' take on the appearance of trackways leading into and out of the quarry. This is clearly marked, as described above, on the 1881 OS 25" map (sheet xvii.12). However, the extent of the earthworks is greater than that surveyed on to this map.
MSE3269	Prehistoric Pottery Sherds	Prehistoric Pottery Sherds.
MSE3270	Mesolithic Flints	Mesolithic Flints.
MSE3271	Roman Pottery Sherds	Roman Pottery Sherds.
MSE3272	Medieval Pottery Sherds	Medieval Pottery Sherds.
MSE3310	Possible Roman quarrying site	Quarrying at the Red Hill hengi-form monument (HER 3309), presumably for ironstone as this occurs in the sand bedrock locally. Suggested to be of Roman date, possibly connected with the occupation site at Chatley Farm.
MSE3463	Milestone, Ockham	Milestone, marked Portsmouth 48, Hyde Park Corner 21, Cobham 4 and Guildford 6 miles.
MSE3464	Parish boundary stone, between	A much weathered boundary stone between Ockham and Wisley parishes.

Reference (HER)	Name	Description
	Ockham and Wisley	
MSE3502	Mesolithic Flint Cores, Wisley	Mesolithic Flint Cores, Wisley.
MSE3575	Milestone	Milestone on the south side of the old A3. The top is illegible, the front marked Hyde Park Corner 17 and the sides Esher 3 and Ripley 4.
MSE3695	Worked flints, River Wey area	Worked flints, River Wey area.
MSE3696	Possible field system or quarrying earthworks, Ockham Common	Ridges and other features revealed in motorway construction. The features probably agricultural in origin.
MSE4133	Two Palaeolithic hand-axes	Two Palaeolithic hand-axes.
MSE4738	Medieval pottery	Medieval pottery.
MSE4739	Prehistoric (Bronze Age?) pottery	Prehistoric (Bronze Age?) pottery.
MSE6886	Anti Aircraft Gun Emplacement	Defence Site: Anti Aircraft Gun Emplacement.
MSE13733	Ashted and Epsom Commons landscape survey	Survey of the archaeological and historic landscape of the Commons by C Currie of CKC Archaeology for Surrey County Council and the Corporation of London undertaken with reference to them being proposed as Areas of Historic Landscape Value. In the north of Ashted Common a number of earthworks and other features surround the site of a Roman villa. The villa is a rare type of corridor villa, with considerable evidence that it adjoined a large-scale tile manufactory. Extensive areas of quarries and spoil heaps demonstrate the extent of industrial activity on the site in the Roman period. Nearby are further earthworks associated with a large undated ditched enclosure, and a 17th century medicinal well. There are also a large number of ancient pollarded oaks on the Common. They are a rare survival of an ancient land management type that was mainly superseded in other parts of England in the post-medieval period by overgrazing. Epsom Common has few surviving historic features. The site of Old Wells, a 17th century mineral spring for which Epsom is strongly associated, is covered in housing. Those features that do remain, such as the Stew Ponds, have been much altered, and the historic character of the farmland to the south-west of Ashted Common has been affected by the evolution of temporary features associated with the pasturing of horses.
MSE13861	Bronze Age pottery and flintwork: Nutberry Farm, Wisley	Evaluation by SLR Archaeology prior to the construction of a composting facility. A single linear feature containing Bronze Age pottery and flintwork was revealed.

Reference (HER)	Name	Description
MSE14312	Aerial photograph cropmark features, Byfleet Park	An aerial photograph shows a small cluster of linear features south-west of Byfleet Manor House (NAR29). Two that are linear and parallel with a ditch further east could be of drains.
MSE14725	Cropmarks caused by aggregates work: non antiquities, Ockham	A prominent pair of parallel linear crop-marks seen in a 1988 set of photographs (TQ 0657/2: NMR 4228: frame 80 and others) of the Stratford Bridge area of Ockham (at TQ 061 575) are now thought from other aerial photographic evidence to be due to a road built to a temporary aggregates plant for the construction of the A3 Ripley by-pass in 1975 - and thus not evidence of any 'missing' Roman road in the area. The parallel crop-marks are not aligned with the expected course of a Roman road between London and Farnham.
MSE14766	Dam, Bolder Mere, Ockham Common	Dam bank for Bolder Mere, a large pond of about 6 hectares on Ockham Common. The bank is shown by a straight stretch of earthwork, at a slight angle to the A3, in the south-east corner of the pond. This bank is about 70 m in length, and about 2 m high at its maximum near where the present outfall sluice leaves the pond. A ditch approaching the pond from the south-west is channelled into the pond side of the dam, and is crossed by a small footbridge. The A3 has cut across the north-east end of the dam, destroying some of its original length. The back of the bank is heavily disturbed by drainage channels that seem to have been put in as a result of the upgrading of the A3. As at Frensham Great and Little Ponds, the siting of the dam has been carefully chosen to allow for a minimum length of bank to enclose the maximum water area, thus making as large a pond as possible from the minimum of effort.
MSE14767	Post-medieval pond, Bolder Mere, Ockham Common	A large pond of about 6 hectares on Ockham Common. The A3 runs along the north-west bank cutting across the north-east end of the dam bank. The pond is shown on Norden's county map of 1594, and other early county maps. Local tradition claims the pond was made to power an iron forge, but there is no evidence to support this. Seller's map of circa 1680 shows two 'iron mills' below Wisley Pond, but this should not be translated to Bolder Mere. Although not entirely discounting the iron mill theory, it is not impossible that the pond began its life as a simple fishpond. Previously known as Hut Pond, after the Hut Public House on the north side of the A3.
MSE14768	Remnant of Purple Pond, Ockham	A marshy pool, heavily overgrown, and much silted up. This pond was originally much larger, described by Bloxam (1963, 58-59) as the shape of a medieval boot. Marshy land to the south and south-east probably marks the original extent of the pond. At the north end of the pond, a car park has been made. This may have destroyed part of the pond. It looks as if the present road (Old Lane) may have been the dam to the pond, but it is not possible to be certain of this. On present evidence, it is not known if this was once a purpose-made pond, a former quarry hollow that has filled with water, or a natural depression into which local water drains.
MSE14769	Mound and bank, possible ornamental tree mound, Currie's Clump, Ockham	A large tree covered mound known as Currie's Clump. It stands about 8 m above the surrounding landscape and has a diameter of about 80 m. It is surmounted by conifers. About 30 m from the base of the mound is a bank with an external ditch surrounding the clump. This has been eroded, and cut through by paths and A3 works in places, but it is shown as an encircling boundary on most historic maps. A cafe, toilet and car park seems to have been built across this boundary on the south side. This is probably a natural mound that was used to plant an eye-catching clump or plantation in the later 18th or early 19th century. Manning and Bray record that the 6th and 7th Lord Kings made a number of plantations

Reference (HER)	Name	Description
		on the Commons. It was fashionable to ornament such areas at this time. This clump seems to have been named after the banker, William Currie, who lived at East Horsley Place until he sold it to the 8th Lord King in 1840.
MSE14770	Medieval pond, Wemere	Pond mentioned on the 14 th century bounds of Cobham. Partially silted up.
MSE14771	Pond site, Culverlake, Ockham	An old pond site, lying partly across the old Ockham/Cobham boundary. It was mentioned as Culverlake on the 14th century bounds of Cobham, although this may refer only to the stream that later fed the pond. The dam was on the east and north sides, but this is now partly buried under the M25. According to OS maps, the site was largely dried up before work started on the motorway. A lease of 1740 deals with two ponds in "Redhill Bottom", that may refer to this pond site (SRO 181/15/47).
MSE14772	Ore Lane Trackway	Old trackway mentioned on 14th-century bounds of Cobham as 'Holeweye'. It may have later been mentioned as a 'causeway' (Henn's Causeway) in an indenture of 1783-84 (GMR 53/40). This may refer to the section passing between the "old enclosure" known as Crook's Island and Wemere Pond, where the track crosses the dam of the pond. Once beyond Crook's Island the track follows what is possibly a more recent line across the Common. This does not have a hollow appearance. It seems likely that the original track continued north towards the large quarry shown on the first edition OS 25" map of 1881.
MSE14773	Settlement site, Henn's Enclosure, Ockham	The original enclosure was about four acres, and is variously referred to as the "old enclosure", "Henn's Enclosure" and "Crock's Island". The last two names after former tenants in the 17th to early 19th century. In the south-east corner of the land there were four cottages by the early 19th century. A settlement or farmstead/cottage is recorded on the site from the 17th century at least. However, it is possible that there may have been an assert here in the 14th century.
MSE14774	Red Hill Road Holloway or ditch feature, Wisley	Ditch-like feature, possibly a holloway running alongside the former line of Red Hill Road. By the 18th-century, it may have formed the boundary of adjoining Painshill Park. It is shown as a ditch-like feature on early OS maps, and as a track on other early maps. The OS 25 map of 1870 shows the feature as a ditch alongside the road. The present feature varies in size, but is about 1.2-1.8 m deep, and between 4-6 m wide across the top. In places it is only as wide as a footpath. It ascends the hill from Chatley Farm. Before the Enclosure Act of 1793 for Cobham it probably served as a track to Weybridge from Chatley Farm along the edge of the heath. Probably of medieval origin.
MSE14775	Linear earthworks, Foxwarren Park, Wisley	Linear earthworks running approximately north-south across Wisley Common to boundary of Foxwarren Park. Where the park has been landscaped into gardens, some of the earthworks appear to have been reused as garden features. The hollows forming the ponds (now dry) surrounded by Pulamite stone appear to have reused these earthworks. Elsewhere, they continue north beyond the Common. The earthworks on the far west side are low to begin with, being little over 1 m high and about 5 m across each hollow. However, they quickly become much larger. About 80 m west of the first earthworks, there is a very large ridge over 4 m high and many metres wide. It is possible its size is exaggerated because soil has been dumped on top of a natural ridge here. The ridges continue into a narrow valley between Foxwarren Park and Redhill Road, but do not extend beyond the steep east side of this valley. They are nearly all parallel to one another, and average 2-3 m high in the centre of the earthworks.

Reference (HER)	Name	Description
MSE14776	Dam and pond site, Wisley Pond	Wisley Pond is first mentioned in the 1590s in both documents (GMR LM 348/232) and on Norden's County Map (SRO). On Seller's map of circa 1680, two iron mills are shown on the stream leaving the pond on the north side. Nothing else is known about the pond, its uses or management. In the first years of the 19th century Lord King drained it and turned it into farmland. The original extent of the pond was about 50 acres.
MSE14777	Bank and ditch feature, Wisley Common	Bank with ditch on east side. Known by local farm as Wisley Common Ditch. This feature runs parallel with the west edge of the former Wisley Pond, being about 100 m further west from the former edge. The feature is not shown on the 1896 OS 25" map (sheet xvii.7), and so may be a relatively recent feature.
MSE14778	Pond site, Chatley Wood, Cobham	The pond is presently dry, and appears to have been for the last two or three years. The pond bed is now rough grassland, with some minor invasion by alder scrub. The stream bed that once fed the pond is traceable, but no longer running. There is evidence that this pond has been artificially created as there are clear traces of a dam at the eastern end. This is a bank about 1.6 m high and between 10-15 m broad. There is a large gap near the centre where the now dry stream channel leaves the pond.
MSE14779	Quarry, Chatley Wood	Quarry hollow, about 70 m by 40 m, on the west side of an enclosure bank thought to have been put up following the 1793 enclosure. The pit stands within the area designated for the poor cottagers of Cobham in 1793. The Court Book of 1805 states that this land was left to the cottagers so they could have rights to grazing, collecting fuel and dig 'sand and gravel' (SRO 181/17/2). The position of the quarry, abutting a 1793 enclosure bank, suggests that this quarry may have been created after 1793.
MSE14780	Farmhouse, Pond Farm, Wisley	Brick farmhouse. Built as a 'cottage' by Lord King between circa 1800-1804. The original building can be seen on the east side of the present house. Extension has been added on from just west of a line through the back door and chimney stack on the ridge. This was probably added later in the 19th century.
MSE14781	Barn, Pond Farm, Wisley	Barn with lean-to on north side. Brick west and south sides, weather boarded on east with tile roof. Roof hipped at north end, half-hipped at south end. Central wagon door. Internal roof, slanted queen post.
MSE14782	Boundary bank, Clearmount, Wisley	The bank itself is about 1 m high, and about 2.5 m wide. It has a slight ditch on the Common side. In places, it has oak trees on the bank of some antiquity. As most of these are beginning to shed branches, and many are stag-headed, they are at least 200-250 years old thereby giving a minimum possible age for the bank. These trees are clearly shown on the 1870 OS 25" map. Clearmont was still farmland at this time.
MSE14783	Lord King's ditch, Pond Farm, Wisley	Deep ditch, up to 1.3 m deep and about 2 m wide with signs of regularly recutting. Local tradition ascribes it as the ditch cut by Lord King to drain Wisley Pond circa 1800.
MSE14784	Ockham sand pit, Red Hill, Ockham	Extensive and deep quarry, listed as over an acre in the 19th century. It is shown as a sand pit on the 19th century enclosure map of Ockham (SASRC M14/OCK/7). OS 25" map of 1870 shows it extending over the Cobham boundary. The access track from Pointers Road still visible as a footpath.

Reference (HER)	Name	Description
MSE14785	Enclosure bank, Chatley Wood, Cobham	Bank up to 1.2 m high and 2.5 m wide forming boundary between surviving portion of Chatley Heath and private enclosure created by Thomas Page in 1793. The private enclosure turned into plantations by Page and these have subsequently merged into the Common, although a barbed wire fence on the bank still indicates its private nature. Traces of ditch on Common (west) side.
MSE14786	Enclosure bank, Red Hill, Wisley	Boundary bank 1 m high and up to 2.5 m wide. It forms the boundary bank between Cobham and Wisley, possibly following the line of the 14th century Cobham bounds (...et inde usque Redehelde et inde usque quondam quercum super cursum aquae de Emble...). On the Wisley tithe map it was the south-east boundary of field number 160, nine acres plus of woodland held in hand by Lord Lovelace. Until the enclosure of part of Chatley Heath in 1793, it adjoined the heath. Afterwards it adjoined a private plantation of Thomas Page.
MSE14787	Enclosure bank, Red Hill, Wisley	Bank running alongside of hill and prone to some hill slip on south-west side. Some old trees on the bank, and traces of a ditch on the south-west side. Bank up to 1 m high in places and 3 m wide. Some severe erosion noted in places. This was formerly an enclosure bank between a piece of private woodland (tithe plot 160) and an enclosed part of Wisley Heath (tithe plot 159).
MSE14788	Holloway, Hatchford Wood, Cobham	Traces of holloway between Mausoleum and Elm Cottage along southern edge of Hatchford Wood. The hollow is very considerable in places, with a bank up to 3 m high on the south side. The hollow section is only about 50 m in length. In 1774 a proposal was made to divert (both?) a highway and a footpath over Breach Hill Common from near Hatchford to Ockham (SRO 181/16/23a). In 1793 Hatchford Wood was detached from Chatley Heath as a private enclosure. It is possible these diversions were a prelude to this enclosure so that old ways over the heath did not continue to go over private lands. It is possible that one of these tracks could be the holloway here under discussion.
MSE14789	Enclosure bank, Ockham Village Green	Semi-circular bank and ditch surrounding "Ockham Village Green". The bank is low, about 0.5 m high and about 1.5 m across. The internal area has been deliberately planted up with firs to form a plantation. It is not thought that the designation "village green" has any great antiquity. The land was enclosed from the Common, circa 1869-76, probably at the time of the Ockham Enclosure Map (SASRC M14/OCK/7). On this map it is marked 'Recreation Ground' at 4-0-6 acres, with an empty plot of 0-1-6 alongside that now contains Fellside Cottage. It is not thought that the enclosure existed before 1869-76.
MSE14790	Site of Hut Public House, Wisley	Site of public house known as the Hut. New buildings were erected in 1884 and leased by Lord Lovelace to James Moscrop, hotel keeper. Prior to this it was thought the original public house was started up by George Bradshaw, a dispossessed royalist minister in 1655. A lease of adjoining Bolder Mere in 1784 refers to it as the "Alehouse called the Hut" (GMR 165/267/2/2). An unnamed building is shown on the site on Rocque's map of 1768 (Ravenhill 1974). The hotel and its adjoining buildings were all destroyed following the widening of the A3 circa 1980.
MSE14791	Road, Pointer's Road, Cobham and Ockham	This road is now a tarmaced road that terminates near the A3/M25 interchange. It once extended west of this point. There are no obviously historic features to this road now that it has been modernised, but it follows an earlier alignment. How old this alignment is cannot be said with certainty, as, in 1782, an application was made to divert it (SRO 181/16/24). It is possible that this was to ensure that it kept out of the proposed new enclosures that were

Reference (HER)	Name	Description
		made in part of Chatley Heath following the 1793 enclosure. Rocque's map of 1768 seems to suggest that the old route followed the line of Redhill Road (Ravenhill 1974), but this was abandoned as the thoroughfare from Weybridge to Poynters in 1793. This seems to suggest the current alignment dates from 1782 or alter.
MSE14792	Site of Oldpond House, Wisley	Site of house, now overgrown by nettles and scrub, and partly used as dumping site for farm manure. The house is shown on Rocque's map of 1768 (Ravenhill 1974). It was plot 130 on the Wisley Tithe Map, given as 0 -2-10 acres, a cottage, orchard and garden owned by Lord King, and m the tenure of James Woolger. The OS 25"map of 1870 refers to it as Oldpond House, showing a house and a large outbuilding. They had both gone before the M25 was built, the motorway just missing the site by about 50 m.
MSE14793	Linear earthworks, Red Hill, Cobham and Wisley	A series of linear earthworks crossing the various parish boundaries, and surrounding conventional quarries in the area (HER 3310, 14779, 14785). They are similar to earthworks identified on Ockham Common (HER 3243) and south of Foxwarren Park (HER 14775). They are frequently parallel to one another, and cover a considerable area. The estimate of two hectares covers only those areas where the earthworks are clearly visible, and up to 2 m in height. There are also other areas of less distinct earthworks on the fringes. The association of these earthworks with the adjoining quarries suggests they may be connected with this activity. Gardener (1911 115-16) reports a local oral tradition that they were dug as ironstone quarries to supply local iron mills, but this has been questioned by Potter (1982), who has suggested an Iron Age date.
MSE14794	Mound and linear earthworks, possible barrow, Ockham Heath	Large sub-circular mound, about 40 m diameter and up to 3 m high, on north of track on Ockham Heath. This feature has been exposed by clearance of area to regenerate heathland. It has some similarities to other "barrows" in the area, and is here included to pre-empt its later "discovery" as a genuine barrow. This is made all the more possible by what appears to be the remains of a ditch on the west and east sides.
MSE14795	Parish boundary bank, Ockham Heath	Old parish boundary between Ockham and Cobham. It may be related to the early Saxon boundary called Fullingdic (see HER 3195), to which this monument should be cross-referenced, as they may be one and the same). Its survival is intermittent particularly in the north where its line is much disturbed by quarry workings and other earthworks (see HER 3243). In fact it is difficult to find the line shown on the ground in places. However the Cobham/Ockham boundary is mentioned in a boundary document of the 14th century (SASRC 177/40), and the present alignment seems to follow the earlier line fairly closely.
MSE14796	Quarry pit, Chatley Wood Quarry, Cobham	Small quarry pit circa 40 m by 30 m, set in conifer woodland between Wisley/Cobham Boundary and Chatley Wood Pond. Within 80 m of Redhill Quarry (HER 3310), and other quarry sites and linear earthworks (HER 14784, 14793). There are numerous explanations for quarrying in this area most favouring ironstone workings or sand pits. Different sources have suggested dates ranging from Iron Age (Potter 1982), Roman (HER 3310), and post-medieval (Gardner 1921). This pit is set in land that was enclosed from common for a private plantation in 1793. It is shown as a 'sand pit' in 1870 (OS 25" map, sheet XVII.8; 1870 ed.), with an access route leading up from Pointer's Road.
MSE14998	Negative Evidence: Chatley Farm Estate,	Watching brief (and associated Historic Building Recording) by Wessex Archaeology during alterations and conversion to Chatley Farmhouse and associated farm buildings. No significant finds or features of archaeological interest were recorded during monitoring of the

Reference (HER)	Name	Description
	Pointers Road, Cobham	groundworks involved in the development (see HER 7369 for Historic Building recording).
MSE15844	Ring ditch cropmark	An irregular ring ditch with short lengths of linear ditches.
MSE16852	Claygate to Guildford Milestone	Milestone, Wisley Common near RHS Gardens, north-east of footbridge.
MSE16887	Claygate to Guildford Milestone	South of junction with M25 on slip road (old lane).
MSE17075	Cropmarks	A number of small circular and sub-circular cropmarks.
MSE17084	Cropmarks	Cropmarks.
MSE18141	Earthworth bank, Cobham	Earthworth bank of unknown date, at the edge of a copse with a slight ditch and adjacent pathway. Veteran Field Maple adjacent to path.
MSE18143	Post-medieval hollow, Cobham	Hollow about 40 m across. May be associated with flood meadow management.
MSE18144	Woodland edge, Cobham	Woodland edge marked by Field Maple. May indicate edge of copse or walkway.
MSE18181	The Lodge and Lodge Wood, Cobham	This was the Lodge at the north entrance to Hatchford Park, which was severed from the rest of the estate by the construction of the M25. The woodland to the east of the Lodge appears to be secondary. The Lodge was not visited but is presumed to be 19 th century.
MSE18182	The Bogs: semi-ornamental woodland, Cobham	This is a substantial area of semi-ornamental woodland, first labelled as such in 1876. The name on the OS map appears to apply only to the woodland northwest of Pointers Pond. The woodland to the southwest was called Breach Hill Wood. The Bogs appears to have been cultivated land in 1768 and 1793 and was perhaps developed as woodland as part of the landscaping associated with Poynters in the early 19th century. This is certainly almost the case for the woodland on the east side of Pointers Road. Today the woodland is characterised by an understorey of rhododendron, well-spaced Sweet Chestnut and Oak with frequent Ash and patches of Bracken. If there was wet ground here originally it is no longer evident from the vegetation.
MSE19515	SAUCER BROOCH, Wisley	Saucer Brooch, Wisley.
MSE20867	War Memorial, RHS Headquarters, Wisley	War memorial. Bronze panel surrounded by a frame of Hoptonwood stone. Above the panel is the crest of the Royal Horticultural Society. At the upper corner dexter side is a national symbol of the shield bearing the three English lions. On the sinister side is the emblem of the passion cross. The panel is inscribed: in grateful remembrance of the Wisley students who laid down their lives for their country in the Great War 1914-1919 (20 names). It was unveiled on 3rd June 1921 by the President of the Royal Horticultural Society and dedicated by local clergy and dignitaries. The architect was Sir Robert Lorimer and the cost was £235. First World War.
MSE20868	War Memorial, RHS	Wisley students. War memorial, bronze panel surrounded by a frame of Hoptonwood stone. Second World War.

Reference (HER)	Name	Description
	Headquarters, Wisley	
MSE20871	War Memorial, RHS Headquarters, Wisley	War memorial in the form of a clock with gilded numerals and red hands above the entrance, and a rectangular plaque with a black line border inside the main laboratory building. An inscription reads: The memorial clock erected over the main door of this building was given by the RHS Gardens Club in grateful memory of the men from Wisley Gardens who lost their lives in the two World Wars. 1914-1918. 1939-1945. First World War. Second World War.
MSE21230	Anti Aircraft Site, Wisley Common	An unarmed Anti Aircraft Site at Wisley Common.
MSE21976	The Hermitage at Painshill Park	Site of an 18th century hermitage created by Charles Hamilton as part of his pleasure grounds at Painshill Park. Reconstructed in 2004 as part of the wider Painshill Park restoration project. The site of the original hermitage was established from archive research and a program of archaeological work undertaken in 1986. The Painshill archives contain contemporary sketches and descriptions by visitors to the park and these were used to inform the reconstruction. There are a number of historical descriptions of the Painshill Hermitage, the building was approached from the north along one of the paths from Alpine Valley.
MSE22004	Chippings Farm	Chippings Farm. Site of an Historic Farmstead. Information on this site is currently being compiled as part of a project researching important historic farmsteads and associated buildings within the current administrative county of Surrey.
MSE22157	Highlands Farm	Building; unknown date.
MSE22158	Long Orchard Farm	Farm; unknown date.
MSE22159	Silvermore Farm Estate	Farm; unknown date.
MSE22160	Pains Hill House Farm	Farm; unknown date.
SMR4619	London to Winchester Roman Road	An East-West Roman Road, presumably London to Winchester, passes through Neatham. The surface has been exposed during excavations at Neatham (summer 1976) and consists of a layer of tightly packed flints with a parallel ditch running along the southern edge. The north edge was not examined. The course of the road can be followed between Alton and Farnham but is elsewhere uncertain.

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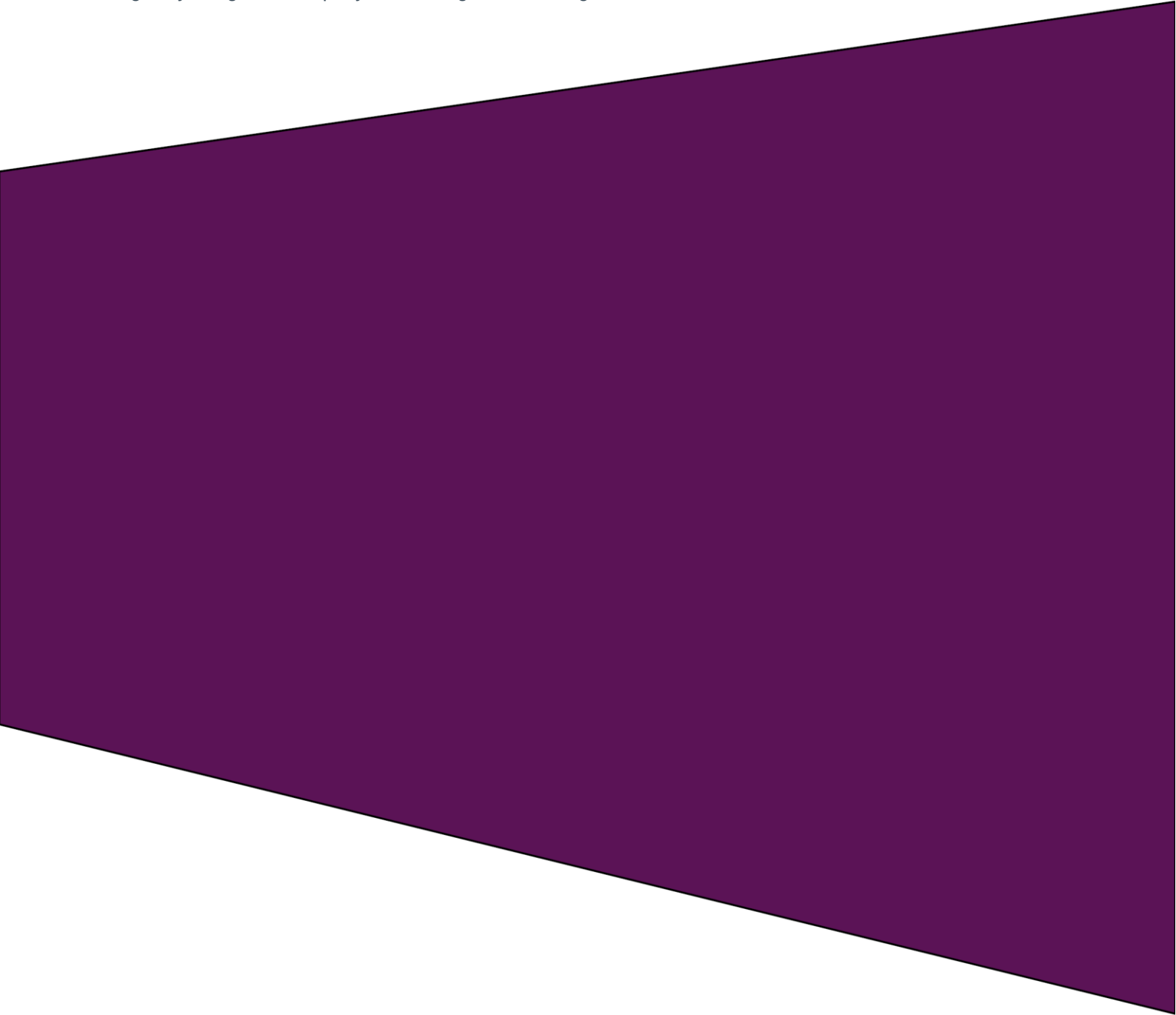
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SCOPING OPINION:

Proposed M25 Junction 10/A3 Wisley Interchange Improvement

Case Reference: TR010030

Adopted by the Planning Inspectorate (on behalf of the
Secretary of State for Communities and Local Government)
pursuant to Regulation 10 of The Infrastructure Planning
(Environmental Impact Assessment) Regulations 2017

January 2018

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APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

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1. INTRODUCTION

1.1 Background

- 1.1.1 On 08 December 2017, the Planning Inspectorate (the Inspectorate) on behalf of the Secretary of State (SoS) received a scoping request from Highways England (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed M25 Junction 10/A3 Wisley Interchange improvements (the Proposed Development).
- 1.1.2 In accordance with Regulation 10 of the EIA Regulations, an Applicant may ask the SoS to state in writing its opinion *'as to the scope, and level of detail, of the information to be provided in the environmental statement'*.
- 1.1.3 This document is the Scoping Opinion (the Opinion) provided by the Inspectorate on behalf of the SoS in respect of the Proposed Development. It is made on the basis of the information provided in the Applicant's report entitled 'Regional Investment Programme M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report' (the Scoping Report). This Opinion can only reflect the proposals as currently described by the Applicant. The Scoping Opinion should be read in conjunction with the Applicant's Scoping Report.
- 1.1.4 The Applicant has notified the SoS under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development. Therefore, in accordance with Regulation 6(2)(a) of the EIA Regulations, the Proposed Development is EIA development.
- 1.1.5 Regulation 10(9) of the EIA Regulations requires that before adopting a scoping opinion the Inspectorate must take into account:
- (a) *any information provided about the proposed development;*
 - (b) *the specific characteristics of the development;*
 - (c) *the likely significant effects of the development on the environment;*
and
 - (d) *in the case of a subsequent application, the environmental statement submitted with the original application.*
- 1.1.6 This Opinion has taken into account the requirements of the EIA Regulations as well as current best practice towards preparation of an ES.
- 1.1.7 The Inspectorate has consulted on the Applicant's Scoping Report and the responses received from the consultation bodies have been taken into account in adopting this Opinion (see Appendix 2).

- 1.1.8 The points addressed by the Applicant in the Scoping Report have been carefully considered and use has been made of professional judgement and experience in order to adopt this Opinion. It should be noted that when it comes to consider the ES, the Inspectorate will take account of relevant legislation and guidelines. The Inspectorate will not be precluded from requiring additional information if it is considered necessary in connection with the ES submitted with the application for a Development Consent Order (DCO).
- 1.1.9 This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in their request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (eg on submission of the application) that any development identified by the Applicant is necessarily to be treated as part of a Nationally Significant Infrastructure Project (NSIP) or associated development or development that does not require development consent.
- 1.1.10 Regulation 10(3) of the EIA Regulations states that a request for a scoping opinion must include:
- (a) *a plan sufficient to identify the land;*
 - (b) *a description of the proposed development, including its location and technical capacity;*
 - (c) *an explanation of the likely significant effects of the development on the environment; and*
 - (d) *such other information or representations as the person making the request may wish to provide or make.*
- 1.1.11 The Inspectorate considers that this has been provided in the Applicant's Scoping Report. The Inspectorate is satisfied that the Scoping Report encompasses the relevant aspects identified in the EIA Regulations.
- 1.1.12 In accordance with Regulation 14(3)(a), where a scoping opinion has been issued in accordance with Regulation 10 an ES accompanying an application for an order granting development consent should be based on *'the most recent scoping opinion adopted (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion)'*.
- 1.1.13 Inspectorate notes the need to carry out an assessment under The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations). This document must be co-ordinated with the EIA, to avoid duplication of information between assessments. The Applicant should be aware that the 2010 Habitats Regulations (as amended) were replaced by new regulations on 30 November 2017 and must ensure that the assessment accords with the 2017 Habitats Regulations.

1.2 The Planning Inspectorate's Consultation

- 1.2.1 In accordance with Regulation 10(6) of the EIA Regulations the Inspectorate has consulted the consultation bodies before adopting a scoping opinion. A list of the consultation bodies formally consulted by the Inspectorate is provided at Appendix 1. The consultation bodies have been notified under Regulation 11(1)(a) of the duty imposed on them by Regulation 11(3) of the EIA Regulations to make information available to the Applicant relevant to the preparation of the ES. The Applicant should note that whilst the list can inform their consultation, it should not be relied upon for that purpose.
- 1.2.2 The list of respondents who replied within the statutory timeframe and whose comments have been taken into account in the preparation of this Opinion is provided, along with copies of their comments, at Appendix 2, to which the Applicant should refer in undertaking the EIA.
- 1.2.3 The ES submitted by the Applicant should demonstrate consideration of the points raised by the consultation bodies. It is recommended that a table is provided in the ES summarising the scoping responses from the consultation bodies and how they are, or are not, addressed in the ES.
- 1.2.4 Any consultation responses received after the statutory deadline for receipt of comments will not be taken into account within this Opinion. Late responses will be forwarded to the Applicant and will be made available on the Inspectorate's website. The Applicant should also give due consideration to those comments in carrying out the EIA.

1.3 Article 50 of the Treaty on European Union

- 1.3.1 On 23 June 2016, the United Kingdom (UK) held a referendum and voted to leave the European Union (EU). On 29 March 2017 the Prime Minister triggered Article 50 of the Treaty on European Union, which commenced a two year period of negotiations regarding the UK's exit from the EU. There is no immediate change to legislation or policy affecting national infrastructure. Relevant EU Directives have been transposed into UK law and those are unchanged until amended by Parliament.

2. THE PROPOSED DEVELOPMENT

2.1 Introduction

- 2.1.1 The following is a summary of the information on the Proposed Development and its site and surroundings prepared by the Applicant and included in their Scoping Report. The information has not been verified and it has been assumed that the information provided reflects the existing knowledge of the Proposed Development and the potential receptors/resources.

2.2 Description of the Proposed Development

- 2.2.1 The Applicant's description of the Proposed Development, its location and technical capacity (where relevant) is provided in the Scoping Report in Sections 1.1, 2.1-2.4 and in Chapter 19 which consists of the location and design plans.
- 2.2.2 The Proposed Development is part of the Government's Road Investment Strategy (RIS) for the Strategic Road Network (SRN) and aims to improve the movement of traffic and road safety on the M25 at the Junction 10 Interchange with the A3 road to Wisley. The proposals include; increasing the capacity of the M25 roundabout, widening the A3 from Ockham to M25 Junction 10 and M25 Junction 10 to Painshill, widening the A245 between the Painshill junction and the B365 Seven Hills junction, and associated works. The widening of the A3 will result in the closure of existing direct accesses to it and therefore the Proposed Development includes alternative provisions. These will involve the creation of new and replacement bridge structures and new access roads. New non-motorised user routes are proposed to be incorporated within these works. Works to upgrade existing Public Rights of Way (PRoW) and to provide new routes, including new sections of bridleways/cycleway, footpaths, and NMU crossings at the Ockham interchange.
- 2.2.3 The Scoping Report states that the Proposed Development will result in land-take from designated nature conservation sites and common land (see below) and therefore the proposals include replacement land in four locations. These areas of land are shown on the Route Protection Plan provided in Chapter 19 of the Scoping Report. The permanent land take of the proposals is stated in the Scoping Report as being approximately 26ha. The temporary land-take is estimated as 33ha in the Scoping Report, which states that it has been included within the proposed DCO boundary presented. The estimates for the permanent land-take in hectares from designated nature conservation habitats are shown in paragraphs 7.5.2 to 7.5.7 of the Scoping Report.
- 2.2.4 The application site is part of the existing south western section of the M25 London Orbital Motorway, at the M25 Junction 10/A3 Wisley Interchange. The M25 is a major route between Gatwick and Heathrow airports and London. The A3 is a main route between London and

Portsmouth. The application site is located south-west of London, north-east of Guildford, north-west of Dorking, east of Woking and south-east of Slough. The town of Byfleet is adjacent to the application site to the north-west and Cobham lies to the west of the Painshill junction of the A3.

- 2.2.5 The application site comprises the existing M25 motorway and interchange with the A3 there are also residential and other community buildings such as schools, farms, the Royal Horticultural Society (RHS) head office at Wisley, and a nursing home in the surrounding area. Existing buildings, overbridges, overhead power lines, and other structures, are shown in the Figures accompanying the Scoping Report.
- 2.2.6 The Thames Basin Heaths Special Protection Area (SPA) and Ockham and Wisley Commons Site of Special Scientific Interest (SSSI), which is also designated as a Local Nature Reserve (LNR), Site of Nature Conservation Interest (SNCI) and Ancient Woodland, are located adjacent to the application site. A number of other international, national, and locally designated sites for nature conservation are located within the vicinity of the application site. The RHS gardens at Wisley are located immediately south-west of Junction 10, and Painshill Park is to the north-east of Junction 10, both these receptors are Registered Parks and Gardens of Historic Interest. The application site is located within an area of Registered Common Land (Wisley Common and Chatley Heath). Also within the vicinity of the application site are several listed buildings, disused landfill sites, areas of public open space, and existing waterbodies and watercourses. The application site is within proximity of the Air Quality Management Area (AQMA) at Cobham north-east of Junction 10. There are a number of other AQMAs within the local area of the application site. The environmental constraints are shown in Figures 2.1-5.1 of the Scoping Report.

2.3 The Planning Inspectorate's Comments

Description of the Proposed Development

- 2.3.1 Chapter 2 of the Scoping Report includes a description of the main components of the Proposed Development. The Inspectorate expects that at the ES which accompanies the application for DCO should include a detailed description of the Proposed Development which includes all of the works for which development consent is sought.
- 2.3.2 The length of the Proposed Development (in km) and the size of the application site (in hectares) should be specified in the ES. Details of components such as signage, gantries, lighting, drainage features, landscaping, and environmental mitigation features should be provided in the ES particularly where these components are relevant to the assessment.
- 2.3.3 The Scoping Report states that the temporary land-take, in which construction activities may take place, is included in the proposed DCO

boundary provided and that construction site areas are shown in the Engineering General Arrangement drawings 1-9 in the Scoping Report (Chapter 19). The Inspectorate notes that despite the statement above the construction compound locations are not yet confirmed. Information relevant to land use during construction should be provided in the ES and should illustrate both temporary and permanent land-take. The Inspectorate recommends that the ES should include detailed information on any requisite demolition works and land use requirements during the construction and operation phases. The ES should clearly identify the land that would be temporarily required during construction (eg the location of construction compounds, material stockpiles, borrow pits, and haul roads), as well as the land that would be required for the operational phase. The proposed DCO boundary applied for must allow for the land-take associated with all works and project elements proposed as part of the application.

- 2.3.4 Where flexibility is sought, the ES should set out the parameters that would apply for all components of the Proposed Development including footprint, heights and proposed limits of deviation. The description in the ES should address each stage of the Proposed Development including construction. The ES should make appropriate use of figures/drawings to support the description provided.
- 2.3.5 The ES should explain how a phased approach to construction (if adopted) would occur. The explanation should address the likely duration and location of construction activities. The Inspectorate notes the information in paragraph 2.4.15 of the Scoping Report regarding the anticipated year of construction and operation and would expect this to be incorporated into the ES. The anticipated traffic management measures (including construction traffic routes) and road closures or diversions during construction should be explained in the ES and particularly where this information influences the assessment.
- 2.3.6 The ES should include a description of the nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) to be used during construction. The ES should describe and assess the likely significant effects associated with any particular technologies or substances proposed to be used for the construction phase.
- 2.3.7 The Scoping Report provides a description of the location of the Proposed Development in Sections 1.1 and 2.1-2.4, and in Chapter 19 within the location and design plans. This information should be expanded in the ES to provide a detailed description of the existing land uses and features across the application site and surrounding area. The Inspectorate notes that all existing footways and other non-motorised routes including Rights of Way in the vicinity of the Proposed Development are to be identified through a desk based assessment supported where applicable by the findings of user surveys that have been undertaken (paragraph 13.7.43). This information should be described in detail in the ES, in particular within the appropriate aspect assessments.

- 2.3.8 The Scoping Report and the accompanying Environmental Constraints Plan (Figure 2.1 of the Scoping Report) identify a number of landscape, nature conservation, historic, and other features in the immediate vicinity of the application site. These features are not individually identified or referenced and it would provide greater clarity to do so. The plans accompanying the ES should include labels on features such as settlements and road names which will support the reader to identify the application site and improve overall clarity. Figures submitted with the ES should be sufficient to cover the full extent of the study area(s) applied in the relevant aspect assessment.

Alternatives

- 2.3.9 The EIA Regulations require that the Applicant provide 'a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.
- 2.3.10 The Inspectorate would expect to see a discrete section in the ES that provides details of the alternatives considered and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.
- 2.3.11 Chapter 3 of the Scoping Report ('Alternatives') sets out the approach taken in developing options for the Proposed Development. This chapter provides an overview of the options and the reasons for choosing the final option, including regard to environmental considerations. Section 3.2 refers to an assessment of the options in terms of environmental impact, and in terms of meeting legal and policy considerations. To address alternative this information should be provided with the ES so that it can be understood how environmental effects, and the responses of stakeholders, have been taken into account in the choices made.
- 2.3.12 The Inspectorate also expects that environmental impacts will be taken into account when considering alternatives to the detailed elements of the Proposed Development design (eg the installation of culverts or single span bridges) and that this should be reported in the ES.

Flexibility

- 2.3.13 The Inspectorate notes that the Applicant intends to apply the Rochdale Envelope approach to the application for the Proposed Development (paragraphs 2.4.1 and 4.3.16, Scoping Report) in accordance with the

Inspectorate's Advice Note 9 'Using the 'Rochdale Envelope'¹, which provides details on the recommended approach.

- 2.3.14 The Applicant should attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The Inspectorate notes the intention in this regard stated in paragraphs 4.3.15 to 4.3.16 of the Scoping Report. The development parameters will need to be consistently and clearly defined in both the draft DCO (dDCO) and the accompanying ES. It is a matter for the Applicant, in preparing an ES, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations.
- 2.3.15 It should be noted that if the Proposed Development changes substantially during the EIA process prior to submission of the DCO application the Applicant may wish to consider requesting a new scoping opinion.

¹ Advice Note nine: Using the Rochdale Envelope. 2012. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/>

3. EIA APPROACH

3.1 Introduction

- 3.1.1 This section contains the Inspectorate's specific comments on the scope and level of detail of information to be provided in the Applicant's ES. General advice on the presentation of an ES is provided in the Inspectorate's Advice Note 7 'Environmental Impact Assessment: Process, Preliminary Environmental Information, and Environmental Statements'² and associated Annex.
- 3.1.2 Aspects/matters are not scoped out unless specifically addressed and justified by the Applicant, and confirmed as being scoped out by the Inspectorate. The ES should be based on the Scoping Opinion in so far as the Proposed Development remains materially the same as the Proposed Development described in the Applicant's Scoping Report. The Inspectorate has set out in this Opinion where it has/has not agreed to scope out certain aspects or matters on the basis of the information available at this time. The Inspectorate is content that this should not prevent the Applicant from subsequently agreeing with the relevant consultees to scope such aspects/matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects/matters have been appropriately addressed, the ES should explain the reasons for scoping them out and justify the approach taken.
- 3.1.3 Where relevant, the ES should provide reference to how the delivery of measures proposed to prevent/minimise adverse effects is secured through DCO requirements (or other suitably robust methods) and whether relevant consultees agree on the adequacy of the measures proposed.

3.2 Relevant National Policy Statements (NPSs)

- 3.2.1 Sector-specific NPSs are produced by the relevant Government Departments and set out national policy for NSIPs. They provide the framework within which the Examining Authority (ExA) will make their recommendation to the SoS and include the Government's objectives for the development of NSIPs. The NPSs may include environmental requirements for NSIPs, which Applicants should address within their ES.
- 3.2.2 The designated NPS relevant to the highways sector is the National Policy Statement for National Networks (NPSNN). The Inspectorate notes that

² Advice Note seven: Environmental Impact Assessment: Process, Preliminary Environmental Information, and Environmental Statements. Available from: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/>

this is identified in the Scoping Report as a key consideration, and advises that the EIA takes account of this policy document.

3.3 Scope of Assessment

General

- 3.3.1 The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables:
- to demonstrate how the assessment has taken account of this Opinion;
 - to identify and collate the residual effects after mitigation for each of the aspect chapters, including the relevant interrelationships and cumulative effects;
 - to set out the proposed mitigation and/or monitoring measures including cross-reference to the means of securing such measures (eg a dDCO requirement);
 - to describe any remedial measures that are identified as being necessary following monitoring; and
 - to identify where details are contained in the Habitats Regulations Assessment (HRA) report, such as descriptions of European sites and their locations, together with any mitigation or compensation measures, are to be found in the ES.
- 3.3.2 The Inspectorate considers that where a DCO application includes works described as 'associated development', that could themselves be defined as an improvement of a highway, the Applicant should ensure that the ES accompanying that application distinguishes between; effects that primarily derive from the integral works which form the proposed (or part of the proposed) NSIP and those that primarily derive from the works described as associated development, for example through a suitably compiled summary table. This will have the benefit of giving greater confidence to the Inspectorate that what is proposed is not in fact an additional NSIP defined in accordance with s22 of the PA2008.
- 3.3.3 The Inspectorate notes that the Applicant considers that the EIA process would be in "conformance" with Highways England's own Design Manual for Roads and Bridges (DMRB) requirements (paragraph 4.1.2). The Inspectorate recommends that the Applicant should ensure that the scope of the EIA adequately meets the requirements of the 2017 EIA Regulations, as referred to in Chapter 4 of the Scoping Report.
- 3.3.4 The Inspectorate notes that the impacts to human health will be addressed in relevant aspect assessments, with the Scoping Report identifying the Air Quality and Noise aspects as particularly relevant. The Inspectorate considers that the Geology and Soils, Materials and Waste, and People and Communities aspect assessments may be of relevance to the assessment of effects on human health. The Inspectorate also notes

the Applicant's intention to produce a Health Impact Assessment separate to the EIA.

- 3.3.5 The Inspectorate has had regard to the receiving environment and existing features, including historic landfill sites and infrastructure assets. Any impacts to these sites or assets and their influence on the design of the proposals should be assessed. The Inspectorate advises that consultation with stakeholders is undertaken and taken into account in the ES, which should describe any interactions with infrastructure where significant effects could arise. Consultation responses from the Health and Safety Executive (HSE), National Grid, and Royal Mail Group Ltd are provided in Appendix 2, and contain information about infrastructure which may interact with the Proposed Development, to which the Applicant should have regard.
- 3.3.6 The Applicant will decide on the structure of the ES. However, the Planning Inspectorate expects that impacts associated with changes in traffic and transport must be assessed in the ES. The assessment should explain the methodology applied to the assessment and to preparing a traffic model. Agreement on the approach should be sought from relevant consultees. Transport for London (TfL) has provided some comment in this regard in their response in Appendix 2. The ES must demonstrate how the information gathered as part of the traffic assessment has been applied to other assessments within the ES, for example Air Quality and Noise and Vibration.
- 3.3.7 The approach to the EIA is outlined in Chapter 4 of the Scoping Report, and paragraph 4.6.1 states that decommissioning effects are not considered relevant to the Proposed Development. Paragraph 2.5.9 states that the Proposed Development will have an indefinite design life and also states that decommissioning will not be included in the environmental assessment. The Inspectorate considers that this is a reasonable approach taking into account the specific characteristics of the Proposed Development as a whole. However, the Inspectorate considers that any decommissioning associated with dismantling and replacing particular elements of the Proposed Development once they reach the end of their design life should be assessed where significant effects are likely to occur.
- 3.3.8 The Scoping Report states that an assessment under the Habitats and Species Regulations 2017 is likely to be required. As a general recommendation, an up to date HRA report should be produced (the Inspectorate notes the assessment referred to in Chapter 4, paragraphs 4.3.29 to 4.3.30) and should be referenced in the ES. The HRA report should in turn contain references to where the information on which it is based is to be found in the ES.
- 3.3.9 Throughout the Scoping Report, reference is made to 'the Scheme,' 'the project', 'the construction site', 'the red line boundary', and 'the site'. Some of these terms appear to be used interchangeably with respect to

each other. The ES should be consistent in applying the terminology used in order to preserve the distinction between terms and aid clarity.

Baseline Scenario

- 3.3.10 The ES should include a description of the baseline scenario with and without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
- 3.3.11 The Inspectorate notes the information within Section 4.3 of the Scoping Report which sets out the temporal scope of the assessments. Reference is made to the use of baseline year and future assessment year or a series of future assessment years but exact scenarios are not committed to in the Scoping Report. The final approach adopted should be defined in the ES and based on the most up to date anticipated project timescales. The approach must be adopted consistently across each aspect chapter of the ES and where any individual aspect assessments depart from that approach it should be explained in the ES.

Forecasting methods or evidence

- 3.3.12 The ES should contain the timescales upon which the surveys which underpin the technical assessments have been based. For clarity, this information should be provided either in the introductory chapters of the ES (with confirmation that these timescales apply to all chapters), or in each aspect chapter.
- 3.3.13 The approach to assessment set out in Chapter 4 of the Scoping Report is noted. The Inspectorate expects the ES to include a chapter setting out the overarching methodology for the EIA, which clearly states which effects are 'significant' and 'non-significant' for the purposes of the EIA. Any departure from that methodology should be described in individual aspect assessment chapters.
- 3.3.14 The Inspectorate recommends that the Applicant fully describes and justifies in the ES the methodologies they have used for the assessments, in particular where these depart from standard guidance or where no standard guidance exists. The Inspectorate considers that the ES should present the specific assessment methodology relevant to each individual aspect/matter assessed. If an overarching methodology is applied this should be explained with relevant cross reference, and any departures from the prescribed methodology should be explained and justified. It would also be of benefit to provide figures in the ES that show the extent of the study areas used for the assessments and identify the receptors. The Inspectorate considers that relevant data which inform the assessments should be appended to the ES.

- 3.3.15 The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

Residues and emissions

- 3.3.16 The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.
- 3.3.17 The Inspectorate notes the proposal at paragraph 4.1.3 of the Scoping Report to scope out heat and radiation according to the Applicant's conclusion that they are not relevant to highways schemes. The Inspectorate has taken into account the nature and characteristics of the Proposed Development and agrees that significant effects resulting from heat and radiation are unlikely to arise and therefore agrees that this aspect may be scoped out.

Mitigation

- 3.3.18 Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The predicted significance of effects both prior to and following the implementation of proposed mitigation measures should be identified. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, ideally with reference to specific DCO requirements or other legally binding agreements.

Vulnerability of the development to risks of major accidents and/or disasters

- 3.3.19 The ES should include a description of the potential vulnerability of the Proposed Development to risks of major accidents and/or disasters, including vulnerability to climate change, which are relevant to the Proposed Development. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
- 3.3.20 The Inspectorate notes from the Scoping Report that major events will be reported in relevant aspect chapters. It is noted that there is a

commitment to assess the vulnerability of the Proposed Development to risks of major accidents and disasters, and how such events could change the predicted environmental effects. The Scoping Report does not address the potential for the Proposed Development to lead to or exacerbate major accidents or disasters. If the Proposed Development could lead to or exacerbate a major accident or disaster this must be assessed in the ES. The Inspectorate notes the proximity of a number of sensitive environmental features, areas exposed to flood risk, infrastructure assets, and historic landfill sites which may be a relevant consideration. The ES should assess these impacts within relevant aspect chapters.

Transboundary effects

- 3.3.21 Schedule 4 Part 5 of the EIA Regulations requires a description of the likely significant transboundary effects to be provided in an ES. The Inspectorate notes that the Applicant has indicated in the Scoping Report that the Proposed Development is unlikely to have significant impacts on another European Economic Area (EEA) State.
- 3.3.22 Regulation 32 of the EIA Regulations inter alia requires the Inspectorate to publicise a DCO application on behalf of the SoS if it is of the view that the proposal is likely to have significant effects on the environment of another EEA state, and where relevant, to consult with the EEA state affected.
- 3.3.23 The Inspectorate considers that where Regulation 32 applies, this is likely to have implications for the examination of a DCO application. The Inspectorate recommends that the ES should identify whether the Proposed Development has the potential for significant transboundary impacts and if so, what these are and which EEA States would be affected.

A reference list

- 3.3.24 A reference list detailing the sources used for the descriptions and assessments must be included in the ES.

3.4 Confidential Information

- 3.4.1 In some circumstances it will be appropriate for information to be kept confidential. In particular, this may relate to information about the presence and locations of rare or sensitive species such as badgers, rare birds and plants where disturbance, damage, persecution or commercial exploitation may result from publication of the information. Where documents are intended to remain confidential the Applicant should provide these as separate paper and electronic documents with their confidential nature clearly indicated in the title, and watermarked as such on each page. The information should not be incorporated within other documents that are intended for publication or which the Inspectorate

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would be required to disclose under the Environmental Information Regulations 2014.

4. ASPECT BASED SCOPING TABLES

4.1 Air Quality

(Scoping Report Chapter 5)

The construction phase study area for the assessment of construction dust is set at 200m from the 'construction site boundary', with reference to the Design Manual for Roads and Bridges (DMRB) (HA 207/07). The construction traffic and operational phase study area is stated as determined by the 'Affected Road Network' (ARN) which includes affected roads for local and regional air quality assessments. At scoping, the ARN has been determined at the option selection stage and will be further refined on the basis of traffic modelling to be undertaken. A number of Air Quality Management Areas (AQMAs) exist within the study area (for NO₂ and PM10). The study area is provided on Figures 5.1 and 5.2 of the Scoping Report.

The proposed methodology is set out in the Scoping Report, and has taken into account DMRB Volume 11; HE interim Advice Notes (IANs); and Defra's Pollution Climate Mapping (PCM) and UK Air Quality Information Resource (UK-AIR). Information on baseline conditions has been gathered through existing monitoring studies and passive diffusion tubes survey. Sensitive receptors are identified in Table 5.7. The Scoping Report proposes a detailed level of assessment with respect to dispersion modelling of operational impacts to human health and designated ecological receptors.

The Applicant considers that there will be increased dust emissions during demolition and construction, and changes to traffic flows during both construction and operation resulting in air quality effects. Assessment scenarios are presented representing the base year of 2015 (for model verification purposes), projected base year of 2022, year of opening (with and without the Proposed Development) 2022, and design year (regional emissions only) 2037.

The Inspectorate has provided comments on matters that the Applicant has set out as being scoped out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	5.4.4	Pollutants	The Scoping Report states that national assessments have demonstrated that there is no risk of exceedance of the air quality objectives set for 1,3-butadiene, benzene, carbon monoxide, lead or sulphur dioxide due to traffic emissions anywhere in the UK, and therefore no further assessment is intended. The Inspectorate agrees with the reasoning in the Scoping Report that significant effects associated with these

			pollutants are unlikely and is content for further assessment to be scoped out of the ES.
2	N/A	Pollutants	The Scoping Report does not state if/how impacts resulting from increased PM2.5 emissions will be taken into account. The Inspectorate considers that the ES should include an assessment of impacts associated with increased PM2.5 resulting from the Proposed Development. In determining significance, the assessment should take into account performance against relevant target/limit values.
3	5.4.5	Ecological receptors	It is noted that only statutory designated sites are identified as sensitive receptors to the effects of NOx. The Applicant should additionally assess any locally designated and non-designated sites that could be significantly affected by the Proposed Development, for example Ancient Woodland. The Inspectorate recommends that the relevant ecological receptors to be included in the assessment should be agreed with Natural England (NE) and other relevant statutory consultees.
	Para	Other points	Inspectorate's comments
4	5.4.16	Baseline conditions	The Inspectorate advises that the assessment is based on recent and up to date baseline data available, and that agreement is sought with the local authorities on the datasets used. Guildford Borough Council (GBC) has commented in this regard, providing information on available baseline data and the Applicant should have regard to this when undertaking the assessment.
5	5.2	Study area – construction dust	The meaning of the term 'Construction site boundary' is unclear. Figure 5.2 shows the 'area potentially affected by construction dust' and illustrates that this area partially excludes the area within the proposed DCO boundary. The study area applied to the construction dust assessment must be clearly described in the ES. The study area should be established applicable to the extent of the likely impacts and explained

			in the ES. With respect to the assessment of construction traffic and operational traffic emissions, the inspectorate notes the intended refinement of the ARN for the local and regional assessments, and advises that the ARN must be clearly defined in the ES. An appropriate cross-reference to the traffic model applied should be included in the ES.
6	5.7.5	Significance of construction dust effects	It is unclear how significance of effects resulting from increased dust emissions will be determined. In the absence of appropriate guidance, such as exists for local air quality effects in the form of IAN 174/13, this should be assessed using an evidence-based methodology, and described in the ES. SCC has provided advice in their response on the methodology to be applied. The Applicant should seek to agree the specific methodology for the assessment of dust impacts with relevant consultees including relevant Local Planning Authorities.

4.2 Noise and Vibration

(Scoping Report Chapter 6)

The proposed study area for the assessment of noise and vibration effects is defined as 600m from the carriageway edge of any proposed new routes or existing routes to be bypassed or improved, and 600m from any other affected routes within 1km of the proposed new routes or altered existing routes. An affected route is defined in paragraph 6.2.1 of the Scoping Report. The study area for the noise impact assessment will be determined when the strategic traffic model is finalised, based on how the affected routes are determined (paragraph 6.2.4 of the Scoping Report). The method for identifying the size and extent of the study area is set out in paragraph 6.2.2 of the Scoping Report and is based on DMRB guidance.

No formal methodology has been developed by the Applicant to determine the significance of effects to receptors of road traffic noise (paragraph 6.7.5). In accordance with DMRB guidance, the magnitude of the impact on noise sensitive receptors, as set out in the ES, over short and long term periods will be assessed. Noise levels at these noise sensitive receptors will be compared with the Significant Observed Adverse Effect Level (SOAEL) and Lowest Observed Adverse Effect (LOAEL) level on the opening year and at future assessment year specified for the highway scheme.

Adverse noise and vibration effects are predicted during construction, due to construction and demolition activities and changes in traffic flows. Adverse effects are also anticipated during operation due to changes in traffic flows, speeds and composition.

The Inspectorate has provided comments on matters that the Applicant has set out as being scoped out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	6.1 6.2 6.7	Noise and vibration assessment	The proposed approach to the assessment of noise and vibration in the Scoping Report does not specifically address how vibration impacts will be assessed. The ES should include an assessment of vibration impacts where such impacts may result in significant effects. The assessment should address all of the impacts that derive from construction and operation.
	Para	Other points	Inspectorate's comments
2	6.2	Study area	The ES should contain evidence explaining how the extent of the study area for the assessment of noise and vibration has been

			determined. The Inspectorate advises that the study area should reflect the extent of the like impacts and effort should be made to agree the study areas with relevant local authorities.
3	6.4	Sensitive receptors	Sensitive receptors applicable to the assessment should be established having regard to the extent of the likely impacts. The Inspectorate notes the consultation undertaken to date with EBC referred to in their consultation response, and advises that agreement should continue to be sought with the relevant local planning authorities. The Forestry Commission (FC) has highlighted the potential for noise disturbance impacts on ancient woodland in terms of amenity value and biodiversity, to which the Applicant should have regard. The ES should set out clearly if and how information gathered within the noise assessment has been applied to the assessment of these impacts, with cross reference to the Biodiversity chapter as appropriate.
4	6.4.10 Table 6-3	Noise important areas	The design and mitigation measures for the Proposed Development relating to the noise important areas should be clearly set out within the ES.
5	6.5	Potential impacts	The Scoping Report does not state whether night time working would be required. If it is, the impacts from noise and vibration at night time should be included in the assessment and the findings reported in the ES as should any mitigation measures which may be required to avoid adverse effects. The Scoping Report does not identify the construction activities and associated plant required for the Proposed Development. These should be clearly explained and the associated impacts assessed within the ES. If uncertainty on these matters exists at the time of application, the ES should clearly set out the assumptions which apply to the assessment of construction noise and vibration.

6	6.7	Noise surveys	The Planning Inspectorate considers that noise surveys to inform the assessment in the ES should be undertaken to a recognised standard e.g. BS7445-1:2003. Monitoring locations should be agreed with the relevant local authorities. GBC have provided comment in their response relating to survey location and effort. Survey results should be reported as part of the assessment in the ES.
7	6.7.5-6.7.8	Significance of effects	The Inspectorate notes the approach described in 6.7.8 of the Scoping Report and advises that the SOAEL and LOAEL thresholds used in the assessment should be clearly set out in the ES, along with details of how these values have been established. The methodology for establishing the significance of effects for construction and operational noise and vibration impacts should be set out in the ES. It should be clear why significant effects on sensitive noise receptors have been identified and whether any mitigation measures are required. The ES should address comments from GBC on the significance criteria applied, and comments from SCC regarding the use of observed effects thresholds.
8	6.7.10	Detailed noise modelling	The Applicant should set out the noise modelling software used and all assumptions which affect the modelling within their ES.
9	6.9	Mitigation	The Scoping Report indicates that new roadside noise barriers or replacement of existing noise barriers may be required as mitigation against increased noise levels at noise sensitive receptors. The effectiveness of noise barriers should be fully described and assessed. The ES should explain the location(s) where noise barriers will be installed as well as the dimensions of any proposed barriers or changes to existing barriers where these are considered necessary during construction and operational phases. The ES should also confirm at what point in the construction

			programme the noise barriers would be installed. All of the mitigation measures which are either incorporated into the design of the Proposed Development, as well as any measures required to reduce noise impacts should be described in the ES. Any interrelationships with other aspects such as the Landscape and Visual assessment or Biodiversity should also be considered.
10	6.10.4	BS5228 assessment	The Applicant refers to the BS5228 assessment but does not state which assessment method(s) will be adopted. The assessment methodology should be agreed with the relevant consultees and the information should be provided in the ES.

4.3 Biodiversity

(Scoping Report Chapter 7)

The study area that has been applied to assess the impacts and potential effects on ecological receptors is described in Section 7.2. The Scoping Report states that the study area includes an Ecological Zone of Influence (EZOI) which is varied in spatial extent depending on the ecological receptor, up to 30km 'from the Scheme footprint' for Special Areas of Conservation (SAC) where bats are a qualifying feature.

Baseline conditions were identified using a combination of desk studies and field surveys, including an Extended Phase 1 Habitat Survey of publicly accessible land following Joint Nature Conservation Committee (JNCC) methodology (2010) and guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) (2012). The Applicant states that a detailed assessment with respect to nature conservation will be carried out, following guidance from DMRB Volume 11, Section 2, Part 1, with further habitat and species surveys continuing into spring 2018.

The Applicant makes reference to the DMRB and associated IANs, and CIEEM guidance (2016) regarding the assessment of significant effects. The Scoping Report indicates that the significance of effects will take into account any mitigation or compensation provided.

Potential impacts on biodiversity during construction and operation are identified as:

- loss, fragmentation and degradation of habitats;
- mortality/injury of protected and/or priority species;
- changes to local hydrology, water and/or air quality;
- disturbance from noise, light, and visual effects.

No matters have been proposed to be scoped out of the assessment.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
	N/A	none	none
	Para	Other points	Inspectorate's comments

1	7.4 7.7.15	Surveys	The Inspectorate notes that a partial suite of surveys have been undertaken to date, and that further surveys will be undertaken in 2018. The Inspectorate advises that a robust suite of ecological surveys are carried out for all areas likely to experience impacts from the Proposed Development, including areas required for mitigation and compensation. The ES should include a full report of the applicable to details to surveys undertaken to inform the assessment. Areas required for any flood risk compensation should be included in the assessment. The Environment Agency (EA) has provided advice in their response regarding surveys for otter, water vole, and breeding birds, and the need to conduct appropriate surveys on compensatory land.
2	7.5.9 and 7.7.4	Potential impacts	The risk of mortality or injury to protected/notable species, for example badger and barn owl during operation is not specifically mentioned and the Inspectorate considers that this should be assessed in the ES. Hydrological impacts to habitats, particularly potential indirect impacts, are briefly noted in 7.7.4 of the Scoping Report where the assessment approach is described but not identified as potential impacts in paragraph 7.5.6. The ES should set out all potential impacts to be assessed. The Inspectorate highlights advice from the EA in their response on impacts due to changes in the surface water regime and to water quality. Air quality effects on habitats, specifically NO_x deposition and the effects of construction dust, are briefly noted in 7.7.4 of the Scoping Report where the assessment approach is described but not identified as potential impacts in paragraph 7.5.6. The ES should set out all potential impacts to be assessed. The ES should make appropriate cross reference to information gathered in the air quality assessment where this has been used to assess effects on biodiversity. The Inspectorate advises that the potential

			impacts of the entire development, including the development of compensatory habitats and flood risk compensation areas if required, are assessed. The Inspectorate consider that that these areas should be subject to the same survey effort applied to the rest of the application site, and that more detail about the proposals for these areas will be required in order to inform the assessment. The Applicant should have regard to comments from the EA in their consultation response on these matters.
3	7.6.14	Valuation of ecological receptors	The Inspectorate notes that any rivers, ponds and reedbeds that are not identified as part of a designated site, will be evaluated by the Applicant depending on the results of surveys and consultation with NE. The Inspectorate advises that agreement on the approach taken with NE and other relevant consultees should be sought.
4	7.9 and Figure 'Route Protection Plan'	Mitigation, compensation, and enhancement measures	The Inspectorate recommends that the Applicant makes effort to agree proposed mitigation and monitoring measures with relevant consultees including NE, EA and the local planning authorities. The ES should provide details for all proposed mitigation measures and demonstrate how they will be secured. The EA, FC and SCC have provided advice on mitigation measures in their consultation responses in Appendix 2 of this Opinion. The reasons supporting the identification of the compensation areas shown as 'replacement land' on the figure entitled 'Route Protection Plan' are not provided in the Scoping Report. The ES should demonstrate why these areas have been selected and assess their suitability. Elmbridge Borough Council (EBC) and Surrey Heath Borough Council (SHBC) have provided comments regarding planning considerations around sites identified for ecological compensation eg the delivery of Suitable Alternative Natural Greenspace (SANG). The Applicant should take these into account when establishing the security and effectiveness of the proposed

			mitigation and compensation measures. The Inspectorate notes that the Scoping Report makes commitments with regard to ecological enhancement, including a green bridge to replace an existing bridge at Cockrow and woodland management works. The ES should commit to achievable ecological enhancement measures, and provide the details for their design which have informed the assessment. The Inspectorate advises the Applicant to discuss the design of these measures with relevant consultees. The FC have provided comments in their response on this matter, including advice on the design of the green bridges proposed as part of the Proposed Development. Details of ongoing monitoring and management of compensation and enhancement habitat following their completion should be included in the ES.
5	7.5.8 – 7.5.9	Protected species licensing	The Inspectorate notes the potential impact on protected species, including a main badger sett which may have implications for the design of the Proposed Development. These implications should be taken into account in the assessments in the ES. The ES should confirm whether any EPS licenses and/or mitigation licenses for other protected species would be required. If so, assurance should be provided to the ExA that the necessary license(s) are likely to be obtained. The Applicant should seek to obtain letters of no impediment (LoNI) from NE. These should be appended to the ES. Advice from NE on this matter is contained in the Inspectorate's Advice Note 11, Annex C.

4.4 Road Drainage and the Water Environment

(Scoping Report Chapter 8)

The study area for the assessment of road drainage and the water environment includes features of the water environment within 1km of 'the Scheme'. The Scoping Report states that the study area may be enlarged beyond 1km where potential effects could extend beyond this, for example downstream flood risk or hydromorphological change. The Scoping Report states that for groundwater the potential zone of impact will be assessed on the underlying Water Framework Directive (WFD) groundwater body.

The surface water assessment will apply the guidance within the DMRB (HD45/09) in conjunction with the Department of Transport (DfT) Transport TAG guidance (WebTAG). The Flood Risk Assessment (FRA) methodology will be carried out in accordance with the NPPF and the EA's 'Climate change allowances for planners supporting guidance.

A WFD compliance assessment is also committed to in the Scoping Report, with reference to the Directive and the Inspectorate's Advice Note 18. Table 8-5 sets out the environmental resources and receptors and their importance.

The potential impact the Proposed Development will have on the water environment includes the increased risk of; contaminating surface water and groundwater, the mobilisation of contaminants to affect surface water and groundwater, impacts to the quality of the surface water and groundwater, alterations to groundwater level and increased flood risk.

No specific matters have been proposed to be scoped out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	8.4.20, 8.4.21	Aquatic ecology/ ecological effects on nature conservation designated sites	The Inspectorate agrees this matter does not need to be assessed in the Road Drainage and Water Environment aspect chapter of the ES because the Scoping Report states that this matter will be assessed in Chapter 7 (Biodiversity) of the ES. The Applicant is referred to comments above in Table 4.3, comment 2 in this regard.
	Para	Other points	Inspectorate's comments
2	8.2.1	Study Area	It is stated that the study area may extend

			beyond 1km to encompass potential effects beyond this distance, such as downstream flood risk and hydromorphological changes. As identified, the study area should be determined by the extent of the likely impacts from the Proposed Development and fully explained and justified within the ES. The ES should make appropriate use of plans or figures to depict the study area and to support the explanation.
3	8.4.13, 8.7.6	Methodology – WFD assessment	The scoping WFD assessment is missing from Appendix D of the Scoping Report. The approach to the WFD assessment should be clearly explained and appropriately referenced in the ES. The approach taken for the WFD compliance assessment should be agreed with the EA and the lead local flood authority before submission of the ES. The EA has provided advice regarding the approach to the WFD assessment in their response.
4	8.4.7 and 8.7.4	Potential impacts – ponds/ watercourses	The Inspectorate is concerned by the approach that known ponds will only be scoped in if there are potential impacts from changes in groundwater. The Inspectorate considers that potential impacts arising from changes to the surface water regime and water quality should also be assessed in the ES. The EA have provided further comment in their response in this regard.
5	General	Flood risk-interrelationships	The outcomes of the FRA (such as the provision of flood compensation areas) may have implications for other assessments in the ES, and the Inspectorate advises that this be addressed in the ES. The EA has provided comments on the approach to FRA in their response in Appendix 2 of this Opinion.
6	8.4.21, Table 8-3	Hydrological impacts to nature conservation designated sites	The Inspectorate notes that Table 8-3 only lists three of the designated sites identified in the Biodiversity chapter and advises that it be clearly explained in the ES why other sites are excluded from the scope of the assessment. The Inspectorate notes that the hydraulic

			connectivity of the designated sites within the study area is currently being researched. The Inspectorate considers that this information will also be required in order to assess ecological effects and to complete the WFD assessment.
7	8.6	Proposed Level and Scope of Assessment	Information is provided in the Scoping Report pertaining to the approach to the WFD assessment and FRA, however, the Scoping Report does not set out the approach to the EIA and this information must be provided in the ES. The Applicant should seek to agree the methodology with the relevant consultees. The EA and GBC have provided comment on the approach to the assessment in their responses in Appendix 2. The Inspectorate considers that the outcomes of the FRA and the WFD assessment are likely to influence the assessment in the ES and the design of mitigation measures. Where this is the case, this should be fully explained in the ES. The Scoping Report states that additional information may require a change in the study area, the baseline data and potentially change the relevant receptors. If this does occur, the ES should include a discussion of why these changes have occurred.
8	8.9.2	Potential mitigation measures	The Inspectorate expects that WFD compliant design requirements should be based on environmental as well as financial considerations. If embedded mitigation is relied upon to minimise significant environmental effects (such as the use of a single span bridge instead of a culvert) then the ES should demonstrate how it will be secured through the DCO process. Paragraph 2.3.12 of this Opinion provides further advice regarding proposal 'alternatives'. The EA have provided advice on mitigation in their consultation response in Appendix 2 to which the Applicant should have regard.

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9	8.10.1	Assumptions and Limitations	The Inspectorate advises that where specific details are uncertain and where the design will be based on parameters a 'worst case scenario approach' is applied to the assessments in the ES. The ES should clearly set out the basis for the assessment and justification for the approach taken where uncertainty remains around the predicted impacts of the Proposed Development.

4.5 Landscape

(Scoping Report Chapter 9)

The Scoping Report states that the study area has been informed by the Option Selection Stage and is described as extending 1.5km from 'the perimeter of the Scheme' for both landscape and visual effects.

The Scoping Report states that the assessment methodology will be based on the guidance contained in IAN 135/10 Landscape and Visual Effects Assessment and DMRB Volume 11, Section 2 Part 2 HA 202/08 Environmental Impact Assessment. The Scoping Report also states that consideration will be given to the Guidelines for Landscape and Visual Impact Assessment (GLVIA) 3rd edition, published by the Landscape Institute and Institute of Environmental Management and Assessment (2013).

The Scoping Report includes potentially adverse landscape and visual impacts but significant effects on both landscape character and visual amenity during the construction and operational phases have yet to be identified.

The Inspectorate has provided comment on matters that the Applicant has proposed to scope out of the ES.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	9.2	Landscape and visual receptors beyond 1.5km from the perimeter and edge of the scheme	The meaning of 'the perimeter of the scheme' and 'the edge of the Scheme' are not defined in the Scoping Report, and no justification is provided for the study area. It is not clear how the 1.5km relates to determining a Zone of Theoretical Visibility (ZTV) for the assessment. Without this information, it is not clear that sensitive receptors beyond 1.5km would not be subject experience impacts with the potential to result in significant effects and therefore the Inspectorate cannot agree to scope out an assessment of impacts to these receptors.
2	9.4.2, Table 9-3	National landscape character	The Applicant states that the Proposed Development would not give rise to the alteration of key characteristics of landscape character at the national level (Table 9-3 also states regional level). The justification presented in the Scoping Report states this is 'due to the localised nature and scale of the proposals'. Given the limited information presented, the

			Inspectorate cannot agree to scope this matter out at this stage and advises that adequate reasoning and justification for this conclusion is presented in the ES.
3	Table 9-4	Views from Seven Hills Hotel (located within 500 m)	The Scoping Report proposes to scope this out given the presence of extensive woodland screening around this receptor. The Scoping Report does not include figures to depict the locations of visual receptors and there is no indication that the ZTV for the Proposed Development has been established. The Inspectorate does not consider that sufficient information has been provided in the Scoping Report to support a decision to scope this matter out. In the absence of this information the Inspectorate does not agree that an assessment for this receptor can be scoped out of the ES.
	Para	Other points	Inspectorate's comments
4	9.2 9.6.6	Study area, figures	The study area in the ES should be established based on the extent of the likely impacts of the Proposed Development. Agreement should be sought with the relevant consultees in this regard, and with respect to the receptors which should be included in the assessment. It is likely to be helpful to consultees to provide appropriate figures depicting the study area and any ZTV established, as well as the location of individual receptors. The ES should describe the ZTV has been defined and how this has been refined to take account of topography, existing built form, and the maximum parameters of the Proposed Development. It should be clear how the ZTV has been used to identify sensitive receptors for inclusion in the visual impact assessment. GBC have provided comments on the study area in their consultation response.
5	9.4	Baseline conditions	The Applicant should ensure that the baseline conditions used to inform the assessment are complete and robust. Information should be sought from the

			relevant consultees, and the Inspectorate draws the Applicant's attention to the response from GBC which contains further information on potential receptors.
6	9.5	Potential construction and operational impacts	The Scoping Report does not provide any detail on lighting proposals for the Proposed Development, and the Inspectorate considers that the impacts from lighting should be assessed. The potential for lighting impacts from night time working during construction should also be assessed. GBC have also commented in this regard in their response. The Inspectorate notes the mention of arboricultural surveys in the Scoping Report, but it is not clear how this information will inform the assessment. Impacts to any existing landscape features in particular mature trees and those associated with landscape designations should be assessed in the ES. The Applicant should have regard to comments from Historic England in relation to the implications for the Registered Park and Gardens affected by the Proposed Development of changes to landscape features. Appropriate cross-reference to the Cultural Heritage assessment should be made in the ES.
7	9.6 9.7	Assessment methodology	The ES should expand upon the information provided in paragraph 9.7.3 of the Scoping Report to clearly explain how the significance of effect will be determined. It should be clear where professional judgement has been applied. The assessment methodology does not clearly set out what level of effect will be considered significant. This should be explained in the ES.
8	9.5 9.9	Mitigation	The proposed landscaping strategy for the Proposed Development should be described in the ES in sufficient detail to inform the assessment. The Applicant should seek agreement with the relevant consultees on the mitigation measures proposed. An appropriate aftercare period for any proposed landscaping should also be

			agreed. It should be clear in the ES any the proposed landscaping would mitigate impacts on landscape and visual receptors, and take into account the performance when it matures. The ES should assess the interactions of the proposed mitigation measures with other aspect areas, for example Biodiversity and Cultural Heritage.
9	9.6.6	Representative photographic viewpoints	The Inspectorate welcomes the intention to produce representative photographic viewpoints as part of the visual assessment, and advises that these should provide views during both winter and summer periods. In particular, photomontages and other plans/figures (as set out in IAN 135/10) should be used to illustrate the visual appearance of new structures which would result in changes to landscape character and visual amenity (in particular the new and widened structures, gantries, earthworks and the alignment of any new slip roads). The locations of the viewpoints and photomontages should be agreed with the relevant local planning authorities. GBC and SCC provide comments in their responses regarding photomontages.

4.6 Geology and Soils

(Scoping Report Chapter 10)

The study area for the assessment has been determined, by professional judgement, as 500m from the 'red line boundary for the Scheme'.

The assessment methodology will adhere to the guidance set out in CLR11, the Good Practise guide to EIA, the National House Building Council (NHBC) and the Environment Agency report R&D66.

The first stage of assessment will consist of a land contamination risk assessment and the second stage will consist of an impact assessment which will compare and assess the baseline conditions with the potential impacts. The assessment methodology for agricultural soils will utilise guidance from DMRB Volume 11, Section 3 Part 6.

The potential impacts identified during construction include the creation of new contamination sources, the mobilisation of new contaminant sources into the surrounding environment, the creation of new contamination pathways to the underlying soils and groundwater, the potential to exacerbate areas of existing ground instability and the loss of common and Public Access land.

The Inspectorate has provided comments below on matters that the Applicant has proposed to scope out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	10.6.5, Table 10-7	Re-use of soils and waste soils	The Applicant states that this matter will be discussed within chapter 12 Materials and Waste and has therefore been scoped out. The Inspectorate notes that chapter 12 does not include information on the assessment of soils and waste soils and therefore, the Inspectorate cannot agree that this matter can be scoped out of the ES.
	Para	Other points	Inspectorate's comments
2	10.2.1	Study Area	The Scoping Report gives little justification for the study area extending 500m from the DCO red line boundary. The ES should include a justification for the study area applied within the ES, ensuring that it encompasses the extent of the likely impacts resulting from the Proposed Development.
3	10.6.2	Proposed level and Scope of Assessment	The Scoping Report states that ground

			investigation (GI) work will be undertaken and used to inform the scheme design (including mitigation design). However, the Scoping Report also implies that this information will not be available to inform the baseline assessment in the ES. The Inspectorate considers that the baseline assessment in the ES should be established using the most appropriate information available and this should include results from any relevant GI work undertaken. GBC also express concerns in this regard in their scoping consultation response. The Applicant states that a ground investigation specification has been drafted. The Applicant should include the specification of the ground investigations used to inform the assessment within the ES. Agreement should be sought from relevant consultees on the scope of the investigation. The EA and GBC have provided advice in their consultation responses in this regard.
4	10.7.9	Proposed Assessment Methodology	The Scoping Report states that an assessment of ground conditions and geology as a valuable resource has been undertaken. This assessment and the results have not been included within the Scoping Opinion. The ES should include the information gained from the assessment and explain how it influences the determination of significant effects.

4.7 Cultural Heritage

(Scoping Report Chapter 11)

The study area applied in the Scoping Report is 500m around the 'alignment of the Scheme' based on relevant guidance and professional judgement, and exceeds the minimum distance within DMRB guidance. The study area contains fifty-five designated heritage assets which comprises four Scheduled Monuments; one Grade I, five Grade II* and forty one Grade II Listed buildings, two Registered Park and Gardens (Grade I and Grade II*), and two Conservation Areas.

The Scoping Report makes reference to desk study data being obtained from Historic England and local authority sources. The proposed methodology is to be carried out in line with DMRB guidance in HA 208/07 and reference is made to relevant guidance from Historic England and the Chartered Institute of Archaeologists. Site visits have also been carried out but the detailed results are not reported in the Scoping Report.

Potential direct impacts are anticipated on several non-designated assets, and unknown archaeological remains given the nature of the area. Impacts to the settings of designated heritage assets is also predicted.

The Inspectorate has provided comment on matters that the Applicant has proposed to scope out of the ES.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	11.4.4 to 11.4.6	Impacts on setting for: twelve named listed buildings within the study area where no impacts on setting are predicted; and seven named assets outside the study area but within Painshill Park.	The Scoping Report proposes to scope out an assessment of impacts to these assets on the basis that the Option Selection stage established there would be no impacts on setting from the Proposed Development. The Scoping Report does not include a Zone of Visual Influence (ZVI) or ZTV and no figure has been provided to depict the locations of these assets. In absence of this information the Inspectorate does not consider sufficient information has been provided in the Scoping Report to rule out significant effects to these assets. The relevant evidence from the Option Selection demonstrating no significant effects, including a statement of agreement with the relevant consultees, should be appended to the ES. This information should be updated as necessary taking into account design changes and relevant

			consultation prior to submission. The Inspectorate cannot agree to scope out impacts to the setting of these heritage assets on the basis of the information in the Scoping Report
2	Table 11.1	Potential for undiscovered archaeology (operational phase)	The Applicant has scoped out the assessment of potential effects on previously undiscovered archaeological remains during the operational phase of the Proposed Development. Given the nature of the proposals, and the information provided in the Scoping Report, the Inspectorate is content that the Proposed Development would not result in significant effects on any undiscovered archaeology during the operational phase of the Proposed Development and agrees that this can be scoped out of the assessment.
	Para	Other points	Inspectorate's comments
3	11.2	Study area	It is noted that no ZVI or ZTV is set in the Scoping Report for this assessment and no reference is made to how one will be established. The ES should include a justification in support of the proposed 500m study area, in particular explaining why it is appropriate to capture all heritage assets which could experience impacts on their setting. The study area applied to the assessment in the ES must be clearly defined and described reflecting the extent of the anticipated impacts. The Applicant should seek agreement with relevant consultees in this regard. The Inspectorate recognises that there is likely to be an inter-relationship between the study area applied to this aspect and other aspects such as the landscape and visual impact assessment, and recommends that appropriate cross-reference is made in the ES.
4	11.4	Baseline conditions	The baseline assessment in the ES should include robust information on local and regional heritage assets, including any updates necessary since the Proposed

			Development will be further refined and the study area may evolve. It is not clear from the Scoping Report what further investigations are required in order to establish a robust baseline for the assessment. The data gathered to support the assessment should be fully reported in the ES. The Applicant should endeavour to agree the extent of studies with consultees. Advice has been provided by Historic England on the approach to further data gathering and on current baseline conditions in the vicinity of the application site.
5	11.5 and 11.10	Potential impacts	The description of potential impacts in the Scoping Report identifies affected receptors but does not explain what the predicted impacts they may experience are. The ES should identify and characterise all impacts considered, both direct and indirect. The ES must take into account updated information on the proposed design including the location and nature of construction areas and compensation land. Where uncertainty remains, the ES should clearly explain the implications for the assessment. The Inspectorate is aware that the Proposed Development may result in changes to noise levels during construction and operation and this should be considered in the assessment of impacts to setting of heritage assets. Advice has been provided by Historic England on the potential impacts of the Proposed Development in their consultation response.
6	11.7	Methodology	The methodology to be applied in the assessment must be clearly set out in the ES, in particular what is considered to constitute a significant effect. The Applicant should seek to agree the methodology with relevant consultees. GBC and Historic England have provided comment on the proposed methodology in their consultation responses.

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7	11.9	Mitigation measures	The Applicant should provide details in the ES of avoidance measures and the specific mitigation measures designed to ameliorate any significant effects. Preservation in situ is not mentioned as a potential mitigation measure in Section 11.9, and the Inspectorate considers that this should be investigated. The Applicant should seek to agree mitigation measures with consultees. Historic England have provided detailed comment on potential avoidance and embedded mitigation measures.
8	11.10	Assumptions and limitations	The Scoping Report includes assumptions relating to the baseline and value of features and regarding the impacts of the as yet unknown elements of the Proposed Development (eg the location of construction compounds). These assumptions are premature in advance of further design detail and the necessary assessment being carried out. The Inspectorate advises that any assumptions relied upon for the purposes of the assessment are critically reviewed, taking into account up to date design information and consultation responses. The Inspectorate draws the Applicant's attention to comments from Historic England in this regard.

4.8 Materials and Waste

(Scoping Report Chapter 12)

The study area for the assessment of waste arising and waste infrastructure is the county of Surrey. The study area is at a national level for material resources and hazardous waste infrastructure.

The methodology for the assessment of materials and waste utilises guidance from IAN 153/11 and the Waste Framework Directive. The methodology will assess the sensitivity of receptors and the magnitude of impact according to the criteria set out in Table 12-5 which have been based on professional judgement in the absence of standard guidance. These will then be combined to reach an assessment of significance of effects.

The potential impacts the Proposed Development will have on receptors during the construction phase include affecting the market for the key resources, impacting the waste arising baseline and impacting the waste infrastructure sites within the study areas. No significant potential impacts are envisaged to occur during the operational phase for material demand or for waste generation.

The Inspectorate has provided comments below on matters that the Applicant has proposed to scope out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	12.6.5 Table 12-4	Change in demand for key construction materials during the operational phase	Having considered the information in the Scoping Report and the nature of the Proposed Development, the Inspectorate considers that the quantities of materials required during operation are not likely to cause significant effects to the demand for key construction materials. The Inspectorate agrees that this matter can be scoped out of the assessment.
2	12.6.5 Table 12-4	Change in baseline regional waste arisings during the operational phase.	Having considered the information in the Scoping Report and the nature of the Proposed Development, the Inspectorate considers that the amount of waste generated during operation is not likely to cause significant effects to the regional baseline waste arisings. The Inspectorate agrees that this matter can be scoped out of the assessment.

3	12.6.5 Table 12-4	Change in capacity of regional waste infrastructure during the operational phase.	Having considered the information in the Scoping Report and the nature of the Proposed Development, the Inspectorate considers that the amount of waste generated during operation is not likely to cause significant effects to the capacity of regional waste infrastructure. The Inspectorate agrees that this matter can be scoped out of the assessment.
	Para	Other points	Inspectorate's comments
4	12.2	Study area	It is not clear how the study areas applied have been determined. Where professional judgement has been used in place of standard guidance this should be stated in the ES and justified.
5	12.4.8	Material Resource Baseline	The Inspectorate notes that the Applicant has not established an estimate of future baseline for the assessment of these matters. The Applicant should ensure that the baseline(s) used in the assessment are appropriate and the ES should justify the approach taken. The Inspectorate notes from the Scoping Report that information from SCC relevant to the assessment was not yet available. This is addressed by SCC in their consultation response. The Applicant should consult with relevant local authorities in order to establish a robust baseline assessment. GBC have provided advice in their response with respect to baseline information which should be taken into account in the assessment.
6	12.4.12	Waste Infrastructure Baseline	
7	12.5	Potential impacts	It is not clear from the Scoping Report how impacts associated with the transportation of materials and waste will be assessed. The consideration of the use of natural resources is limited, focusing on the use of timber and aggregate in the context of national demand. The Inspectorate considers that regional information should also be applied where available. Consultation should be undertaken with local authorities and the Inspectorate draws the Applicant's attention to the response

Scoping Opinion for M25 Junction 10/A3 Wisley Interchange improvement

			from GBC in Appendix 2.
8	12.7.7 and 12.9	Mitigation	Both these sections of the Scoping Report discuss avoidance and mitigation measures, and it is not clear what will be committed to within the design of the Proposed Development and what represents additional mitigation. Embedded mitigation and additional mitigation should be clearly set out in the ES, including the means by which measures will be secured.
9	12.7.9	Vulnerability to Major Accidents and Disasters	The Scoping Report does not provide any detail or evidence to support the conclusions in this section. The ES should include this information.
10	12.10.1 para 9	Assumptions and limitations	The Scoping Report does not state how contaminated soils will be treated/ disposed of. The report states that 'contaminated soils will be considered separately' but does not go on to discuss how they will be considered. The Applicant should provide details of how contaminated soils will be considered within the ES. Furthermore, chapter 10 Geology and Soils states that this Aspect chapter will discuss the re-use of soils and waste soils, however, these matters are not discussed. The Applicant should provide details of the re-use, treatment, and disposal of soils within this aspect chapter in the ES.

4.9 People and Communities

(Scoping Report Chapter 13)

For the assessment of impacts on matters within this aspect area the Scoping Report states a study area extending 500m from the 'red line boundary' of the Proposed Development will be applied. This study area may be increased as a result of findings as assessments within the EIA as a whole progress.

The assessment for this aspect of potential effects of the Proposed Development uses guidance set out in IAN 125/15 and the DMRB, Volume 11, Section 3 to consider the impacts of the Proposed Development on people and communities, and combines the Non-Motorised User and Community Effects components of Part 8, Part 9 for impacts on Vehicle Travellers, and Part 6 for Land Use impacts. Guidance from TAG Unit 4.1 Social Impact Appraisal (November 2004) will also be used. The assessment of agricultural land will follow guidance from the Planning Policy Guidance Note 7 (1997).

The Scoping Report identifies potential impacts relating to: temporary and permanent land take; severance affecting land and property; alteration of views from the road; and temporarily increased driver stress for motorised travellers during construction; community severance and changes in accessibility; and changes to amenity for private and community assets during the construction and operational stages of the Proposed Development.

The Inspectorate has provided comments on matters that the Applicant has set out as being scoped out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	13.7.73 13.11.2 Table 13-17	Vulnerability to major accidents and disasters	The Applicant states that vulnerability to major accidents and disasters as a result of the Proposed Development is considered to be sufficiently low to not warrant further consideration. No specific information or justification is provided in the Scoping Report. Based on the nature of the Proposed Development and the information within other chapters of the Scoping Report, the Inspectorate considers that insufficient information has been provided in this chapter and that significant effects on people and communities arising from the Proposed Development's vulnerability to major events should be assessed in the ES. Therefore, the Inspectorate does not agree to scope this matter out.

			The Applicant should also have regard to the comments in paragraphs 3.3.19 and 3.3.20 of this Opinion above with respect to assessment of this matter.
	Para	Other points	Inspectorate's comments
2	13.2.1	Study area	The Applicant must ensure that the study area for the assessment is clearly defined and justified in the ES. The Applicant should seek to agree the study area and receptors to be included within the assessment with relevant consultees. GBC and SCC have provided advice and information relevant to determination of the study area in their responses, which the Applicant should take into account. The Inspectorate notes that DMRB Volume 11, Section 3, Part 8, Para 2.2, states that community facilities 'and their catchment areas' should be included in the assessment. It should be clear in the ES how this requirement has been taken into account in the selection of appropriate study areas. The ES should explain how the routes affected by the Proposed Development have been identified for the purposes of the assessment of community severance, accessibility and connectivity.
3	13.4	Baseline Conditions	The ES should clearly reference the information on changes to traffic flows on the road network used to inform the assessment of effects of the Proposed Development on People and Communities. It would be helpful to understand the impacts of the Proposed Development, and to aid consultation, to include appropriate figures illustrating the baseline conditions within the ES. Receptors included within the assessment should be set within the context of the proposed DCO boundary and study area and labelled clearly.
4	13.4.7 to 13.4.10	Baseline - Agricultural Land	The Scoping Report states that 'none of the affected land is expected to be of Best Most Versatile quality' but states that land is grade 3-4. While it is understood that impacts to soils are to be assessed under Geology and Soils, this information will

			underpin the assessment of the significance of effects to agricultural holdings in this aspect chapter. The Applicant should ensure consistency between the two assessments in terms of agricultural land classification grade and identified land take. A figure detailing the location and grade of the agricultural land classifications within the study area should be included within the ES.
5	13.5	Potential impacts	Adverse impacts from construction have been identified as being temporary. The ES should explain the duration of impacts and what constitutes temporary impact, ensuring consistency with the other aspect assessments. In the assessment of impacts to development land, the ES should demonstrate regard to the comments from EBC and SHBC on planning considerations related to the areas identified as replacement land (and compensation habitats). GBC have also provided information on the Guildford Borough Submission Local Plan which the Applicant should take into account.
6	13.7	Assessment Methodology - general	The Scoping Report sets out where assessment criteria have been taken from the DMRB and where they have been based on professional judgement. Where standard guidance is not used and professional judgement is applied this should be fully explained and justified in the ES.
7	13.7.6	Assessment Methodology – Private Land Take and Severance	The Scoping Report states that the 'Scheme is not currently expected to result in demolition of any dwellings' if this changes and demolition of dwellings is required, the impacts associated must be assessed in the ES.
8	13.7.18	Assessment Methodology – Community Assets: Land Take and Severance	The Applicant has undertaken a land use survey for Common Land but has not included the results or the survey within the Scoping Report. The Applicant should include the survey and the results within the ES to the level of detail which has

Scoping Opinion for M25 Junction 10/A3 Wisley Interchange improvement

			informed the assessment.
9	13.7.27 Table 13-7	Proposed Assessment Methodology – Community Assets: Amenity	In determining the magnitude of impact the Scoping Report states that a 'large number of people' and 'many people' but has not defined these phrases. The Applicant should provide definitions of these phrases within the ES.
10	13.9.1	Mitigation measures	The Scoping Report states that mitigation will be implemented where significant adverse effects are identified. No specific mitigation measures have been included within the Scoping Report and the Applicant should provide a detailed discussion of proposed mitigation measures within the ES. The ES should demonstrate the efficacy of mitigation measures and how these will be secured through the DCO process.

4.10 Climate

(Scoping Report Chapter 14)

The study area for greenhouse gas (GHG) emissions is defined in terms of the lifecycle stages of Section 7 of PAS 2080:2016 covering the aspects of the Proposed Development as described in paragraph 14.2.2 and Table 14.1 of the Scoping Report.

The Scoping Report states that the study area includes off-site transportation during the construction stage and off-site construction waste processing and operational energy use.

A desk based assessment is proposed. Greenhouse gas emissions will be quantified using PAS 2080 (Publicly Available Specification, British Standards Institution) and Institute for Environmental Management and Assessment (IEMA) guidance. Baseline conditions are defined by national background emissions data and informed by estimates based on data from other highways projects. The proposed assessment methodology will use the available design and construction data. The Scoping Report states that the same information for construction activities used for the noise assessment will be used, and for in-use traffic emissions information used for the air quality assessment will be applied.

Potential impacts are considered as the quantities of emissions which occur from each life-cycle stage or as a sub-activity during each stage, as listed in Table 14-1. Operational reductions in energy use and traffic emissions will be measured relative to the baseline emissions.

The Inspectorate has provided comments on matters that the Applicant has set out as being scoped out of the EIA.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
1	Table 16.1	Sea level rise	This matter is listed in the summary chapter of the Scoping Report and not discussed in Chapter 14. The Applicant is referred to advice in Section 3 of this Opinion regarding the need to clearly set out the matters which have been scoped in or out of the ES. However, given the statement in Table 16.1 and the nature of the Proposed Development the Inspectorate accepts that the Proposed Development is unlikely to contribute or be vulnerable to significant effects resulting from sea level rise. The Inspectorate is therefore content for this matter to be scoped out of the ES.

2	14.2.4	Preliminary studies and investigations; direct operational GHG emissions; operational water use; other processes; end of life.	The Scoping Report states that these matters will be excluded from the study due to likely negligible emissions or the life cycle stage not being applicable to the Proposed Development. With the exception of 'direct operational GHG emissions', given the nature of the Proposed Development, it is agreed that significant effects are unlikely to arise, but the Inspectorate asks that the evidence for excluding these processes is included in the ES. In the case of 'direct operational GHG emissions' see comment 5 below.
	Para	Other points	Inspectorate's comments
3	14.2	Study area information	The Inspectorate notes that the study area will be dependent on the availability of design and construction information and if this data is unavailable, part or all of the affected lifecycles will be excluded from the assessment. The study area should be determined by the extent of the predicted impacts of the Proposed Development, and if applicable based on professional judgement in the absence of known data. If necessary the ES should clearly set out the assumptions applied to this assessment in place of any information that is unavailable, and any implications this may have had for the robustness of the assessment. It is not made clear in the Scoping Report how the study area for the assessment of the Proposed Development's vulnerability to climate change has been determined or what the study area's limits are considered to be. This should be explained and justified in the ES.
4	14.3.1	Climate resilience assessment	UK climate projections 2009 (UKCP09) are referenced in paragraph 14.3.1, but no reference is made to the potential revision of climate projections when the updated UKCP18 projections are available. The Applicant should clearly state the range of climate projections used for the purposes of

			any adaptation or resilience assessment, taking into account the anticipated updated projections in 2018. The Scoping Report does not explicitly set out the methodology that will be used to assess the resilience of the Proposed Development to climate change. The methodology should be set out within the ES.
5	14.6.1	Significance of effects	The Inspectorate notes that there is currently no specific guidance for carbon emission thresholds, which if exceeded, is considered to be significant. The ES should therefore set out the criteria used to report on the significance of effects. The assessment of significance in the ES should be placed in context to the UK carbon budgets, the associated reduction targets, and in the context of the climate resilience of wider systems over time.
6	14.7.3– 14.7.6	Calculation of greenhouse gas emissions	The Scoping Report states that the Applicant will use the Atkins Carbon Knowledgebase (CKB) software to calculate emissions during all the lifecycle of the Proposed Development. Details of this carbon calculation and analysis software tool should be provided within the ES. This section implies that all traffic emissions will be assessed and therefore appears inconsistent with paragraph 14.2.4 which proposes to scope out 'direct operational' GHG emissions (see comment 2 above). On this basis, the Inspectorate considers that insufficient information has been provided and cannot agree to scope out 'direct operational GHG emissions'. Where no impacts which could give rise to significant effects are anticipated the ES should clearly report this, with supporting evidence.
7	14.11	Assumptions and limitations	The Scoping Report states that for consultation purposes a detailed emissions assessment is not required and where project specific data is unavailable, suitable proxy data will be used where engineering and construction expertise can be obtained

Scoping Opinion for M25 Junction 10/A3 Wisley Interchange improvement

			to generate this data. The Inspectorate advises that the Applicant should consult with relevant stakeholders on what data they would require for consultation purposes.

4.11 Assessment of Cumulative Effects

(Scoping Report Chapter 15)

The study area encompasses all trunk road and motorway projects identified by the Applicant as being confirmed, development projects with valid planning permissions, applications for consent which have been made, allocated sites in emerging or adopted Local Plans, and other applications which could have implications for the project as set out in Section 15.2 and identified in Table 15.1 of the Scoping Report.

The assessment will follow guidance contained in DMRB Volume 11 Section 2 Part 5 (HA 205/08) and the Inspectorate's Advice Note 17. The Scoping Report states that the traffic model will take account of the operational effects of major developments in the area and surrounding region.

Information on potential impacts will be gathered from the other aspect assessments. Cumulative effects from the interaction of the aspects of the Proposed Development identified in the ES and cumulative effects assessed in combination with the other developments are to be included in the assessment.

No matters have been proposed to be scoped out of the assessment.

ID	Para	Applicant's proposed matters to scope out	Inspectorate's comments
	N/A	None identified	N/A
	Para	Other points	Inspectorate's comments
1	Table 15.1	Zone of Influence / Study Area	The information presented shows the study areas used for the other aspect assessments to identify potential impacts. The study area applied to the assessment of cumulative effects should be fully explained and justified in the ES. The Inspectorate advises that the Applicant adopt the approach detailed in Advice Note 17, including when determining the study area and refining the list of other developments to take into account in the assessment. The Applicant should make an effort to seek information and agreement from consultees. GBC and Woking Borough Council (WBC) have provided information in their response on other developments and plans which the Applicant should take into account in the assessment.

2	15.2.11	Scope of assessment	The list of developments to be included in the assessment does not indicate their distances from the application site. In accordance with the tiered approach described in Advice Note 17, a level of 'certainty' should be applied to each of the 'other' developments considered. The Inspectorate recommends the use of tables to aid clarity of presentation. The Inspectorate also recommends the use of labelled figures to illustrate the location of the developments included in the assessment in relation to the application site.
3	Table 15-1	Assessment of cumulative effects	The environmental aspect of climate has been omitted from the assessment of cumulative effects and this should be explained within the ES. If climate is not anticipated to give rise to any potential cumulative effects this should be clearly explained in the ES.
4	15.3	Assessment methodology	The Scoping Report does not distinguish between methodologies for the two elements of the assessment identified under the DMRB – cumulative effects from one project (ie from a number of impacts on a particular receptor) and cumulative effects from different projects. The assessment methodology should be clearly set out in the ES.
5	15.4.6 Table 15-2	Significance of cumulative effects	The Applicant should provide a clear description and justification in the ES of how significant effects have been determined. This should include a definition of the terms 'short-term', 'long-term', and 'temporary'.

5. INFORMATION SOURCES

5.0.1 The Inspectorate's National Infrastructure Planning website includes links to a range of advice regarding the making of applications and environmental procedures, these include:

- Pre-application prospectus³
- Planning Inspectorate advice notes⁴:
 - Advice Note Three: EIA Notification and Consultation;
 - Advice Note Four: Section 52: Obtaining information about interests in land (Planning Act 2008);
 - Advice Note Five: Section 53: Rights of Entry (Planning Act 2008);
 - Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information, and Environmental Statements;
 - Advice Note Nine: Using the 'Rochdale Envelope';
 - Advice Note Ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects (includes discussion of Evidence Plan process);
 - Advice Note Twelve: Transboundary Impacts
 - Advice Note Seventeen: Cumulative Effects Assessment; and
 - Advice Note Eighteen: The Water Framework Directive.

5.0.2 Applicants are also advised to review the list of information required to be submitted within an application for Development as set out in The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009 (as amended).

³ The Planning Inspectorate's pre-application services for applicants. Available from: <https://infrastructure.planninginspectorate.gov.uk/application-process/pre-application-service-for-applicants/>

⁴ The Planning Inspectorate's series of advice notes in relation to the Planning Act 2008 process. Available from: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/>

APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

TABLE A1: PRESCRIBED CONSULTATION BODIES⁵

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Health and Safety Executive	Health and Safety Executive
The National Health Service Commissioning Board	NHS England
The relevant Clinical Commissioning Group	Guildford and Waverley Clinical Commissioning Group
	North West Surrey Clinical Commissioning Group
	Surrey Downs Clinical Commissioning Group
Natural England	Natural England
The Historic Buildings and Monuments Commission for England	Historic England – South East
The relevant fire and rescue authority	Surrey Fire and Rescue Service
The relevant police and crime commissioner	Office of the Police and Crime Commissioner for Surrey
The relevant parish councils	Parish of Wisley with Pyford
	Ockham Parish Council
The Environment Agency	The Environment Agency - Thames
The Civil Aviation Authority	Civil Aviation Authority
The Relevant Highways Authority	Surrey County Council

⁵ Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) (the 'APFP Regulations')

SCHEDULE 1 DESCRIPTION	ORGANISATION
The relevant strategic highways company	Highways England – South East
Transport for London	Transport for London
The Canal and River Trust	The Canal and River Trust
Public Health England	Public Health England
The Crown Estate Commissioners	The Crown Estate
The Forestry Commission	Forestry Commission - South East and London
The Secretary of State for Defence	Ministry of Defence

TABLE A2: RELEVANT STATUTORY UNDERTAKERS⁶

STATUTORY UNDERTAKER	ORGANISATION
The relevant Clinical Commissioning Group	Guildford and Waverley Clinical Commissioning Group
	North West Surrey Clinical Commissioning Group
	Surrey Downs Clinical Commissioning Group
The relevant NHS Foundation Trust	South East Coast Ambulance Service NHS Foundation Trust
Railways	Network Rail Infrastructure Ltd
	Highways England Historical Railways Estate
Road Transport	Transport for London
Canal Or Inland Navigation Authorities	The Canal and River Trust

⁶ 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008 (as amended)

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STATUTORY UNDERTAKER	ORGANISATION
	National Trust
	AINA
Civil Aviation Authority	Civil Aviation Authority
Licence Holder (Chapter 1 Of Part 1 Of Transport Act 2000)	NATS En-Route Safeguarding
Universal Service Provider	Royal Mail Group
Homes and Communities Agency	Homes and Communities Agency
The relevant Environment Agency	The Environment Agency - Thames
The relevant water and sewage undertaker	Affinity Water
	Sutton and East Surrey Water
	Thames Water
The relevant public gas transporter	Cadent Gas Limited
	Energetics Gas Limited
	Energy Assets Pipelines Limited
	ES Pipelines Ltd
	ESP Connections Ltd
	ESP Networks Ltd
	ESP Pipelines Ltd
	Fulcrum Pipelines Limited
	GTC Pipelines Limited
	Independent Pipelines Limited
	Indigo Pipelines Limited
	Quadrant Pipelines Limited
	National Grid Gas Plc
	Scotland Gas Networks Plc

STATUTORY UNDERTAKER	ORGANISATION
	Southern Gas Networks Plc
	Wales and West Utilities Ltd
The relevant electricity distributor with CPO Powers	Energetics Electricity Limited
	Energy Assets Power Networks
	ESP Electricity Limited
	G2 Energy IDNO Limited
	Harlaxton Energy Networks Limited
	Independent Power Networks Limited
	Leep Electricity Networks Limited
	The Electricity Network Company Limited
	UK Power Distribution Limited
	Utility Assets Limited
	Utility Distribution Networks Limited
	UK Power Networks Limited
The relevant electricity transmitter with CPO Powers	National Grid Electricity Transmission Plc

TABLE A3: SECTION 43 CONSULTEES (FOR THE PURPOSES OF SECTION 42(1)(B))⁷

LOCAL AUTHORITY⁸
Woking Borough Council

⁷ Sections 43 and 42(B) of the PA2008

⁸ As defined in Section 43(3) of the PA2008

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LOCAL AUTHORITY⁸
Guildford Borough Council
Elmbridge Borough council
Waverley Borough Council
Surrey Heath Borough Council
Runnymede Borough Council
Splethorne Borough Council
Mole Valley District Council
Rushmoor Borough Council
The Royal Borough of Kingston Upon Thames
London Borough of Richmond
Surrey County Council
West Sussex County Council
East Sussex County Council
Hampshire County Council
South Downs National Park Authority
Slough Borough Council
The Royal Borough of Windsor and Maidenhead
London Borough of Sutton
London Borough of Croydon
London Borough of Bromley
London Borough of Hounslow
London Borough of Hillingdon
Bracknell Forest Council
Kent County Council

THE GREATER LONDON AUTHORITY

The Greater London Authority (GLA) have also been identified as a consultation body under the EIA Regulations because the proposed application relates to land within Greater London.

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

Consultation bodies who replied by the statutory deadline:

Bracknell Forest Council
Elmbridge Borough Council
Energy Assets
Environment Agency
ESP Gas Group Ltd
Forestry Commission
Guildford Borough Council
Health and Safety Executive
Highways England
Historic England
London Borough of Hounslow
National Grid
National Trust
NATS Safeguarding
Natural England
Public Health England
Royal Borough of Kingston upon Thames
Royal Mail Group Ltd
Rushmoor Borough Council
South Downs National Park Authority
Spelthorne Borough Council
Surrey County Council

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Surrey Heath Borough Council
Transport for London
Wales and West Utilities Ltd
Waverley Borough Council
Woking Borough Council



The Planning Inspectorate
3D Eagle Wing
Temple Quay HOUse
2 The Square
Bristol
BS1 6PN

11th January 2018

Consultation Response

Dear Sir/Madam

Town and Country Planning Act 1990

REFERENCE: 17/01375/OBS/OBSZ

DESCRIPTION: Request for observations on a scoping opinion under Regulation 13 of The Town and Country Planning (Environment Impact Assessment) 2011.

LOCATION: M25 Junction 10/A3 Wisley Interchange Bracknell
Berkshire

CASE OFFICER: Trevor Yerworth, direct line 01344 351182

I refer to your consultation on the above application received on 13th December 2017. My comments are;

01. Thank you for consulting Bracknell Forest Council (BFC) on Highways England's Scoping Report for the improvements proposed to the M25/A3 junction at Wisley.

BFC does not wish to comment on this Scoping Report.

Should you wish to discuss this matter further, please do not hesitate to contact me.

Yours faithfully

Trevor Yerworth

Principal Planning Officer
Environment, Culture & Communities Department
email trevor.yerworth@bracknell-forest.gov.uk
Direct Line 01344 351182

ENVIRONMENT, CULTURE AND COMMUNITIES

Bracknell Forest Borough Council, Time Square, Market Street, Bracknell, Berkshire RG12 1JD
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Elmbridge Borough Council

... bridging the communities ...

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Gail Boyle
Senior EIA Advisor
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol, BS1 6PN

contact: Judith Jenkins
direct line: 01372 474799
e-mail: jjenkins@elmbridge.gov.uk
my ref:

11th January 2018

Dear Ms Boyle,

M25 junction 10/A3 Wisley interchange improvement scheme The Infrastructure Planning (EIA) Regulations 2017 Consultation on the Application for a Scoping Opinion

Thank you for your letter of 13th December notifying the Council of Highway England's submission of an Environmental Scoping Report for M25 junction 10/A3 Wisley interchange and also seeking comment in advance of The Planning Inspectorate adopting a Scoping Opinion. We have reviewed the document submitted and have the following comments to make:

Planning Policy

- P199, para 13.3.27 the assessment will need to refer to the Council's most recent Local Development Scheme which sets out that adoption of the Local Plan will be by December 2019, following examination in August/September of that year. This clarification will be needed at other points within the assessment where Local Plan timescales are referred to, such as p16.
- P241, para 15.2.12 the Council is currently working to provide Highways England with additional detail on developments within the vicinity of the scheme. This will include clarification that site allocation DEV/COB9 should be removed from ongoing consideration as it is no longer included in land availability assessments due to uncertainty around deliverability.
- P240, para 15.2.12 for both planning applications 2017/0524 and 2016/4204 Highways England has requested that Road Safety Audits be undertaken in advance of determination of the applications.
- P110, para 7.9.1 references compensatory habitat land. Alongside biodiversity considerations that will be investigated through the EIA, the designation of additional SPA land could have a significant impact on the borough in planning policy terms. Additional land designated as SPA could impact the buffer zones within which

mitigation is required for new development. This mitigation takes the form of provision of SANG land and any requirement for additional SANG land will be an important consideration in Local Plan preparation.

Landscape and Heritage

- Chapter 11 is entitled Cultural Heritage, which albeit having an ICOMOS definition, has the potential to be confusing without clarification as it covers Built and Natural Environments and Artefacts plus tangible and intangible forms. The Scoping Consultation appears to concentrate on Built tangibles so perhaps titling it “Heritage” would cover the historic environment elements, making clear that although inevitably there is a hierarchy, designated and non-designated historic assets must be taken into account.
- P179, para 11.8 Proposed Consultation appears to ignore the local authority Heritage Managers, although they are included at para 11.11.3. 10. A consistency in approach is required.
- P179, para 11.9 highlights the need for further investigations which are crucial. Landscaping is referenced as mitigation to screen visual impacts, although this could also have a negative impact on the setting and interpretation of the historic environment.

Air quality and noise

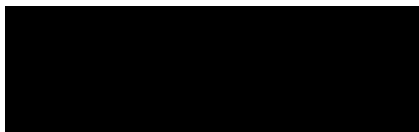
- P70, para 6.4.3 – Elmbridge Borough Council has already responded to Highways England enquiries in November 2017 about noise sensitive receptors within/around the scheme boundary, suggesting that additional potential noise sensitive receptors should be referenced. Potential receptors highlighted include properties in Convent Lane, Seven Hills Road, Pointers Road, Ockham Lane and Hatchford Park.
- P53 – there should be reference to the more recent 2017 IAQM guidance for Planning.

Biodiversity

- P109, para 7.8.1 – The list of organisations to be consulted should also include Countryside Officers within the relevant local authorities.

If you have any queries on this response please contact us on the number provided.

Yours sincerely,



Kim Tagliarini
Head of Planning Services, Elmbridge Borough Council

From: [Allana Johnston](#)
To: [M25 Junction 10](#)
Subject: TR010030-TR010030-000008
Date: 21 December 2017 11:44:45
Attachments: [image1af5e5.JPG](#)
[image863560.JPG](#)

To whom it may concern

I can confirm EAP do not have any comments

Regards

Allana Johnston
Utility Network Coordinator



Tel: 01506 425378

Web: www.energyassets.co.uk



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Gail Boyle
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
Avon
BS1 6PN

Our ref: WA/2017/124677/01-L01
Your ref: TR010030-TR010030-
000008
Date: 09 January 2018

Dear Gail

M25 Junction 10/A3 Wisley Interchange Improvement Scheme ("The Development")

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 Regulation 8(1)(B) Notification and Regulation 10(1) application for a scoping opinion – M25 J10 / A3 Wisley Interchange

Thank you for contacting us regarding the proposed development noted above and request for an environmental impact assessment (EIA) scoping opinion.

Environment Agency position

We have reviewed the scoping report submitted and have further comments to make in respect of Flood Risk, Biodiversity and Groundwater Protection to ensure that the Environmental Statement (ES) will appropriately address the environmental issues we consider are of most importance for this proposal. Our technical comments detailing the information we consider should be provided in the environmental statement are provided below.

Technical comments and advice

Flood Risk

We strongly advise that the Flood Risk and Water Quality topic areas (Chapter 8 – Road Drainage and Water Environment) should be separated out into two separate chapters in their own right. This will avoid any confusion as the risks and opportunities associated with each topic area are very different. We made it very clear in our pre-development meeting with the applicant previously that this was our expectation.

We are concerned that there is very little information on fluvial flood risk within this chapter. The wording within the chapter is also confusing. Fluvial flooding is listed under a section referring to 'Surface Water'.

Cont/d..

We are pleased that there is a commitment to carry out a detailed Flood Risk Assessment (FRA) to support the ES. We advise that fluvial (river), pluvial (surface water) and groundwater flooding should all be split up within the FRA and ES as separate issues. Mitigation for each of these different sources of flooding are unlikely to be linked and so it makes sense to address each individually.

We are slightly confused by the ranking of risk (importance) within Table 8-5. Why is the Stratford Brook listed as 'high' importance and the River Mole listed as 'very high'? Both seem to have the same number of receptors? No clear explanation is given.

At the scoping stage it is sometimes useful to outline the methodology of the FRA and get our advisory comments. The scoping opinion just states that it will be carried out in accordance with the (National Planning Policy Framework (NPPF)). We would recommend that you arrange a technical meeting with ourselves to discuss the detailed requirements for the FRA and get this agreed before you proceed.

You will need to carry out detailed flood modelling of the Stratford Brook as part of the FRA. We can provide you with advice on the general modelling requirements and the new climate change allowances which will need to be applied to this development. Please find attached our requirements for modelling and Thames guidance for climate change allowances.

From our experience of other similar infrastructure projects the key aspects of the FRA will need to include:

- Sequential approach – including the Sequential Test and Exception Test when required. Non-essential infrastructure and higher vulnerability development associated with the scheme should be located in areas of lowest flood risk.
- Floodplain Compensation - if embankment widening or other infrastructure is required within areas at risk of flooding, mitigation for the loss of floodplain storage will be required, on a level for level basis where possible. Early consideration of this will make it easier and cheaper to achieve this, preventing flood risk being increased elsewhere.
- Watercourses – any works on or near watercourses has the potential to increase flood risk. New culverts should be avoided where possible.
- Flood flow routes – assessment will be needed of any proposals that will affected flood flow routes, this includes the construction of any new under bridges or closing off of existing under bridges or culverts.

Biodiversity

Our main concerns are with the ecological and geomorphological impacts of the proposed culverting, works affecting water supply to water-dependent habitats, works affecting Bolder Mere Lake, loss of floodplain habitat and road run-off affecting water quality.

Otter and Water Vole

We welcome the further otter and water vole survey to be carried out on the Stratford Brook – presumably this is what the 'wet ditch' refers to? Otter and water vole surveys should also be carried out on the rivers Mole and Wey where the allocated 'replacement land' is adjacent to these rivers. An otter survey should also be carried out on the Guilehill Brook due to its proximity to the compound area at the A3 Ockham Park junction and potential for otter to use the surrounding terrestrial habitat. In addition, otter and water vole surveys should be carried out on any ordinary watercourses affected by the scheme, e.g. the watercourse which exits Boldermere lake.

Boldermere Lake

Boldermere lake should be assessed for its potential for breeding and wintering birds

Water Framework Directive

Paragraph 7.6.14 states that “Rivers, ponds and reedbed should be valued in consultation with Natural England”. The Environment Agency should also be involved in this consultation as the responsible body for implementing the Water Framework Directive.

We welcome the commitment to carrying out a Water Framework Directive assessment although we are unclear with the approach referred to in paragraph 8.7.6 and unfortunately the preliminary WFD assessment is missing from appendix D. This will be particularly important for assessing the impacts of the proposed culverting and encroachment into Boldermere lake.

Paragraph 8.4.7 states that lakes and other surface water features will only be scoped in if there are potential affects due to changes in groundwater. Please note that these surface water features should be scoped in if there are *any* potential impacts, i.e. also relating to water quality and direct habitat loss.

The assessment of the impacts on watercourses and recommended mitigation measures should be based on River Corridor Surveys (RCSs) of the affected reaches. Channel surveys should also inform the design of the crossings. Table 8.4 does not refer to River Corridor Surveys but instead states that a River Habitat Survey and fluvial audit will be used to inform the WFD assessment where available. Please note that a River Corridor Survey would be more suitable and should be carried out.

The areas proposed to offset the impacts on the SPA/SSSI should also be subject to the same suite of surveys as the rest of the scheme. More detail should be provided as to what is proposed for these areas. Please note that works within the floodplain/close to the river may require a Flood Risk Activity Permit from the Environment Agency and therefore early consultation with us is recommended.

Table 8.5 values the biodiversity importance of waterbodies at less than ‘good’ status as ‘low’. The Water Framework Directive requires all waterbodies to reach good ecological and chemical status and therefore no waterbody should be valued as low.

Paragraph 8.9.1 states that adverse impacts will be mitigated if significant. Please note that all adverse impacts should be mitigated or compensated for, regardless of whether they’re significant.

When carrying out the WFD assessment the Applicant will need to look at the current WFD Cycle 2 data (available here: <https://data.gov.uk/dataset/wfd-classification-status-cycle-2>) and assess whether their proposal will impact upon each of the classification elements (i.e. the receptors). They will need to assess potential impacts against the WFD objectives outlined in the Thames River Basin Management Plan (found here: <https://www.gov.uk/government/publications/thames-river-basin-district-river-basin-management-plan>) and how they intend to avoid, mitigate or compensate for those impacts.

It may be useful to look at the reasons for failure (available at: <https://data.gov.uk/dataset/wfd-classification-status-cycle-2>) to ensure that the assessment recognises existing problems and targets mitigation in the best way that

can alleviate existing issues.

Mitigation measures

We would welcome further involvement in the mitigation measures proposed once further detail on the crossings and impact on Boldermere lake have been provided. Mitigation may be appropriate on a site by site basis, particularly if the habitat affected is of high quality or where an opportunity exists, e.g. to improve fish passage or re-instate a more natural river channel where a watercourse is to be diverted. However, it may be more beneficial to combine mitigation resources (i.e. where several culverts are proposed) to deliver mitigation in an area, potentially away from where the impact will occur, which is of known greater ecological value or with greater restoration potential.

Clear span bridges and culverts

Paragraph 8.9.2 highlights our preference for clear spanning bridges as opposed to culverts, this is for flood risk alongside biodiversity reasons; this section also recognises the additional cost associated with bridges. Please note that cost alone is not a sufficient justification for proposing culverts over bridges and we would expect to see further reasoning for the selection of any culverts.

Construction impacts

We are concerned that the compound at the Ockham Park junction on the A3 is extremely close to the Stratford Brook – the plans should be revised to show a 10m minimum buffer between the compound and the bank top of the Brook to minimise any risk of pollution and protect the river corridor.

Ecological enhancements

There is no mention of ecological enhancements in chapter 7. Ecological enhancements that demonstrate an overall net gain in biodiversity should be included in the EIA.

Groundwater and Contaminated Land

Sustainable Drainage Systems (SUDs) are mentioned in section 8.9.1 with the possibility of infiltration being used. We doubt the ability of the Bagshot Beds to be suitable for sufficient infiltration and we expect a series of infiltration tests will be undertaken to assess the suitability of this method of drainage before committing to this approach.

Historic landfills have been mentioned in Chapter 10 as a possible source of contamination that require further investigation (Section 10.6.2). We note that it specifically refers to additional surface water analysis, but we would also like to see groundwater quality analysis undertaken in any investigation. Groundwater sampling should include parameters related to landfilling, such as metals and ammonium and also those related to current motorway use such as petroleum hydrocarbons.

We agree the scope of further assessment in principle and note that further detailed discussion may be required for earthworks and materials management, especially in relation to any made ground or reworked materials potentially being re-used under the Definition of waste code of practice. Appropriate ground water monitoring would be required to assess disturbance effects before, during and after any earthworks activities are undertaken.

Environmental permitting and other regulation

This development may require an Environmental Permit from the Environment Agency under the terms of the Environmental Permitting (England and Wales) (Amendment) (No. 2) Regulations 2016 for any proposed works or structures, in, under, over or within

8 metres of the top of the bank of designated 'main rivers'. This was formerly called a Flood Defence Consent. Some activities are also now [excluded](#) or [exempt](#). **An environmental permit is in addition to and a separate process from obtaining planning permission.** Further details and guidance are available on the GOV.UK website: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>.

Final comments

Once again, thank you for contacting us. Our comments are based on our available records and the information submitted to us. Please use our reference number in any future correspondence.

If you have any further questions please contact us.

Yours sincerely

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Requirements for completing computer river modelling for Flood Risk Assessments

Guidance for Developers - version 7

We are the Environment Agency. We protect and improve the environment and make it **a better place** for people and wildlife.

We operate at the place where environmental change has its greatest impact on people's lives. We reduce the risks to people and properties from flooding; make sure there is enough water for people and wildlife; protect and improve air, land and water quality and apply the environmental standards within which industry can operate.

Acting to reduce climate change and helping people and wildlife adapt to its consequences are at the heart of all that we do.

We cannot do this alone. We work closely with a wide range of partners including government, business, local authorities, other agencies, civil society groups and the communities we serve.

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Executive Summary

You have received this document because you have either requested flood risk model information from the Environment Agency for use in completing a Flood Risk Assessment (FRA), or you have been in consultation with the Environment Agency about your intentions to complete an FRA.

This document is intended to be used by developers as a guide to completing computer river modelling as part of an FRA which satisfies the requirements of your local Environment Agency office.

It has been developed from National Guidance and contains requirements of your local Environment Agency Office (West Thames Area, Environment Agency South East), and should be used to ensure there are no hold ups within the consultation process once the FRA has been submitted to us. It details requirements for hydrological and hydraulic modelling, model outputs such as flood outlines and levels and information that are to be submitted as part of the FRA. If the guide is used when completing river modelling for your FRA it will be less likely we will require the submitted FRA to undergo a lengthy process of further amendment and review post submission. If the model is intended to produce results to alter the Flood Map then the Flood Map Policy, which is available by request using the contact details below, must be considered before the modelling starts.

We have included a checklist in Appendix A which you can use to ensure you have included all the necessary items when submitting your Flood Risk Assessment.

This document applies to Flood Risk Assessments using river modelling. However, many of the principles apply equally to coastal modelling.

If there is any doubt about the modelling requirements for an FRA you should contact the Development & Flood Risk Team in your local Environment Agency office at the earliest opportunity to discuss what would be needed.

When contacting us you should ensure that you are speaking to the area office local to your site of interest. Further details of Environment Agency office locations can be found on our website www.environment-agency.gov.uk on our 'contact us' page. Details of the West Thames Area, Environment Agency South East office can be found in Section 7.1 of this guide.

Please read our Standard Notice supplied at the end of this document, which details our terms and conditions.

If you have any queries about the content of this document or suggestions for improvement please email kirsty.butler@environment-agency.gov.uk.

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1. Introduction

Purpose of this Document

The purpose of this document is to provide guidance for carrying out computer river modelling within a Flood Risk Assessment (FRA). FRAs may be carried out by individuals, developers, consultants or Local Planning Authorities for a variety of reasons (e.g. for development purposes).

Previous to this guidance, the FRA consultation process was frequently delayed or prolonged due to insufficient or inaccurate information being submitted where river modelling had been carried out.

This document provides a comprehensive guide to the information and approach expected of a complete FRA. It is intended to give our best practice guidance on the standards that should be used when carrying out computer modelling of watercourses when completing an FRA, and to comply with our local requirements.

Consultants, developers and Local Authorities that follow this guidance will reduce the likelihood of further revisions of the model, or further information being requested during consultation with the Environment Agency. This will minimise the delays in our response, and help us to be as efficient as we can be in the model review process.

Use the checklist in Appendix A of this document to ensure you have enclosed all the required documents and files for a review of your FRA.

Further details about undertaking Flood Risk / Consequence Assessments for the construction industry are given elsewhere, in particular in CIRIA Report C624. Further information may be required for land use development purposes as detailed in PPS25.

2. Modelling Requirements

It is not always necessary to produce a hydraulic model for all flood risk assessments. A decision on whether to construct a model should be made based on the scale and nature of the potential flood risk, as well as the scale of the development and existing information available on flood risk. In many less complex assessments, simple hydrological and hydraulic analysis may be all that is required. CIRIA Report C624 recommends a staged approach to Flood Risk Assessment to determine the need for and extent of such a model.

If there is any doubt whether a model is required, this should be discussed with local Environment Agency staff (Development and Flood Risk Teams for Land Use Planning, Flood Risk Mapping & Data Management Teams for other modelling requirements) at the earliest opportunity. Requirements at specific locations should always be discussed with local Environment Agency staff to ensure that any site-specific factors are identified, which may require special treatment when carrying out the modelling.

Even if a model is not constructed, an assessment of the impact of any proposed development on runoff should be carried out using Flood Estimation Handbook (FEH) techniques in almost all cases. The science report 'Improving the FEH statistical procedures for flood frequency estimation' published in June 2008, is available on our website through the Publications catalogue and should be referred to for updated FEH methods.

DEFRA/Environment Agency R&D Technical Report W5-074/A "Preliminary Rainfall Run-off Management for Developments" provides further information on runoff assessment for developments.

2.1 Objectives of the Model Study

The objectives and the required outputs of the modelling exercise should be defined at the outset. These should be reviewed at regular intervals and at completion.

At an early stage, the design condition should be clarified. This may, for example, include a freeboard and an allowance for climate change. Further information on freeboard is in R&D W187.

2.2 Data Collection

If you have not already requested information for your FRA, we recommend you submit a one-off request for information from your local Environment Agency External Relations Team (see Section 7). They will be able to provide you with any available existing data relevant to your site including channel survey, topographic survey (LiDAR), historic flood events, hydrometric data, existing models, flood levels, extents and flows. These data sets are detailed below.

If you will be collecting new survey data as part of your FRA, please refer to Appendix B 'Survey Requirements for Flood Risk Assessment'. This also contains the survey reporting format we expect with the FRA.

2.2.1 Hydrometric and Survey Data

The Environment Agency may hold existing hydrographic and floodplain survey data which may be of use in a flood risk assessment. External Relations will be able to assist with any requests for data.

River flow, river level and rainfall data relevant to the model should be collected where these exist. This should be requested as part of the one-off request to the Environment Agency for data at the start of the FRA. An understanding of the uncertainty and confidence within this data should be sought from its owners and further developed.

The Flood Estimation Handbook should be used as a source of hydrological data. Refer to the science report 'Improving the FEH statistical procedures for flood frequency estimation' for updates. The UK HiFLOWS Project also provides up to date information for gauging stations including AMAX and POT data www.environmentagency.gov.uk/hiflowsuk

2.2.2 Historic Information

Information on historic flooding (e.g. newspaper articles, photos, flood marks) should be collected and utilised to guide the survey extent and to aid the modelling process. Such data is particularly valuable as it can provide information on historic flooding prior to the periods covered by hydrometric data. A search of the Internet can often provide useful information, the Chronology of British Hydrological Events may contain useful information. However, the effect of any alterations and additions to the watercourse and associated structures since the date of the recorded event needs to be considered.

The West Thames Environment Agency office holds GIS shapefiles of historic fluvial flood event extents where we have records of events. We also have a limited number of records on locations which have suffered from surface water flooding, sewer flooding and groundwater flooding. There may have been flooding in the catchment that we do not have a record for therefore you are advised to contact the relevant Local Authority for additional historic flooding information.

2.2.3 Previous Modelling

The West Thames Environment Agency office have carried out detailed river modelling for a number of catchments for flood risk mapping studies, the design of flood alleviation schemes and previous flood risk assessments. You may wish to use this information for your study, however we advise you to contact the External Relations team before requesting this data to determine if existing modelling is available for your area of interest.

Where existing models are available, consideration should be given to whether these could be used as part of the flood risk assessment. Data from the Environment Agency will be supplied with any relevant data warnings or disclaimers, which must be

considered in the FRA. There may be cost, licensing and intellectual property right (IPR) issues associated with the use of models, which External Relations can help once a data request has been received.

We recommended check surveys are undertaken if the FRA intends to use existing survey data provided by the Environment Agency or third parties at key locations to ensure that the data provided is compatible with current conditions.

The Environment Agency may not own the Intellectual Property Rights to hydraulic models completed by third parties that we hold. We may therefore not be able to release information you are aware we hold if we do not have the required permissions to use it in FRAs. However, in accordance with Operational Instruction 'Use of 3rd party IP from Flood Risk / Consequence Assessments' , ownership of the IPR or an approved IPR licence is not required for us to use the data in accordance with our statutory obligations.

Contact External Relations (Section 7.1) if you wish to request modelled data.

2.3 Choice of model software

The modelling software chosen should be capable of producing the required output. It will generally be appropriate to choose commercial hydraulic/river modelling software that is in widespread use.

In certain circumstances, for example where the applicability of a model to a specific situation has not been previously demonstrated, it may be necessary to carry out independent benchmarking tests to demonstrate model performance using standard data. Examples of how this may be achieved under a range of scenarios are provided in the Defra/Environment Agency R&D Report 'Benchmarking of hydraulic river modelling software packages' (W5-105) which is available via the Joint Defra/Environment Agency Flood and Coastal Erosion Risk Management R&D Programme website.

2.4 Type of model

The choice of which model set up to use should be made between a fully hydrodynamic 1D or 2D model or a steady-state backwater model, flood routing model or combination of methods.

A full hydrodynamic model must be used if the study area contains either structures whose operation varies with time (e.g. pumps, sluices, and tidal outfalls) or a tidal estuary where tidal water levels increase going up the estuary. This should also be employed in complex tidal/fluvial situations and where the watercourse is subject to rapid increases and decreases in flow. If there is significant floodplain storage and complex flow routes on the floodplain then 2D modelling of the floodplain may be more representative. In other cases, either a steady-state or hydrodynamic model may be chosen. It should be noted that a steady-state model is unlikely to give a reasonable estimation of water levels where storage is present.

2.5 Hydrological Assessment

A hydrological assessment of the flood flows should be made using the methodology described in the Flood Estimation Handbook and the Environment Agency's Guidelines on use of the Flood Estimation Handbook. Contact the FRM&DM team if you require a copy of our guidelines.

FEH is the industry standard for flood frequency estimation. As a result of R&D funded by the Environment Agency and Defra and carried out by CEH (the publishers of FEH) a number of changes to the statistical procedures were recommended (see Kjeldsen. T. R., Jones. D. A., and Bayliss. A. C., 2008. Improving the FEH statistical procedures for flood frequency estimation. Science report SC050050/SR. Environment Agency, Bristol.)

These changes (where practicable) have been incorporated into recent work carried out by the Environment Agency and we advise they are incorporated into flood frequency estimation work carried out by 3rd parties.

The changes do not deviate from the overall framework of the FEH methodology. However, the most technical details of the method have been updated to improve the performance of the procedure.

The report details the updates to the statistical method including:

- A new equation for estimating QMED at ungauged catchments
- An improved procedure for using donor catchments for estimating QMED at ungauged catchments
- An improved procedure for formation of pooled growth curves.

These improvements should be adopted as standard practice by anyone involved with flood frequency estimation in the UK

The Revitalised Flood Hydrograph Method (ReFH) was released in 2006 and has superseded the FEH rainfall-runoff for most fluvial flood risk applications in England and Wales. The ReFH method should be used in place of FEH rainfall-runoff for most applications.

Wherever it is available, the hydrological assessment should use local data to improve the estimation of flood flows.

If a hydrodynamic model is used for the modelling, the hydrological assessment should include consideration of peak flows, flood volumes and shape of the flood hydrograph. If the problem includes storage (e.g. reservoir storage or a tide-locked watercourse) it is essential that the critical duration storm for storage (which often differs from the critical duration for peak flow) is identified. If a steady-state model is used, this may be limited to just consideration of peak flows.

Hydrological inputs should be estimated for a range of return periods up to and including the design flow (typically the flow with an annual probability of exceedence of 1%), and should include an appropriate allowance for climate change. This is a 20% increase in peak river flows, as advised in PPS25. We request design events of 1 in 5, 1 in 20, 1 in 100 and 1 in 100 year + 20%.

If using the FEH methodology, the proforma in Appendix C must be completed to justify decisions made, and provide a record of calculations.

2.6 Surface Water Flooding

An assessment should be made of the local topography and drainage routes to determine whether flooding might occur on the site if local drainage was overwhelmed by intense rainfall, or backing up due to high levels in the receiving watercourse. Given these findings, recommendations should be made on the design of any buildings on the site to eliminate the risk of significant flood damage.

Strategic Flood Risk Assessments (SFRAs), Surface Water Management Plans or any local sources may be useful when looking for evidence of surface water flooding.

2.7 Guidance for Tidal Breach Analysis on the Thames

Whilst we provide information and advice as set out below, the responsibility for the modelling being fit for purpose remains with those undertaking the modelling. Depending on the site, alterations may be necessary and should be considered in the initial request for information. If there is any doubt please contact the Tidal Thames team to discuss (details in section 7.1).

The general approach for the Tidal Thames (Teddington Weir to Purfleet) and the tidally dominated section of the tributaries is as follows:

The latest Thames Estuary Joint Probability (ISIS model) is used to give the variation in tide levels for a number of possible return periods and to select an extreme case to coincide with a breach in the defences.

The approach is to obtain (from our External Relations team) advice on the critical breach location, the 1 in 200 year level for the Tidal Thames and the tidal hydrograph relevant to the site location. We will also provide breach width (this depends on the type of defence).

Location of the breach is selected to give the most severe condition at the site. We achieve this by examining topographical data from LiDAR surveys and estimating the most likely flow route to the site. The breach should be taken down to the landward ground level, not necessarily that adjacent to the wall, which may be a bank forming part of the defence. The level of breach should be justified in the report including providing ground level plans and sections. Weir coefficients for the breach should also be explicitly stated and justified in the report.

The breach should be open for 18 hours for a hard defence and 36 hours for a soft or composite flood defence. The model should then be run for as long as it takes to reach the maximum flood extent.

For sites downstream of the Thames Barrier, generally, the breach should be taken to occur on the rise of the tide before the peak tide because the surge element will tend to span over three tide cycles. For single tide breach assessments between Teddington Lock and the Thames Barrier the breach should be taken to occur on the rise of the peak tide and should be considered breached when the tide level reaches the breach level. The exception to this is when the property is within approximately 100 metres of the defences. In this scenario the velocity may be an important factor in relation to the forces that new buildings and structures would have to withstand should a breach occur.

When necessary additional breach model runs should be carried out taking the breach to occur at the top of the peak tide to calculate the worst case water velocities. The decision on whether to carry out additional peak velocity modelling should be justified in the report based on the site ground levels relative to the 200-year river level and the proximity to the breach location.

The flow calculated through a breach is then routed through the urban area using a hydraulic model based on LiDAR ground survey. The LiDAR data can also be requested from our External Relations team. The LiDAR grid size recommended for urban areas is 5m or less. If it is above 5m it needs to be justified, but should never be greater than 10m. The use of 1D or 2D modelling depends on the location of the site in relation to the breach location and the topography of the ground in the proximity of both. The choice of a 1D or 2D model needs to be clearly reasoned in the report.

The LiDAR survey data often needs manual alteration to deal with errors such as the inability of LiDAR to detect flow routes through openings under viaducts and low ground "hidden" by vegetation. Velocity and depth of flows at the site are dependent on the passage of the flood through the urban area. Velocities need to be discussed/considered in relation to the integrity of any buildings or part of any buildings to be used as a safe flood refuge.

There will be a significant time lag between the breach occurring and water actually reaching the site if your site is a significant distance from the Thames. Only 2D modelling will illustrate this and will therefore be useful for emergency planning. Similarly only 2D modelling can assess the peak flood velocities where this is needed.

The output data must include flood levels clearly referenced to ordnance datum.

3. Model Building

3.1 General

The model should be built to represent the key flood flow routes, flood storage and structures in the study area. The defined study area should be sufficient to demonstrate the effects of any development on locations upstream and downstream from the site of the proposed development. Blockage scenarios should be considered if appropriate.

3.2 Upstream Boundary (Inflows)

The upstream boundary or boundaries should be developed under the hydrological assessment described in Section 2.2.6. For some models, one single upstream inflow per flood event may be sufficient, whilst for others, many upstream boundaries may be needed if a number of tributaries or other inflows are present. The choice of location of the upstream boundaries should be based on hydraulic considerations, not on the upstream limit of the development. The upstream boundary should be far enough upstream to allow the full impact of the development on upstream water levels to be identified.

3.3 Downstream Boundary (Levels)

The downstream boundary should be at a location where the relationship between level and flow is well defined, e.g. a weir. Where this is not possible, it should be sufficiently downstream of the area of interest so that any errors in the boundary will not significantly affect predicted water levels at the proposed development site. For a typical fluvial river, a rule of thumb is that a backwater effect extends a length $L=0.7D/s$, where D = bankfull depth and s = river slope. Hence if the downstream boundary is greater than L from the site it is likely that any errors in the rating curve at the boundary will not affect flood levels at the site. If the downstream boundary is tidal, it should be a location where a tidal curve can be accurately defined. Any tidal boundary should take into account both the astronomical tide (i.e. the tide caused by the gravitational effects of the Moon and the Sun and reported in published tide tables) and storm surges (i.e. the elevation of tidal levels caused by weather conditions). Careful consideration of combined probabilities¹⁰ may be required in such cases. The Environment Agency holds extensive extreme tide information from Flood Risk Mapping Studies.

3.4 Hydraulic Coefficients

The coefficients used in the model (e.g. channel roughness, weir coefficients) should be determined with guidance from standard textbooks. These texts should be referenced in the modelling report. Work is ongoing to produce guidance relevant to the UK, but in the meantime standard works such as Chow and Hicks & Mason can provide some guidance. Further information on roughness can also be obtained from the Defra / Environment Agency Conveyance Estimation System (CES) – <http://www.river-conveyance.net/>

4. Model Calibration, Verification and Sensitivity Testing

4.1 Calibration

Wherever practicable, the hydrological assessment and the hydraulic model should be calibrated against recorded flows and/or water levels from observed flood events. If calibration data is available, the model should be calibrated using at least three separate events. If no calibration data is available, a 'reality check' on the predicted levels and flows can often be carried out from photographs, historic information and anecdotal accounts of flooding.

The coefficients used in the calibration process should only be varied within the possible ranges suggested in the standard textbooks. The calibration of steady-state models should consider flow and flood levels. Calibration of hydrodynamic models should also consider the timing of the flood peak, flood volume and shape of the flood hydrograph.

4.2 Verification

If calibration is carried out, at least one separate observed event should be run through the model after the calibration to verify the adjustment of parameters.

4.3 Sensitivity Testing

The model should be tested by adjusting the key parameters within it to assess the effects on calculated flood levels. Unless otherwise agreed with the Environment Agency, the following parameters should be tested as a minimum:

- model inflows
- downstream boundary condition
- channel roughness and
- key structure coefficients

The range of parameters used in sensitivity tests should reflect uncertainties, possible changes due to climate change and variations in hydraulic coefficients (e.g. from seasonal changes or periodic maintenance). The parameters should be increased and decreased by a set percentage (usually 20%) and the results compared to the original run to assess whether the model gives expected results (i.e. the results are inside the set percentage increase and decrease). If the results vary significantly more than the set percentage then more investigation is required.

Sensitivity to blockage of critical structures should also be tested. The 2004 R&D study 'Scoping study into the hydraulic performance of bridges and other structures, including effects of blockage, at high flow' includes current understanding & some interim guidance.

Using the outputs of the sensitivity tests

The results of the sensitivity tests should be used to assess the possible circumstances that could cause flood levels to be significantly higher than the modelled best estimates. Examples are blockage of a downstream culvert, underestimation of design flows (if hydrometric data is poor) or increase in channel roughness in the event of decreased maintenance. Given the findings, recommendations should be made on the design of any buildings on site to eliminate risk of significant flood damage to the building.

5. Model Report Requirements

A report must accompany the submission to describe the modelling method and assumptions. The report is to enable a review of the model and results to be carried out. In some cases, only the report will be used to evaluate the appropriateness of the model, therefore it must be thorough. It should be a self-contained report that will provide sufficient information to allow future use of the model by the Environment Agency including if necessary replicating the work undertaken. The detail of the report should be appropriate to the complexity of the modelling.

5.1 Format of reporting

The report should be in a format that is easy to transmit electronically, and must include all plans and schematics. Adobe pdf files are therefore preferred. The language should be clear and non-technical where possible.

The following plans should be included with the report:

- A location plan at an appropriate scale, with national grid coordinates and OS basemapping, identifying geographical features, street names and all watercourses or bodies of water in the area of the site.
- A plan and description of any structures which may influence local hydraulics.

5.2 Report

For a comprehensive report, we suggest the following report structure, in line with the model requirements in Section 2.

Introduction

General site description:

- Larger scale plan showing location in the catchment
- What the site is used for currently
- Size of the site
- What is proposed
- Whether the Agency have been involved with the site previously (existing consents or references)
- Brief Flood History of the site
- The flood extents / flood zones that the site falls within
- Source of flooding on site / mechanisms of flooding
- Watercourses/drainage ditches in the area

Objectives of the Model Study

Provide a justification for why the modelling exercise has been undertaken and the planned objectives of the exercise. Indicate any deviations from the original objectives or planned project outputs, and outline the reasons why these occurred.

Method Statement and Justification

The report should include a clear method statement, detailing how the modelling has been carried out to fulfil the objectives.

Data sources

List all data used in the model and provide these when submitting the report.

Detail methods of data capture and/or sources of data, and the processes by which the raw data were converted.

Any reference to earlier work should be clearly referenced, and applications or development of existing models should be subject to the same rigorous inspection methods.

State the ownership of the data collected and the format of the data.

Uncertainty in data sources should be referenced especially where data have been discounted due to low confidence.

Provide the Environment Agency's data request reference here (usually prefixed with "WT"). Any licences and disclaimers accompanying data should be provided as an appendix.

Hydrological model

Explain why the chosen methodology is suitable for the catchment. Report details of decisions made and justifications for these. The FEH proforma provided in Appendix C must be supplied with the report. It is essential that this information is supplied for us to be able to undertake a full model review.

The report must include a table of the design inflows to be used in the hydraulic model.

A complete description of the catchment areas contributing to flooding at the proposed site must be supplied.

Hydraulic model

A hydraulic model will need to be produced for a Flood Risk Assessment where the effect of flood risk to the site can not otherwise be demonstrated (existing information, hand calculations etc). It will be necessary to produce a hydraulic model where the flood risk before and after development needs to be demonstrated, if the development involves changes to the river channel or structures, or if the development includes flood storage.

Provide a description of the hydraulic modelling approach including a description of the watercourse being modelled. The discussion must include justification of the selected modelling software including a technical description of the model and its components. Only a brief technical description is required if the tool is well known to the Environment Agency / widely applied, such as ISIS, TuFLOW and HecRas. Include the name and version of the software used.

Justify the decision to use fully hydrodynamic 1D or 2D model or a steady-state backwater model, flood routing model or combination of methods. Indicate any perceived advantages or disadvantages of applying the chosen tool.

Supply details of existing defences and local structures and how they have been represented in the model. Also supply details of how inflow and downstream boundaries have been represented.

Provide the schematic showing how individual parts of the model are connected, as an appendix.

Parameters

State and justify the derivation of the parameters (e.g. channel/overbank roughness, weir coefficients) used within both the hydrological assessment and the hydraulic model.

Calibration/Verification

Where calibration has been undertaken, the method used must be clearly illustrated and the number of independent data sets used for verification must be displayed. The model results must be presented against observed values for key locations for each verification data set, and descriptive statistics applied to describe the error band in the model.

Sensitivity Analysis

Discuss what sensitivity tests were carried out and how, including which parameters were varied and to what extent. Describe the results of the sensitivity testing and discuss the potential effect these could have on the model output.

Results

Results of the hydraulic model should be indicated in a summary table showing roughness coefficients, peak flow, water surface elevation, flow velocity, Froude Number etc. at each cross section. If possible, calculated flood levels could be shown on cross section data.

Map(s) indicating the flood extents adjacent to and including the proposed site must be provided for the modelled design events.

Audit Trail

The audit trail developed should be described in unambiguous detail. This should detail the build stages, changes made and the file names of all modelling/model support files produced. Documentation should also be included within the model data files to clearly set out the conditions applied.

Limitations

Highlight and discuss any limitations of the model or modelling technique. The impact of such limitations on the present or future use should be clearly stated.

Data given to multiple decimal places gives the impression of high confidence in the accuracy. Avoid doing this unless you are able to state the accuracy and confidence in the data.

Conclusions

The report must include concluding remarks, which highlight key issues from other sections and draw attention to the critical locations and/or structures within the model.

The same key items in reporting will apply to both modelling and hydrology.

The conclusion should comment on the current flood risk to the development site and the proposed level of risk post development. It should also comment on the existing flood risk to locations upstream and downstream of the site and any changes to the level of risk to these areas following development.

5.3 Appendices

Additional items to include as appendices:

Environment Agency Data used in the FRA

- Copy of the data licence: Include a copy of the licence/copyright which accompanies the
- data provided by the Environment Agency.
- If an Environment Agency model has been used/adapted as part of the FRA, include the model disclaimer which was provided with the data. This is to ensure any data warnings have been regarded.

Appropriate Modelling Staff Involved

Include a description of experience/CV of modelling staff involved with the FRA. This is to demonstrate to the Agency that suitably qualified and experienced personnel have carried out the work described in this document. Table 1 below illustrates the expected levels of experience.

Complexity of flood estimation study	Example of study	Value of flood defence works or damages	Indicative timescales for flood estimation	Competence criteria	
				Analyst	Supervision and approval
Simple	Preliminary assessment; culvert capacity check	-	<1 day	Level 1	Level 2
Routine	Low-risk DC application	<£50,000	1-2 days	Level 1	Level 2
Moderate	Small FM study or medium-risk DC application	<£250,000	2-10 days	Level 2	Level 3
Difficult	Medium FM study or CFMP or pre-feasibility	<£1million	2-4 weeks	Level 2	Level 3

Very difficult	Major scheme design or large FM study / CFMP	>£1million	>1 month	Level 3	Level 3
1. The values in all columns are indicative. 2. DC: Development Control FM: Flood Mapping CFMP: Catchment Flood Management Plan. 3. The competence criteria should be interpreted as minimum levels 4. An analyst who has not carried out or supervised the study must give approval. 5. Level 1 – Hydrologist with minimum approved experience in flood estimation 6. Level 2 – Senior Hydrologist 7. Level 3 – Senior Hydrologist with extensive experience of flood estimation					

Model Schematic

The schematic showing how individual parts of the model are connected should be provided, geo-referenced if possible.

5.4 Model Review during consultation

Once the model and report has been submitted to the Environment Agency for consultation it will be reviewed to determine whether the model is fit for the purpose of Flood Risk Assessment against the National Environment Agency guidance. We are not permitted to publish this guidance, however we have produced this guidance document to ensure the FRA model is fit for purpose. As an indication, our review of the model will focus on the items indicated in Appendix C.

We require at least 4 weeks to complete this. Please bear in mind that your model may require modification following the review, before the FRA can be accepted. You should allow for this within your timescales.

6. Updating the Flood Map

Flood Zones are used within the Environment Agency to delineate PPS25 flood zones and make planning decisions. The data is also used by a variety of external users, and can be viewed at www.environment-agency.gov.uk

If you would like the Flood Zones to be updated with FRA modelled extents, the model and outputs must be fit for purpose. Our requirements are as follows:

- Extents must represent the flood events with an annual probability of 1% (1 in 100), and 0.1% (1 in 1000).
- The model must be undefended, so not take account of any formal raised defences, in accordance with PPS25. You can check with the Flood Risk Mapping & Data Management team for a current list of formal raised defences. Other infrastructure (bridges, culverts, engineered channels, bypass channels) and embankments that are not flood defences, can be included in modelling and mapping flood zones.
- Flood Zones can only be updated with fluvial or tidal modelling.
- The modelling must be based on surveyed ground levels.
- Dry Islands within the floodplain may be mapped if they are larger than 200m² and not less than 10m wide.
- Survey must show that the **land** (not the property) is at least 100mm above the flood level.
- The modelling outputs for the Flood Map purposes must make no allowance for blockages (although blockage modelling may still need to be considered as part of the FRA, as a sensitivity test).
- We will incorporate third party data that is suitable for flood zones where we have approved the model is to Environment Agency requirements, if we have the owner's permission to do so. For this, the owner will need to hand over all intellectual property rights on the data to the Environment Agency. See Section 6.3, future use of FRA model.

6.1 How to challenge

Please indicate within your FRA submission that you wish the model outputs to be considered for updating Flood Zones. We will then review the suitability of the model for this purpose as part of the FRA model review. If you are not carrying out modelling as part of your FRA, but you have evidence to challenge the Flood Map, please contact our Flood Risk Mapping & Data Management team at Wallingford, TH-WE-MAPPING-&-DATA@environment-agency.gov.uk

6.2 Timescales for updates

We make quarterly updates to the Flood Map in January, April, July and October. In order for us to be able to incorporate your new modelled extents into the Flood Map, we will require the final approved extents 10 weeks before an update.

6.3 Future use of FRA model

If the model is required to update the Environment Agency's Flood Map/risk assessment products to represent the as-built situation, ownership of the Intellectual Property Rights (IPR) or an approved IPR licence will be required by the Agency. A statement should accompany the report and model data to indicate the allowable future uses of the model and its associated documentation.

7. Other

7.1 Contact Details

Environment Agency South East, West Thames Area External Relations:

Email: WTenquiries@environment-agency.gov.uk

7.2 Quality Assurance and Audit Trail

Throughout the study, a well-defined audit trail should be defined and reported. This should include all relevant documentation and should link with the appropriate quality assurance procedures of the organisation carrying out the study. Provision should be made to make the relevant documentation available to others who may use the model in future.

Glossary of terms

Backwater Curve - The longitudinal profile of the water surface (in a non-uniform flow in an open channel) when the water surface is not parallel to the river bed. This is caused by a restriction such as a dam or weir, increasing the depth of the water above the normal water level that would result if the restriction were removed.

Backwater Effect - The effect where a dam or other restriction raises the surface of the water upstream from it above the normal water level.

Backwater Flooding - Flooding caused by downstream conditions such as a channel restriction and/or high flow in a stream at a confluence downstream of the flooding.

Backwater Model – A model built to represent the backwater effect.

Calibration – The process of adjusting parameter values in a model to try and match recorded data, so that the model can be taken as a good representation of reality.

Combined Probability – The chance of two or more independent events occurring concurrently.

Critical Duration Storm – The duration of storm necessary to produce the maximum instantaneous peak flow or volume at a specific location in a drainage system, for any given flood event probability.

Floodplain – Land adjacent to a watercourse over which water may flow in time of flood. This generally includes the defended floodplain, an area over which water would flow if flood defences were not present, or if flood defences fail.

Flood Routing Model – Process of determining progressively the timing, shape, and amplitude of the flow in a flood wave as it moves downstream at successive points along the river.

Hydrological Model – A mathematical model used to estimate the flow in a river that will result from rainfall. It will usually be based on such things as catchment size, geology and soil type, steepness, land use and storage within the catchment. The model will be calibrated and verified using recorded rainfall and flows, before using design rainfall to estimate the flows which might be expected in floods of different probabilities.

Hydraulic Model – A mathematical model used to predict possible future levels (and flows in a hydrodynamic model) taking into account the topography, shape and roughness of the river bed and floodplain, obstructions (e.g. weirs and bridges), and the inflows provided by the hydrological model etc. Models are calibrated using recorded historic flood data, where it is available.

Hydrograph – A graph showing the water level (stage), discharge, or other property of the flows in a river, with respect to time.

Hydrological Assessment – Carried out to understand the cycle of precipitation, consequent runoff, infiltration, and storage; eventual evaporation etc.

Intellectual Property Rights – The legal ownership of the content of the work in question.

Storage – Location where water is retained due to the lie of the land, man made influence or effect of tides / other river flows.

Steady-State Model – A hydraulic model in which the flow at any point in the model is constant with time (there can be many different flows but all are constant over time). This type of model cannot estimate the effects of storage on flood levels or downstream flows.

Hydrodynamic model – These estimate flows and levels throughout a flood event, and can therefore take into account the effects of storage on flows and flood levels.

Topographic Survey – Survey to measure and record the physical features of an area in horizontal and vertical dimensions.

Tributary – A river or stream that flows into a larger river.

Upstream / Downstream Boundary – The limits of the model or assessment upstream and downstream of the site of interest.

Verification – The process of checking the accuracy of the outputs of the calibrated model in comparison with recorded data. If sufficient data is available it is good practice to calibrate the model using some recorded data, and verify the model using data from other flood events.

List of abbreviations

PPS25 – Policy Planning Statement Note 25

TAN15 – Technical Advice Note 15

CIRIA – The Construction Industry Research and Information Association

DEFRA – Department for Environment, Farming and Rural Affairs

R&D – Research and Development

1D – One Dimensional

2D – Two Dimensional

FRA – Flood Risk Assessment

References

- Centre for Ecology and Hydrology, 1999. Flood Estimation Handbook. Wallingford, CEH. (Further details are available at <http://www.nwl.ac.uk/feh/> or from CEH on 01491 838800.)
- Defra / EA R&D Programme. Joint probabilities - dependence mapping & best practice, FD 2308/TR1. HR Wallingford. 2003.
- Defra / EA, March 2004. Flood & Coastal Defence R&D Programme, Benchmarking Hydraulic River Modelling Software Packages, R&D Study: W5-105/TR1.
- Defra/EA R&D Programme. July 2004. Scoping study into the hydraulic performance of bridges and other structures, including effects of blockage, at high flow.
- D.M.Hicks & P.D.Mason. Roughness Characteristics of New Zealand Rivers. 1999.
- Environment Agency: Fluvial Freeboard Guidance Note. Technical Report W.187.2000.
- Environment Agency, 2000. Flood Estimation Handbook Guidelines (Parts 1 and 2) Bristol, Environment Agency.
- HR Wallingford (2004) Preliminary rainfall runoff management for developments: Users Guide. Defra / EA R&D Technical Report W5-074/A, HR Wallingford.
- Kjeldsen. T. R., Jones. D. A., and Bayliss. A. C., 2008. Improving the FEH statistical procedures for flood frequency estimation. Science report SC050050/SR. Defra / EA R&D Programme. (This is available on the Environment Agency website, through the Publications Catalogue. Search for product code SCHO0608BOFF-E-P.)
- Lancaster, J., Preene, M. and Marshall, C. 2004, CIRIA Report C624, Development and Flood Risk – Guidance for the Construction Industry, CIRIA, London.
- The Chronology of British Hydrological Events, <http://www.dundee.ac.uk/geography/cbhe>
- Ven Te Chow, Open Channel Hydraulics, McGraw-Hill 1959.

Appendix A

Checklist of items that must be submitted to the Environment Agency for consultation & review

- ✓ Model Report using format recommended in Section 5
- ✓ Survey Report (If appropriate)
- ✓ Data request reference from Environment Agency External Relations
- ✓ Location / site plans
- ✓ Maps of outputs – flood extents produced by the model
- ✓ Details of any challenges to the Flood Map (see Section 6)
- ✓ All model data files, including sufficient instructions allowing model to be run and viewed (time-step, runtime, initial conditions etc.) - see the model file checklist below.
- ✓ All documents and files provided electronically

Appendices:

- ✓ Data licence from the Environment Agency allowing use of our data and any associated model disclaimers
- ✓ Statement on future use of the model / IPR licence
- ✓ CV of modelling staff involved with the Flood Risk Assessment
- ✓ Model Schematic
- ✓ FEH proforma (if FEH has been used)

Model Files

HEC-RAS Models

Description	HEC-RAS file
project file	*.prj
geometric data file	*.g
steady flow data file	*.f
unsteady flow data file	*.u
plan data file	*.p
results file	*.o

ISIS Models

Description	ISIS file
river model data	*.dat
initial condition (if not in .dat file)	*.zzs
summary of output; maxima at all nodes	*.zzr
unsteady state output	*.zzn
run and error messages + bitmaps of convergence graphs	*.zzd
Binary results file	*.zzl
Run time parameters	*.ief
(Optional) Geographic schematic	*.gxy
(Optional) ISIS event files	*.ied
(Optional) calibration/verification points	*.cal
(Optional) maximum calibration/verification points	*.cus
(Optional) hydrologic boundary	*.zzb
(Optional) hydrographs	*.zzh
(Optional) FEH boundary	*.ied

TUFLOW Models

Description		TUFLOW file
File Path	Use relative path names for input files (e.g. “..\model\geometry.tgc”) so that models are easily moved from one folder to another.	N/A
Control Files	TUFLOW Control File	*.tcf
	ESTRY Control File (if using 1D domain)	*.ecf
	Geometry Control File	*.tgc
	Boundary Conditions Control File	*.tbc
Data Input Files	Boundary Condition Database (bc_dbase)	*.csv
	Inflow and Outflow time series (e.g. hydrographs and hyetographs)	*.csv
	GIS files (2d_bc, 2d_mat, 2d_zln etc.)	*.mif / *.mid
	TUFLOW materials file	*tmf
Data Output File	SMS super file	*.sup
	SMS mesh file	*.2dm
	SMS data file	*.dat
	Text output of time series data	*.csv
	Files for viewing 2D and 1D domain results in GIS	*.mif / *.mid
	Flood duration outputs	
Check files	TUFLOW log file	*.tlf
	Estry log file	*.elf
	GIS formats for viewing graphically any errors, warnings and checks, the 1D network, 2D grid, 2D topography, 2D/1D boundaries and connections (e.g. 2d_grd_check)	*.mif/.mid

INFOWORKS RS (1D & 2D) Models

Description	INFOWORKS file
Transportable Database (Zipped up database containing all data: networks, events, results, ground models, calibration, etc.) NB: Data must be “checked in”	*.iwc

Appendix B

Survey Requirements for Flood Risk Assessments

Purpose of Document

This document is a statement of best practice from which is intended to improve the quality of surveys submitted to the Environment Agency South East, West Thames Area for flood risk assessments (FRA) by:

- Reducing the risk posed by using poor survey data.
- Ensuring survey is quality controlled and quality assured by the surveyor. It is their duty to ensure their work is carried out according to best practice, which includes a responsibility to carry out and document internal and independent checks of the survey.
- Making the process of validation of surveys more efficient and effective.
- Reliable and complete survey information will speed up the review of flood risk assessments.

Documentation

Every survey should be submitted with a survey report stating:

- ✓ Survey company name
- ✓ Date of survey
- ✓ Name of surveyor(s) with qualifications
- ✓ Purpose of survey and required survey accuracy with justification
- ✓ Method statement (techniques used)
- ✓ Details of source control and new control established on the site
- ✓ Manufacturer, model and serial number of survey equipment used for the survey together with calibration certificates
- ✓ Statement of results of self-checks (closures and cross-checks)
- ✓ Statement of results of independent checks
- ✓ Appendices of all survey field observations, computations and diagrams



Submissions of data such as topographic survey, long sections and cross sections must be provided in a data formats agreed with modellers using the data. (i.e.) HECRAS, ISIS, XYZ

General

The model should be based on a topographic survey and/or channel survey of the watercourse. The upstream and downstream limits should be defined by the objectives of the flood risk assessment, rather than to the limits of the project / study area. The lateral extent of the survey should be sufficient to include the full extent of flooding. Guidance on this extent may come from flooding records and from the Flood Map. The extent of the survey work should be defined jointly by those undertaking the river modelling and those undertaking the survey in conjunction with advice from Environment Agency Flood Risk Mapping & Data Management staff.

The survey (and the model on which the survey is based) should continue far enough downstream so that uncertainty in the boundary condition does not significantly influence the estimated flood levels.

The cross sections surveyed should be representative of the channel and floodplain and the spacing between cross sections and orientation should be determined from the appropriate software documentation and textbooks. Consideration shall be given to the additional survey information that may be required between cross-sections in areas where detailed flood depths or extents are needed. This can be achieved by either adding further cross sections or surveying additional spot levels.

During the survey, information on structures, flood routes, potential blockages / obstructions to the channel and channel roughness should also be gathered.

All cross sections and other survey information shall be located in plan relative to the Ordnance Survey (OS) National Grid. It is considered best practice that the survey is undertaken by a land surveying company that is "Regulated by the Royal Institution of Chartered Surveyors".

Errors

The primary objective is to control systematic and gross errors and blunders.

A systematic error is one that arises in all measurements made with particular equipment if the instrument is reading incorrectly due to constant or proportional instrument errors and / or environmental factors.

A gross error or blunder can arise through a method error, misidentification, and reading/writing errors.

Techniques

This section covers observations of the critical dimension for flood risk assessments - height / level above sea level (Ordnance Datum Newlyn (ODN)). It does not cover positioning although there may be instances where inaccurate plan affects height.

General

At least two permanent stations (e.g. PK nail in asphalt) should be established at the site of the FRA in places where they are unlikely to be disturbed. Simple descriptions (with photos) including level value are required to enable the EA to find them.

All spot levels shown on site plans / cross-sections shall be numbered and referenced to observations and field notes.

Line levelling should be carried out using a spirit level - not theodolite / total station. However, these instruments may be used to observe spot levels on a site or cross-section levels provided that a sample of points is checked by another method (e.g. spirit levelling).

Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) observations

Observations must be made only with survey-grade dual frequency GPS or GNSS receivers at locations where the sky view is substantially clear above 15% elevation. New GPS control should be gross-error checked by levelling to (say) a spot level from a landline map or to an Ordnance Survey Bench Mark (OSBM). <http://benchmarks.ordnancesurvey.co.uk> and follow link to benchmark locator. Some minor and low risk developments do not justify the cost and time required to establish heights based upon GPS on the site. In these cases it **may** be acceptable to base the survey on OSBMs and this is at the discretion of the Agency's Development and Flood Risk Officer based on the appropriateness 'test' in PPS25.

Static GPS observations

Where static GPS observations are used to establish a benchmark, GPS baseline observations should be made to at least three source control stations (e.g. OS Net stations) for sufficient time to obtain a level of the required accuracy. Height of instrument should be checked by measuring more than once and using a different scale (e.g. feet), using two set-ups on the same point or by observing a second station with level connection between the two stations.

A text / html file of the report for at least one GPS baseline computation should be included in the survey report.

An unconstrained computation should be run holding one source control station fixed to published co-ordinates. The co-ordinates of the new GPS station are computed from this. Then the coordinates of other source control stations are computed from the new GPS station. The difference between observed and published level at unfixed source control stations should not exceed 20mm. The comparison table should be included in the survey report. A text /html file of the unconstrained computation report should be included in the appendix to the survey report.

A constrained computation should then be run. This holds all accepted source control stations fixed and computes an adjusted position for the new GPS station. A text / html file of the constrained computation report should be included in the appendix to the survey report.

Network RTK GPS

Network RTK GPS observations may be used if the accuracy of the technique is satisfactory for the purpose of the survey. Surveyor should follow The Survey Association guidance (<http://www.tsa-uk.org.uk/guidance.php>), published in November 2008. Self-checks and independent checks must be documented in the survey report.

Levelling

Source control for site levels and cross-section data should be GPS stations established as above. However, dependent upon the required accuracy of the survey, OSBMs may be used as source control.

The height above ODN for critical points on the site plan and for cross-section base point pegs should normally be spirit levelled. Critical points should be checked either by incorporating them as change points in a closed level loop or another form of independent check.

The survey report appendix should include a copy of the field notes for a two-peg test carried out on the level used for the survey within the previous two weeks. The test shall comprise observations before and after adjustment (if the level is adjusted).

All level runs must be closed to better than $12\text{mm} \times \sqrt{k}$, where k is the levelled distance in km. However closures should also reflect the accuracy of the levelling equipment being used.

The levelling should be connected and adjusted to two different benchmarks, to provide a self-check and an independent check. Note that the difference between levels based on OSBM source control and GPS source control may be up to 80mm within Environment Agency South East. The EA Survey Group has some data on this and can supply on request. Contact andrew.bevan@environment-agency.gov.uk stating the 1km grid ref of the site – e.g. SP 5923. Provided that these checks are made and incorporated in the levelling calculations, heights should be correct to within 0.05m.

If only one benchmark is used, a photo of the benchmark shall be included in the report with details of independent checks which were carried out (e.g. level comparison on spot heights from OS landline / mastermap mapping). Note that this is less reliable than use of two benchmarks and the EA would only expect heights surveyed using this method to be reliable to +/- 0.2m.

Please submit your Survey Report with your Flood Risk Assessment Report and modelling as part of your Planning Application submission.

Appendix C

Reviewing computer modelling for Flood Risk Assessments

As a guide, our review will consider the following aspects of the model and reporting:

General:

- Clearly defined objectives
- Flood Mechanisms identified
- Climate change considered
- Requirements discussed with Development and Flood Risk. Requirements at specific locations and design conditions (for example requirements of a freeboard and an allowance for climate change) should be discussed with local Agency staff to ensure that any site-specific factors are identified, which may require consideration when carrying out the modelling
- Site visits undertaken to ensure the model is realistic
- Appropriate approach to analysis for the site
- Checks carried out where existing models have been used, at key locations to ensure that the model / levels provided are compatible with current conditions. Changes summarised in report
- Location details and site plans provided
- Suitably qualified and experienced staff involved in building the model

Survey Data (see Appendix B regarding our survey requirements):

- Survey data used is current / appropriate
- Survey report submitted for checking
- Extent of the survey is sufficient to include the full extent of flooding. Extends far enough downstream so that uncertainty in the boundary condition does not significantly influence the estimated flood levels
- Representative spacing of the cross sections
- All hydraulically significant structures surveyed

Hydrometric Data:

- Relevant available flow, level and rainfall data used
- Hi-Flows database (v3.1.1) consulted to update records and check suitability of sites for use

Historic Data:

- Existing information on extent or depth of flood events provided

Hydrological assessment:

- Details of the hydrological analysis and justification for using the chosen method provided
- Justification if FEH methods have not been used
- Audit trail provided and all decisions justified
- Proforma provided for FEH calculations
- Justification provided if ReFH has been used in place of the statistical method
- Local data / knowledge used in the assessment / confidence in hydrometric assessment of gauge data considered
- Consideration of gauge station design & history
- Extent of gauge bypassing at high flows
- Effect of weed growth/blockages at the gauge
- Rating curves up to date for this assessment
- Calibrated and verified model using existing gauging station data, with regard to any limitations with this data
- If data is available, three events should be used for calibration, and 1 additional event for verification.
- URBEXT 2000 used plus update if there have been significant changes in the catchment
- Catchment boundary checks

Model Building:

- Initial conditions, choice of parameters, boundary locations and conditions
- Representation of key flow routes, storage and structures
- Methodology clearly stated

Model calibration, verification and sensitivity testing:

- Calibration attempted and appropriate
- Sensitivity tests carried out on parameters expected to have a major effect on predicted water levels, or if there is uncertainty in the parameters adopted
- Discussion of limitations of the model

Model accuracy and stability:

- Confidence limits stated for the model results (+/-mm)
- Discussion of model stability around the peak

Appendix D

a) Flood Estimation Calculation Record

b) Flood Estimation Calculation Record for single sites

(Separate attachments)

**Would you like to find out more about us,
or about your environment?**

Then call us on

03708 506 506 (Mon-Fri 8-6)

Calls to 03 numbers cost the same as calls to standard geographic numbers
(i.e. numbers beginning with 01 or 02).

email

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incident hotline 0800 80 70 60 (24hrs)

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Thames Area Climate Change Allowances

Guidance for their use in flood risk assessments

Jan 2017

We recently updated our national guidance on climate change allowances for Flood Risk Assessments. The following information provides additional local guidance which applies to developments within our Thames area boundary.

Climate change allowances - overview

The National Planning Practice Guidance refers planners, developers and advisors to the Environment Agency to our guidance on considering climate change in Flood Risk Assessments. We updated this guidance in February 2016 and it should be read in conjunction with this document to inform planning applications, local plans, neighbourhood plans and other projects. It provides:

- Climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height
- A range of allowances to assess fluvial flooding, rather than a single national allowance
- Advice on which allowances to use for assessments based on vulnerability classification, flood zone and development lifetime

Updated climate change allowances guidance:

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

National Planning Practice Guidance:

<http://planningguidance.communities.gov.uk/>

Assessing climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location (flood zone). Please note that this should be used as a guide only. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences.

Applicants and consultants may contact the Environment Agency at the pre-planning application stage to confirm the assessment approach on a case-by-case basis. We provide standard guidance free of charge or bespoke advice for a fee for developments for which we are a statutory consultee. If your development is instead covered by Flood Risk Standing Advice, we recommend you contact the relevant Local Planning Authority for their guidance and confirmation of the assessment approach. Flood Risk Standing Advice can be found here:

<https://www.gov.uk/flood-risk-assessment-local-planning-authorities>

Table A defines three possible approaches to account for flood risk impacts due to climate change in new development proposals:

1. **Basic** - Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
2. **Intermediate** - Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the 'design flood' flow.
3. **Detailed** - Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

Vulnerability classification	Flood zone	Assessment by development type		
		Minor	Small-Major	Large-Major
Essential infrastructure	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
Highly vulnerable	Zone 2	Intermediate/Basic	Intermediate/Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
More vulnerable	Zone 2	Basic	Basic	Intermediate/Basic
	Zone 3a	Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
Less vulnerable	Zone 2	Basic	Basic	Intermediate/Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
Water compatible	Zone 2	None		
	Zone 3a	Intermediate/Basic		
	Zone 3b	Detailed		

Definitions of terms in Table A

Minor

1-9 dwellings/less than 0.5 ha; office/light industrial under 1ha; general industrial under 1 ha; retail under 1 ha; travelling community site between 0 and 9 pitches.

Small-Major

10 to 30 dwellings; office/light industrial 1ha to 5ha; general industrial 1ha to 5ha; retail over 1ha to 5ha; travelling community site over 10 to 30 pitches.

Large-Major

30+ dwellings; office; light industrial 5ha+; general industrial 5ha+; retail 5ha+; gypsy/traveller site over 30+ pitches; any other development that creates a non-residential building or development over 1000 sqm.

Further info on vulnerability classifications:

<http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/>

Further info on flood zones:

<http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-2-flood-risk-vulnerability-classification/>

Specific local considerations

Where the Environment Agency and the applicant or their consultant has agreed that a basic level of assessment is appropriate, the figures in Table B below can be used as an allowance for potential climate change impacts on peak design (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local allowances for potential climate change impacts

Watercourse	Central	Higher central	Upper
Thames	500mm	700mm	1000mm

Use of these allowances will only be accepted after discussion with the Environment Agency.

Fluvial food risk mitigation

Please use the [national guidance](#) to find out which allowances to use to assess the impact of climate change on flood risk.

For planning consultations where we are a statutory consultee and our [Flood Risk Standing Advice](#) does not apply, we use the following benchmarks to inform flood risk mitigation for different vulnerability classifications.

These benchmarks are a guide only. We strongly recommend you contact us at the pre-planning application stage to confirm this on a case-by-case basis. Please note you may be charged for pre-planning advice.

For planning consultations where we are not a statutory consultee or where our Flood Risk Standing Advice does apply, we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

Essential Infrastructure

For these developments, our benchmark for flood risk mitigation is for it to be designed to the **upper end** climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.

Highly Vulnerable

For these developments in flood zone 2, the **higher central** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **upper end** allowance.

More Vulnerable

For these developments in flood zone 2, the **central** climate change allowance is our minimum benchmark for flood risk mitigation. In flood zone 3 the **higher central** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).

Water Compatible or Less Vulnerable

For these developments, the **central** climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** to inform built in resilience, particularly in flood zone 3.

Further info on our Flood Risk Standing Advice:

<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

For more information

Please contact our Thames area Customers and Engagement team:

Enquiries_THM@environment-agency.gov.uk

From: [ESP Utilities Group Ltd](#)
To: [Ian Wallis](#)
Subject: Your Reference: TR010030-TR010030-000008. Our Reference: PE133796. Plant Not Affected Notice from ES Pipelines
Date: 27 December 2017 14:46:55

Ian Wallis
The Planning Inspectorate
M25 Junction 10/A3 Wisley interchange improvement

27 December 2017

Reference: TR010030-TR010030-000008

Dear Sir/Madam,

Thank you for your recent plant enquiry at (TR010030-TR010030-000008).

I can confirm that ESP Gas Group Ltd has no gas or electricity apparatus in the vicinity of this site address and will not be affected by your proposed works.

ESP are continually laying new gas and electricity networks and this notification is valid for 90 days from the date of this letter. If your proposed works start after this period of time, please re-submit your enquiry.

Important Notice

Please be advised that any enquiries for ESP Connections Ltd, formerly known as British Gas Connections Ltd, should be sent directly to us at the address shown above or alternatively you can email us at: PlantResponses@espipelines.com

Yours faithfully,

Alan Slee
Operations Manager



Mole Business Park
Leatherhead
KT22 7BA
☎ 01372 587500 📠 01372 377996

<http://www.espug.com>

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South East & London Area Office
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Tel: 0300 0674420
southeast.fce@forestry.gsi.gov.uk

Area Director
Alison Field

11 January, 2018

Your Ref: **TR010030-000008**
M25 junction 10/A3
Wisley interchange

Dear Ms Boyle,

Thank you for your consultation on the above scheme dated 13 December 2017 which was received by the Forestry Commission via email on 13 December 2017.

The Forestry Commission's summary points are:

- Ancient Woodlands and Veteran Trees* are acknowledged as an irreplaceable habitat and a part of our Natural Heritage asset. Where loss is unavoidable, then, any compensation woodland creation should be significant. For instance, Highways England suggested a ratio of 30:1 in a presentation to us on 5th October 2017.
- Encourage wider mitigation of any loss of trees and woodlands within the project boundary.
- Ancient woodland habitats adjacent to the road improvements will be impacted by:
 - Pollution: aerial gases/nutrients/salt/heavy metals/litter; and
 - Noise disturbance.
- Where appropriate, recommended mitigation for impacts would include establishing a "continuous cover" management regime that maintains a dense multi-storey woodland structure in a belt at least 30 meter buffer adjacent to the roadside boundary (i.e. edge of road curtilage not edge of carriageway).
- Encourage you to design the associated infrastructure (green space, woodlands, public footpaths and cycleways) to build on the evolving network of green infrastructure linking the adjacent conurbations to the countryside. There are a range of options for green infrastructure delivery and the Forestry Commission would draw your attention to what has already been achieved in just 10 years at Jeskyns¹.
- Ensuring woodlands are protected and managed will also contribute to meeting the new requirements of Schedule 4 of the EIA Regulations (2017). Careful consideration of the role trees and woodlands play in the Scheme will ensure delivery of a more resilient landscape and contribute towards reducing greenhouse emissions, increasing carbon sequestration and to the wider climate change agenda.
- Locally sourced timber is used in construction of appropriate structures including sound baffles.

(*Note: Ancient Woodlands includes Ancient Semi-Natural Woodland (ASNW) and Plantations (including conifers) on Ancient Woodland Sites (PAWS).

Overall, we recommend that Highways England consider how they can optimise the Natural Capital Value of the compensation woodland creation and woodland management to enhance the network of greenspace in this rapidly growing area. As highlighted in the Government's recently release document: A Green Future: Our 25 Year Plan to Improve the Environment²

"The value of natural capital is routinely understated. If we look at England's woods and forests, for example, as a national asset, using a natural capital approach, the value of the services they deliver is an estimated £2.3bn. Of this sizeable sum, according to a recent study, only a small proportion – 10% – is in timber values. The rest derives from other benefits provided to society, such as human recreation and carbon sequestration".

The Forestry Commission is the Government Department that works with others to protect, improve and expand our nation's forests and woodland, increasing their value to society and the environment. As recognised in the Government Forestry and Woodlands Policy Statement (2013)³:

"New and better managed woodland also has a role in making our rural and urban landscapes more resilient to the effects of climate change. Our objectives for sustainable woodland creation and management will improve woodlands' resilience to climate change and other threats and enhance its contribution to wider climate change adaptation. Carbon will be sequestered through the growth of new woodlands. The wood products that are harvested from England's woodlands will help to reduce greenhouse emissions from the energy sector directly as woodfuel and from other sectors where timber replaces more energy intensive materials. In addition, our focus on protection will help to ensure that we can safeguard the large store of carbon in England's woodlands."

The Forestry Commission is the Government experts on forestry & woodland and a statutory consultee (as defined by Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms And Procedures) Regulations 2009)⁴ for major infrastructure (Nationally Significant Infrastructure Projects (NSIPS)) that are likely to affect the protection or expansion of forests and woodlands (Planning Act 2008)⁵.

The Forestry Commission's response is based on information provided in the Highways England M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report dated 6 December 2017. This response highlights matters which should be resolved as part of the pre-application process. We believe that these issues should be addressed by the applicant as part of the examination and consenting process before development consent is granted.

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/673203/25-year-environment-plan.pdf

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221023/pb13871-forestry-policy-statement.pdf

⁴ <http://www.legislation.gov.uk/ukxi/2009/2264/contents/made>

⁵ <http://www.legislation.gov.uk/ukxi/2009/2264/schedule/1/made>

M25 J10 / A3 Wisley Interchange Environmental Scoping Report (the Report)

1. Introduction

1.4. Structure and contents of the Scoping Report

This section of the Report outlines the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations (2017)⁶, and the approach taken in the Report to meet these requirements. The Report has also noted the new requirement of the EIA Regulation (2017) to address Climate. As noted in Schedule 4, Part 5(f)⁷, this must also include a description of the likely significant effects of the development on the environment resulting from “the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change”.

1.7. Key legislation and policy **Policy Overview**

The Report has correctly highlighted that Regulation 5 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the EIA to identify, describe and assess direct and indirect significant effects of the proposed development on biodiversity (with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC), Land, soil, water, air, climate, cultural heritage and the landscape.

To ensure compliance with the requirements of Part 2c, Regulation 14 of Infrastructure Planning (Environmental Impact Assessment) Regulations (2017), it is important that the applicant includes at least “a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment”.⁸ As recognised in the European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, “climate change and biodiversity are generally complex issues with long-term impacts and consequences. EIAs that aim to properly address biodiversity and climate should take this into account and assess the combined impact of any number of different effects. This requires an understanding of evolving baseline trends and an assessment of the cumulative effects of the project on the changing baseline.”⁹

2. The Project

2.2. Project objectives

This section of the Report outlines the Client Scheme Requirements including:

- support compliance with the UK’s legally binding limits and targets on air quality and water quality status and support targets to cut greenhouse gas emissions; and,
- through good design, ensure the Scheme’s contribution to the quality of the surrounding environment, addressing existing problems wherever feasible, avoiding, mitigating or compensating for significant adverse impacts and promoting opportunities to deliver positive environmental outcomes.

⁶ <http://www.legislation.gov.uk/ukxi/2017/572/contents/made>

⁷ <http://www.legislation.gov.uk/ukxi/2017/572/schedule/4/made>

⁸ <http://www.legislation.gov.uk/ukxi/2017/572/regulation/14/made>

⁹ <http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>

To meet the requirements, the Forestry Commission would like to reiterate the importance of all woodlands in making our rural and urban landscapes more resilient to the effects of climate change and contribution to wider climate change adaptation. Consideration for how sustainable woodland creation and management of England's Woodlands can be secured and the use of timber as a construction material is utilised within this scheme will secure the role that woodlands have in reducing greenhouse emissions and carbon sequestration.

To this end, the Forestry Commission would recommend consideration of the role trees and woodlands would contribute towards the Scheme's ability to deliver a more resilient landscape and contribute towards reducing greenhouse emissions, increasing carbon sequestration and contribution to wider climate change mitigation and adaptation.

4.3. Proposed EIA approach for the Scheme Establishment of baseline conditions

The Report acknowledges the need to establish a baseline and to clearly identify receptors that may be affected and their value or sensitivity to potential change. The Forestry Commission would suggest taking a Natural Capital Assessment approach at an early stage. As well as ensuring the environmental costs are adequately considered in assessing public benefit, a Natural Capital approach will also give the applicant a baseline with which to use when planning compensation / mitigation. The applicant will be able to demonstrate for example the current Natural Capital value of a woodland asset before the scheme commences, then plan how that woodland can be managed in the future to increase its Natural Capital value and therefore the Ecosystem Service benefits that will be derived from it. This approach will also help to demonstrate how net biodiversity gain will be achieved.

7. Biodiversity

7.3. Planning and policy context

National Policy Statement for National Networks 2014

National Planning Policy Framework 2012

Local Planning Policy

The Forestry Commission welcomes the recognition and inclusion of ancient woodlands and veteran trees. Also, through the assessment of local planning policies, the recognition for the need:

(Elmbridge Borough Council: CS15 – Biodiversity)

- to protect all woodlands, including ancient woodlands from damaging development and land uses;
- Promoting the effective management, and where appropriate, extension and creation of new woodland areas including, in association with areas of major development, where this helps to restore and enhance degraded landscapes, screen noise and pollution, provide recreational opportunities, help mitigate climate change, and contributes to floodplain management;
- Replacing woodland unavoidably lost through development with new woodland on at the same scale;
- Promoting and encouraging the economic use of woodlands and wood resources, including wood fuels as renewable energy source; and
- Promoting the growth and procurement of sustainable timber products.

(Elmbridge Borough Council: DM6- Landscape and trees)

- Encourages adaption to climate change, for instance by incorporating Sustainable Drainage Systems (SuDS), providing areas for flood mitigation, green roofs, green walls, tree planting for shade, shelter and cooling and a balance of hard and soft element;
- Adequately protects existing trees including their root systems prior to, during and after construction process;
- Would not result in the loss or deterioration of irreplaceable habitats including ancient woodland and ancient or veteran trees, unless in exceptional circumstances the benefits would outweigh the loss; and
- Includes proposals for the successful implementation, maintenance and management of landscape and tree planting schemes.

In addition to the regulatory and policy framework outlined in the report, the Forestry Commission considers the relevant documents and guidance notes outlined below as being pertinent to this DCO in relation to woodlands including ancient woodland and veteran trees and should also be included in the report considerations.

[The UK Forestry Standard](#) (4th edition published August 2017).

[Managing ancient and native woodland in England](#) (last updated August 2016)

[National Planning Practice Guidance](#) – Natural Environment Guidance (published January 2016)

[Our plan to protect and increase biodiversity](#) – Highways England biodiversity plan (published June 2015)

[Standing Advice for Ancient Woodland and Veteran Trees](#) (published April 2014, updated November 2017)

[European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment](#) (published 2013)

[Natural England Commissioned Report \(NERC 132\) Edition 3](#) (published November 2013)

[BS 42020:2013 Biodiversity. Code of practice for planning and development](#) (published August 2013)

[Ancient and other veteran trees: further guidance on management](#) (published February 2013)

[Government Forestry and Woodlands Policy Statement](#) (published January 2013)

[Impacts of nearby development on ancient woodland – addendum](#) (published December 2012)

[BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations](#) (published April 2012)

[Biodiversity 2020: a strategy for England's wildlife and ecosystem services](#) (published August 2011).

[Natural Environment White Paper "The Natural Choice"](#) (published June 2011)

[Impacts of nearby development on the ecology of ancient woodland](#) (published October 2008)

[Keepers of Time](#) – A Statement of Policy for England's Ancient and Native Woodland (published June 2005).

[A Habitats Translocation Policy for Britain](#) – (published July 2003)

[Veteran Trees: A guide to good management](#) – (published February 2000)

7.4 Baseline conditions

The report outlines the sources used to identify the ecological baseline conditions for the Scheme. Once again, the Forestry Commission welcomes the recognition and inclusion of ancient woodlands and veteran trees as part of this assessment. To meet the new requirements for climate outlined in Regulations 5 and 14 of the EIA Regulations (2017), the Forestry Commission would recommend that all woodlands are included as part of the ecological baseline conditions assessment.

Designated Sites

Ancient Woodlands and Veteran trees outside of ancient woodlands Habitats

Ancient woodlands and veteran trees are included in the list of protected species as highlighted on the Natural England website¹⁰. The Forestry Commission welcome the recognition in the Report given to ancient woodlands as being an irreplaceable habitat.

In the absence of an environmental constraints map that outlines the 1km boundary, it is not possible for the Forestry Commission to fully comment on impact of ancient woodland and other woodland sites that fall within the 1km boundary.

As highlighted in the Natural Environment section of the National Planning Practice Guidance (NPPG) under Biodiversity and ecosystems¹¹:

"Both Ancient Semi-Natural Woodland (ASNW) as well as Plantations on Ancient Woodland Sites (PAWS) are ancient woodland. Both types should be treated equally in terms of the protection afforded to ancient woodland in the National Planning Policy Framework."

All ASNW, PAWS and ancient woodland areas should be included in the study area to:

- ensure these areas are treated equally in terms of protection afforded to ancient woodlands; and,
- to secure the future of one of the most diverse ecosystems in perpetuity.

The habitats section of the report has recognised that veteran pedunculated oak trees are present in the woodlands to the north-west of the scheme. Therefore, the Forestry

¹⁰ <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications>

¹¹ <https://www.gov.uk/guidance/natural-environment>

Commission would recommend that the location of the veteran pedunculated oak trees is confirmed and included in the Ancient Woodlands and Veteran trees outside of ancient woodlands section of the report.

In line with the NPPG, the Forestry Commission recommends that these tables clearly defines the status of all ancient woodland sites, Ancient Semi-Natural Woodland (ASNW), Plantations on Ancient Woodland Sites (PAWS), veteran trees and woodland habitats recognised as a habitat of principal importance under Section 41 of the NERC Act 2006¹² are included in all survey work and study reports. This will ensure that a thorough assessment will acknowledge the impacts on any potential losses of irreplaceable and important woodland habitats.

Ancient woodlands and veteran trees are irreplaceable and are considered important for their wildlife, soils, recreation, cultural value, history and contribution to the landscape. Therefore, ancient woodlands and veteran trees must be included in all future habitat* and species surveys in relation to the Scheme within the application boundary of the Project. The Forestry Commission have noted the comment that through the desktop study, no ancient or veteran trees have been located within 50m of the scheme, and that an arboricultural assessment of the Scheme has not yet been conducted. (*Note: When using a BS5837:2012 Cascade chart¹³ for tree quality assessment, ancient woodlands would automatically be classified as A3 due to their natural heritage and ecological value.)

Due to the nature of ancient woodlands and veteran trees being an irreplaceable habitat, the Forestry Commission recommends that every effort is afforded to avoid this scheme affecting ancient woodlands or veteran trees. The Planning Inspectorate and applicant should start by looking for ways to avoid the development affecting ancient woodland or veteran trees e.g. by redesigning the scheme in line with the recommendations outlined in BS 5837:2012¹⁴. It is not possible to fully compensate for the loss or damage to ancient woodlands, thus compromising Highways England's aim to achieve no net loss of biodiversity by 2020 as set out in their strategy document: 'Our plan to protect and increase biodiversity' (Highways England 2015)¹⁵.

Consideration must also be given to lowland beech, lowland mixed deciduous woodland, wet woodland, wood pasture and parkland¹⁶. Under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006¹⁷, these habitats "are of principal importance for the purpose of conserving biodiversity." Therefore, these woodland habitats must also be included in all future habitat surveys to ensure adherence to the requirements of the National Policy Statement National Networks (NPSNN) report as outlined below:

Paragraph 5.25

"As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot

¹² <http://www.legislation.gov.uk/ukpga/2006/16/section/41>

¹³ http://www.flac.uk.com/wp-content/uploads/2012/09/Table-1_flac.pdf

¹⁴ <https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642>

¹⁵ http://scate.org.uk/wp-content/uploads/2015/07/Highways_England_Biodiversity_Plan.pdf

¹⁶ <http://jncc.defra.gov.uk/page-1437>

¹⁷ <http://www.legislation.gov.uk/ukpga/2006/16/section/41>

be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought.”

The habitats section of the report has recognised that the most abundant habitat within the scheme is mixed woodland. The Forestry Commission would welcome the opportunity to work with the applicant to review how the Natural Capital value of these woodlands can be increased.

To ensure compliance with the climate change requirements outlined in Schedule 4 of the EIA Regulation, and in recognition of the role that forestry and woodlands have in contribution to wider climate change adaptation as outlined in the Government’s Policy Statement on forestry and woodlands (2013), the Forestry Commission would also recommend inclusion of all woodland sites that fall within the scheme boundary.

7.5. Potential impacts Designated sites

The section of the report outlines the permanent and temporary land take that will occur during delivery of the scheme. As outlined in the Government Forestry and Woodland Policy Statement, the Government is fully committed to protecting our trees, woods and forests, improving our valuable woodland assets, expanding our woodland resource to 12% by 2060 and realising more of our woodlands’ value. In recognition of this, the Forestry Commission would request further information on how much of this land take has tree cover to avoid net deforestation through delivery of this scheme.

Ancient Woodlands and Veteran trees outside of ancient woodlands

In regard to loss of ancient woodland, the report has proposed that temporary loss of ancient woodland will count as permanent loss. The Forestry Commission appreciate the recognition given to the impacts to ancient woodland soils that any disturbance will have. Please note comment above which highlights ASNW and PAWS sites are afforded the same status as ancient woodlands.

Due to the nature of ancient woodlands and veteran trees being an irreplaceable habitat, the Forestry Commission recommends that every effort is afforded to avoid this scheme affecting ancient woodlands or veteran trees. The Planning Inspectorate and applicant should start by looking for ways to avoid the development affecting ancient woodland or veteran trees e.g. by redesigning the scheme in line with the recommendations outlined in BS 5837:2012¹⁸. It is not possible to fully compensate for the loss or damage to ancient woodlands, thus compromising Highways England’s aim to achieve no net loss of biodiversity by 2020 as set out in their strategy document: ‘Our plan to protect and increase biodiversity’ (Highways England 2015)¹⁹.

The Forestry Commission would also highlight the *Irreplaceable habitats including ancient woodland and veteran trees* section of the National Policy Statement National Networks (NPSNN):

Paragraph 5.32

“Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The

¹⁸ <https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642>

¹⁹ http://scate.org.uk/wp-content/uploads/2015/07/Highways_England_Biodiversity_Plan.pdf

Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.”

Notable Habitats

The Forestry Commission recommends that all woodland habitats recognised as a habitat of principal importance under Section 41 of the NERC Act 2006 are included in all future survey work to ensure that a thorough assessment will acknowledge the impacts on any potential losses of an irreplaceable habitat.

The Forestry Commission would welcome the opportunity to work with the applicant to look at how to minimise any loss, and to avoid loss of ancient woodland and notable habitats through temporary land take.

7.6. Proposed level and scope of assessment

Table 7-8: Nature conservation receptors that will be subject to further assessment

Table 7-9: Valuation of nature conservation features

The Forestry Commission note that ancient woodlands and notable habitats, including lowland mixed deciduous woodland, wood pasture and parklands are included in *Table 7-8: Nature conservation receptors that will be subject to further assessment*.

The Forestry Commission appreciate nature conservation features including ancient woodland and veteran trees have been valued in accordance with the Interim Advice Note 130/10Ecology and Nature Conservation: Criteria for Impact Assessment²⁰ as outlined in Table 7-9.

The Forestry Commission would seek clarity of the status and location of all woodland including ancient woodland and lowland mixed deciduous woodland habitats within the Scheme boundary.

The Forestry Commission acknowledge that the Report has recognised that the final Scheme Design has the potential to result in the direct loss of some ancient woodland and other lowland mixed deciduous woodland, wood pasture and parkland. The Forestry Commission would welcome the opportunity to provide advice at the appropriate time to ensure the most applicable measures are adopted to minimise and / or compensate for the impacts on all woodlands, particularly Ancient Woodland sites.

To meet the Government’s objective to improve woodlands’ resilience to climate change and contribute to climate change adaptation, along with addressing climate change as part of the new requirements outlined in Schedule 4 of the EIA Regulation (2017), the Forestry Commission would recommend that impacts to all woodlands are

²⁰ <http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian130.pdf>

assessed to allow an in-depth appreciation of the beneficial and adverse environmental consequences at the geographic scale of the Scheme. From these results, the Forestry Commission will be able to work with the applicant to identify appropriate measures that will avoid, reduce and / or compensate for significant effects to woodlands due to the construction and operation phases of the Scheme.

Ancient Woodlands

As the government experts on forestry & woodland and a statutory consultee (as defined by Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms And Procedures) Regulations 2009) for major infrastructure (Nationally Significant Infrastructure Projects (NSIPs)), the Forestry Commission would welcome the opportunity to discuss with the applicant to value ancient woodlands and to consider options for addressing issues with regard to the M25 J10 / A3 Wisley Interchange NSIP.

7.7. Proposed assessment methodology

This section of the report outlines the desk-based and field-based surveys that will be undertaken to gain an understanding of the baseline environmental condition within the Ecological zone of Influence. Assessments will take into account onsite impacts and those that may occur to adjacent and more distant ecological features. This will include direct loss and fragmentation or isolation of habitats.

The work to be carried out will follow guidance from the Guidelines for Ecological Impact Assessment in the UK and Ireland and IAN 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment. The Forestry Commission would recommend that all assessments also comply with the requirements of the NPSNN and the NPPF.

Where significant effects are considered likely, the assessment will determine the features that require measures to mitigate potential impacts, and to guide the type and scale of mitigation and / or compensation required, in consultation with key stakeholders. The assessment will also consider cumulative effects as described in Chapter 15.

In landscapes fragmented by development, the Lawton Report²¹ has concluded that isolated habitats and nature reserves are not sufficient to maintain ecological connectivity because species are unable to move. Therefore, the principle of “no net loss of biodiversity by 2020” must be quality rather than quantity.

The Forestry Commission would be pleased to work with the applicant to consider the impacts of this scheme to maximise the environmental benefits that can be achieved by working in partnership. We would be pleased to advise further on these opportunities to consider biodiversity impacts and possible cumulative impacts at the wider landscape scale.

²¹

<http://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>

7.9. Potential mitigation measures

The Report has made design suggestions based on current understanding of the nature conservation constraints and opportunities. These include:

- “Opening up of the woodland either side of the new Cockrow bridge, in order to encourage heathland regeneration, and create a continuous connected belt of heathland habitat between the two quadrants”

The Forestry Commission would recommend retention of the visual impact of woodland adjacent to the A3 for screening purposes. For the remaining areas, where felling of woodland to use the land for a different purpose is proposed, this may be subject to Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999. The Forestry Commission website²² provides further advice on the area threshold for proposed projects. Consequently we recommend that a heathland connection is established as a ‘heathy woodland’ rather than open heath.
- “Restoration of heathland and sandy habitats within temporarily cleared areas of woodland within the SPA/SSSI. Cleared areas will be managed to allow heathland regeneration, and excess sandy soils will be used to create features, such as exposed banks to support key invertebrates, a qualifying feature of the SSSI”

The Forestry Commission requests clarity of the strategic view of what the habitat requirement post scheme development will be. Where land cover is currently woodland, then conversion to heathland must be clearly justified. Assuming the temporarily cleared woodlands are for the proposed locations of the works sites then proposals need to reflect the best after-use of that part of the site.

If the proposed area is adjacent to the road and within the road curtilage, then the Forestry Commission would recommend that the applicant and Natural England work with the Forestry Commission to agree what the woodland immediately outwith the curtilage of the refurbished road will need to deliver. A belt of woodland managed under a Continuous Cover regime would provide visual and to a degree audible and air filtering screening between the well-used commons and the road.
- A multi-functional bridge linking the south-west and north-west quadrants. This bridge could be designed to support vegetation and provide connectivity between Wisley Common and the woodland and heathland within the north-west quadrant. This bridge may contain vegetation, connecting the habitats on either side of the bridge

This is in keeping with paragraph 5.36 of the National Policy Statement National Networks (NPSNN) which states “opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the ‘greening’ of existing network crossing points, the use of green bridges and the habitat improvement of the network verge.” The Forestry Commission welcomes this suggestion and would refer the applicant to the A21 at Scotney Castle in Kent example²³.

²² <https://www.forestry.gov.uk/england-eia>

²³ <https://www.gov.uk/government/news/green-bridges-safer-travel-for-wildlife>

- “Felling of some wooded areas within the north-west quadrant, in order to encourage heathland regeneration and increase the existing areas of heathland within this quadrant”
Any loss of woodland would require mitigation to ensure compliance with the Government’s commitment to no net loss of woodland. Therefore, where conversion of woodland to a different landuse is proposed, this may be subject to Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999.
- “Soil from any ancient woodland to be lost to be translocated to a compensation area for woodland planting”
As highlighted in the Joint Nature Conservation Committee (JNCC) Habitat Translocation Policy document²⁴:
“Available information shows that it is not possible to move species assemblages without substantial changes taking place in the structure of the habitat and its species composition, thus rendering the translocation unsuccessful.”
Through a literature review of case studies to address environmental impacts of linear transport infrastructure on protected species and habitats, Edition 3 of the Natural England Commissioned Report (NERC 132)²⁵ reiterates the message that “translocation of ancient woodland soils and coppiced stools does not imply that these methods mitigate the loss of ancient woodland.” and that “the measure should not be interpreted as a successful means of mitigating the fragmentation of ancient woodland; a resource which cannot be re-created through tree planting or habitat translocation due to its complex structure and wider-ranging biodiversity.”

The Planning Inspectorate should use planning conditions or obligations to secure compensation measures and subsequent ecological monitoring. The joint Standing Advice, prepared by Forestry Commission and Natural England, provides advice and the assessment tools to be used when assessing the impacts of the A2 Bean and Ebbsfleet Junction Improvement NSIP.

Where the impacts cannot be fully avoided, compensatory habitat provision will be required. The Forestry Commission will of course provide advice on impacts to ancient woodland outside of SSSI sites. For ancient woodlands within SSSI sites, we would provide advice alongside colleagues from Natural England as the scheme progresses towards the submission stage.

The Forestry Commission would also encourage the inclusion of measures to build the evolving network of green infrastructure to link the adjacent conurbations to the countryside. This will aid the promotion of help encourage people to access the countryside by the local community for quiet enjoyment. There are a range of options for green infrastructure and the Forestry Commission would draw attention to what has been achieved at Jeskyns. Linking Jeskyns to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of landscape scale green infrastructure.

²⁴ http://jncc.defra.gov.uk/pdf/habitats_policy.pdf

²⁵ <http://publications.naturalengland.org.uk/publication/6184646404472832>

Conclusion:

From the information supplied in the Report, we advise that in respect of loss of any woodland, particularly the loss of irreplaceable habitats which are part of our Natural Heritage and principally important habitats and ecosystems must be included in the applicant's assessment. Paragraph 5.130 of the NPSNN states:

"The Secretary of State should take into account the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets, the contribution of their settings and the positive contribution that their conservation can make to sustainable communities – including their economic vitality. The Secretary of State should also take into account the desirability of new development making a positive contribution to the character and local distinctiveness of the historic environment. The consideration of design should include scale, height, massing, alignment, materials, use and landscaping (for example, screen planting)."

For the loss of any woodland, the Forestry Commission would ask:

1. To explore with you how this loss could be further reduced and how direct and indirect impacts on ancient woodlands can be minimised;
2. How best to target the creation of new woodland to compensate for the loss of trees and woodlands;
3. That the applicant engages with the Forestry Commission at the earliest opportunity so that our expertise can be used to support the development of options and design of the chosen way forwards.

Outlined above are the key areas of information would be required in order to allow the applicant to proceed with delivery of this scheme with least detrimental impact to the surrounding environment, and the Examining Authority properly to undertake its task or where further work is required to determine the effects of the project and/or to flesh out compensation proposals to provide a sufficient degree of confidence as to their efficacy.

Forestry Commission's headline points are that on the basis of the information submitted, if approved, the project must be subject to all necessary and appropriate requirements which ensure that unacceptable environmental impacts either do not occur or are sufficiently compensated, as proposed in the proposed Code of Construction Practice.

If you disagree with our recommendations for the above schemes, then please consult the Forestry Commission.

Yours sincerely,

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Appendix 1: National Policy Statement for National Networks 2014

The National Policy Statement for National Networks (NPSNN), hereafter referred to as 'NPS', sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.

Chapter 1: Introduction

Purpose and scope

1.2 The Secretary of State will use this NPS as the primary basis for making decisions on development consent applications for national networks nationally significant infrastructure projects in England. Other NPSs may also be relevant to decisions on national networks nationally significant infrastructure projects. Under section 104 of the Planning Act the Secretary of State must decide an application for a national networks nationally significant infrastructure project in accordance with this NPS unless he/she is satisfied that to do so would:

- *lead to the UK being in breach of its international obligations;*
- *be unlawful;*
- *lead to the Secretary of State being in breach of any duty imposed by or under any legislation;*
- *result in adverse impacts of the development outweighing its benefits;*
- *be contrary to legislation about how the decisions are to be taken*

1.3 Where a development does not meet the current requirements for a nationally significant infrastructure project set out in the Planning Act (as amended by the Threshold Order), but is considered to be nationally significant, there is a power in the Planning Act for the Secretary of State, on application, to direct that a development should be treated as a nationally significant infrastructure project. In these circumstances any application for development consent would need to be considered in accordance with this NPS. The relevant development plan is also likely to be an important and relevant matter especially in respect of establishing the need for the development.

Consistency of NPS with the National Planning Policy Framework

1.17 The overall strategic aims of the National Planning Policy Framework (NPPF) and the NPS are consistent, however, the two have differing but equally important roles to play.

1.18 The NPPF provides a framework upon which local authorities can construct local plans to bring forward developments, and the NPPF would be a material consideration in planning decisions for such developments under the Town and Country Planning Act 1990. An important function of the NPPF is to embed the principles of sustainable development within local plans prepared under it. The NPPF is also likely to be an important and relevant consideration in decisions on nationally significant infrastructure projects, but only to the extent relevant to that project.

1.19 However, the NPPF makes clear that it is not intended to contain specific policies for NSIPs where quite particular considerations can apply. The National Networks NPS will assume that function and provide transport policy which will guide individual development brought under it.

1.20 In addition, the NPS provides guidance and imposes requirements on matters such as good scheme design, as well as the treatment of environmental impacts. So, both documents seek to achieve sustainable development and recognise that different approaches and measures will be necessary to achieve this.

Chapter 2: The need for development of the national networks and Government's policy

Summary of needs

Government's vision and strategic objectives for the national networks

The Government will deliver national networks that meet the country's longterm needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system. This means:

- *Networks which support the delivery of environmental goals and the move to a low carbon economy.*
- *Networks which join up our communities and link effectively to each other.*

2.9 Broader environment, safety and accessibility goals will also generate requirements for development. In particular, development will be needed to address safety problems, enhance the environment or enhance accessibility for non-motorised users. In their current state, development, the national networks will act as a constraint to sustainable economic growth, quality of life and wider environmental objectives.

The need for development of the national road Network

2.16 Traffic congestion constrains the economy and impacts negatively on quality of life by:

- *constraining existing economic activity as well as economic growth, by increasing costs to businesses, damaging their competitiveness and making it harder for them to access export markets. Businesses regularly consider access to good roads and other transport connections as key criteria in making decisions about where to locate.*
- *leading to a marked deterioration in the experience of road users. For some, particularly those with time-pressured journeys, congestion can cause frustration and stress, as well as inconvenience, reducing quality of life.*
- *constraining job opportunities as workers have more difficulty accessing labour markets.*
- *causing more environmental problems, with more emissions per vehicle and greater problems of blight and intrusion for people nearby. **This is especially true where traffic is routed through small communities or sensitive environmental areas.***

Chapter 3: Wider Government policy on the national networks

Environment and social impacts

- 3.2** The Government recognises that for development of the national road and rail networks to be sustainable these should be designed to minimise social and environmental impacts and improve quality of life.
- 3.3** In delivering new schemes, the Government expects applicants to avoid and mitigate environmental and social impacts in line with the principles set out in the NPPF and the Government's planning guidance. Applicants should also provide evidence that they have considered reasonable opportunities to deliver environmental and social benefits as part of schemes. The Government's detailed policy on environmental mitigations for developments is set out in Chapter 5 of this document.
- 3.5** Outside the nationally significant infrastructure project regime, Government policy is to bring forward targeted works to address existing environmental problems on the Strategic Road Network and improve the performance of the network. This includes reconnecting habitats and ecosystems, enhancing the settings of historic and cultural heritage features, respecting and enhancing landscape character, improving water quality and reducing flood risk, avoiding significant adverse impacts from noise and vibration and addressing areas of poor air quality.

Chapter 4: Assessment principles

- 4.3** In considering any proposed development, and in particular, when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State should take into account:
- *its potential benefits, including the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits;*
 - *its potential adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.*
- 4.4** In this context, environmental, safety, social and economic benefits and adverse impacts, should be considered at national, regional and local levels. These may be identified in this NPS, or elsewhere.
- 4.5** Applications for road and rail projects (with the exception of those for SRFIs, for which the position is covered in paragraph 4.8 below) will normally be supported by a business case prepared in accordance with Treasury Green Book principles. This business case provides the basis for investment decisions on road and rail projects. The business case will normally be developed based on the Department's Transport Business Case guidance and WebTAG guidance. The economic case prepared for a transport business case will assess the economic, environmental and social impacts of a development. The information provided will be proportionate to the development. This information will be important for the Examining Authority and the Secretary of State's consideration of the adverse impacts and benefits of a proposed development. It is expected that NSIP schemes brought forward through the development consent order process by virtue of Section 35 of the Planning Act 2008, should also meet this requirement.

Environmental Impact Assessment

4.15 All proposals for projects that are subject to the European Union's Environmental Impact Assessment Directive⁵² and are likely to have significant effects on the environment, must be accompanied by an environmental statement (ES), describing the aspects of the environment likely to be significantly affected by the project. The Directive specifically requires an environmental impact assessment to identify, describe and assess effects on human beings,⁵⁴ fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them. Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 sets out the information that should be included in the environmental statement including a description of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project, and also the measures envisaged for avoiding or mitigating significant adverse effects. Further guidance can be found in the online planning portal. When examining a proposal, the Examining Authority should ensure that likely significant effects at all stages of the project have been adequately assessed. Any requests for environmental information not included in the original environmental statement should be proportionate and focus only on significant effects. In this NPS, the terms 'effects', 'impacts' or 'benefits' should accordingly be understood to mean likely significant effects, impacts or benefits.

Habitats Regulations Assessment

4.25 Where a development may negatively affect any priority habitat or species on a site for which they are a protected feature, any Imperative Reasons of Overriding Public Interest (IROPI) case would need to be established solely on one or more of the grounds relating to human health, public safety or beneficial consequences of primary importance to the environment.

Alternatives

4.26 Applicants should comply with all legal requirements and any policy requirements set out in this NPS on the assessment of alternatives. In particular:

- *The EIA Directive requires projects with significant environmental effects to include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.*
- *There may also be other specific legal requirements for the consideration of alternatives, for example, under the Habitats and Water Framework Directives.*
- *There may also be policy requirements in this NPS, for example the flood risk sequential test and the assessment of alternatives for developments in National Parks, the Broads and Areas of Outstanding Natural Beauty (AONB).*

Criteria for "good design" for national network infrastructure

4.34 Whilst the applicant may only have limited choice in the physical appearance of some national networks infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, landform and vegetation.

Climate change adaptation

- 4.37** This section sets out how the NPS puts Government policy on climate change adaptation into practice, and in particular how applicants and the Secretary of State should take the effects of climate change into account when developing and consenting infrastructure. Climate change mitigation is essential to minimise the most dangerous impacts of climate change, as previous global greenhouse gas emissions have already committed us to some degree of continued climate change for at least the next 30 years. Climate change is likely to mean that the UK will experience hotter, drier summers and warmer, wetter winters. There is an increased risk of flooding, drought, heatwaves, intense rainfall events and other extreme events such as storms and wildfires, as well as rising sea levels.
- 4.38** Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the provision of green infrastructure.
- 4.40** New national networks infrastructure will be typically long-term investments which will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the impacts of climate change when planning location, design, build and operation. Any accompanying environment statement should set out how the proposal will take account of the projected impacts of climate change.

Chapter 5. Generic impacts

Overview

- 5.2** Sufficient relevant information is crucial to good decision-taking, particularly where formal assessments are required (such as Environmental Impact Assessment, Habitats Regulations Assessment and Flood Risk Assessment). To avoid delay, applicants should discuss what information is needed with statutory environmental bodies as early as possible.

Biodiversity and ecological conservation

- 5.20** Biodiversity is the variety of life in all its forms and encompasses all species of plants and animals and the complex ecosystems of which they are a part. Government policy for the natural environment is set out in the *Natural Environment White Paper* (NEWP). The NEWP sets out a vision of moving progressively from net biodiversity loss to net gain, by supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks that are more resilient to current and future pressures. Geological conservation relates to the sites that are designated for their geology and/or their geomorphological importance.
- 5.22** Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems.

- 5.23** The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.
- 5.24** The Government's biodiversity strategy is set out in *Biodiversity 2020: A Strategy for England's wildlife and ecosystem services*. Its aim is to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people. This aim needs to be viewed in the context of the challenge of climate change: failure to address this challenge will result in significant impact on biodiversity.
- 5.25** **As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought.**
- 5.26** In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment.
- 5.32** **Ancient woodland is a valuable biodiversity resource** both for its diversity of species and for its longevity as woodland. **Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss.** Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.
- 5.33** Development proposals potentially provide many opportunities for building in beneficial biodiversity or geological features as part of good design.⁸⁰ When considering proposals, the Secretary of State should consider whether the applicant has maximised such opportunities in and around developments. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered.
- 5.36** Applicants should include appropriate mitigation measures as an integral part of their proposed development, including identifying where and how these will be secured. In particular, the applicant should demonstrate that:
- *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;*

- *during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised (including as a consequence of transport access arrangements);*
- *habitats will, where practicable, be restored after construction works have finished;*
- *developments will be designed and landscaped to provide green corridors and minimise habitat fragmentation where reasonable;*
- *opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the 'greening' of existing network crossing points, the use of green bridges and the habitat improvement of the network verge.*

5.123 Some heritage assets have a level of significance that justifies official designation. Categories of designated heritage assets are: World Heritage Sites; Scheduled Monuments; Listed Buildings; Protected Wreck Sites; Protected Military Remains; Registered Parks and Gardens; and Registered Battlefields; Conservation Areas.

5.130 The Secretary of State should take into account the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets, the contribution of their settings and the positive contribution that their conservation can make to sustainable communities – including their economic vitality. The Secretary of State should also take into account the desirability of new development making a positive contribution to the character and local distinctiveness of the historic environment. The consideration of design should include scale, height, massing, alignment, materials, use and landscaping (for example, screen planting).

5.132 Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset, the greater the justification that will be needed for any loss.

Appendix 2: National Planning Policy Framework 2012

The National Planning Policy Framework (NPPF) set out the Government's planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF).

Introduction:

- 7 *There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:*
- **an environmental role** – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

Achieving Sustainable Development:

Chapter 10: Meeting the challenge of climate change, flooding and coastal change

- 95** *To support the move to a low carbon future, local planning authorities should:*
- *plan for new development in locations and ways which reduce greenhouse gas emissions*
- 99** *Local Plans should take account of climate change over the longer term, including factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.*

Chapter 11: Conserving and enhancing the natural environment

- 109** *The planning system should contribute to and enhance the natural and local environment by:*
- *Protecting and enhancing valued landscapes, geological conservation interests and soils;*
 - *Recognising the wider benefits of ecosystem services; and*
 - *Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.*
- 114** *Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.*

117 *Local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. To minimise impacts on biodiversity and geodiversity, planning policies should:*

- *Plan for biodiversity at a landscape-scale across local authority boundaries; identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;*
- *Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan; and, _ Aim to prevent harm to geological conservation interests; and where Nature Improvement Areas are identified in Local Plans, consider specifying the types of development that may be appropriate in these Areas.*

118 *When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*

- *If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.*
- *Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly*
- *outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;*
- *Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *Opportunities to incorporate biodiversity in and around developments should be encouraged; and,*
- ***Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and.***
- *the following wildlife sites should be given the same protection as European sites:*
 - *potential Special Protection Areas and possible Special Areas of Conservation;*
 - *listed or proposed Ramsar sites; and*
 - *sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

119 *The presumption in favour of sustainable development (paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.*

Chapter 12: Conserving and enhancing the historic environment

132 *When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. As heritage assets are irreplaceable, any harm or loss should require clear and convincing justification. Substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.*

Plan-making

Local Plans

156 *Local planning authorities should set out the strategic priorities for the area in the Local Plan. This should include strategic policies to deliver:*

- *climate change mitigation and adaptation, conservation and enhancement of the natural and historic environment, including landscape.*

157 *Crucially, Local Plans should:*

- *plan positively for the development and infrastructure required in the area to meet the objectives, principles and policies of this Framework;*
- *be drawn up over an appropriate time scale, preferably a 15-year time horizon, take account of longer term requirements, and be kept up to date;*
- *be based on co-operation with neighbouring authorities, public, voluntary and private sector organisations;*
- *indicate broad locations for strategic development on a key diagram and land-use designations on a proposals map;*
- *allocate sites to promote development and flexible use of land, bringing forward new land where necessary, and provide detail on form, scale, access and quantum of development where appropriate;*
- *identify areas where it may be necessary to limit freedom to change the uses of buildings, and support such restrictions with a clear explanation;*
- *identify land where development would be inappropriate, for instance because of its environmental or historic significance; and*
- *contain a clear strategy for enhancing the natural, built and historic environment, and supporting Nature Improvement Areas where they have been identified.*

Environment

165. *Planning policies and decisions should be based on up-to-date information about the natural environment and other characteristics of the area including drawing, for example, from River Basin Management Plans. Working with Local Nature Partnerships where appropriate, this should include an assessment of existing and potential components of ecological networks. A sustainability appraisal which meets the requirements of the European Directive on strategic environmental assessment should be an integral part of the plan preparation process, and should consider all the likely significant effects on the environment, economic and social factors.*

Appendix 3: National Planning Practice Guidance

As highlighted in the Natural Environment section of the NPPG under Biodiversity and ecosystems, the Forestry Commission consider the following sections to be relevant:

What are local ecological networks and what evidence should be taken into account in identifying and mapping them?

The components of an ecological network are explained at section 2.12 of the Natural environment white paper²⁶.

Relevant evidence in identifying and mapping local ecological networks includes:

- the broad geological, geomorphological and bio-geographical character of the area, creating its main landscapes types;*
- key natural systems and processes within the area, including fluvial and coastal;*
- the location and extent of internationally, nationally and locally designated sites;*
- the distribution of protected and priority habitats and species²⁷;*
- areas of irreplaceable natural habitat²⁸, such as ancient woodland or limestone pavement, the significance of which may be derived from habitat age, uniqueness, species diversity and/or the impossibilities of re-creation;*
- habitats where specific land management practices are required for their conservation;*
- main landscape features which, due to their linear or continuous nature, are important for the migration, dispersal and genetic exchanges of plants and animals, including any potential for new habitat corridors to link any isolated sites that hold nature conservation value, and therefore improve species dispersal;*
- areas with potential for habitat enhancement or restoration, including those necessary to help biodiversity adapt to climate change or which could assist with the habitats shifts and species migrations arising from climate change;*
- an audit of green space within built areas and where new development is proposed;*
- information on the biodiversity and geodiversity value of previously developed sites and the opportunities for incorporating this in developments; and*
- areas of geological value which would benefit from enhancement and management.*

How are ecosystems services taken into account in planning?

The National Planning Policy Framework states that the planning system should recognise the wider benefits of ecosystem services. Information about ecosystems services is in Biodiversity 2020: A strategy for England's biodiversity and ecosystems services²⁹. An Introductory guide to valuing ecosystems services³⁰ has also been published by Defra along with a practice guide, which could, where appropriate, inform plan-making and decision-taking on planning applications. The National pollinator

²⁶ <https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature>

²⁷ <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications>

²⁸ <https://www.gov.uk/guidance/protected-sites-and-areas-how-to-review-planning-applications>

²⁹ <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>

³⁰ <https://www.gov.uk/government/publications/an-introductory-guide-to-valuing-ecosystem-services>

strategy: for bees and other pollinators in England³¹ is a 10 year plan to protect pollinating insects which support our food production and the diversity of our environment.

(Relevant to NPPF paragraph 109)

How can I find out whether an area is 'ancient woodland'?

A starting point to establish whether an area is ancient woodland is to look at the relevant ancient woodland inventory. These inventories comprise county maps of sites (generally greater than 2 hectares) that are thought to have been continuously wooded since 1600 AD. The national inventory³² is published and updated by Natural England. Both Ancient Semi-Natural Woodland (ASNW) as well as Plantations on Ancient Woodland Sites (PAWS) are ancient woodland. Both types should be treated equally in terms of the protection afforded to ancient woodland in the National Planning Policy Framework.³³

How can I find out whether trees that could be affected by a development proposal are 'aged or veteran' trees?

Guidance on the features and importance of veteran trees³⁴ is provided by Natural England. Local Records Centres and other organisations with an interest in trees may be able to advise on the location of known veteran trees.

(Relevant to NPPF paragraph 118)

³¹ <https://www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england>

³² http://www.gis.naturalengland.org.uk/pubs/gis/tech_aw.htm

³³ <https://www.gov.uk/guidance/natural-environment#biodiversity-and-ecosystems>

³⁴ <http://publications.naturalengland.org.uk/publication/75035>

Appendix 4: other relevant documents

The UK Forestry Standard³⁵ (4th edition published August 2017)

Page 22-23 "Areas of woodland are material considerations in the planning process and may be protected in local authority Area Plans. These plans pay particular attention to woods listed on the Ancient Woodland Inventory and areas identified as Sites of Local Nature Conservation Importance SLNCIs).

Natural England Commissioned Report (NERC 132) Edition 3: Literature review and analysis of the effectiveness of mitigation measures to address environmental impacts of linear transport infrastructure on protected species and habitats³⁶ (Published November 2013)

Contents: "translocation of ancient woodland soils and coppiced stools does not imply that these methods mitigate the loss of ancient woodland. Ancient woodland is an irreplaceable resource, the loss of which cannot be mitigated or compensated."

Table 4.1: the measure should not be interpreted as a successful means of mitigating the fragmentation of ancient woodland; a resource which cannot be re-created through tree planting or habitat translocation due to its complex structure and wider-ranging biodiversity.

European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment³⁷ (published 2013)

"climate change and biodiversity are generally complex issues with long-term impacts and consequences. EIAs that aim to properly address biodiversity and climate should take this into account and assess the combined impact of any number of different effects. This requires an understanding of evolving baseline trends and an assessment of the cumulative effects of the project on the changing baseline."

BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations³⁸ (published April 2012)

Trees are important elements of green infrastructure, contributing to urban cooling through evapotranspiration and providing micro-climatic effects that can reduce energy demands in buildings. They therefore represent a key resource that can significantly contribute to climate change adaptation.

Impacts of nearby development on ancient woodland – addendum³⁹ (published December 2012)

"If disturbance of ancient woodland is to take place then it is vital that the ecology of the wood is well documented and understood before the disturbance takes place. The connection between that woodland and other woods or remnants of woods in the area also needs to be understood as connectivity between patches of woodland is important for promoting species diversity within a landscape. Structural complexity of both the interior of the wood and the woodland edges should also be ensured to maintain habitat quality. Any restoration of woodland patches should be spatially targeted to ensure maximum success."

³⁵ <https://www.forestry.gov.uk/ukfs>

³⁶ <http://publications.naturalengland.org.uk/publication/6184646404472832>

³⁷ <http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>

³⁸ <https://shop.bsigroup.com/ProductDetail/?pid=00000000030213642>

³⁹ <https://www.woodlandtrust.org.uk/mediafile/100168353/Impacts-of-nearby-development-on-the-ecology-of-ancient-woodland-addendum.pdf>

Biodiversity 2020: a strategy for England's wildlife and ecosystem services⁴⁰ (published August 2011).

Paragraph 2.16 - Further commitments to protect ancient woodland and to continue restoration of Plantations on Ancient Woodland Sites (PAWS).

Natural Environment White Paper "The Natural Choice"⁴¹ (published June 2011)

Paragraph 2.53 - This has a "renewed commitment to conserving and restoring ancient woodlands".

Paragraph 2.56 - "The Government is committed to providing appropriate protection to ancient woodlands and to more restoration of plantations on ancient woodland sites".

Impacts of nearby development on the ecology of ancient woodland⁴² (published October 2008)

Ancient woodland is a functionally irreplaceable resource for biodiversity that is also an important part of our cultural heritage. The aim of this review is to synthesise existing literature on the direct, indirect and cumulative effects of development on nearby woodland.

Natural Environment and Rural Communities Act 2006⁴³ (published October 2006)

Section 40(1) imposes a duty to conserve biodiversity:

"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."

Section 40(3) of the Act explains that:

"Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat".

The duty applies to all public body (including government departments and local authorities) and extends beyond just conserving what is already there to carrying out, supporting and requiring actions that may also restore or enhance biodiversity.

Keepers of Time⁴⁴ (published June 2005)

A Statement of Policy for England's Ancient and Native Woodland.

Page 10 "The existing area of ancient woodland should be maintained and there should be a net increase in the area of native woodland".

A Habitats Translocation Policy for Britain⁴⁵ (published July 2003)

"Available information shows that it is not possible to move species assemblages without substantial changes taking place in the structure of the habitat and its species composition, thus rendering the translocation unsuccessful."

Veteran Trees: A guide to good management⁴⁶ (published February 2000)

⁴⁰ <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>

⁴¹ <https://www.gov.uk/government/news/natural-environment-white-paper-discussion-document-record-response>

⁴² <https://www.woodlandtrust.org.uk/mediafile/100168350/Impacts-of-nearby-development-on-the-ecology-of-ancient-woodland.pdf>

⁴³ <http://www.legislation.gov.uk/ukpga/2006/16/section/40>

⁴⁴ <https://www.forestry.gov.uk/keepersoftime>

⁴⁵ http://jncc.defra.gov.uk/pdf/habitats_policy.pdf

⁴⁶ <http://publications.naturalengland.org.uk/publication/75035>

This handbook provides understanding of best practice in veteran tree management. It gives practical advice on all aspects of managing veteran trees, their habitats and dependent species. All is set in context by an understanding of the way in which trees grow, age and decay.



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Ms Gail Boyle
Senior EIA and Land Rights Advisor
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

Your reference: TR010030-TR010030000008

11 January 2018

Dear Gail

Re: Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) – Regulations 10 and 11

Application by Highways England for an Order granting Development Consent for the M25 Junction 10/A3 Wisley Interchange Improvement

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

I refer to your letter dated 13 December 2017 regarding the above matter and to your request that the local planning authority:

- Inform the Secretary of State of the information we consider should be provided in the Environmental Statement; or
- Confirm that we do not have any comments.

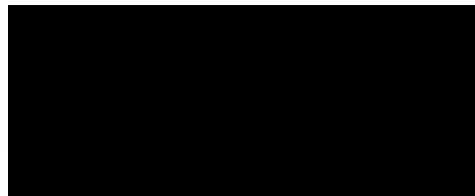
The Council has reviewed Highways England's Regional Investment Programme M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report dated 6 December 2017.

This review was a significant task, which was made more challenging by the consultation period running across the Christmas and New Year period. For this reason, the Council commissioned Mott MacDonald Ltd to assist with this review.

The Council has a number of comments with respect to the information that we consider should be provided in the Environmental Statement in order to ensure thorough and appropriate environmental assessment is undertaken and suitable mitigation implemented. The Council's comments are set out in the Statement of Comments/Observations in Appendix 1 of this letter.

The Council would welcome further consultation with Highways England as the scheme progresses. If you need any further assistance or wish to discuss any matters arising, please feel free to contact me.

Yours sincerely



Tracey Coleman
Director of Planning and Regeneration

Appendix 1 – Statement of Comments/Observations on the Regional Investment Programme
M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report 06/12/17

Appendix 1 – Statement of Comments/Observations on the Regional Investment Programme M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report 06/12/17

Promoter	Highways England
Stakeholder Reviewer	Guildford Borough Council
Document Reviewed	Regional Investment Programme M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report 06/12/17

ID	Chapter/ Topic/ Section	Comments/Observations
1	General Comment	The Scoping Report details potential mitigation measures within each topic chapter, however the report does not consider any environmental enhancement measures (measures that go above and beyond mitigation) - the Council believes enhancement measures should be considered throughout the preliminary design of the Scheme due to the sensitive nature of the environment in this location.
2	Chapter 1 Introduction / Section 1.2.4	The local planning authority is not the decision maker for the project.
3	Chapter 1 Introduction / Section 1.4.6	Noted that an Equality Impact assessment (EqIA) and Health Impact Assessment (HIA) will be reported separately to EIA.
4	Chapter 1 Introduction / Section 1.4.6	It is understood that a separate HIA will be undertaken for the Scheme, however It is not clear whether 'population and human health' will be considered in the ES - in accordance the Infrastructure Planning (EIA) Regulations 2017 this needs to be considered and reported in the ES. It should be made clear in the ES where this will be considered.
5	Chapter 1 Introduction / Section 1.7.3	Should use the title of the organisation of 'Guildford Borough Council' rather than the words 'Borough of Guildford'. (We note that the paragraph uses the title 'Elmbridge Borough Council' for the neighbouring lower tier authority.)
6	Chapter 1 Introduction / Section 1.7.3	The Scoping Report has not taken into account the Guildford borough Proposed Submission Local Plan: strategy and sites (Guildford Borough Council, June 2017), which was consulted upon under Regulation 19 of the Town and Country Planning (Local Planning) (England) Regulations 2012, or the Guildford Borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017).

7	Chapter 1 Introduction / Section 1.7.3 and Table 1.2	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Paragraph 216 of the National Planning Policy Framework (DCLG, March 2012) states that 'From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to: • the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given); • the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and • the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).' Whilst the emerging plan currently carries limited weight in decision taking, the weight will increase as we move through the examination process (in particular after the initial hearing sessions which are expected to begin in spring/early summer 2018) and ultimately to full weight at adoption of the new plan (current timetable indicates adoption in December 2018). Given the timescales of this project and the expected Local Plan timetable, we would suggest that the assessment takes into account those in the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017), in particular the following policies: • Policy S2: Planning for the borough - our spatial development strategy • Policy P5: Thames Basin Heaths Special Protection Area • Policy ID1: Infrastructure and delivery, which cross-references at point (4) the Appendix C Infrastructure Schedule of which schemes referenced SRN3, SRN5, SRN9 and SRN10 are of relevance. • Policy ID2: Supporting the Department for Transport's 'Road Investment Strategy' • Policy ID3: Sustainable transport for new developments • Policy A35: Former Wisley airfield, Ockham • Policy A38: Land to the west of West Horsley • Policy A39: Land near Horsley railway station, Ockham Road North, East Horsley • Policy A40: Land to the north of West Horsley • Policy A43: Land at Garlick's Arch, Send Marsh/Burnt Common and Ripley • Policy A43a: Land for new north facing slip roads to/from A3 at Send Marsh/Burnt Common • Policy A58: Land around Burnt Common warehouse, London Road, Send.

8	Chapter 2 The Project/ Section 2.3.2	Overall it is recognised that the location of the Scheme is set in a visually attractive area with a large amount of public open space. The M25 Junction 10/A3 Wisley Interchange junction is set within a predominantly wooded area to the south-west of Cobham and south of Byfleet and it is an attractive area despite the presence of the A3 and M25. Much of the area around junction is covered by the internationally designated Thames Basin Heaths Special Protection Area (SPA) and nationally designated Ockham and Wisley Commons Site of Special Scientific Interest (SSSI), as well as designations as a Local Nature Reserve (LNR), Site of Nature Conservation Interest (SNCI) and ancient woodland. The Council would like reassurance that the construction and operation of the Scheme would not significantly impact on the visually appealing setting of the area and on the ecologically designated sites. The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) states as one of its Strategic Objectives is "To protect those areas designated as Thames Basin Heaths Special Protection Area, Special Areas of Conservation, Sites of Special Scientific Interest and Areas of Outstanding Natural Beauty for their biodiversity and landscape characteristics".
9	Chapter 2 The Project/ Section 2.4.15	Specific construction, operational and long term management arrangements are not known in detail at this stage of the Scheme. Potential locations of construction compounds for the contractor have been identified and are included within the temporary land take for the Scheme. However, the Scoping Report does not detail where the construction compounds are to be located. Depending on the location these could have impacts on human health due to construction dust and noise. The Council would like to know where abouts the contractor construction compounds are planning on being located? Please note that; previously part of the former Wisley Airfield has been used as a construction depot. Please can the site of any depot be identified, as the old airfield site use has and is the subject of considerable local concern regarding both permanent and temporary use.
10	Chapter 3 Alternatives	A good level of detail has been given regarding the alternative options considered, at this scoping stage. A little more detail focussing on the differences in environmental effects from each option would be useful in the ES.
11	Chapter 4 Scope of the Assessment / Section 4.1.3	It has not been made clear where 'Population and Human Health' is covered under existing topics - this should be clarified in the ES. We also recommended that a combined / cumulative assessment is undertaken for human health, to assess the cumulative impact on human health from the Scheme, acknowledging the outcomes of assessment on human health in each of the relevant environmental topics.

12	Chapter 4 Scope of the Assessment / Section 4.3.25	The study area outlined here for Materials and Waste only considers waste arisings (within the County of Surrey), and does not consider the study area used for (the source of) material resources. This should be outlined here as per Paragraph 12.2.2 in Chapter 12 Materials and Waste.
13	Chapter 4 Scope of the Assessment / Section 4.3.30	It has been noted that a Habitat Regulation Assessment (HRA) will be undertaken in regards to the Thames Basin Heaths SPA European designated site. The Council is concerned because at this stage the HRA screening matrix has identified that Significant effects on habitats are considered likely. Consultation with Natural England has been mentioned in the Scoping report as ongoing. The Council would like to see evidence of the outcomes of such consultation and would expect Highways England to implement appropriate mitigation to ensure that no significant effects on the SPA would result.
14	Chapter 5 Air Quality / General Comment	This chapter of the scoping report closely follows all required DMRB guidance and considered appropriate for the assessment of impacts from large road schemes.
15	Chapter 5 Air Quality / Section 5.4	The background monitoring data does not include the most up to date data from the 2017 Air Quality Annual Status Report (ASR) (Guildford Borough Council, July 2017) that sets out: • The declaration of an AQMA in The Street, Compton. • The Ministerial direction dated July 2017 for Guildford Borough Council amongst other councils to undertake a Feasibility Study of air quality in and around the A331, this location having been identified by Defra's PCM model. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633803/air-quality-direction-2017.pdf . Whilst both of these sites are some distance from M25 Junction 10, the assessment criteria that the Council is required by the Joint Air Quality Unit (JAQU) at Defra to use for the A331 study is somewhat different to that used in the Local Air Quality Management (LAQM) process. Accordingly, we would ask HE to explain why it does not propose to use the assessment criteria that the Council is required by the Joint Air Quality Unit (JAQU) at Defra to use for the A331 study. For the A331 study, the receptor is defined as being the nearest public access, not residence or other receptor as in LAQM process (which is what HE appears to be proposing to use - see para 5.4.14). It is noted that Defra's PCM has not covered this area, but we do believe that parts of the A3 have been assessed with this model to date.

16	Chapter 5 Air Quality paragraph 5.4.13	It is not clearly stated which scenario has been used from the PCM model (baseline, CAZ or CAZ + additional measures.) Baseline scenario should be used to provide a worst case assessment.
17	Chapter 5 Air Quality paragraph 5.6.1	Modelling of construction vehicles would be welcomed. The number of construction vehicles for construction should be quantified. A clear rationale for scoping out a simple or detailed construction phase assessment should be included in the EIA when construction vehicle numbers are available.
18	Chapter 5 Air Quality / Section 5.7.6	This section notes that a simple level of assessment will be undertaken for regional emissions of NOx, PM10 and CO2 for the opening and design years, no reasoning has been given regarding this decision - this needs to be clarified in the ES.
19	Chapter 5 Air Quality paragraph 5.7.7	The EIA should confirm that the opening year (currently 2022) is worst case in terms of air quality impacts.
20	Chapter 5 Air Quality paragraph 5.7.20	We note that there will be consideration of vulnerability to major accidents and disasters. If this is included within the assessment, modelling of short term impacts should be undertaken in accordance with Defra guidelines.
21	Chapter 5 Air Quality / Section 5.8	Consultation - which local authorities will be consulted with in terms of ensuring relevant receptors are included in assessment, as the scoping report mentions several local authorities that are both within and without the ARN area? The Council requests more information on the level of consultation that has occurred to date.
22	Chapter 6 Noise and Vibration / Overall	Overall this document describes noise policy and the assessment methodology in general terms but, with the exception of consideration of receptors and NIAs, does not address the specific issues relating to this scheme in any great detail. This is appropriate at the scoping stage but more detail will be required as the project progresses.
23	Chapter 6 Noise and Vibration / Section 6.2.3	6.2.3 states that the study area has been determined, but the subsequent para. 6.2.4 states that it will be determined. In either case, it would be helpful if the text made clear whether this is the study area for operational noise only or for both construction and operation. This needs to be made very clear in the ES.
24	Chapter 6 Noise and Vibration / Section 6.4.10	There are a large number of Noise Important Areas (NIAs) that have been identified within the study area.

25	Chapter 6 Noise and Vibration / Section 6.5	The construction phase is potentially controlled by the Control Of Pollution Act 1974 and it is recommended that a Section 61 Prior Consent application is made to the local authority. It may need to be cross boundary with Elmbridge BC. The detail will need to be comprehensive, but is usually dealt with at the start of construction.
26	Chapter 6 Noise and Vibration / Section 6.7.1	The location of the baseline noise surveys should be agreed with the Council. The Council is aware of the proximity of the dwellings in Pond Farm, Wisley Village, Foxwarren Park and Katz Castle (both in Redhill Road), and would like to raise if they require additional noise measures.
27	Chapter 6 Noise and Vibration / Overall	The document does not state how night-time noise will be calculated or assessed. This needs to be clarified in the ES.
28	Chapter 6 Noise and Vibration / Overall	Aircraft noise is mentioned as a potential noise source. The document does not specify how this source of noise will be (a) calculated or (b) combined with road traffic noise. In this context, it is noted that the L10 noise index used for road traffic noise cannot be used directly for aircraft noise which is transient.
29	Chapter 6 Noise and Vibration / Overall	Although SOAEL is mentioned, the criteria for a significant adverse impact are not. In particular, it would be helpful to know if a significant adverse effect is associated simply with receptors exposed to noise levels above SOAEL or if there is also a requirement for a particular increase (such as the values of 1dB or 3dB cited in 6.2.1 in the short term and long term respectively.) Note that current advice from HE is that a significant adverse effect arises when receptors are exposed to noise above SOAEL and there is an increase of 1dB in either the short term or long term.
30	Chapter 6 Noise and Vibration / Overall	The document sets out the case for the definition of LOAEL and SOAEL but does not propose any values for these so they are not available for discussion or review yet are a vital element of the assessment methodology.
31	Chapter 6 Noise and Vibration / Overall	It is not clear if vibration will/not be within scope of the assessment.
32	Chapter 7 Biodiversity / Section 7.3	The planning and policy context section does not refer to policy NRM6 Thames Basin Heaths Special Protection Area of the South East Plan. This is probably the most significant policy for the SPA. Note: The South East Plan has not been fully withdrawn - NRM6 remains in force and carries full weight.

33	Chapter 7 Biodiversity / Section 7.4	The baseline section has no mention of badgers, otters or water vole - have these surveys/assessments not been undertaken yet or been scoped out? Please clarify these have not been mentioned in baseline conditions.
34	Chapter 7 Biodiversity / Section 7.4	There are 23 parcels of ancient woodland within 1 km of the Scheme. The Woodland Trust website identified no veteran trees within 50 m of the Scheme boundary. However, an arboriculture assessment of the Scheme footprint has not yet been conducted. This survey may identify additional veteran trees. We are highlighting this as a concern now and await details of the survey.
35	Chapter 7 Biodiversity / Section 7.4.3	There is one European designated SPA, three nationally designated SSSIs and one LNR within 2km of the scheme, this poses a large number of ecological constraints. In addition, two SACs where bats are listed as one of the qualifying features of the designation were identified within 30 km of the Scheme, and Seventeen SNCIs were identified within 2 km of the Scheme boundary. There is the need to ensure appropriate surveys and assessment are undertaken of all designated areas. The Surrey Transport Plan Environmental Report (Surrey County Council, January 2011) made recommendations that "any new transport related developments make use of land that is not known, or found to be on further investigation, of significant ecological value." In particular, it mentions the safeguarding of sites of national (SSSIs), international (Ramsar Sites) and European (SACs and SPAs) nature conservation importance and to protect European Protected Species from damage and harm. It also recommends that that any new transport related developments and all maintenance works be designed and delivered in ways that minimise any risks of damage, loss and disturbance to which the ecological assets of the areas affected might be exposed as a consequence of the projects. And that opportunities for habitat creation and enhancement associated with the further development or maintenance and improvement of the transport network and associated infrastructure be maximised. The Council is concerned over the appropriate safeguarding of nearby designated ecological in line with the Surrey Transport Plan Environmental Report (Surrey County Council, January 2011) recommendations.

36	Chapter 7 Biodiversity / Section 7.4.13 onwards	The Scoping report gives no detail as to the survey methodology/timings. For example, reptile presence/absence surveys were undertaken August to October 2017 but the number of surveys is not provided. Is it seven undertaken or was it more as you have the presence of EPS species such as sand lizard? Is it possible that smooth snakes have been missed by the surveys due to the months surveyed? When have dormouse checks been undertaken - April to November or were they stopped in September assuming a point score of 20 was achieved etc?. A little more detail in this section would have been beneficial for the reviewer to see, please ensure all this detail is outlined in the ES.
37	Chapter 7 Biodiversity / Section 7.5.2	The Scheme will involve an approximate permanent land take of 25.7 ha and an additional temporary land take of 32.8 ha. The Council is concerned because of this area the Scheme will cause the direct loss of approximately 22.4 ha of permanent land take of HPI habitat, and an additional 22.4 ha of temporary land take.
38	Chapter 8 Road Drainage and the Water Environment / Overall	Some aspects of the presentation could be improved for clarity over how the receptors and potential impacts will be assessed in the EIA compared to within the FRA and (updated) WFD assessments. A clearer link should be made to ecological aspects of the WFD that are mentioned in this chapter with the biodiversity / ecology chapter - it is cross-referenced in passing but as ecological value and impacts are mentioned throughout the chapter it should be made clear where these links will be made in the EIA. We have not reviewed the existing WFD Assessment as this is not in the Scoping Report appendices provided - albeit paragraph 8.4.13 states that full details of the scoping WFD assessment are provided in Appendix D - so have made no comment on its content or outcomes.
39	Chapter 8 Road Drainage and the Water Environment / Section 8.4.1	The following statement is not clear "WFD full walkover surveys of the affected watercourses and lakes will be undertaken as part of this stage". It is not clear if the walkover surveys have now been done at Scoping Stage or would be done during EIA?
40	Chapter 8 Road Drainage and the Water Environment / Sections 8.4.3 and 8.4.6, and Table 8.2	Four WFD surface water bodies are identified in 8.4.3 and Table 8.2 which are all rivers, and then a lake is added in 8.4.6. It would be better to include all in Table 8.2 as the lake is a surface water body. We recommend that for the ES the WFD water bodies are presented together and in a more clear and understandable format.

41	Chapter 8 Road Drainage and the Water Environment / Section 8.4.13	The WFD Assessment has been referred to in the text as Appendix D but Appendix D is not present in Scoping Document. Therefore this has not been reviewed.
42	Chapter 8 Road Drainage and the Water Environment / Section 8.4.17	Flood zones 2 and 3 are associated with nearby surface watercourses which are adjacent to the Scheme. In addition, the hydrogeological character of the study area means that groundwater flood risk may be an issue. This is an issue for the Council because a key recommendation of the Surrey Transport Plan Environmental Report (Surrey County Council, January 2011) was that "any new transport related developments make use of land that is not located in areas that are subject to significant risk of flooding from all sources, and that does not increase flood risk elsewhere as a consequence of the development."
43	Chapter 8 Road Drainage and the Water Environment / Section 8.6.3 and Table 8.5	This table seems unnecessarily overcomplicated and confuses resources and receptors. We recommend that more thought is taken into the presentation of information (especially in tables) in the ES.
44	Chapter 9 Landscape / Section 9.2	This section states that 'any effects upon landscape receptors/ on visual receptors beyond the study area are unlikely to be significant and have been scoped out of further assessment', however any elevated long distance views will need to be identified and considered in the assessment, if none exist then this should be stated.
45	Chapter 9 Landscape / Section 9.3	Guildford Borough Council has a Historic Parks and Gardens Gazetteer which includes the following sites within the area: ● Ockham Park, Ockham ● Dunsborough Park, Ripley ● Send Grove, Send ● Sendholme, Send ● Foxwarren Park, Wisley. These should be referred to/ruled in or out and included in Appendix F as non-designated heritage assets and also need to be considered in the landscape assessment.

46	Chapter 9 Landscape / Section 9.3.5	There are sections of the NPPF 2012 which would also be pertinent to this report including valuing landscapes (NPPF para 109) and visual impacts (NPPF para 143).
47	Chapter 9 Landscape / Section 9.3.18	Guildford Borough Council Local Plan 2003 Policy HE12 Historic Parks and Gardens applies as written. Although, in the main policy text for registered parks and gardens, the text also covers the further assessment of areas of historic landscape importance i.e. the gazetteer.
48	Chapter 9 Landscape / Section 9.4.5	Are RF7, RV4, SS10, SW6 LR2 character areas not considered relevant in this report?
49	Chapter 9 Landscape / Section 9.4	The main receptors include the users of PROWs and Wisley and Chatley Heath Commons. Other visual receptors include people in Painshill Park and RHS Garden Wisley, local communities, visitor to publicly accessible sites, schools, and road users.
50	Chapter 9 Landscape / Section 9.5.14	This paragraph seems to overstate the replacement environmental design. Environmental measures and reduction of environmental effects should be provided as standard and assessed as part of EIA.
51	Chapter 9 Landscape / Section 9.6	Will there be an assessment of lighting effects during construction and/or operation? We recommend including one.
52	Chapter 9 Landscape / Section 9.6.4	Will photomontages or photo visualisations will be provided? We recommend including this information in the ES. These should be AVRs (accurate visual representation).
53	Chapter 9 Landscape / Section 9.6.6	Is "Outline Landscape Design" different to a Preliminary Landscape Design, or are these comparable? Please make it clearer in the ES.
54	Chapter 9 Landscape / Section 9.6.7	Are the selection of "woodland areas around M25 Junction 10" and "Areas of vegetation including semi mature and mature trees, hedgerows along the road corridors approaches to the M25 Junction 10 junction" considered as receptors, consistent with the GLVIA3 guidance? Are these selected because they contain Open Access Land? Please make the justification clear in the ES.

55	Chapter 9 Landscape / Section 9.6.7	There may be some confusion between what an "effect" and a "receptor" are. An effect is the outcome of the impact upon a landscape character area as a receptor.
56	Chapter 9 Landscape / Section 9.6.7	Residential receptors appear to be missing from the list of landscape receptors that are scoped in.
57	Chapter 9 Landscape / Section 9.6.8	Table 9.3: There appears to be some confusion with what constitutes a "receptor" traditionally areas of vegetation and "effects" are not receptors.
58	Chapter 9 Landscape / Section 9.6.9	Table 9.4: The distance of receptors does not offer much detail on their relationship to the scheme. For example if RHS Wisley adjoins the scheme it is misleading to describe it as being with 2000m when other areas which "adjoin" are described at being 500m away.
59	Chapter 9 Landscape / Section 9.6.9	Table 9.4: There appears to be residential receptors missing from the table.
60	Chapter 9 Landscape / Section 9.7.2	Will design alternatives be covered in an separate preceding chapter and then revisited in this chapter? It may be more efficient to make a reference to their earlier inclusion.
61	Chapter 9 Landscape / Section 9.7.6	We recommend referring to IAN 135/10 (2.16 Table 1) on visual sensitivity and typical descriptors.
62	Chapter 9 Landscape / Section 9.8.1	The proposed consultation section should include likely actions and objectives of consultations and who consultees would be e.g. Identification of key views, Statutory Environmental Bodies etc.
63	Chapter 9 Landscape / Section 9.9.1	It would be helpful to include some assumptions and limitations that will effect the future assessment. These should include accessibility to receptors and representative views, the type of data used, whether site visits are undertaken in the summer or winter period etc.
64	Chapter 9 Landscape / Section 9.1	It would be helpful for the Conclusion to make some statements regarding an overview as to what has or has not been scoped in, and what the predicted effects are for landscape and visual receptors are as a whole.

65	Chapter 10 Geology and Soils / Section 10.2.1	A study area of 500m has been selected, however the 500m study area boundary has not identified on figure within Chapter 19. It would be useful to include this study area on the figure in the ES submission.
66	Chapter 10 Geology and Soils / Section 10.4	As part of the baseline conditions, is previous ground investigation information available (highlighted in 10.6.1 and 10.7.2, second bullet point) including ground model information? This should be considered for the ES.
67	Chapter 10 Geology and Soils / Section 10.4.2	Refers to BGS geological mapping, however, there is no further detail regarding the name/details of the map(s)/source of information. Is it possible to be more specific about what superficial deposits will be encountered and where? The text currently provides a general list and states that these deposits are anticipated. Same comment regarding bedrock. This should be taken on board for the details in the ES.
68	Chapter 10 ecology and Soils / Section 10.4.3	Historical landfills and other existing infrastructure anticipated to be present throughout the scheme - Is there any further details available? Please include these details in the ES.
69	Chapter 10 Geology and Soils / Section 10.4.4	No geological SSSIs or Local Geological Sites are located within the study area - assuming "study area" is within 500m? Please clarify this in the ES.
70	Chapter 10 Geology and Soils / Section 10.4.6	BGS mineral resources map identified that the western, southern and northern extents of the Scheme fall within sand and gravel mineral resource zones, associated with the River Wey and River Mole. Details of the mineral maps should be disclosed in the ES.
71	Chapter 10 Geology and Soils / Section 10.4.8	A review of the Highways Agency Geotechnical Data Management System (HAGDMS) was undertaken on 30 November 2017 and identified 96 No. earthworks and 21 No. geotechnical defects within the scheme extents - Will this information be detailed within a different report? It is recommended that this is included/appended to ES.
72	Chapter 10 Geology and Soils / Section 10.4.13 - 10.4.16	There are several water courses which are impacted by the scheme and could be affected in the event that contaminated shallow groundwater migrates towards them, and they could also be affected by surface water transport. Further discussion is within Chapter 8. Has the impact of the scheme on these individual water courses and potential mitigation measures been discussed? This needs to be considered in the ES.
73	Chapter 10 Geology and Soils / Section 10.4.17	We envisage that this information has been obtained by analysing the 1:250,000 ALC maps by Natural England. Is this correct/can a reference for this information be provided?

74	Chapter 10 Geology and Soils / Section 10.4.18	Noted that a full review of potentially contaminated land uses will be completed in the ES.
75	Chapter 10 Geology and Soils / Section 10.4.19	Historical landfill sites and a number of pollution incidents have been reordered within the study area. This should be referenced in the ES.
76	Chapter 10 Geology and Soils / Section 10.5	No impact on agricultural land are listed in the 'Potential impacts' in Section 10.5, however Section 10.10 indicates these may be present. This is more of an observation, as soils and agricultural land are scoped-in to be assessed further so their omission from 10.5 has not precluded further analysis.
77	Chapter 10 Geology and Soils / Section 10.6.1	Section 10.6.1 states "limited ground information is currently available for the scheme", however section 10.7.2, second bullet point states "Previous ground investigation and limited remediation have been undertaken at the site of the Scheme". Further clarification required about the ground investigation, slightly conflicting comment.
78	Chapter 10 Geology and Soils / Section 10.6.2	Providing an assessment of the groundwater regime at the site - As part of the contamination testing regime, will the surface water features be tested within the "study area" to confirm baseline levels? This needs to be clarified in the ES.
79	Chapter 10 Geology and Soils / Section 10.6.3	The ES will review the soils and geology issues at baseline, albeit based on desk based information only in the absence of ground investigation data which will not be available in time to be reported in the ES. Is data available from previous ground investigations undertaken? Limited ground investigation highlighted in section 10.6.1 and previous ground investigation highlighted within 10.7.2 second bullet point.
80	Chapter 10 Geology and Soils / Section 10.6.3	The Council is concerned that the scheme specific ground investigation data will not be available in time to be reported in the ES, and that this will jeopardise the validity of the assessment. The ground investigation results are required to inform appropriate mitigation measures.
81	Chapter 10 Geology and Soils / Sections 10.6.3 and 10.7.2	Section 10.6.3 states that ground investigation data will not be available to inform the ES, however in Section 10.7.2 it states that the ground investigation results will be used to inform the risk assessment, which will be produced before the impact assessment. Clarification is required as to when the ground investigation data/results will be available. If available, this data should be used to inform the EIA presented in the ES.
82	Chapter 10 Geology and Soils / Section 10.7.2	Highlighted previous ground investigation and limited remediation have been undertaken at the site. Can this ground model information be included with the baseline conditions? How old is this ground investigation and the contamination results? Has there been significant development since this GI and would these results be relevant?

83	Chapter 10 Geology and Soils / Section 10.7.26	It is considered that the proposed level and scope of assessment detailed in section 10.5 will be sufficient to assess baseline conditions - Is this based on using existing ground investigation data? Clarification is required as to whether the ground investigation data for the Scheme will be available to inform the ES.
84	Chapter 10 Geology and Soils / Overall	There are no Part IIA sites in Guildford Borough. Apart from the nearby commercial uses at former Wisley Airfield, Wisley Sewage works and RHS Garden Wisley, there are no known potentially contaminated sites within the area. Please note that a full historical search if required will only be conducted on payment of the appropriate fee to the Council.
85	Chapter 11 Cultural Heritage / General	Throughout the document there is a lack of reference to non designated built heritage assets. If these have not been assessed as part of this scoping exercise this needs to be included in the limitations. If they have been assessed then this needs to be more explicit in the assessment in the report.
86	Chapter 11 Cultural Heritage / Section 11.2.1	Can the study area be clarified. By alignment is it meant from the centre line, the works boundary, the carriageway edge? This needs to be clarified in the ES.
87	Chapter 11 Cultural Heritage / Section 11.2.1	We would like to know if the study area will be revised to reflect locations of works compounds, ecological mitigation, balancing ponds, replacement common? We recommend that it should be for the ES.

88	Chapter 11 Cultural Heritage / Section 11.3	National Planning Policy Framework – think this needs expanding to more fully reflect consideration of heritage assets and significance and how the report and evidence will appropriately acknowledge and respond, so for example: NPPF 128 – includes that applicants should ‘.....describe the significance of any heritage assets affected, including and contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk –based assessment and, where necessary, a field evaluation’. Perhaps link this more closely to how this has this already been considered (11.4 Baseline conditions), how will this be done for all areas where there are historic assets/ settings/ archaeological sites that may be effected, or within vicinity of works – including mapping, visuals, photomontages etc.. and how they have been considered ruled in or out.... NPPF Policy 131 includes the ‘desirability of new development making a positive contribution to local character and distinctiveness’ NPPF Policy 132 – When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the assets’ conservation. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting’..... ‘Substantial harm to or loss of designated heritage assets of the highest significance, notably scheduled monuments,.....grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.’

88 (cont)	Chapter 11 Cultural Heritage / Section 11.3 (cont)	NPPF Policy 133. 'Where a proposed development will lead to substantial harm to or loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss...' NPPF Policy 134 'Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including optimum viable use.' If there is some harm, but less than substantial harm to any heritage assets is identified (Wisley, Ockham, Painshill, settings etc ?) can the scheme be judged to balance this harm with protecting, but also assisting in for e.g. viability of RHS Wisley/others through for eg. improved access etc. as well as the wider public benefits to road users overall? Any mitigation to be provided that would limit harm identified...? NPPF Policy 135. The effect of an application on the significance of a non-designated heritage asset should be taken into account. In weighing applications that effect directly or non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset. (Need to consider for example impact on setting of gardens in the Guildford Borough Council has a Historic Parks and Gardens Gazetteer if appropriate/ or no impact) NPPF policy 139. Non –designated heritage assets of archaeological interest that area demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.
89	Chapter 11 Cultural Heritage / Section 11.3.3	The Scoping report just refers to non-designated archaeological assets. Definitions of all non-designated heritage assets should be included. Both NPS and NPPF note that all non designated assets should be taken into account in decision making. Please take this into account for the assessment at ES stage.
90	Chapter 11 Cultural Heritage / Section 11.3.7	The definition of substantial harm is incorrect and significantly plays down the level of harm required which would result in substantial harm. Total loss is substantial harm. See NPPG para 017 for a description of how to identify substantial harm, the NPPG description is not reflected here.
91	Chapter 11 Cultural Heritage / Section 11.3.8	Please clarify here that substantial harm to designated assets means a strong presumption against development. This needs to better reflect the balance between harm and public benefit i.e. the more harm the stronger the justification in terms of public benefit needs to be.

92	Chapter 11 Cultural Heritage / Section 11.3.7	The Council is concerned about the use of the word degradation. NPPF notes that deliberate neglect should not be taken into account in decision making. Can this be reflected in how degradation is defined here i.e. not deliberate neglect.
93	Chapter 11 Cultural Heritage / Section 11.3.9	Less that substantial harm needs defining in more detail. It is likely that most of the impacts/effects are going to result in less than substantial harm, therefore this section needs to be more robust in its definition. It particularly needs to show an understanding of the levels/spectrum of less than substantial harm and how this relates to the need to balance between the harm and the public benefits of a scheme.
94	Chapter 11 Cultural Heritage / Section 11.3.10	Please note that consultation on the Guildford borough Proposed Submission Local Plan: strategy and sites (Guildford Borough Council, June 2017) is now complete and that the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Examination is expected to begin in spring/early summer 2018 whilst the current published timetable anticipates adoption in December 2018. Paragraph 216 of the National Planning Policy Framework (DCLG, March 2012) states that 'From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to: • the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given); • the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and • the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).' Whilst the emerging plan currently carries limited weight in decision taking, the weight will increase as we move through the examination process (in particular after the initial hearing sessions which are expected to begin in spring/early summer 2018) and ultimately to full weight at adoption of the new plan (current timetable indicates adoption in December 2018). Given the timescales of this project and the expected Local Plan timetable, we would suggest that the assessment takes into account those in the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017).
95	Chapter 11 Cultural Heritage / Section 11.3.11	Policy HE6: Locally listed buildings - there doesn't seem to be any further discussion of locally listed buildings in the chapter to establish whether the scope for the ES will address this policy.

96	Chapter 11 Cultural Heritage / Section 11.3.11	Will there be any new highway developments within Ripley itself which is within a Conservation Area (such as changes to junctions on existing routes e.g. High Street, Newark Lane) or in Ockham, Send – whereby GBC local plan policies HE1 Proposals which effect Listed Buildings, HE4 New development which affects the setting of a listed building, and HE7 New development in Conservation Areas, may also be relevant and apply? Consideration should also be given to any possible knock on impact of traffic changes within sensitive areas such as Ripley, Ockham. Also, Ockham Mill (hamlet) is a Conservation Area with a number of listed buildings/ settings / views to consider.
97	Chapter 11 Cultural Heritage / Section 11.3.13	Legislation is erroneously included here. It needs to be included but is neither guidance or a standard. Also there is no mention of GPA2, Historic England Conservation principles or Ripley Conservation Area Appraisal - please can it be confirmed these were used to prepare the scoping report? Just a note that GPA3 has been updated since this was prepared and the new guidance should be used in the ES.
98	Chapter 11 Cultural Heritage / Section 11.4.2	There does not seem to be any non-designated built heritage in the gazetteer, or anything from a local list. As noted above, there does not seem to have been a comprehensive survey of non-designated built heritage to inform the scoping report. This needs to be done to inform the ES.
99	Chapter 11 Cultural Heritage / Section 11.4.4	The report notes listed buildings are scoped out due to visual connectivity with the scheme. Has the assessment considered other non-visual relationships which may contribute to setting (for example noise, relationship with other heritage assets, views across the scheme etc)? This needs to form part of the assessment to fully scope these assets out. Please refer to table 1 in GPA3 for fuller (but non exhaustive) list of factors which may contribute to setting.
100	Chapter 11 Cultural Heritage / Section 11.4.6	We observed that there are "no setting impacts", there needs to be a brief summary of why no setting impacts were identified so that the reason for scoping out can be fully appreciated.
101	Chapter 11 Cultural Heritage / Sections 11.4.7 and 11.4.8	No indication of what is scoped in or out - similar to how the section on designated assets is dealt with. Clarification is required as to what aspects are scoped in or out.
102	Chapter 11 Cultural Heritage / Section 11.5	There is no indication as to what is scoped in or scoped out of the assessment. It is assumed that everything mentioned in this section is scoped in, however can this be made more explicit?

103	Chapter 11 Cultural Heritage / Section 11.5	Areas for works and access for the development proposals? What land is to be used and where for temporary periods – will this effect or impact on heritage assets and landscapes and their settings. Any harm? Mitigation? Reinstatements. Other long term benefits that might be negotiated as part of the scheme?
104	Chapter 11 Cultural Heritage / Section 11.5.2	Please can "direct impacts" be clarified? Direct impacts can either be physical impacts to the asset or impacts to the setting. This should be clarified in the ES.
105	Chapter 11 Cultural Heritage / Section 11.5.6 - 11.5.9	Road widening in Ockham and any likely impact on setting of curtilage listed estate walls, gates and parkland as part of the Ockham Park estate – will any of these be affected?
106	Chapter 11 Cultural Heritage / Section 11.5.17	Are any impacts with regard to unknown archaeology expected at Elm Lane, as such is this scoped in or out? Clarification is required.
107	Chapter 11 Cultural Heritage / Section 11.6.4	Is non-intrusive investigation also proposed? Clarification is required.
108	Chapter 11 Cultural Heritage / Section 11.7.1	Not clear whether this is the methodology for ES or for the scoping report, assume it is the methodology proposed for ES - this needs to be explicit. The methodology used for the EIA needs to be fully outlined in the ES.
109	Chapter 11 Cultural Heritage / Section 11.7.1	Regarding archaeological evaluation, a programme should be designed and undertaken during preliminary design to inform the design and mitigation. The Council is concerned that if this is left to after detailed design, then there will be no opportunity to mitigate through avoidance of assets or design amendments to minimise the impact. It should be noted that evaluation and recording is not mitigation - para 141 of the NPPF notes "However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted".
110	Chapter 11 Cultural Heritage / Section 11.7.2	It is not clear whether this is how the ES will be assessed or how the scoping has been assessed.
111	Chapter 11 Cultural Heritage / Section 11.7.2	The mention of significance should be directly related to heritage significance as defined in the NPPF. Otherwise there is the potential for confusion with significance of effect as defined in EIA terms.

112	Chapter 11 Cultural Heritage / Section 11.7.3 and Table 11.2	In the example for very high and high, there is no mention of archaeological sites/remains. In negligible, are assets of no historic interest proposed to be included? If they are of no historic value then they are not a heritage asset as defined in the NPPF.
113	Chapter 11 Cultural Heritage / Section 11.7.4 and Table 11.3	The inclusion of harm in the description and nature of change is misleading and could lead to potential issues in defining where there is a significant impact/effect. Substantial and less than substantial harm are more nuanced than the definitions of major adverse/moderate adverse etc. Saying that all cases of less than substantial harm will result in a significant impact is misleading and could lead to incorrect assessments of the level of significant effect. Also, not all cases of Major adverse impact will be due to substantial harm and similarly may result in incorrect assessments. Limited harm used in minor adverse impact has no definition within policy. Unless better defined both in the table and in 11.3 policy terminology should not be incorporated into the ES assessment terminology. The same definition for the impact of physical alteration appears in both moderate and minor adverse impact leading to issues in defining the level of impact. The word significance is used throughout the table, there is the potential for the use of the word in the heritage context to lead to confusion when discussing significance of effect in the context of the ES assessment.
114	Chapter 11 Cultural Heritage / Section 11.7.5	It is not defined what significance of effect would constitute a significant effect. This needs to be outlined in the ES.
115	Chapter 11 Cultural Heritage / Section 11.7.6	First and fifth bullet point - can these be combined into a single "historic environment desk based assessment" to produce a more proportionate assessment as required by the NPPF? Bullet points two and three - this is confusing when read with 11.7.1 which suggests that all archaeological investigation will be undertaken during detailed design. Please can it be clarified when archaeological investigation/evaluation is expected to take place.
116	Chapter 11 Cultural Heritage / Section 11.7	Why are there two methodologies which appear to contradict each other. Can one methodology be described with reference to where this has been developed from?
117	Chapter 11 Cultural Heritage / Section 11.8	Consultation with the conservation officer or relevant planning officer needs to be undertaken alongside the other proposed stakeholder consultations. Also have the Gardens Trust been consulted with regard to the registered parks and gardens?

118	Chapter 11 Cultural Heritage / Section 11.9.1	Investigations proposed here do not constitute mitigation in policy terms (NPPF 141).
119	Chapter 11 Cultural Heritage / Section 11.10.1	Second bullet point - HER data should have been acquired to see if there was any potential for setting issues from the introduction of gantries - it should be obtained for the ES assessment.
120	Chapter 11 Cultural Heritage / Section 11.10.1	Third bullet point - how can setting be assessed if the compound is on the edge of the study area and may impact assets outside the study area. Study area should be amended when compound locations are known.
121	Chapter 11 Cultural Heritage / Section 11.11.1	This seems to suggest that all non designated assets are scoped in for assessment. This should be revised as it would not result in a proportionate assessment as required by policy.
122	Chapter 12 Materials and Waste / Section 12.2 Study Area	There is no mention of how the study area has been determined, the Council would expect the report to reference/explain that there is no study area for materials defined in the DMRB Vol 2. and as a result the study area has been determined through professional judgement by the influence of the proposed scheme rather than through a set geographical location.
123	Chapter 12 Materials and Waste / Section 12.3 Planning Policy and Context	The Council would recommend that in the ES the legislation section could be more concise and only relevant legislation should be included. Some key legislation and policy docs/guidance are missing e.g. landfill regs and the Waste Prevention Programme. We suggest removing legislation references to packaging, WEEE, asbestos, batteries and accumulators CLP and PCBs as these are quite specific and for road schemes, where relevant, are mainly covered under other legislation.
124	Chapter 12 Materials and Waste / Section 12.4 Baseline	The report states that it has been written in accordance with the IAN but does not reference DMRB Vol 2 Section 2 part 4, which is the overall document.

125	Chapter 12 Materials and Waste / Section 12.4 Baseline	The baseline section should be expanded on in the Scoping Report. It considers national material resources but not more local/regional sources, which is where the impact will be greater. In addition, the baseline data will need reviewing to include more up to date data and sources as it is currently limited to AMRs and Waste Interrogator tools, other sources are available through the DEFRA and EA statistical data and summaries.
126	Chapter 12 Materials and Waste / Section 12.4.12	Waste facilities within Surrey should be identified and reported in the waste baseline section of the ES.
127	Chapter 12 Materials and Waste / Section 12.5.2	The potential impacts section is missing quite a lot of detail, the Council recommend that the following details of impacts are included in the ES. ● Potential impacts/effects from all the material use/waste arisings associated with the project activity and the potential to generate significant effects such as import and use of aggregates and those associated with their generation and disposal of waste. ● Potential impacts associated with the use of material resources for the construction of the scheme is the potential depletion of virgin/natural/non-renewable resources - this has not been considered and also needs to be considered in the ES.
128	Chapter 12 Materials and Waste / Table 12.5	What is the source of the criteria for classifying the magnitude of environmental effects.
129	Chapter 12 Materials and Waste / Section 12.7	The general methodology is weak and needs emphasising. It currently focuses on hazardous waste which is only a small part of the waste generated. The proposed methodology needs to consider the level of assessment as identified in the DMRB.

130	Chapter 12 Materials and Waste / Section 12.9	The mitigation measures outlined in this section only consider measures to minimise the amount of waste generated. There is also no mention of a SWMP or CEMP. Mitigation measures to reduce the quantity of material resources required to construct the Scheme have not been considered. This should be considered throughout the design of the Scheme and the EIA, for example in line with the measures outlined in Surrey Transport Plan Environmental Report (Surrey County Council, January 2011) which states that "any new developments and all maintenance works maximise the use of recovered and recycled materials, prioritise the use of renewable material resources over non-renewable resources, and re-use materials wherever feasible". In addition, measures outlined in the Surrey Transport Plan Environmental Report (Surrey County Council, January 2011) to minimise waste generation include "any new developments and all maintenance works be designed and delivered in ways that minimise the generation of non-recoverable, non-recyclable and non-reusable waste materials". The ES will need to clarify where and how these materials will be used.
131	Chapter 12 Materials and Waste / Section 12.11	The conclusion does not emphasise why the specific level of assessment is being used or mentions that an SWMP or CEMP will be produced to consider the reuse/recycling of materials and the sourcing, transport, use and disposal of materials in a sustainable manner.
132	Chapter 12 Materials and Waste / General	There is no evidence that contaminated land is identified or how/what sources of information will be used to do this, but it is mentioned and is said to be considered separately. As this is a material/waste is needs to be considered in the ES as part of the waste assessment. There is also no cross reference to other specific topics e.g. transport for waste and materials import/export, air quality and contaminated land/geology and soils.
133	Chapter 13 People and Communities / Overall Comment	It is noted that agricultural land will be assessed within this chapter, however this has already been outlined that it will be assessed in Chapter 10 Geology and Soils - clarification is required as to how these assessments would differ and whether will be aligned with each other. It is recommended that the assessment is not repeated.

134	Chapter 13 / People and Communities / 13.3	The zone of influence for the 'People and Communities' environmental topic should include the village of Ripley as it is considered that the scheme, as presently proposed, is likely to increase traffic flows through this village. The present pattern of recurrent peak period traffic congestion in Ripley and associated adverse community and environmental impacts is a concern to Surrey County Council, the Local Highway Authority. In addition, further consideration should also be given to including other settlements nearby to the proposed scheme, including Wisley, Ockham, East Horsley and West Horsley, within the zone of influence for the 'People and Communities' environmental topic.
135	Chapter 13 / People and Communities / 13.3.28-13.3.32	Should use the title of the organisation of 'Guildford Borough Council' rather than the words 'Borough of Guildford'. (We note that the paragraphs above introduced by the title 'Elmbridge Borough Council' and those below by the title 'Woking Borough Council' for the neighbouring lower tier authorities.)
136	Chapter 13 / People and Communities / 13.3.31	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Examination is expected to begin in spring/early summer 2018 whilst the current published timetable anticipates adoption in December 2018.

137	Chapter 13 / People and Communities / 13.3.32	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Paragraph 216 of the National Planning Policy Framework (DCLG, March 2012) states that 'From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to:● the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given);● the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and● the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).' Whilst the emerging plan currently carries limited weight in decision taking, the weight will increase as we move through the examination process (in particular after the initial hearing sessions which are expected to begin in spring/early summer 2018) and ultimately to full weight at adoption of the new plan (current timetable indicates adoption in December 2018). Given the timescales of this project and the expected Local Plan timetable, we would suggest that the assessment takes into account those in the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017), in particular the following policies:● Policy S2: Planning for the borough - our spatial development strategy● Policy P5: Thames Basin Heaths Special Protection Area● Policy ID1: Infrastructure and delivery, which cross-references at point (4) the Appendix C Infrastructure Schedule of which schemes referenced SRN3, SRN5, SRN9 and SRN10 are of relevance.● Policy ID2: Supporting the Department for Transport's 'Road Investment Strategy'● Policy ID3: Sustainable transport for new developments● Policy A35: Former Wisley airfield, Ockham● Policy A38: Land to the west of West Horsley● Policy A39: Land near Horsley railway station, Ockham Road North, East Horsley● Policy A40: Land to the north of West Horsley● Policy A43: Land at Garlick's Arch, Send Marsh/Burnt Common and Ripley● Policy A43a: Land for new north facing slip roads to/from A3 at Send Marsh/Burnt Common● Policy A58: Land around Burnt Common warehouse, London Road, Send. In addition, we note that the NPSNN, at paragraph 5.165, states that 'The applicant should identify existing and proposed land uses near the project...', as is referred to in paragraph 13.3.5 of this draft Environmental Scoping Report.
138	Chapter 13 / People and Communities / 13.3	The Planning and Policy Context section, as presently drafted, is very long, but it is not clear to which planning policy or other social or economic policy or legislation, infrastructure policy or strategy, or transport policy, the Scheme will be required to respond.

139	Chapter 13/ People and Communities/ 13.4.7 to 13.4.9	Most of the land within the Scheme boundary does look like it would be non-agricultural. However, Grade 3 could be BMV land as it is split into Grade 3a (BMV land) and Grade 3b land (not BMV and medium value agricultural land), whilst there looks like there is a pocket of land near Hatchford End which looks like it could be Grade 1 ALC land.
140	Chapter 13 / People and Communities 1/ 3.4.7 - 13.4.9	Natural England's 1:250,000 ALC Maps have been used as background information for these paragraphs (as per reference 65). However: 1. Natural England state that the 1:250,000 maps are not sufficiently accurate to identify ALC on a site-by-site basis. 2. The 1:250,000 maps were created before the sub classification of Grade 3 land into Grade 3a (BMV) and Grade 3b (non-BMV). This could be made clearer in the text.
141	Chapter 13/ People and Communities/ 13.4.10	Will the impact assessment consider impacts on permissive or informal NMU routes as well (including impacts on NMU crossing points)?
142	Chapter 13/ People and Communities/ 13.4.11	Should use the title of the organisation of 'Guildford Borough Council' rather than the words 'Borough of Guildford', given that use the title of 'Elmbridge Borough Council' from paragraph 13.4.12.
143	Chapter 13/ People and Communities/ Table 13-1	Should use the title of the organisation of 'Guildford Borough Council' rather than the words 'Borough of Guildford', given that use the title of 'Elmbridge Borough Council' in Table 13-2.

144	Chapter 13/ People and Communities/ Table 13-1	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Paragraph 216 of the National Planning Policy Framework (DCLG, March 2012) states that 'From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to: • the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given); • the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and • the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).' Whilst the emerging plan currently carries limited weight in decision taking, the weight will increase as we move through the examination process (in particular after the initial hearing sessions which are expected to begin in spring/early summer 2018) and ultimately to full weight at adoption of the new plan (current timetable indicates adoption in December 2018). Given the timescales of this project and the expected Local Plan timetable, we would suggest that the assessment takes into account the site policies in the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017), in particular the following: • Policy A35: Former Wisley airfield, Ockham • Policy A38: Land to the west of West Horsley • Policy A39: Land near Horsley railway station, Ockham Road North, East Horsley • Policy A40: Land to the north of West Horsley • Policy A43: Land at Garlick's Arch, Send Marsh/Burnt Common and Ripley • Policy A43a: Land for new north facing slip roads to/from A3 at Send Marsh/Burnt Common • Policy A58: Land around Burnt Common warehouse, London Road, Send. In addition, we note that the NPSNN, at paragraph 5.165, states that 'The applicant should identify existing and proposed land uses near the project...', as is referred to in paragraph 13.3.5 of this draft Environmental Scoping Report.

145	Chapter 13/ People and Communities/ 13.4.14	Have any NMU surveys been undertaken or are any planned?
146	Chapter 13/ People and Communities/ 13.4.15	The zone of influence for the 'People and Communities' environmental topic should include the village of Ripley as it is considered that the scheme, as presently proposed, is likely to increase traffic flows through this village, with potential impacts on non-motorised users including community severance which may require mitigation. The present pattern of recurrent peak period traffic congestion in Ripley and associated adverse community and environmental impacts is a concern to Surrey County Council, the Local Highway Authority. In addition, further consideration should also be given to including other settlements nearby to the proposed scheme, including Wisley, Ockham, East Horsley and West Horsley, within the zone of influence for the 'People and Communities' environmental topic.
147	Chapter 13 / People and Communities / 13.5.1	This section needs greater clarity on the temporary and permanent land take that will be required. There is reference to the property impacts later in the chapter but it should appear in this section. The effects of the scheme on access to properties needs greater clarification. The project description raises that the construction work will require the closure of some access routes to properties. How many properties will be affected?
148	Chapter 13 / People and Communities / 13.5.2	The link between the potential impacts identified (traffic, visual etc) and the effects on residential amenity need to be more strongly drawn here.
149	Chapter 13/ People and Communities/ 13.5.11 to 13.5.12	Potential for impacts on BMV land? Is there potential for significant effects on agricultural land/ farm businesses? Will any mitigation measures be included?

150	Chapter 13 People and Communities / Section 13.5.14	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Paragraph 216 of the National Planning Policy Framework (DCLG, March 2012) states that 'From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to:● the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given);● the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and● the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).' Whilst the emerging plan currently carries limited weight in decision taking, the weight will increase as we move through the examination process (in particular after the initial hearing sessions which are expected to begin in spring/early summer 2018) and ultimately to full weight at adoption of the new plan (current timetable indicates adoption in December 2018). Given the timescales of this project and the expected Local Plan timetable, we would suggest that the assessment takes into account the site policies in the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017), in particular the following:● Policy A35: Former Wisley airfield, Ockham● Policy A38: Land to the west of West Horsley● Policy A39: Land near Horsley railway station, Ockham Road North, East Horsley● Policy A40: Land to the north of West Horsley● Policy A43: Land at Garlick's Arch, Send Marsh/Burnt Common and Ripley● Policy A43a: Land for new north facing slip roads to/from A3 at Send Marsh/Burnt Common● Policy A58: Land around Burnt Common warehouse, London Road, Send. In addition, we note that the NPSNN, at paragraph 5.165, states that 'The applicant should identify existing and proposed land uses near the project...', as is referred to in paragraph 13.3.5 of this draft Environmental Scoping Report.
151	Chapter 13/ People and Communities/ 13.5.15 to 13.5.19	The zone of influence for the 'People and Communities' environmental topic should include the village of Ripley as it is considered that the scheme, as presently proposed, is likely to increase traffic flows through this village, with potential impacts on non-motorised users including community severance which may require mitigation. The present pattern of recurrent peak period traffic congestion in Ripley and associated adverse community and environmental impacts is a concern to Surrey County Council, the Local Highway Authority. In addition, further consideration should also be given to including other settlements nearby to the proposed scheme, including Wisley, Ockham, East Horsley and West Horsley, within the zone of influence for the 'People and Communities' environmental topic.

152	Chapter 13/ People and Communities/ 13.5.15 to 13.5.19	Will any new routes or temporary crossings be provided to mitigate impacts on NMUs?
153	Chapter 13 People and Communities / Section 13.5.16	This refers to an increase in construction traffic and HGV trip numbers with a potential to make road crossing more difficult, dangerous, intimidating or time consuming. Mitigation measures should be identified. We would note that the Health Profile 2016 for Guildford borough, as published by Public Health England, identified that performance for the Killed and seriously injured on roads indicator in the borough was 'significantly worse than England average'.
154	Chapter 13 / People and Communities / 13.6	No level of assessment is proposed in this section: simple or detailed assessment should be recommended.
155	Chapter 13 People and Communities / Section 13.7.34	Is there any significance criteria for effects on agricultural land as a national resource i.e. BMV land?
156	Chapter 13 People and Communities / Section 13.7.34 - 13.7.37	Previously the agricultural land sections in this chapter have focussed on both the impact on best and most versatile agricultural land as well as the impact on farm businesses, however this section only outlines the methodology/significance for the assessment on the impact on farm business. Is this because the assessment of best and most versatile agricultural land will be covered in Chapter 10? If so this needs to be clarified, it is not recommended that the assessment is repeated in both the geology and soils and people and communities chapters.

157	Chapter 13 People and Communities / Section 13.7.39 - 13.7.41	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Paragraph 216 of the National Planning Policy Framework (DCLG, March 2012) states that 'From the day of publication, decision-takers may also give weight to relevant policies in emerging plans according to: • the stage of preparation of the emerging plan (the more advanced the preparation, the greater the weight that may be given); • the extent to which there are unresolved objections to relevant policies (the less significant the unresolved objections, the greater the weight that may be given); and • the degree of consistency of the relevant policies in the emerging plan to the policies in this Framework (the closer the policies in the emerging plan to the policies in the Framework, the greater the weight that may be given).' Whilst the emerging plan currently carries limited weight in decision taking, the weight will increase as we move through the examination process (in particular after the initial hearing sessions which are expected to begin in spring/early summer 2018) and ultimately to full weight at adoption of the new plan (current timetable indicates adoption in December 2018). Given the timescales of this project and the expected Local Plan timetable, we would suggest that the assessment takes into account the site policies in the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017), in particular the following: • Policy A35: Former Wisley airfield, Ockham • Policy A38: Land to the west of West Horsley • Policy A39: Land near Horsley railway station, Ockham Road North, East Horsley • Policy A40: Land to the north of West Horsley • Policy A43: Land at Garlick's Arch, Send Marsh/Burnt Common and Ripley • Policy A43a: Land for new north facing slip roads to/from A3 at Send Marsh/Burnt Common • Policy A58: Land around Burnt Common warehouse, London Road, Send. In addition, we note that the NPSNN, at paragraph 5.165, states that 'The applicant should identify existing and proposed land uses near the project...', as is referred to in paragraph 13.3.5 of this draft Environmental Scoping Report.

158	Chapter 13 People and Communities / Section 13.7.42 - 13.7.56	The zone of influence for the 'People and Communities' environmental topic should include the village of Ripley as it is considered that the scheme, as presently proposed, is likely to increase traffic flows through this village, with potential impacts on non-motorised users including community severance which may require mitigation. The present pattern of recurrent peak period traffic congestion in Ripley and associated adverse community and environmental impacts is a concern to Surrey County Council, the Local Highway Authority. In addition, further consideration should also be given to including other settlements nearby to the proposed scheme, including Wisley, Ockham, East Horsley and West Horsley, within the zone of influence for the 'People and Communities' environmental topic.
159	Chapter 13 People and Communities / Section 13.7.42 - 13.7.47	Are NMU surveys going to be undertaken to inform the assessment? DMRB Volume 11 Section 3 Part 8 Chapter 9 states that 'counts of pedestrians and others should be undertaken where this is necessary to achieve the objective of this stage of assessment' i.e. where there are going to be permanent changes to journey times and safety and amenity is likely to be prejudiced. Furthermore, where 'pedestrians and others' travel patterns are complex and a scheme could have a major impact, origin destination surveys should be considered'. Is there any significance criteria that will be used to assess effects of the Scheme on NMUs? How will you determine if an effect is significant or not?
160	Chapter 13 People and Communities / Section 13.7.46	Is this an assumption? Have NMU surveys (including origin destination surveys) been carried out to confirm this?
161	Chapter 13/ People and Communities/ 13.7.48	Is there any significance criteria that will be used to assess effects of the Scheme on amenity for NMUs?
162	Chapter 13/ People and Communities/ 13.7.50	Is there any significance criteria that will be used to assess effects of the Scheme on severance?
163	Chapter 13/ People and Communities/ 13.7.62	Is there any significance criteria that will be used to assess effects of the Scheme on driver stress?

164	Chapter 13 / People and Communities 13.9	Some mention of construction management process would be helpful here to understand how construction impact may be mitigated.
165	Chapter 13/ People and Communities/ 13.9.1	Are there any mitigation proposals for agricultural land and NMUs? It is not clear how significant adverse effects will be assessed for NMUs either.
166	Chapter 13 People and Communities / Section 13.11.4	Vulnerability to major accidents and disasters - Should the effects of this be scoped out? Junction 10 of the M25 is one of the most congested junctions on the network. Accidents on the A3 cause significant delay. The scheme proposes closure of a number of side roads on the A3. Where an accident occurs on the A3 road users will seek to use alternative routes. This will include Portsmouth Road and the High Street through the village of Ripley. Where a major accident occurs, and the number of vehicles using the A3 has increased because of the scheme, there is likely to be a greater impact on Ripley from traffic seeking to use alternative routes. The impacts of a major incident on communities, particularly Ripley should therefore be considered, and mitigation identified as appropriate.
167	Chapter 13 / People and Communities / 13.11.4	No distinction is made in the summary table between the scoping of construction and operational effects.
168	Chapter 14 Climate / Overall Comment	Section 14.1.2 outlines that the chapter considers both the potential effects of the scheme on climate change and the vulnerability of the scheme to climate change, however the scoping assessment presented within this chapter purely focuses on the effects of the scheme on climate change. The vulnerability of the scheme to climate change has not been considered - it is recommended that this is considered and assessed within the ES in accordance with the EIA Regulations 2017.
169	Chapter 14/ Climate/ Section 14.4	No baseline conditions for regional climate is given.
170	Chapter 14/ Climate/ Section 14.4.3	In setting the scheme baseline emissions, what calculation tool has been used and will the same tool be used for this Scheme?

171	Chapter 14/ Climate/ Section 14.6.1	Bearing in mind there is currently no DMRB methodology or guidance on how to carry out a "simple" or "detailed" assessment for Climate, how did you draw the conclusion that a "simple" assessment is necessary?
172	Chapter 14/ Climate/ Section 14.7.3	Why is the Highways England Carbon Calculation Tool not being used for the final carbon footprint to be reported in the ES, as this will allow the Scheme to be intercompared with other Highways England schemes.
173	Chapter 14/ Climate/ Section 14.7.4.	It is noted that the CKB tool will be used for the assessment, and that this tool includes an emissions factor library that is automatically used to convert activity data to emissions data. In line with best practice, to ensure appropriate levels of transparency, it is recommended that the activity data and emissions factors used within the calculations should be presented alongside the calculation methodology in the technical appendix of the ES.
174	Chapter 14 Climate / Section 14.7.6	The references to the tables in this paragraph do not make sense, as this paragraph relates to significance criteria and the tables referenced outline the study area and the relevant legislation/policies. It would have been useful to include the criteria against which effects are classified as major, moderate, minor, negligible or no change specific to the climate change assessment - this needs to be provided in the ES to ensure clarity what constitutes each level of effect.
175	Chapter 14 Climate / 14.5.1	The potential impacts section states "there is only one impact, global warming, which occurs with the same level of effect per unit of emissions and is also entirely non-site specific." This is not quite correct as the real impact is climate change, which will include warming but will also have other impacts, such as an increase in extreme weather events and changing rainfall patterns (drier summers, wetter winters).
176	Chapter 15 Assessment of Cumulative Effects / Section 15.1	Reference should be made to PINS Advice Note Seventeen which is the most up-to-date guidance on the methodology for assessing cumulative effects for Nationally Significant Infrastructure Projects.

177	Chapter 15 Assessment of Cumulative Effects / Section 15.2.2	The approach to identifying the 'other developments' using proposed thresholds and spatial area (of developments) outlined in Section 15.2.2 separately to the identification of the ZOI for each topic in Table 15.1, does not accord with PINs Advice Note Seventeen. PINS Advice Note Seventeen states that the applicant should determine the likely spatial ZOI for each environmental topic area (as has been done in Table 15.1), it then states that ' the applicant undertakes a desk study of planning applications, development plan documents, relevant development frameworks and any other available sources to identify 'other developments' within the ZOI'. Therefore, developments should be identified on the basis of the topic ZOIs (the largest ZOI) not under a separate criteria. However, if chosen to also use the criteria in 15.2.2 then a definition needs to be provided of what constitutes a regionally significant development, a major development and a minor development.
178	Chapter 15 Assessment of Cumulative Effects / Section 15.2.5	This sentence states that 'the traffic model will take account of the operational effects of major developments in the area and the wider surrounding region' - the air quality and noise assessments use the traffic model data within their assessments, therefore cumulative operational assessments for air quality and noise are often already undertaken. If this is the case, this should be stated within the methodology and included for clarity.
179	Chapter 15 Assessment of Cumulative Effects / Section 15.2.6 - 15.2.12	It would be useful to have identified the distance of the developments from the Scheme; this should be outlined in the ES as per Appendix 1 Matrix 1 of PINS Advice Note Seventeen - additionally, it is recommended that a series of drawings are produced to accompany the ES, showing the proposed Scheme in relation to each of the 'other developments' and the ZOIs.
180	Chapter 15 Assessment of Cumulative Effects / Section 15.2.6 - 15.2.12	A 'level of certainty' for each development has not been assigned. In accordance with PINS Advice Note Seventeen, this should be done for each development (see Table 3 in PINS Advice Note Seventeen) and presented within the ES.
181	Chapter 15 Assessment of Cumulative Effects / Section 15.2.6 - 15.2.12	It is recommended that the information on the 'other developments' is presented within a table, as per Appendix 1 Matrix 1 of PINS Advice Note Seventeen, for the purpose of clarity and ease of comprehension.

182	Chapter 15 Assessment of Cumulative Effects / Section 15.2.7	The site area for this proposed allocation was enlarged to 95.9 ha in the updated Guildford borough Proposed Submission Local Plan: strategy and sites (Guildford Borough Council, June 2017) although the allocation of 2,000 homes was not changed.
183	Chapter 15 Assessment of Cumulative Effects / Section 15.2.8	The Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) was submitted to the Secretary of State in December 2017. Examination is expected to begin in spring/early summer 2018 whilst the current published timetable anticipates adoption in December 2018.
184	Chapter 15 Assessment of Cumulative Effects / Section 15.2.9	An updated and consolidated Land Availability Assessment (2017) was submitted alongside the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017) in December 2017. This includes a Housing Trajectory which indicates that development of the Former Wisley airfield site (Policy A35) as commencing in 2022/23 and completing by 2033/34.
185	Chapter 15 Assessment of Cumulative Effects / Section 15.2.9	As above comment, Examination is expected to begin in spring/early summer 2018 whilst the current published timetable anticipates adoption in December 2018.
186	Chapter 15 Assessment of Cumulative Effects / Section 15.2.10	It is unlikely that a decision on the planning appeal for the refused Former Wisley airfield planning application will be made until late 2018. The Inspector has indicated that his report to the Secretary of State will not be ready until mid-March 2018.
187	Chapter 15 Assessment of Cumulative Effects / Section 15.2.11	We note the thresholds in para 15.2.2 however would suggest that lower, more sensitive thresholds may be appropriate. There are significant developments proposed along the A3, south of Junction 10. Notably these include proposed site allocations: A43 Garlick's Arch (400 homes), A43a new southbound and northbound slips onto the A3, A58 Land at Burnt Common warehouse (minimum of 7,000 sqm industrial floorspace), A25 Gosden Hill (residential led development for 2,000 homes), A24 Slyfield Area Regeneration Project (1,500 homes), A26 Blackwell Farm (residential led development for 1,800 homes). These proposals are all likely to impact to some degree upon the north/south movement along the A3 and other routes.

188	Chapter 15 Assessment of Cumulative Effects / Sections 15.2.11 and 15.4.5	We suggest that the schemes referenced SRN9 and SRN10 for north facing junctions to be provided to the A3 at the A247 Burnt Common interchange, as included in Appendix C Infrastructure of the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017), and cross-referenced as a Requirement for Policy A35 Former Wisley airfield, Ockham, should be included in the assessment. The Submission Local Plan was submitted to the Secretary of State in December 2017. Examination is expected to begin in spring/early summer 2018 whilst the current published timetable anticipates adoption in December 2018. Whilst this scheme is not confirmed at this time, paragraph 15.2.1 states with respect to the list of types of nearby potential developments that should be considered in the assessment that it is 'not necessarily limited to' those listed. As stated in the Topic Paper: Transport (Guildford Borough Council, December 2017), which accompanied the Guildford borough Submission Local Plan: strategy and sites (Guildford Borough Council, December 2017): 'These junctions are being promoted to mitigate the impact of the level of strategic planned growth and in particular the development traffic flows resulting from the development of a new settlement at the former Wisley airfield site (site Policy A35), as well as limiting any increase in traffic joining and leaving the A3 at the Ockham interchange.'
189	Chapter 15 Assessment of Cumulative Effects / Section 15.4	The methodology is lacking and does not seem to follow the staged approach set out in PINS Advice Note Seventeen - it is recommended that this approach is followed and outlined in the ES. In addition, the methodology does not differentiate the differing methodologies required for the two types of cumulative effects (cumulative effects for a single scheme and cumulative effects from different schemes). The methodology should reflect the differing approaches in the ES.
190	Chapter 15 Assessment of Cumulative Effects / Table 15.1	The zone of influence for the 'People and Communities' environmental topic should include the village of Ripley as it is considered that the scheme, as presently proposed, is likely to increase traffic flows through this village. The present pattern of recurrent peak period traffic congestion in Ripley and associated adverse community and environmental impacts is a concern to Surrey County Council, the Local Highway Authority. In addition, further consideration should also be given to including other settlements nearby to the proposed scheme, including Wisley, Ockham, East Horsley and West Horsley, within the zone of influence for the 'People and Communities' environmental topic.

191	Chapter 15 Assessment of Cumulative Effects / Section 15.7.3	No assessment has been undertaken in this chapter, therefore the Council is unsure how it can be concluded that 'the main developments that could cause combined and cumulative effects are the highway intervention schemes the M25 Junction 10 - 16 Smart Motorway Programme (SMP) and the A3 Guildford scheme, the RHS Wisley improvement works and the former Wisley Airfield adjacent the scheme'. Further information gathering and assessment is required to inform this conclusion, and therefore this should not be used as a basis to rule out 'other developments' from the cumulative assessment. The assessment process will need to be fully reported, in accordance with PINS Advice Note Seventeen, to ensure that the reasons for excluding any development from further consideration is clearly recorded and to clearly record any decisions made by the applicant in the assessment process.
192	Chapter 16 Summary / Table 16.1	Climate section of the table - the effects listed in this table correspond to the 'vulnerability of the Scheme to climate change', however as noted in comments above the 'vulnerability of the Scheme to climate change' has not been considered in the climate chapter. Therefore, how can it be concluded that these effects would result if this has not been considered in the chapter? Additionally, this table does not conclude the information that has actually been considered in the climate chapter which focusses on the 'effects of the Scheme on climate change'. Clarification is required as to what exactly the climate chapter/assessment of the ES will consider - it is recommended that both the 'effects of the Scheme on climate change' and the 'vulnerability of the Scheme to climate change' is considered and assessed in the ES.
END OF COMMENTS		

From: Dave.Adams2@hse.gov.uk on behalf of NSIP.Applications@hse.gov.uk
To: [M25 Junction 10](#)
Subject: NSIP - Proposed M25 J10/A3 Wisley Interchange Improvement - HSE Response
Date: 02 January 2018 13:58:19
Attachments: [image003.png](#)
[NSIP - Proposed M25 J10 A3 Wisley Interchange Improvement - EIA Scoping Consultation, HSE PDF Response.PDF](#)

FAO Ms Gail Boyle

Dear Gail,

Thank you for your letter dated 13th December 2017. HSE does not comment on EIA Scoping Reports but the information attached is likely to be useful to the Applicant.

Kind regards,

Dave Adams

Dave.MHPD.Adams

Land Use Planning Policy, Chemicals, Explosives & Microbiological Hazards Division, Health and Safety Executive.

Desk 76, 2.2, Redgrave Court, Merton Road, Bootle, Merseyside L20 7HS

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www.hse.gov.uk | <http://hse.gov.uk/landuseplanning>

HSE EVP Blue Logo.png



From: M25 Junction 10 [<mailto:M25Junction10@pins.gsi.gov.uk>]
Sent: 13 December 2017 15:52
To: M25 Junction 10
Subject: TRIM: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation

Dear Sir/Madam

Please see the attached letter on the proposed M25 Junction 10/A3 Wisley interchange improvement.

Please note the deadline for consultation responses is 11 January 2018, and is a statutory requirement that cannot be extended.

Kind regards

Ian Wallis

EIA and Land Rights Advisor

Major Applications and Plans

The Planning Inspectorate, 3D Temple Quay House, Temple Quay, Bristol BS1 6PN

Direct Line: 0303 444 5724

Helpline: 0303 444 5000

Email: ian.wallis@pins.gsi.gov.uk

Web: www.gov.uk/government/organisations/planning-inspectorate (The Planning Inspectorate)

Web: www.infrastructure.planninginspectorate.gov.uk (National Infrastructure Planning)
Twitter: [@PINSgov](https://twitter.com/PINSgov)

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CEMHD Policy - Land Use Planning
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Building 2.2, Redgrave Court
Merton Road, Bootle
Merseyside, L20 7HS

Your ref: TR010030
Our ref: 4.2.1.6227
HSE email: NSIP.applications@hse.gov.uk

FAO Gail Boyle
The Planning Inspectorate
Bristol
BS1 6PN
By e-mail

02/01/18

Dear Ms Boyle

**PROPOSED M25 J10/A3 WISLEY INTERCHANGE IMPROVEMENT (the project)
PROPOSAL BY HIGHWAYS ENGLAND (the applicant)
INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (as amended) – Regulations 10 and 11**

Thank you for your letter of 13th December 2017 regarding the information to be provided in an environmental statement relating to the above project.

HSE does not comment on EIA Scoping Reports but the following information is likely to be useful to the applicant.

HSE's land use planning advice

Will the proposed development fall within any of HSE's consultation distances?

The red line DCO boundary falls within the consultation zones for two major accident hazard pipelines:

HSE Ref	Operator	Pipeline ref	Name
6964	Southern Gas Networks	1236	Cobham PT / Cobham PRS
6963	Southern Gas Networks	1235	Hooley (V38) Ripley Pig Trap

Hazardous Substance Consent

The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) may require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others, for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) Regulations 2015.

Hazardous Substances Consent would be required if the site is intending to store or use any of the Named Hazardous Substances or Categories of Substances and Preparations at or above the controlled quantities set out in schedule 1 of these Regulations.

Explosives sites

HSE has no comment to make as there are no licensed explosive sites in the vicinity

Waste

In respect of waste management the applicant should take account of and adhere to relevant health and safety requirements. Particular attention should be paid in respect of risks created from historical landfill sites. More details can be found on HSE's website at: <http://www.hse.gov.uk/waste/index.htm>

Electrical Safety

No comment from a planning perspective

Please send any further electronic communication on this project directly to the HSE's designated e-mail account for NSIP applications. Alternatively any hard copy correspondence should be sent to:

Mr Dave Adams (MHPD)
NSIP Consultations
2.2 Redgrave Court
Merton Road, Bootle,
Merseyside L20 7HS

Yours sincerely,

A black rectangular box used to redact the signature of Dave Adams.

Dave Adams
(CEMHD4 Policy)

From: [Burgess, Janice](#)
To: [M25 Junction 10](#)
Cc: [Planning SE](#)
Subject: M25 Junction 10/A3 Wisley Interchange Improvements: Scoping Consultation
Date: 03 January 2018 16:56:46
Attachments: [image002.png](#)
[image004.png](#)

For the attention of Gayle Boyle

I refer to the email dated 13 December 2017 from Ian Wallis inviting comment on the Scoping Consultation for the above improvement proposal.

Highways England Spatial Planning Team have been in consultation with the M25 Junction 10/A3 Wisley Improvement project team since project inception and therefore have had opportunities to feed into the creation of the current proposals. I therefore do not have any specific comments to add at this time.

Thank you for the opportunity to comment now and in the future as the project progresses through the Development Consent process.

Regards,

Janice Burgess, Spatial Planning Manager Area 5

Highways England Company Limited
Bridge House, 1 Walnut Tree Close, Guildford, Surrey, GU1 4LZ
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Highways England Company Limited | General enquiries: 0300 123 5000
| National Traffic Operations Centre, 3 Ridgeway, Quinton Business Park,
Birmingham B32 1AF | [https://www.gov.uk/government/organisations/highways-](https://www.gov.uk/government/organisations/highways-england)
[england](http://www.highwaysengland.co.uk) | info@highwaysengland.co.uk

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Historic England

Gail Boyle
Senior EIA and Land Rights Advisor
Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
BRISTOL
BS1 6PN

Our ref:
Your ref:
TR010030 -
000008
Telephone
01483 252038

08 January 2018

Dear Ms Boyle,

re: Scoping consultation – application by Highways England for Development Consent for the M25 J 10/A3 Wisley Interchange Improvement.

Thank you for consulting Historic England about EIA scoping for the above proposed development.

As the Government's statutory adviser, Historic England is keen to ensure that conservation and enhancement of the historic environment is fully taken into account at all stages and levels of the planning process. Accordingly, we have reviewed this consultation in the context of the National Planning Policy Framework (NPPF) and its core principle that heritage assets be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life for this and future generations. We have also considered the National Policy Statement for National Networks.

We are providing pre-application advice to Highways England focussed on the potential for this highways related development to have significant effects upon designated heritage assets and/or their settings. This has so far concentrated on the two registered historic parks and gardens – RHS Wisley and Painshill Park but now needs to include the full range of heritage assets that will be affected. We provided advice which has been used as part of the announcement of the preferred design option, but we retain concerns about some of the conclusions reached and we will expect these to be further scrutinised as part of the EIA process. We are in contact with Highways England about how we can continue to engage with their proposals as they work on a DCO application and an Environmental Statement.

We think that the principal historic environment issues applicable to this proposal will be



Historic England, Eastgate Court, 195-205 High Street, Guildford GU1 3EH
Telephone 01483 25 2020 HistoricEngland.org.uk

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Correspondence or information which you send us may therefore become publicly available.





- Direct physical impacts upon designated heritage assets (most notably the two high grade registered historic parks and gardens),
- Indirect effects upon the significance of designated heritage assets by virtue of change within their settings affecting the contribution that these make to such significance,
- Effects upon the operation and viability of designated heritage assets under their established uses,
- Direct and Indirect effects upon non-designated heritage assets (specifically potentially those with archaeological value), some of which may yet to be recognised.

In general the above issues have been appropriately identified as matters to be addressed through the EIA process and we make the comments below to inform this.

Direct physical impacts upon heritage assets

Appendix F provides a gazetteer of the heritage assets to be taken into account. We are content that for the most part relevant designated and undesignated examples have been identified. However the Temple of Bacchus at Painshill Park is part of the RPG and is a structure that is now approaching complete restoration by the Trust. It is a heritage asset close to the location of the proposed works to widen the A3 and it therefore deserves individual consideration and inclusion in the gazetteer.

We note that the significance of Painshill Park in some part of the scoping report is understated, including when compared with the description of RHS Wisley (compare paras 9.3.2 & 9.3.3). We think there needs to be a read across between chapters 9 and 11 and that the statements of significance for these two high grade landscapes need to be fully accurate. Effects on that significance should then be more easily understood and mitigated. Painshill Park (grade 1 RPG) is of international significance as a one of the most important picturesque landscapes of the 18th century. It is open to the public for thousands of visits each year. Statements of Significance for both Painshill and RHS Wisley (grade II* RPG) as prepared by their owners exist and these should now be used to inform the proposal.

We also urge caution that some of the descriptions quoted in the Scoping Report come from older documents that are no longer accurate, such as table 9.2 for Elmbridge BC Landscape Character Areas or appendix F for National Heritage List for England data. For example, at Painshill Park both the Water Wheel and Grotto have now been fully conserved. The EIA team will be familiar with such issues as this and will we trust make their own assessments based on the present day position.

The illustrative material for the preferred design (drawings DR- CH-000001 – 11) is of a scale which makes it difficult for us to fully understand what land-take will be required from both of the RPGs but some such direct impact will be required. It appears to us to be more significant for Painshill Park than for RHS Wisley but we wish to understand this better. Loss of any registered land is to be regretted and we wish to understand why this is necessary. The contribution to significance made by the land so affected needs to be assessed so as to understand levels of harm, but in



addition other less direct effects will also need to be considered. For example the continued viability for the existing uses made by RHS Wisley of land adjacent to the A3 requires consideration.

Clarification of which trees would be lost is required and the significance of these, either individually or as part of the historic landscapes, is required. At Painshill Park we think that the land take will be more significant and again the effect on significance is required. Individual trees here might be individually less significant than at RHS Wisley but the relevance of these in providing screening (both visual and for noise) from the A3 needs to be considered. In addition attention is required as to how any tree removal and new structures might alter the existing environmental condition within the park, including for wind patterns. It will need to be demonstrated that agreed changes will not have unintentional consequences for the rest of the park and its planting, including for its longevity and vulnerability to storm events.

Indirect effects by virtue of change within the settings of heritage assets

Change within the settings of designated heritage assets has the potential to cause harm to significance. This is relevant to the RPGs, potentially to some other listed buildings and for the scheduled monuments located close to the existing M25 junction 10 or adjacent to Painshill Park.

Proposals for new overbridges at Wisley Lane and close to Redhill Road each have the potential to harm RHS Wisley and Painshill Park respectively. For the latter the proposed bridge in close proximity to the Gothic Tower (listed II*) is of particular concern. We wish to understand why less harmful solutions, such as a crossing nearer the San Dominico site, have not been adopted and whether re-consideration of this element is still possible. The EIA process will provide more precise understanding of the level of harm to be caused by a new bridge next to the high grade listed tower. We will expect harm to be minimised including by considering alternative designs and or locations. If harm cannot be avoided we understand that mitigation of harmful effects can be provided by Highways England. We think that opportunities to enhance the setting of designated heritage assets should form part of the proposed mitigation for unavoidable harm. For example the existing electricity pylons close to the Gothic Tower are very harmful and we think opportunities should be taken to relocate these as a public benefit that might help offset harm to be caused by the new works.

The scheduled barrow at Cock Crow Hill is already very close to the existing junction 10 and will remain so with on-going harm to its setting. We think that an improved management regime for this monument could be one way of mitigating some of that harm, particularly if existing trackways close to it are to be closed off. Agreement of a management plan for this barrow and any other archaeological remains that might now be identified (and the funding to carry this into effect) might be one form of mitigation of unavoidable harm.

Effects on the setting of heritage assets are most often described in visual terms but other factors are also relevant, of which noise is an important one. At present both





RPGs experience significant levels of road noise and it needs to be demonstrated how this will change under the proposals and what forms of mitigation, that are acceptable in historic environment terms, might now be possible. This might mean noise attenuation barriers but it could also be noise reduction road surfaces. The aim should be to achieve an improvement over the existing position and certainly not to make it worse. The operation of both RPGs includes opening to visitors and is hence affected by road noise. At Painshill Park this is of particular relevance to its existing and future operational viability. Funding to sustain the heritage asset and to continue its conservation is increasingly earned from fees for filming opportunities at the site and already road noise is an issue affecting how often the site is selected as a location and thus the income to be earned. This important source of income should not be reduced as a result of the proposal.

Undesignated heritage assets, including the potential for as yet unrecognised examples.

The Scoping Report includes the potential for there to be as yet unrecognised heritage assets which might be harmed by the proposal. This potential is possibly at its highest for the land near the scheduled barrows, since it is common for other buried archaeological remains to be found around such funerary or ceremonial structures. The report advances a fairly standard approach to understanding whether such remains exist and if they do for the effect of the proposal upon the significance of these. Walkover and geophysical surveys both have a role but we think that trial trenching will also be necessary (including potentially to verify that absence of evidence is indeed a reliable indicator that nothing exists). There is a potential role for analysis of LIDAR data in areas with existing tree cover and heathland in order to explore whether earthwork remains too subtle to be readily visible to the human eye might in fact be present.

Para 11.10 of the report describes assumptions and limitations should additional heritage assets not currently in the HER data be identified. At 11.01.1 it is wrongly assumed that such remains might only be of local to regional importance. It is possible that as yet unrecognised archaeological remains of a higher significance might be revealed and in which case these should be considered under NPPF criteria, whereby remains of an equivalent significance to scheduled monuments would under para 139 be treated as if they were a designated heritage asset. It should not be assumed that archaeological investigation to record significance will be the only appropriate option, since the presumption for nationally important archaeological remains begins with their physical preservation in situ, for example through design changes.

Finally para 11.10.1 also refers to “auxiliary work” of a temporary or permanent nature to include such issues as construction compounds, service diversions or habitat mitigation. It is stated that these will be restricted to within the study area. It is essential that this is the case since major harm to heritage assets can be caused if such activities are not planned in from the earliest stage and their environmental effects understood and mitigated. For temporary effects, such as construction compounds, harm to any heritage assets (including archaeological remains of





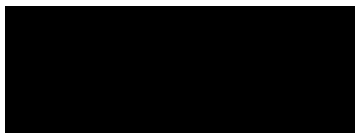
Historic England

regional or local importance) should be avoided or minimised wherever possible since once caused this cannot be undone and all archaeological remains are worthy of consideration for physical preservation.

Should you have any questions about any of the advice contained in this letter please do not hesitate to contact us. We look forward to continuing our discussions with Highways England and indeed we have a meeting fixed for later this month in order to do so.

Please note that this advice is based on the information that has been provided to us and does not affect our obligation to advise on, and potentially object to any specific development proposal which may subsequently arise from these documents, and which may have adverse effects on the historic environment.

Yours sincerely



Peter Kendall
Principal Inspector of Ancient Monuments

Peter.kendall@historicengland.org.uk



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Telephone 01483 25 2020 HistoricEngland.org.uk

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Economic Development and Environment

Regeneration, Economic Development and
Environment Department

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Development Management

**London Borough of Hounslow, The Civic Centre
Lampton Road, Hounslow, TW3 4DN**

Your contact is: Nesha Burnham

Direct Line: 020 8583 5145

Fax: 020 8583 4900

E-Mail: nesha.burnham@hounslow.gov.uk

Our ref: C/2017/5311

Your ref: TR010030-TR010030-000008

Date: 11th January 2018

Dear Ms Boyle,

**Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental
Imapct Assessment) Regulations 2017 (the EIA Regulations)- Regulations 10 and 11**

**Application by Highways England for an Order granting Development Consent for
the M25 Junction 10/A3 Wisley Interchange Improvement**

Thank you for the consultation letter dated 13th December 2017 which seeks the London
Borough of Hounslow's views in respect of Highways England's Environmental Scoping
Report.

From the information submitted and made available on the National Infrastructure Planning
website, the London Borough of Hounslow does not wish to make any comments.

I trust that this information is of assistance.

Yours sincerely,

Marilyn Smith
Chief Planning Officer

GH

Land and Acquisitions

Spencer Jefferies
Development Liaison Officer
Network management
Spencer.Jefferies@nationalgrid.com
Direct tel: +44 (0)7812 651481

SUBMITTED ELECTRONICALLY:
M25Junction10@pins.gsi.gov.uk

www.nationalgrid.com

09 January 2018

Dear Sir/Madam

Application by Highways England for an Order granting Development Consent for the M25 Junction 10/A3 Wisley Interchange Improvement (the Order)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

This is a response on behalf of National Grid Electricity Transmission PLC (NGET).

I refer to your letter dated 13th December 2017 regarding the Order. NGET wish to express their interest in further consultation while the impact on our assets is still being assessed.

In respect of existing NGET infrastructure, NGET will require appropriate protection for retained apparatus including compliance with relevant standards for works proposed within close proximity of its apparatus.

National Grid Electricity Transmission Assets affected by the Order

- ZM Overhead Line 275kV Route. Towers potentially affected: ZM007 to ZM025 (see attached plan)

Where the Promoter intends to acquire land, extinguish rights, or interfere with any of NGET's apparatus, both will require appropriate protection and further discussion on the impact to its apparatus and rights.

Please see relevant guidance for working near NGET assets below.

Specific Comments – Electricity Infrastructure:

- National Grid's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset
- Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for “overhead line clearances Issue 3 (2004)” and also shown in the following National Grid Document:
<http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=6169>
- If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.
- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 “Avoidance of Danger from Overhead Electric Lines” and all relevant site staff should make sure that they are both aware of and understand this guidance.
- Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum “sag” and “swing” and overhead line profile (maximum “sag” and “swing”) drawings should be obtained using the contact details above.
- If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.
- Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or “pillars of support” of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation (“pillar of support”) drawings can be obtained using the contact details above.
- National Grid Electricity Transmission high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide National Grid full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with National Grid prior to any works taking place.
- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.

To view the SSW22 Document, please use the link below:

<http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=33968>

To view the National Grid Policy's for our Sense of Place Document. Please use the link below:

<http://www2.nationalgrid.com/uk/services/land-and-development/publications/>

To download a copy of the HSE Guidance HS(G)47, please use the following link:

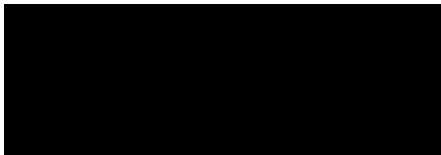
<http://www.hse.gov.uk/pubns/books/hsg47.htm>

Further information in relation to in proximity to National Grid's apparatus can be found at:

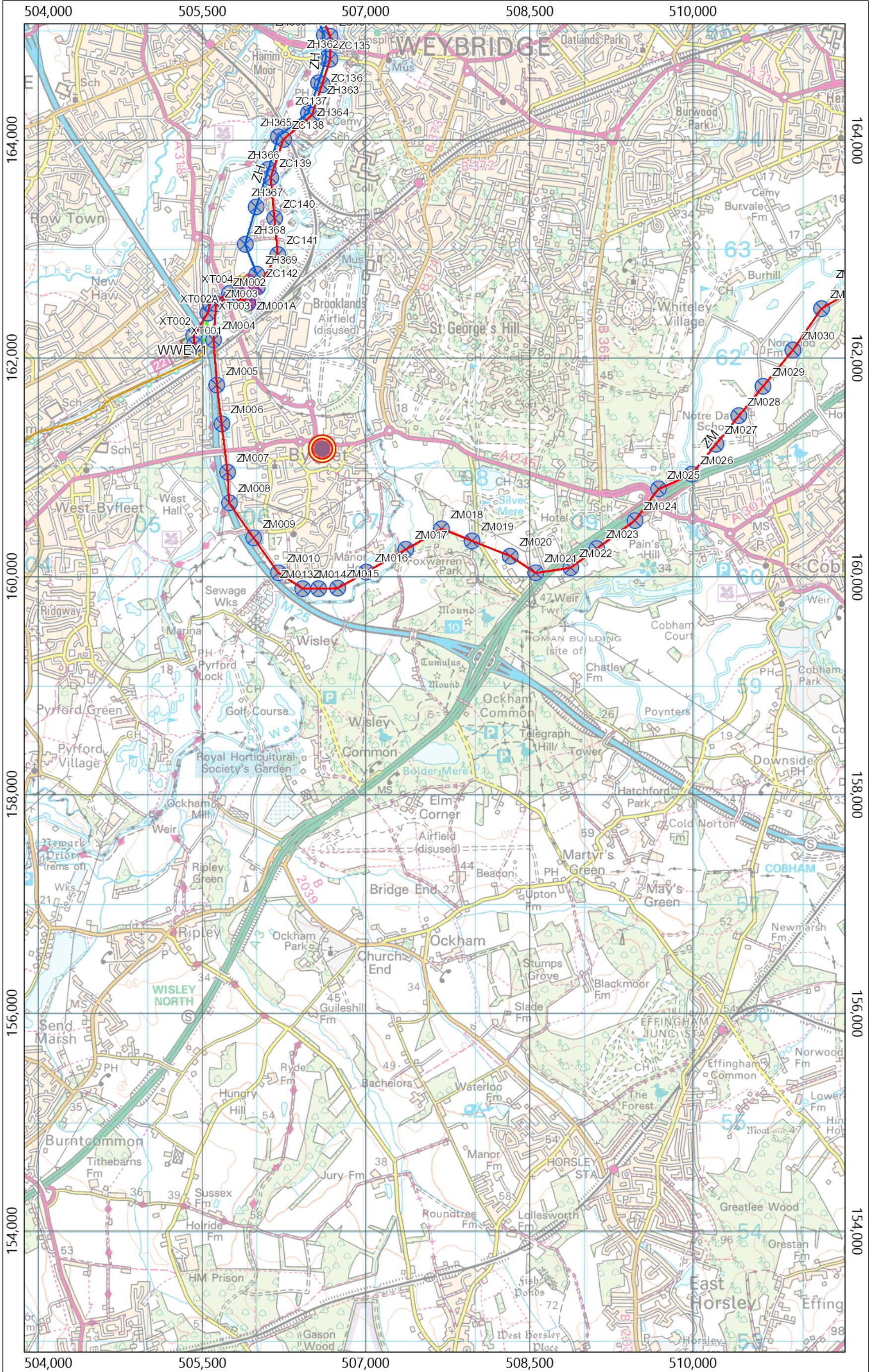
<http://www2.nationalgrid.com/UK/Safety/Library/>

I hope the above information is useful. If you require any further information please do not hesitate to contact me.

Yours sincerely



Spencer Jefferies
Development Liaison Officer, Land and Acquisitions.



Legend:

- Substations Commissioned
- OHL 400Kv Commissioned
- OHL 275Kv Commissioned
- OHL 132Kv & Below Commissioned
- Towers Commissioned
- Buried Cable Commissioned
- Fibre Cable Commissioned
- Pilot Cable
- Gas Operational Boundary
- Gas Site Boundary
- Block Valve
- Compressor
- LNG Site
- Multijunction
- Minimum Offtake
- Future Minimum Offtake
- Offtake
- Pressure Reduction Installation
- Pig Trap
- Terminal
- Transferred Offtake
- Aerial Marker Post
- CP Test Post
- Transformer Rectifier
- Gas Pipe Feeder
- Commissioned
- Decommissioned Group
- Planned and Spares
- SRP Sightings - Open
- SRP Sightings - Closed
- Eagles Enquiries - Open
- Eagles Enquiries - Closed

Notes:

0 0.63 1.3 Kilometers

Scale: 1: 34,392

Print by: **Jefferies, Spencer**

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Date: 08/01/2018
Time: 11:18:38

Page size:
A3 Portrait

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Note: Any sketches on the map are approximate and not captured to any particular level of precision.

From: [Waterton, Laura](#)
To: [M25 Junction 10](#)
Cc: [Gibson, John](#); [Botcherby, Rachel](#)
Subject: Scoping consultation response - M25 junction 10/Wisley interchange improvements
Date: 11 January 2018 11:39:20

Dear Sir/Madam

Re: Scoping consultation in relation to works associated with M25 junction 10/ Wisley interchange improvements

Thank you for contacting the National Trust regarding the content of the Environment Statement relating to the above.

We have now had the opportunity to review the relevant documentation and, in this instance, have **no comment** to make on the content of the Environment Statement.

We are taking this view on the understanding that this does not prejudice our ability to comment on subsequent consultations for this major road works.

Yours faithfully,

Laura Waterton

Laura Waterton BA (Hons) M UrbRegPlan DipTP MRTPI
Planning Adviser

† **National Trust - London and South East**

The Clare Charity Centre, Wycombe Road, Saunderton, Bucks HP14 4BF

Email: laura.waterton@nationaltrust.org.uk

Tel: 01494 569022

Mobile: [REDACTED]

****Working days: Tues, Wed and Thurs****

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From: [NATS Safeguarding](#)
To: [M25 Junction 10](#)
Subject: RE: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation (Our Ref: SG25591)
Date: 18 December 2017 09:18:07
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.gif](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)

The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal, **however, we would request that the development does not exceed 45m in height.**

However, please be aware that this response applies specifically to the above consultation and only reflects the position of NATS (that is responsible for the management of en route air traffic) based on the information supplied at the time of this application. This letter does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise. It remains your responsibility to ensure that all the appropriate consultees are properly consulted.

If any changes are proposed to the information supplied to NATS in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.

Yours Faithfully



NATS Safeguarding

D: 01489 444687

E: natssafeguarding@nats.co.uk

4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk



From: M25 Junction 10 [mailto:M25Junction10@pins.gsi.gov.uk]
Sent: 13 December 2017 15:52
To: M25 Junction 10
Subject: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation

Mimecast Attachment Protection has deemed this file to be safe, but always exercise caution when opening files.

Dear Sir/Madam

Please see the attached letter on the proposed M25 Junction 10/A3 Wisley interchange improvement.

Please note the deadline for consultation responses is 11 January 2018, and is a statutory requirement that cannot be extended.

Kind regards

Ian Wallis

EIA and Land Rights Advisor

Major Applications and Plans

The Planning Inspectorate, 3D Temple Quay House, Temple Quay, Bristol BS1 6PN

Direct Line: 0303 444 5724

Helpline: 0303 444 5000

Email: ian.wallis@pins.gsi.gov.uk

Web: www.gov.uk/government/organisations/planning-inspectorate (The Planning Inspectorate)

Web: www.infrastructure.planninginspectorate.gov.uk (National Infrastructure Planning)

Twitter: [@PINSGov](https://twitter.com/PINSGov)

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Date: 22 December 2017
Our ref: 233944
Your ref: TR010030-TR010030-000008



Ian Wallis
ian.wallis@pins.gsi.gov.uk

BY EMAIL ONLY

Customer Services
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Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Dear Mr Wallis

Environmental Impact Assessment Scoping consultation (Regulation 15 (3) (i) of the EIA Regulations 2011): M25 Junction 10/A3 Wisley Interchange

Thank you for seeking our advice on the scope of the Environmental Statement in your consultation dated 13 December 2017 which we received on the same day.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Case law¹ and guidance² has stressed the need for a full set of environmental information to be available for consideration prior to a decision being taken on whether or not to grant planning permission.

Summary of Natural England's Advice

Having reviewed the Regional Investment Programme M25 Junction 10/A3 Wisley Interchange Environmental Scoping Report, dated 6th December 2017, Natural England can confirm we are satisfied with the proposed scope of the assessment. Furthermore, we would offer the following detailed advice:

- In relation to assessment of air quality impacts Natural England is pleased to see the proposal to apply a precautionary approach and to use recommended standards for levels of NOx deposition which pose a risk of impacts on sensitive vegetation types. Lowland heathland is vulnerable to adverse impacts arising from nutrient deposition, including elevated levels of NOx. This can change the character of heathland from heather-dominated vegetation to more grass-dominated types, and encourage the growth of trees and shrubs thus rendering the habitat less suitable for ground-nesting birds. This risk has been recognised in the document. The proposal to limit assessment of potential impacts on sensitive vegetation to 200 metres is in line with agreed policy between Highways England and Natural England.
- In relation to assessment of noise impacts Natural England is pleased to see proposed consideration of the use of noise barriers to ameliorate potential disturbance effects on sensitive breeding birds.

¹ Harrison, J in *R. v. Cornwall County Council ex parte Hardy* (2001)

² *Note on Environmental Impact Assessment Directive for Local Planning Authorities* Office of the Deputy Prime Minister (April 2004) available from <http://webarchive.nationalarchives.gov.uk/+http://www.communities.gov.uk/planningandbuilding/planning/sustainability/environmental/environmentalimpactassessment/noteenvironmental/>

- In relation to biodiversity, Natural England is satisfied with the proposed limits of the study area.
- Natural England is satisfied with the interpretation of chapter 5 (Biodiversity) of the National Policy Statement for National Networks as set out in the document.
- Natural England is satisfied that the proposed ecological studies and surveys are sufficient and appropriate to inform the Environmental Impact Assessment.
- Natural England is satisfied with the proposed valuation of environmental resources and receptors. These are in accordance with advice provided by Natural England during informal consultation. I can confirm that Natural England and Highways England are in regular and continuing communication over the scope of ecological surveys as stated in the document.

Should the proposal be amended in a way which significantly affects its impact on the natural environment then, in accordance with Section 4 of the Natural Environment and Rural Communities Act 2006, Natural England should be consulted again.

We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us. For any queries relating to the specific advice in this letter only please contact Rebecca Ingram on rebecca.ingram@naturalengland.org.uk or 02080267712. For any new consultations, or to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

Yours sincerely,

Rebecca Ingram
Thames Team



Public Health
England

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Chilton F +44 (0) 1235 822614
Didcot
Oxfordshire OX11 0RQ www.gov.uk/phe

Ms Gail Boyle
Senior EIA and Land Rights Adviser
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol BS1 6PN

Your Ref : TR010030-TR010030-000008

Our Ref : 41860

11th January 2018

Dear Gail

**Re: Scoping Consultation
Application for an Order Granting Development Consent for the proposed M25
Junction 10/ A3 Wisley Interchange**

Thank you for including Public Health England (PHE) in the scoping consultation phase of the above application. Our response focuses on health protection issues relating to chemicals and radiation. Advice offered by PHE is impartial and independent.

We understand that the promoter will wish to avoid unnecessary duplication and that many issues including air quality, emissions to water, waste, contaminated land etc. will be covered elsewhere in the Environmental Statement (ES). We believe the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health. Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.

In terms of the level of detail to be included in an ES, we recognise that the differing nature of projects is such that their impacts will vary. Any assessments undertaken to inform the ES should be proportionate to the potential impacts of the proposal, therefore we accept that, in some circumstances particular assessments may not be relevant to an application, or that an assessment may be adequately completed using a qualitative rather than quantitative methodology. In cases where this decision is made the promoters should fully explain and justify their rationale in the submitted documentation.

The attached appendix outlines generic areas that should be addressed by all promoters when preparing ES for inclusion with an NSIP submission. We are happy to assist and discuss proposals further in the light of this advice.

Yours sincerely,

Environmental Public Health Scientist

nsipconsultations@phe.gov.uk

Please mark any correspondence for the attention of National Infrastructure Planning Administration.

Appendix: PHE recommendations regarding the scoping document

General approach

The EIA should give consideration to best practice guidance such as the Government's Good Practice Guide for EIA¹. It is important that the EIA identifies and assesses the potential public health impacts of the activities at, and emissions from, the installation. Assessment should consider the development, operational, and decommissioning phases.

It is not PHE's role to undertake these assessments on behalf of promoters as this would conflict with PHE's role as an impartial and independent body.

Consideration of alternatives (including alternative sites, choice of process, and the phasing of construction) is widely regarded as good practice. Ideally, EIA should start at the stage of site and process selection, so that the environmental merits of practicable alternatives can be properly considered. Where this is undertaken, the main alternatives considered should be outlined in the ES².

The following text covers a range of issues that PHE would expect to be addressed by the promoter. However this list is not exhaustive and the onus is on the promoter to ensure that the relevant public health issues are identified and addressed. PHE's advice and recommendations carry no statutory weight and constitute non-binding guidance.

Receptors

The ES should clearly identify the development's location and the location and distance from the development of off-site human receptors that may be affected by emissions from, or activities at, the development. Off-site human receptors may include people living in residential premises; people working in commercial, and industrial premises and people using transport infrastructure (such as roads and railways), recreational areas, and publicly-accessible land. Consideration should also be given to environmental receptors such as the surrounding land, watercourses, surface and groundwater, and drinking water supplies such as wells, boreholes and water abstraction points.

Impacts arising from construction and decommissioning

Any assessment of impacts arising from emissions due to construction and decommissioning should consider potential impacts on all receptors and describe monitoring and mitigation during these phases. Construction and decommissioning will be associated with vehicle movements and cumulative impacts should be accounted for.

We would expect the promoter to follow best practice guidance during all phases from construction to decommissioning to ensure appropriate measures are in place

¹ Environmental Impact Assessment: A guide to good practice and procedures - A consultation paper; 2006; Department for Communities and Local Government. Available from: <http://webarchive.nationalarchives.gov.uk/20100410180038/http://communities.gov.uk/planningandbuilding/planning/sustainability/environmental/environmentalimpactassessment/>

² DCLG guidance, 1999 <http://www.communities.gov.uk/documents/planningandbuilding/pdf/155958.pdf>

to mitigate any potential impact on health from emissions (point source, fugitive and traffic-related). An effective Construction Environmental Management Plan (CEMP) (and Decommissioning Environmental Management Plan (DEMP)) will help provide reassurance that activities are well managed. The promoter should ensure that there are robust mechanisms in place to respond to any complaints of traffic-related pollution, during construction, operation, and decommissioning of the facility.

Emissions to air and water

Significant impacts are unlikely to arise from installations which employ Best Available Techniques (BAT) and which meet regulatory requirements concerning emission limits and design parameters. However, PHE has a number of comments regarding emissions in order that the EIA provides a comprehensive assessment of potential impacts.

When considering a baseline (of existing environmental quality) and in the assessment and future monitoring of impacts these:

- should include appropriate screening assessments and detailed dispersion modelling where this is screened as necessary
- should encompass all pollutants which may be emitted by the installation in combination with all pollutants arising from associated development and transport, ideally these should be considered in a single holistic assessment
- should consider the construction, operational, and decommissioning phases
- should consider the typical operational emissions and emissions from start-up, shut-down, abnormal operation and accidents when assessing potential impacts and include an assessment of worst-case impacts
- should fully account for fugitive emissions
- should include appropriate estimates of background levels
- should identify cumulative and incremental impacts (i.e. assess cumulative impacts from multiple sources), including those arising from associated development, other existing and proposed development in the local area, and new vehicle movements associated with the proposed development; associated transport emissions should include consideration of non-road impacts (i.e. rail, sea, and air)
- should include consideration of local authority, Environment Agency, Defra national network, and any other local site-specific sources of monitoring data
- should compare predicted environmental concentrations to the applicable standard or guideline value for the affected medium (such as UK Air Quality Standards and Objectives and Environmental Assessment Levels)
 - If no standard or guideline value exists, the predicted exposure to humans should be estimated and compared to an appropriate health-based value (a Tolerable Daily Intake or equivalent). Further guidance is provided in Annex 1
 - This should consider all applicable routes of exposure e.g. include consideration of aspects such as the deposition of chemicals emitted to air and their uptake via ingestion
- should identify and consider impacts on residential areas and sensitive receptors (such as schools, nursing homes and healthcare facilities) in the area(s) which may be affected by emissions, this should include consideration of any new receptors arising from future development

Whilst screening of impacts using qualitative methodologies is common practice (e.g. for impacts arising from fugitive emissions such as dust), where it is possible to undertake a quantitative assessment of impacts then this should be undertaken.

PHE's view is that the EIA should appraise and describe the measures that will be used to control both point source and fugitive emissions and demonstrate that standards, guideline values or health-based values will not be exceeded due to emissions from the installation, as described above. This should include consideration of any emitted pollutants for which there are no set emission limits. When assessing the potential impact of a proposed installation on environmental quality, predicted environmental concentrations should be compared to the permitted concentrations in the affected media; this should include both standards for short and long-term exposure.

Additional points specific to emissions to air

When considering a baseline (of existing air quality) and in the assessment and future monitoring of impacts these:

- should include consideration of impacts on existing areas of poor air quality e.g. existing or proposed local authority Air Quality Management Areas (AQMAS)
- should include modelling using appropriate meteorological data (i.e. come from the nearest suitable meteorological station and include a range of years and worst case conditions)
- should include modelling taking into account local topography

Additional points specific to emissions to water

When considering a baseline (of existing water quality) and in the assessment and future monitoring of impacts these:

- should include assessment of potential impacts on human health and not focus solely on ecological impacts
- should identify and consider all routes by which emissions may lead to population exposure (e.g. surface watercourses; recreational waters; sewers; geological routes etc.)
- should assess the potential off-site effects of emissions to groundwater (e.g. on aquifers used for drinking water) and surface water (used for drinking water abstraction) in terms of the potential for population exposure
- should include consideration of potential impacts on recreational users (e.g. from fishing, canoeing etc) alongside assessment of potential exposure via drinking water

Land quality

We would expect the promoter to provide details of any hazardous contamination present on site (including ground gas) as part of the site condition report.

Emissions to and from the ground should be considered in terms of the previous history of the site and the potential of the site, once operational, to give rise to issues. Public health impacts associated with ground contamination and/or the

migration of material off-site should be assessed³ and the potential impact on nearby receptors and control and mitigation measures should be outlined.

Relevant areas outlined in the Government's Good Practice Guide for EIA include:

- effects associated with ground contamination that may already exist
- effects associated with the potential for polluting substances that are used (during construction / operation) to cause new ground contamination issues on a site, for example introducing / changing the source of contamination
- impacts associated with re-use of soils and waste soils, for example, re-use of site-sourced materials on-site or offsite, disposal of site-sourced materials offsite, importation of materials to the site, etc.

Waste

The EIA should demonstrate compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery and disposal).

For wastes arising from the installation the EIA should consider:

- the implications and wider environmental and public health impacts of different waste disposal options
- disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated

Other aspects

Within the EIA PHE would expect to see information about how the promoter would respond to accidents with potential off-site emissions e.g. flooding or fires, spills, leaks or releases off-site. Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects.

The EIA should include consideration of the COMAH Regulations (Control of Major Accident Hazards) and the Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009: both in terms of their applicability to the installation itself, and the installation's potential to impact on, or be impacted by, any nearby installations themselves subject to the these Regulations.

There is evidence that, in some cases, perception of risk may have a greater impact on health than the hazard itself. A 2009 report⁴, jointly published by Liverpool John Moores University and the HPA, examined health risk perception and environmental problems using a number of case studies. As a point to consider, the report suggested: "Estimation of community anxiety and stress should be included as part of every risk or impact assessment of proposed plans that involve a potential environmental hazard. This is true even when the physical health risks may be

³ Following the approach outlined in the section above dealing with emissions to air and water i.e. comparing predicted environmental concentrations to the applicable standard or guideline value for the affected medium (such as Soil Guideline Values)

⁴ Available from: <http://www.cph.org.uk/wp-content/uploads/2012/08/health-risk-perception-and-environmental-problems--summary-report.pdf>

negligible.” PHE supports the inclusion of this information within EIAs as good practice.

Electromagnetic fields (EMF)

This statement is intended to support planning proposals involving electrical installations such as substations and connecting underground cables or overhead lines. PHE advice on the health effects of power frequency electric and magnetic fields is available in the following link:

<https://www.gov.uk/government/collections/electromagnetic-fields#low-frequency-electric-and-magnetic-fields>

There is a potential health impact associated with the electric and magnetic fields around substations, and power lines and cables. The field strength tends to reduce with distance from such equipment.

The following information provides a framework for considering the health impact associated with the electric and magnetic fields produced by the proposed development, including the direct and indirect effects of the electric and magnetic fields as indicated above.

Policy Measures for the Electricity Industry

The Department of Energy and Climate Change has published a voluntary code of practice which sets out key principles for complying with the ICNIRP guidelines:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/37447/1256-code-practice-emf-public-exp-guidelines.pdf

Companion codes of practice dealing with optimum phasing of high voltage power lines and aspects of the guidelines that relate to indirect effects are also available:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48309/1255-code-practice-optimum-phasing-power-lines.pdf

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224766/powerlines_vcop_microshocks.pdf

Exposure Guidelines

PHE recommends the adoption in the UK of the EMF exposure guidelines published by the International Commission on Non-ionizing Radiation Protection (ICNIRP). Formal advice to this effect was published by one of PHE’s predecessor organisations (NRPB) in 2004 based on an accompanying comprehensive review of the scientific evidence:-

<http://webarchive.nationalarchives.gov.uk/20140629102627/http://www.hpa.org.uk/Publications/Radiation/NPRBArchive/DocumentsOfTheNRPB/Absd1502/>

Updates to the ICNIRP guidelines for static fields have been issued in 2009 and for low frequency fields in 2010. However, Government policy is that the ICNIRP guidelines are implemented in line with the terms of the 1999 EU Council Recommendation on limiting exposure of the general public (1999/519/EC):

http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/PublicHealth/HealthProtection/DH_4089500

Static magnetic fields

For static magnetic fields, the ICNIRP guidelines published in 2009 recommend that acute exposure of the general public should not exceed 400 mT (millitesla), for any part of the body, although the previously recommended value of 40 mT is the value used in the Council Recommendation. However, because of potential indirect adverse effects, ICNIRP recognises that practical policies need to be implemented to prevent inadvertent harmful exposure of people with implanted electronic medical devices and implants containing ferromagnetic materials, and injuries due to flying ferromagnetic objects, and these considerations can lead to much lower restrictions, such as 0.5 mT.

Power frequency electric and magnetic fields

At 50 Hz, the known direct effects include those of induced currents in the body on the central nervous system (CNS) and indirect effects include the risk of painful spark discharge on contact with metal objects exposed to the field. The ICNIRP guidelines published in 1998 give reference levels for public exposure to 50 Hz electric and magnetic fields, and these are respectively 5 kV m^{-1} (kilovolts per metre) and $100 \text{ }\mu\text{T}$ (microtesla). The reference level for magnetic fields changes to $200 \text{ }\mu\text{T}$ in the revised (ICNIRP 2010) guidelines because of new basic restrictions based on induced electric fields inside the body, rather than induced current density. If people are not exposed to field strengths above these levels, direct effects on the CNS should be avoided and indirect effects such as the risk of painful spark discharge will be small. The reference levels are not in themselves limits but provide guidance for assessing compliance with the basic restrictions and reducing the risk of indirect effects.

Long term effects

There is concern about the possible effects of long-term exposure to electromagnetic fields, including possible carcinogenic effects at levels much lower than those given in the ICNIRP guidelines. In the NRPB advice issued in 2004, it was concluded that the studies that suggest health effects, including those concerning childhood leukaemia, could not be used to derive quantitative guidance on restricting exposure. However, the results of these studies represented uncertainty in the underlying evidence base, and taken together with people's concerns, provided a basis for providing an additional recommendation for Government to consider the need for

further precautionary measures, particularly with respect to the exposure of children to power frequency magnetic fields.

The Stakeholder Advisory Group on ELF EMFs (SAGE)

SAGE was set up to explore the implications for a precautionary approach to extremely low frequency electric and magnetic fields (ELF EMFs), and to make practical recommendations to Government:

<http://www.emfs.info/policy/sage/>

SAGE issued its First Interim Assessment in 2007, making several recommendations concerning high voltage power lines. Government supported the implantation of low cost options such as optimal phasing to reduce exposure; however it did not support not support the option of creating corridors around power lines on health grounds, which was considered to be a disproportionate measure given the evidence base on the potential long term health risks arising from exposure. The Government response to SAGE's First Interim Assessment is available here:

http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107124

The Government also supported calls for providing more information on power frequency electric and magnetic fields, which is available on the PHE web pages (see first link above).

Ionising radiation

Particular considerations apply when an application involves the possibility of exposure to ionising radiation. In such cases it is important that the basic principles of radiation protection recommended by the International Commission on Radiological Protection⁵ (ICRP) are followed. PHE provides advice on the application of these recommendations in the UK. The ICRP recommendations are implemented in the Euratom Basic Safety Standards⁶ (BSS) and these form the basis for UK legislation, including the Ionising Radiation Regulations 1999, the Radioactive Substances Act 1993, and the Environmental Permitting Regulations 2016.

PHE expects promoters to carry out the necessary radiological impact assessments to demonstrate compliance with UK legislation and the principles of radiation protection. This should be set out clearly in a separate section or report and should not require any further analysis by PHE. In particular, the important principles of justification, optimisation and radiation dose limitation should be addressed. In addition compliance with the Euratom BSS and UK legislation should be clear.

⁵ These recommendations are given in publications of the ICRP notably publications 90 and 103 see the website at <http://www.icrp.org/>

⁶ Council Directive 96/29/EURATOM laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation.

When considering the radiological impact of routine discharges of radionuclides to the environment PHE would expect to see a full radiation dose assessment considering both individual and collective (population) doses for the public and, where necessary, workers. For individual doses, consideration should be given to those members of the public who are likely to receive the highest exposures (referred to as the representative person, which is equivalent to the previous term, critical group). Different age groups should be considered as appropriate and should normally include adults, 1 year old and 10 year old children. In particular situations doses to the fetus should also be calculated⁷. The estimated doses to the representative person should be compared to the appropriate radiation dose criteria (dose constraints and dose limits), taking account of other releases of radionuclides from nearby locations as appropriate. Collective doses should also be considered for the UK, European and world populations where appropriate. The methods for assessing individual and collective radiation doses should follow the guidance given in 'Principles for the Assessment of Prospective Public Doses arising from Authorised Discharges of Radioactive Waste to the Environment August 2012'⁸. It is important that the methods used in any radiological dose assessment are clear and that key parameter values and assumptions are given (for example, the location of the representative persons, habit data and models used in the assessment).

Any radiological impact assessment should also consider the possibility of short-term planned releases and the potential for accidental releases of radionuclides to the environment. This can be done by referring to compliance with the Ionising Radiation Regulations and other relevant legislation and guidance.

The radiological impact of any solid waste storage and disposal should also be addressed in the assessment to ensure that this complies with UK practice and legislation; information should be provided on the category of waste involved (e.g. very low level waste, VLLW). It is also important that the radiological impact associated with the decommissioning of the site is addressed. Of relevance here is PHE advice on radiological criteria and assessments for land-based solid waste disposal facilities⁹. PHE advises that assessments of radiological impact during the operational phase should be performed in the same way as for any site authorised to discharge radioactive waste. PHE also advises that assessments of radiological impact during the post operational phase of the facility should consider long timescales (possibly in excess of 10,000 years) that are appropriate to the long-lived nature of the radionuclides in the waste, some of which may have half-lives of millions of years. The radiological assessment should consider exposure of members of hypothetical representative groups for a number of scenarios including the expected migration of radionuclides from the facility, and inadvertent intrusion into the facility once institutional control has ceased. For scenarios where the

⁷ HPA (2008) Guidance on the application of dose coefficients for the embryo, fetus and breastfed infant in dose assessments for members of the public. Doc HPA, RCE-5, 1-78, available at <https://www.gov.uk/government/publications/embryo-fetus-and-breastfed-infant-application-of-dose-coefficients>

⁸ The Environment Agency (EA), Scottish Environment Protection Agency (SEPA), Northern Ireland Environment Agency, Health Protection Agency and the Food Standards Agency (FSA). Principles for the Assessment of Prospective Public Doses arising from Authorised Discharges of Radioactive Waste to the Environment August 2012. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296390/geho1202bklh-e-e.pdf

⁹ HPA RCE-8, Radiological Protection Objectives for the Land-based Disposal of Solid Radioactive Wastes, February 2009

probability of occurrence can be estimated, both doses and health risks should be presented, where the health risk is the product of the probability that the scenario occurs, the dose if the scenario occurs and the health risk corresponding to unit dose. For inadvertent intrusion, the dose if the intrusion occurs should be presented. It is recommended that the post-closure phase be considered as a series of timescales, with the approach changing from more quantitative to more qualitative as times further in the future are considered. The level of detail and sophistication in the modelling should also reflect the level of hazard presented by the waste. The uncertainty due to the long timescales means that the concept of collective dose has very limited use, although estimates of collective dose from the 'expected' migration scenario can be used to compare the relatively early impacts from some disposal options if required.

Annex 1

Human health risk assessment (chemical pollutants)

The points below are cross-cutting and should be considered when undertaking a human health risk assessment:

- The promoter should consider including Chemical Abstract Service (CAS) numbers alongside chemical names, where referenced in the ES
- Where available, the most recent United Kingdom standards for the appropriate media (e.g. air, water, and/or soil) and health-based guideline values should be used when quantifying the risk to human health from chemical pollutants. Where UK standards or guideline values are not available, those recommended by the European Union or World Health Organisation can be used
- When assessing the human health risk of a chemical emitted from a facility or operation, the background exposure to the chemical from other sources should be taken into account
- When quantitatively assessing the health risk of genotoxic and carcinogenic chemical pollutants PHE does not favour the use of mathematical models to extrapolate from high dose levels used in animal carcinogenicity studies to well below the observed region of a dose-response relationship. When only animal data are available, we recommend that the 'Margin of Exposure' (MOE) approach¹⁰ is used

¹⁰ Benford D et al. 2010. Application of the margin of exposure approach to substances in food that are genotoxic and carcinogenic. Food Chem Toxicol 48 Suppl 1: S2-24

From: [Nick Greenwood](#)
To: [M25 Junction 10](#)
Subject: M25 Junction 10 / A3 Wisley Interchange Improvement
Date: 22 December 2017 15:01:29

Dear Sir/Madam

Thank you for your recent correspondence regarding the application by Highways England for an Order granting Development Consent for the M25 Junction 10 / A3 Wisley Interchange Improvement.

On initial inspection, the Scoping Report appears comprehensive, and this authority has no specific observations at this time. However, we would be grateful to be maintained as a consultation body and to be fully informed of any future developments, with the opportunity to comment at the appropriate time.

Thank you

Kind regards

Nick Greenwood

--

Nick Greenwood
Senior Transport Planner

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M25 Junction 10/A3 Wisley Interchange Improvements

Royal Mail Group Limited comments on information to be provided in applicant's Environmental Statement

Introduction

Reference the letter from PINS to Royal Mail dated 13 December 2017 requesting Royal Mail's comments on the information that should be provided in Highways England's Environmental Statement for the proposed M25 Junction 10/A3 Wisley Interchange Improvements.

Royal Mail's consultants BNP Paribas Real Estate have reviewed the applicant's Scoping Report as submitted to the Secretary of State on 8 December 2017.

Royal Mail– relevant information

Royal Mail is responsible for providing efficient mail sorting and delivery nationally. As the Universal Service Provider under the Postal Services Act 2011, Royal Mail has a statutory duty to deliver mail to every residential and business address in the country as well as collecting mail from all Post Offices and post boxes six days a week.

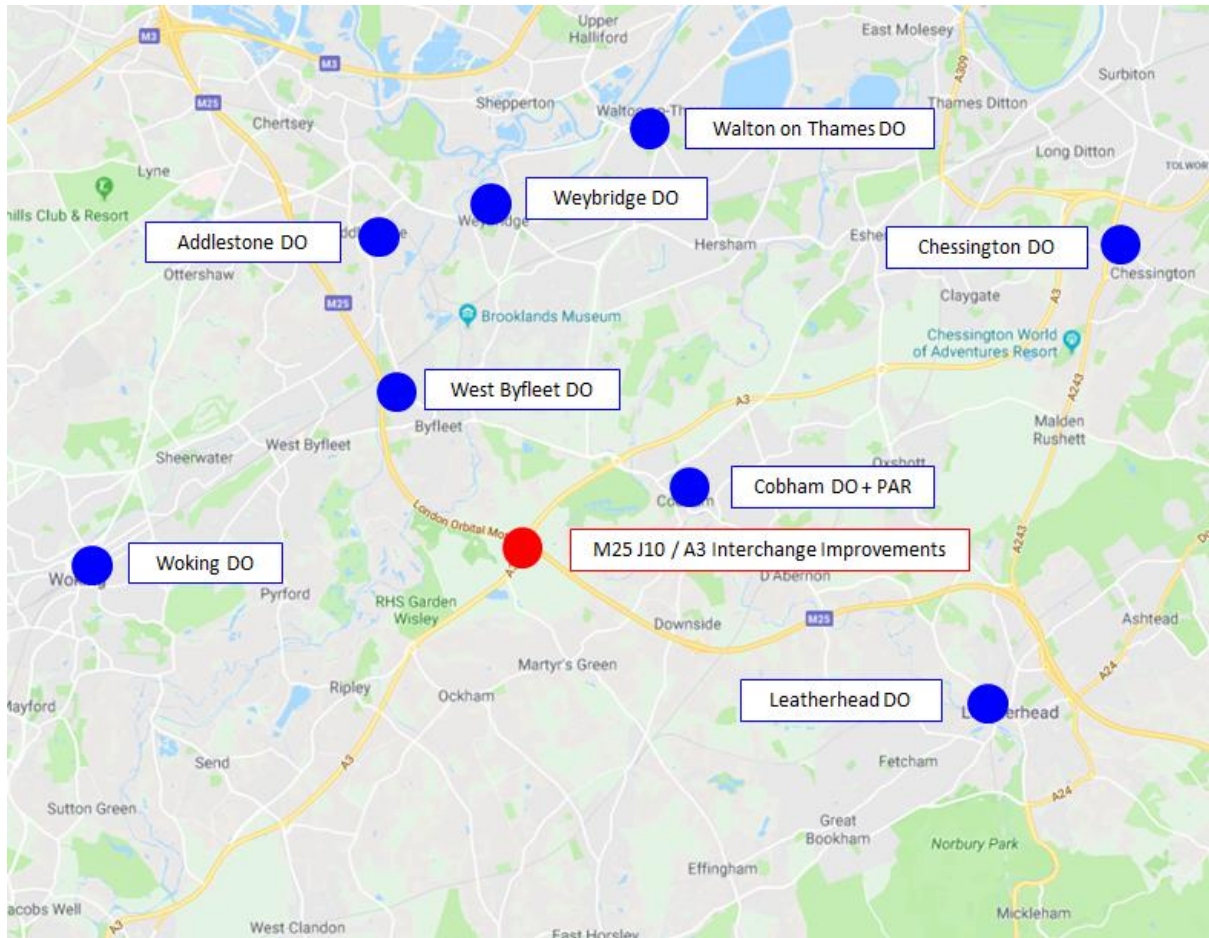
Royal Mail's postal sorting and delivery operations rely heavily on road communications. Royal Mail's ability to provide efficient mail collection, sorting and delivery to the public is sensitive to changes in the capacity of the highway network.

Royal Mail is a major road user nationally. Disruption to the highway network and traffic delays can have direct consequences on Royal Mail's operations, its ability to meet the Universal Service Obligation and comply with the regulatory regime for postal services thereby presenting a significant risk to Royal Mail's business.

Royal Mail therefore wishes to ensure the protection of its future ability to provide an efficient mail sorting and delivery service to the public in accordance with its statutory obligations which may potentially be adversely affected by the construction of this proposed road scheme.

Royal Mail's has nine operational properties within 10.2 miles of the proposed DCO boundary as listed and shown on plan below:

Cobham Delivery Office	1 High Street, Cobham KT11 3EL	2.4 miles
Cobham Vehicle Park	Tiltwood, Hog Hill Lane, Cobham KT11 2AQ	2.9 miles
West Byfleet Delivery Office	Circuit Centre, Avro Way KT13 0XG	4.7 miles
Weybridge Delivery Office	1 Elmgrove Road, Weybridge KT13 8AA	5.5 miles
Walton on Thames Delivery Office	73 Hersham Road, Walton-on-Thames, KT12 7LN	5.8 miles
Addlestone Delivery Office	75 Station Road, Addlestone KT15 2AA	6.4 miles
Leatherhead Delivery Office	Station Road, Leatherhead KT22 7AE	7.6 miles
Chessington Delivery Office	Elm Road, Chessington KT9 1AA	9.3 miles
Woking Delivery Office	White Rose Lane, Woking GU22 7ZZ	10.2 miles



The M25 and A3 are both strategically important distribution routes for Royal Mail operational traffic. Also, in exercising its statutory duties Royal Mail vehicles use on a daily basis all of the local roads that may potentially be affected by additional traffic arising from the construction of the proposed junction improvements.

It is envisaged that the proposed M25 Junction 10/A3 Wisley Interchange Improvements will, once constructed, reduce congestion which will have benefits for Royal Mail operational traffic movements. However, Royal Mail is concerned about the potential for disruption to its operations during the construction phase. In particular, Royal Mail requires more information and certainty about traffic management measures that will be put in place to mitigate construction impacts on traffic flows on the M25 and A3 and the surrounding local highway network.

Royal Mail's comments on information that should be provided in Highways England's Environmental Statement

In view of the above, Royal Mail has the following comments / requests:

1. The ES should include information on the needs of major road users (such as Royal Mail) and acknowledge the requirement to ensure that major road users are not disrupted through full advance consultation by the applicant at the appropriate time in the DCO and development process.



2. The ES and DCO application should include detailed information on the construction traffic mitigation measures that are proposed to be implemented by Highways England / its contractor, including a draft Construction Traffic Management Plan (CTMP).
3. Royal Mail is fully pre-consulted by Highways England / its contractor on any proposed road closures / diversions/ alternative access arrangements, hours of working and the content of the CTMP. The ES should acknowledge the need for this consultation with Royal Mail and other relevant major road users.

Royal Mail is able to supply Highways England with information on its road usage / trips if required.

Should PINS or Highways England have any queries in relation to the above then in the first instance please contact Joe Walsh (***joseph.walsh@royalmail.com***) of Royal Mail's Legal Services Team or Daniel Parry-Jones (***daniel.parry-jones@bnpparibas.com***) of BNP Paribas Real Estate.



Highways England
c/o The Planning Inspectorate
Fao: Mr Ian Wallis, EIA & Land Rights
Advisor, Major Applications & Plans
The Planning Inspectorate
3D Temple Quay House
Temple Quay
Bristol
BS1 6PN

Contact	David Stevens
Telephone	01252 398738
Email	david.stevens@rushmoor.gov.uk
Date	19th December 2017
Your Ref	TR010030-TR010030-000008
Our Ref	17/01020/ADJ

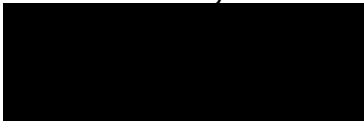
Dear Sirs

CONSULTATION : SCOPING OPINION : Application by Highways England for an Order granting Development Consent for the M25 Junction 10/A3 Wisley Interchange Improvement.

Thank you for your consultation concerning the above matter, which was received on 13 December 2017.

I confirm that Rushmoor Borough Council has no comments to make in respect of this consultation. Nevertheless, it is noted that the application site involves some sections of land designated as SSSI and also component parts of the Thames Basin Heaths Special Protection Area (SPA). Accordingly any decision to be made must take this into account in order to remain Habitats Regulations compliant.

Yours sincerely


pp Keith Holland
Head of Planning
Rushmoor Borough Council

From: [Robert Ainslie](#)
To: [M25 Junction 10](#)
Cc: [Ian Wallis](#)
Subject: RE: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation
Date: 22 December 2017 10:13:55
Attachments: [image001.jpg](#)

Dear Mr Wallis

Thank you for your e-mail. The Authority does not wish to comment on the Scoping Opinion and do not consider it needs to be a statutory consultee for this development.

I trust this is of assistance.

Yours sincerely

Rob Ainslie
Development Manager
South Downs National Park Authority
Tel: 01730 819265 | Mobile: [REDACTED]
South Downs Centre, North Street, Midhurst, West Sussex, GU29 9DH
www.southdowns.gov.uk | [facebook](#) | [SDNPA twitter](#) | [Ranger twitter](#) | [youtube](#)
RTPI Award



From: M25 Junction 10 [mailto:M25Junction10@pins.gsi.gov.uk]
Sent: 13 December 2017 15:52
To: M25 Junction 10 <M25Junction10@pins.gsi.gov.uk>
Subject: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation

Dear Sir/Madam

Please see the attached letter on the proposed M25 Junction 10/A3 Wisley interchange improvement.

Please note the deadline for consultation responses is 11 January 2018, and is a statutory requirement that cannot be extended.

Kind regards

Ian Wallis
EIA and Land Rights Advisor
Major Applications and Plans
The Planning Inspectorate, 3D Temple Quay House, Temple Quay, Bristol BS1 6PN

Direct Line: 0303 444 5724

Helpline: 0303 444 5000

Email: ian.wallis@pins.gsi.gov.uk

Web: www.gov.uk/government/organisations/planning-inspectorate (The Planning Inspectorate)

Web: www.infrastructure.planninginspectorate.gov.uk (National Infrastructure Planning)

Twitter: [@PINSgov](https://twitter.com/PINSgov)

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From: [Mounty, Russ](#)
To: [M25 Junction 10](#)
Subject: TR010030-TR010030-000008 - Pproposed M25 junction 10 /A3 Wisley Interchange Improvement.
Date: 10 January 2018 16:42:41

Dear Ms Boyle,

**Planning Act 2008 (as amended) and The Infrastructure Planning
(Environmental Impact Assessment) Regulations 2017(the EIA Regulations) –
Regulations 10 and 11
Application by Highways England for an Order granting Development Consent
for the M25 Junction 10/A3 Wisley Interchange Improvement
Scoping consultation and notification of the Applicant's contact details and
duty to make available information to the Applicant if requested**

Thank you for consulting Spelthorne Borough Council regarding the proposed M25 junction 10 /A3 Wisley interchange improvement.

I can confirm that Spelthorne Borough council has no comments.

Regards

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Spelthorne Means Business

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Ms Gail Boyle
Senior EIA & Land Rights Adviser
The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol BS1 6PN

11 January 2018

Dear Ms Boyle,

Response to Consultation under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Application by Highways England for an Order Granting Development Consent for the M25 Junction 10 / A3 Wisley Interchange Improvement

PINS Reference: TR010030-TR010030-000008

1. We write in response to your letter dated 13 December 2017, seeking the views of Surrey County Council on the information to be included in the Environmental Statement (ES) that will be submitted by Highways England as part of the application for a Development Consent Order (DCO) for the proposed improvement works at the M25 Junction 10 / A3 Wisley interchange. The County Council has reviewed the information presented in the prospective applicant's environmental scoping report, and has a number of recommendations to make in respect of the proposed scope of the EIA for the scheme.
2. Due to the relatively short period of time allowed for the consultation, we have been unable to review the submitted material in as great a depth as might otherwise have been the case. Consequently our comments and advice are somewhat limited, in terms of the level and depth of detail provided.

Part A: Air Quality – Chapter 5 (pp.48-66) of the Environmental Scoping Report

3. **Definition of Study Area:** Section 5.2 (p.48) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on air quality. A study area extending to some 200 metres from the defined site boundary is specified with reference to the potential effects of the construction phase (paragraph 5.2.1, p.48), and of the operational phase (paragraph 5.2.4, p.48). The County Council concurs with the proposed extent of the study area for the operational effects of the development, but recommends that for the construction phase the study area be extended to 350 metres from the site boundary, in line with the Institute of Air Quality Management (IAQM) '*Guidance on the assessment of dust from demolition & construction*' (2014).
4. **Description of Baseline Conditions:** Section 5.4 (pp.51-59) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. Measured and modelled information is provided for background levels of particulate matter and nitrogen dioxide at the proposed site and in the wider surrounding area (paragraphs 5.4.3 to 5.4.24, pp.52-55, and Tables 5-2, p.53 to 5-7, pp.58-59). The location of sensitive receptors, in terms of both human health and ecology, that are located in close proximity to the site of the proposed development, is covered in paragraphs 5.4.25 to 5.4.29 (p.58) and Table 5-7 (pp.58-59). The County Council has no comments to make on the sources of baseline that it is proposed be relied upon, nor on the sensitive receptors that would be covered by the assessment.
5. **Proposed Method of Assessment:** Section 5.5 (pp.59-60) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme. Those impacts include emissions of dust for the construction phase, and emissions from vehicles for the construction and operational phases. The County Council concurs with the types of impacts that have been identified as requiring assessment during the construction and demolition phases of the scheme.
6. Section 5.6 (pp.60-61) and section 5.7 (pp.61-64) of the Environmental Scoping Report discuss the way in which the assessment of impacts on air quality would be undertaken, and cite the guidance that would be followed (DMRB and associated IANs, and Defra's local air quality management technical guidance).
 - 6.1 For the construction phase, a qualitative assessment of dust impacts is proposed (paragraph 5.7.5, p.61), which would be carried out in line with the method set out in the DMRB. The County Council advises that, for construction effects, the assessment should follow the methodology set out in the IAQM's '*Guidance on the assessment of dust from demolition & construction*' (2014), which includes a specific risk assessment methodology for construction dust.

- 6.2 For the construction phase, a quantitative assessment of the traffic impacts of the scheme would only be undertaken if suitable and sufficient information, on vehicle numbers, flows, composition and speeds, and traffic management measures were available (paragraph 5.7.5, p.61). The County Council recommends that the applicant estimate the vehicle movements that would be expected to arise from the construction phase, and compare those numbers with the criteria cited in the DMRB for determining which roads would be affected. Where impacts are identified (i.e. the relevant criteria are exceeded), it is recommended that modelling be undertaken to establish the likely significance of the predicted effects.
- 6.3 For the operational phase, the proposed method of assessment is set out in paragraphs 5.7.6 to 5.7.20 (pp.62-64), and would consider the impacts of operational traffic on local air quality, on regional emissions, and the effect on the development of major accidents and disasters. The County Council concurs with the proposed method of assessment in respect of operational air quality effects.
- 6.4 For cumulative effects, it is noted that a zone of influence of 200 metres from the affected road network is specified for air quality impacts in chapter 15 (cumulative effects) of the Environmental Scoping Report. The County Council recommends that such a distance is appropriate for the operational phase of the project, but that a distance of 350 metres be used for the assessment of construction phase impacts.
7. **Mitigation Measures:** Section 5.9 (pp.64-65) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme.
- 7.1 For the construction phase, the County Council recommends that the mitigation and control measures described in the IAQM's '*Guidance on the assessment of dust from demolition & construction*' (2014), be applied.
- 7.2 For the operational phase, the need for mitigation of effects on sensitive human receptors appears to have been ruled out in advance of the assessment having been undertaken. The County Council recommends that a transparent assessment of the likely effects be provided, and that appropriate mitigation measures be identified and deployed.

Part B: Noise & Vibration – Chapter 6 (pp.67-77) of the Environmental Scoping Report

8. **Definition of Study Area:** Section 6.2 (p.67) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on background levels of noise and vibration. Paragraph 6.2.3 (p.67) indicates that the study area would cover land situated within 600 metres of the carriageway edge of any affected road links that are located within 1

kilometre of the proposed scheme, and was determined in line with the guidance set out in Volume 11, Part 3, Section 7 HD 213/11 Noise of the DMRB. The County Council confirms that the approach used to define the study area is acceptable.

9. **Description of Baseline Conditions:** Section 6.4 (pp.70-72) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. Paragraph 6.4.1 (p.70) refers to a number of data sources that would be used to determine background noise conditions for the affected area of land, and to identify noise sensitive receptors in the vicinity. A preliminary suite of noise sensitive receptors is identified in paragraphs 6.4.2 to 6.4.6 (pp.70-71), and the sources of information that would be used to define the baseline noise climate, including noise surveys, are described in paragraphs 6.4.7 to 6.4.11 (pp.71-72). The County Council agrees with the preliminary list of noise sensitive receptors, and the sources of baseline information that would be used. The County Council would welcome the opportunity to review and comment upon any changes that may be made to the list of sensitive receptors as the assessment proceeds, and on any amendments that may be made in respect of the proposed baseline monitoring method and locations.
10. **Proposed Method of Assessment:** Section 6.5 (pp.72-73) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme. For the construction phase the impacts would be temporary, and would arise from the physical works, and from temporary traffic control measures (paragraphs 6.5.2 and 6.5.3, p.73). For the operational phase, the impacts would be associated with changes in traffic (type, volume, density, and speed), and with changes in the alignment of the road network relative to sensitive noise receptors (paragraph 6.5.4, p.73).
11. Section 6.6 (p.73) and section 6.7 (pp.74-76) of the Environmental Scoping Report discuss the way in which the assessment of the proposed scheme's impacts on the noise environment would be undertaken. Paragraph 6.6.1 (p.73) states that traffic data for the noise assessment would be sourced from the South East regional strategic traffic model (SERTM). Paragraphs 6.6.3 (p.73), and paragraphs 6.7.1 to 6.7.10 (pp.74-75) report that the assessment of operational impacts would be carried out in accordance with the detailed appraisal method defined in the DMRB HD 213/11 guidance. The County Council understands that the DMRB is currently under review, and therefore recommends that the assessment take account of the likely changes to that guidance, by including assessment of night-time noise, and including the use of 'no observed effects levels' (NOELs), 'lowest observed effects levels' (LOELs), and 'significant observed effects levels' (SOELs).
12. **Mitigation & Residual Effects:** Section 6.9 (p.76) of the Environmental Scoping Report identifies the mitigation measures that would be deployed to address the noise impacts arising from the scheme. The proposed mitigation would be focused on the operational phase of the scheme, and would primarily comprise of low noise road surfacing, and the construction of noise barriers or bunds alongside the carriageway. The County Council recommends that consideration also be given to the potential for the scheme to deliver

improvements in existing noise mitigation measures situated within the proposed application area.

Part C: Biodiversity – Chapter 7 (pp.78-112) of the Environmental Scoping Report

13. **Definition of Study Area:** Section 7.2 (pp.78-79) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on ecological assets and systems. The extent of the proposed study area is dependent on the ecological aspect under consideration, ranging from 50 metres for veteran trees, to one kilometre for Ancient Woodlands, notable habitats, and notable or protected species, to two kilometres for conservation verges, non-statutory Sites of Nature Conservation Importance (SNCIs), and statutory nature conservation designations (SSSIs, SPAs, SACs, Ramsar Sites, NNRs and LNRs), to ten kilometres for bats, and to thirty kilometres for SACs where bats are a qualifying species. The County Council concurs with the proposed study area, and with the aspects of the natural environment to be covered by the assessment.
14. **Description of Baseline Conditions:** Section 7.4 (pp.85-100) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. The sources of baseline information to be used in the assessment are listed under paragraph 7.4.1 (pp.85-86), and include both existing records and the findings of surveys commissioned for the purposes of the scheme. Paragraph 7.4.1 (pp.85-86) reports that a Phase 1 Habitat Survey and a NVC survey have been carried out on the publically accessible land around Junction 10, and surveys of a range of fauna have been carried out in 2016 and 2017 on land surrounding the junction. The County Council is content that the proposed ecological baseline covers all relevant aspects of the natural environment.
15. **Proposed Method of Assessment:** Section 7.5 (pp.100-101) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme, with reference to ecology. The primary impact of concern is the permanent removal of land that is currently subject to statutory and non-statutory nature conservation designations, which extends to some 25.7 hectares, with a further 32.8 hectares subject to temporary change of use (paragraph 7.5.2, p.100). In terms of habitat loss, paragraph 7.5.6 (p.101) reports that some 22.4 hectares of habitats of principal importance would be permanently altered, and a further 22.4 hectares of habitats of principal importance would be affected by a temporary change of use. Paragraphs 7.5.8 and 7.5.9 (p.101) report that impacts, including disturbance, disruption of migration and commuting routes, loss of foraging areas, population fragmentation, and the risk of death or injury, could arise in respect of a range of protected and notable faunal species. The County Council notes that no reference is made in Section 7.5 of the Environmental Scoping Report to the potential ecological effects of changes in air quality, noise disturbance or hydrology, but acknowledges that such matters are raised in Section 7.6 (pp.101-106) and 7.7 (pp.106-109) of the report.

16. Section 7.6 (pp.101-106) and 7.7 (pp.106-109) of the Environmental Scoping Report discuss the way in which the assessment of impacts on the ecological interest of the affected land would be undertaken. Table 7-8 (pp.102-103) in Section 7.6, reports that the assessment would cover impacts on a wide range of ecological assets, including statutory and non-statutory designated sites, and protected and notable habitats and species. A list of the organisations that are considered to be key stakeholders with respect to the natural environment is provided in paragraph 7.6.3 (pp.101-102), to which the County Council requests that it be added, as a major landowner, alongside the Surrey Wildlife Trust, which manages Ockham & Wisley Commons on the County Council's behalf.
17. Paragraph 7.7.3 (p.106) of Section 7.7 of the Environmental Scoping Report indicates that the assessment would be undertaken in line with the published CIEEM guidance on ecological impact assessment, and relevant parts of the DMRB Volume 11. Paragraph 7.7.15 (pp.108-109) reports on the surveys, of habitats and species, that commenced in May 2017, and will continue throughout the preliminary design stage of the project, and paragraph 7.7.16 (p.109) reports that an arboricultural assessment of veteran trees would be undertaken. The County Council is generally content with the range of surveys proposed, but would recommend that the survey of veteran trees include an ecological assessment, due to their potential to harbour important assemblages of bats and invertebrates.
18. **Mitigation & Residual Effects:** Section 7.9 (pp.110-111) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme. Paragraph 7.9.1 (pp.110-111), at the eighth bullet point, makes reference to the purchase of land, which would be managed to create compensatory heathland and woodland habitats, to offset the losses incurred by the SSSI and the SPA as a consequence of the proposed scheme. The County Council notes that the report does not explain the methodology that would be used to calculate the amounts and types of compensatory habitat required, and recommends that the approach outlined in the Defra publication 'Technical Paper: the metric for the biodiversity offsetting pilot in England' (2012) (copy enclosed) could be appropriate. The County Council also notes that, although the need for compensatory habitat is identified, the discussion of mitigation does not extend to the longer term management of those areas, and it is recommended that arrangements for such are developed in light of the guidance set out in the Surrey Nature Partnership's 'Biodiversity Opportunity Area Policy Statement TBH06 Wisley, Ockham & Walton Heaths' (copy enclosed).

Part D: Road Drainage & the Water Environment – Chapter 8 (pp.113-128) of the Environmental Scoping Report

19. **Definition of Study Area:** Section 8.2 (p.113) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on the water environment. Paragraph 8.2.1 (p.113) reports that the assessment would cover all components of the water environment located within 1 kilometre of the area of land affected by the proposed scheme, extending beyond

1 kilometre where effects could arise further afield (e.g. downstream flood risk, hydromorphological change). For the underlying groundwater body, the Chobham Bagshot Beds, paragraph 8.2.1 (p.113) indicates that the assessment would cover the entire waterbody. The County Council concurs with the proposed study area, and with the aspects of the water environment to be covered by the assessment.

21. **Description of Baseline Conditions:** Section 8.4 (pp.116-119) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. Paragraphs 8.4.2 to 8.4.7 report on the aspects of the water environment that would be covered by the assessment, including surface water bodies and other surface water features, groundwater bodies, licensed abstractions and discharges, and all sources of flood risk. The County Council recommends that a hydrogeological risk assessment is undertaken, to inform the groundwater impact assessment, and to provide information about existing groundwater levels, and the quality of groundwater and surface waters. The County Council also recommends that the assessment cover the potential physical effects (e.g. truncation or diversion of flows, changes to base flows to surface water features, etc.) of the proposed scheme on the groundwater environment, in addition to the potential chemical effects of contamination.
23. **Proposed Method of Assessment:** Section 8.5(pp.119-120) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme, with reference to the water environment. For the construction phase, paragraphs 8.5.2 (p.119) and 8.5.4 (p.120) report that the main issues of concern would be the release of sediments or contaminants into watercourses, the mobilisation of contamination, and changes in flood risk from fluvial, pluvial and groundwater sources. For the operational phase, paragraph 8.5.5 (p.120) reports that the main issues of concern would be physical and chemical effects on surface waters and groundwaters, and changes in flood risk associated with the permanent changes in land use.
24. Section 8.6 (pp.120-124) and section 8.7 (pp.124-125) of the Environmental Scoping Report discuss the way in which the assessment of impacts on the water environment and flood risk would be undertaken. Table 8-4 (pp.120-121) reports that the assessment would cover the impacts of the proposed scheme on surface waterbodies and lakes, on groundwater bodies, on abstractions and discharges, on flood risk, on the Water Framework Directive status of nearby waterbodies that are subject to monitoring under that regime, and on water dependent designated nature conservation sites. The methods that would be applied with respect to the aspects of the water environment requiring assessment are outlined in paragraphs 8.7.1 to 8.7.7 (pp.124-125). The County Council is generally content with the proposed approach, but would recommend that a hydrogeological risk assessment be included with reference to groundwater, and that account be taken of the most up-to-date guidance with reference to flood risk assessment and climate change allowances.

25. **Mitigation & Residual Effects:** Section 8.9 (pp.125-126) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme with reference to management of the impacts of the scheme on the water environment and flood risk. The County Council is broadly content with the approach proposed, with reference to the identification of mitigation measures.

Part E: Landscape – Chapter 9 (pp.129-147) of the Environmental Scoping Report

26. **Definition of Study Area:** Section 9.2 (p.129) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on the landscape and visual amenity. For landscape effects, paragraph 9.2.2 (p.129) the study area would extend to 1.5 kilometres beyond the perimeter of the land covered by the proposed scheme. A similar study area is proposed in paragraph 9.2.5 (p.129) with reference to visual impacts. The County Council concurs with the proposed extent of the study area for landscape and visual effects, subject to there being no substantial alterations to the proposed scheme.
27. **Description of Baseline Conditions:** Section 9.4 (pp.132-135) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area, with reference to landscape character and the visual environment.
- 27.1 For landscape character, paragraphs 9.4.2 to 9.4.7 (pp.132-135) identify and summarise the National Character Areas and local Landscape Character Areas relevant to the affected land. It is noted that reference is made to the 2015 Surrey Landscape Character Assessment with reference to those parts of the scheme situated in the borough of Elmbridge, but not for those parts situated in the borough of Guildford. The County Council recommends that the baseline description of landscape character make reference to the County level LCA (2015) across the entire area of the scheme, in addition to national and local level assessments.
- 27.2 For the visual environment, paragraphs 9.4.8 to 9.4.11 (p.135) identify and summarise the key categories of visual receptors to be taken into account in the assessment. The County Council concurs with the proposed list of potentially affected visual receptors that would be taken into consideration during the assessment.
28. **Proposed Method of Assessment:** Section 9.5 (pp.135-137) of the Environmental Scoping Report identifies the main impacts on landscape character and visual amenity that it is proposed would be addressed through the assessment, for both the construction and operational phases of the scheme. For landscape character, paragraphs 9.5.2 to 9.5.7 (p.136) identify the key impacts as being, changes in land use and land form, changes in tranquillity, and the introduction of new built elements into the area. For visual amenity, paragraphs 9.5.8 to 9.5.14 (pp.136-137) identify the key impacts as being, changes in land

use and land form, and the introduction of new built elements into the area. The County Council concurs with the impacts and effects that the assessment proposes to cover.

29. Section 9.6 (pp.137-140) and section 9.7 (pp.140-146) of the Environmental Scoping Report discuss the way in which the assessment of impacts on landscape character and visual amenity would be undertaken. The scope of the landscape character assessment, and the aspects of the landscape to be taken into account, is discussed in paragraphs 9.6.7 to 9.6.8 and Table 9-3 (p.138). The scope of the visual impact assessment, and the visual receptors to be taken into account, is discussed in paragraph 9.6.9 (p.139) and Table 9-4 (pp.139-140). The proposed methods of assessment for landscape character and visual amenity are discussed in paragraphs 9.7.1 to 9.7.14 (pp.140-146), with paragraph 9.7.1 (p.140) reporting that the assessment would be carried out in line with the 'Guidelines for Landscape & Visual Impact Assessment' (3rd edition, Landscape Institute & IEMA). The County Council is broadly content with the proposed methodology, but would recommend that photomontages are used to illustrate the changes to key views, and that the Landscape Institute's 'Technical Guidance Note 02/17' is followed.
30. **Mitigation & Residual Effects:** Section 9.9 (p.146) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme with reference to management of the impacts of the scheme on landscape character and visual amenity. The County Council is broadly content with the approach proposed, with reference to the identification of mitigation measures.

Part F: Geology & Soils – Chapter 10 (pp.148-165) of the Environmental Scoping Report

31. **Definition of Study Area:** Section 10.2 (p.148) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on geology and soil resources. Paragraph 10.2.1 (p.148) reports that the study area would extend to 500 metres from the perimeter of the land affected by the proposed scheme. The County Council concurs with the proposed extent of the study area for geology and soils, subject to there being no substantial alterations to the proposed scheme.
32. **Description of Baseline Conditions:** Section 10.4 (pp.149-151) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. The range of issues to be covered by the description of baseline conditions is broad, including geology, hydrogeology, hydrology, agricultural soils, land contamination, and unexploded ordnance. The County Council would recommend that the topics of hydrogeology and hydrology be more appropriately tackled in the water environment chapter of the Environmental Statement, to avoid potential duplication of assessment. The County Council would also advise that the area of land affected by the proposed scheme does not coincide with any of the Mineral Safeguarding Areas defined under the Surrey Minerals Plan, and consequently the scheme is considered unlikely to result in the sterilisation of significant minerals resources.

33. **Proposed Method of Assessment:** Section 10.5 (p.152) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme. The main issues of concern include the potential for contamination of the land, the potential to create new areas of instability, and the potential to give rise to contamination of ground and surface waters. The County Council is broadly content with the range of issues that have been identified as requiring assessment with respect to geology and soils.
34. Section 10.6 (pp.152-153) and section 10.7 (pp.154-162) of the Environmental Scoping Report discuss the way in which the assessment of impacts on geology and soils would be undertaken. Paragraph 10.6.2 (pp.152-153) reports that ground investigations have been specified and would be undertaken to inform the assessment, and paragraph 10.6.4 (p.153) reports that a range of physical and chemical impacts would be covered by the assessment. Paragraphs 10.7.2 to 10.7.17 (pp.154-160) report on the contaminated land risk assessment and impact assessment that would be undertaken, and on which the Environment Agency would be consulted. Paragraphs 10.7.18 to 10.7.24 (p.161) report on the agricultural soils assessment that would be carried out, which would follow the method set out in Volume 11 of the DMRB. The County Council is broadly content with the approach that has been proposed to the assessment of the schemes effects on land contamination, and on agricultural soils. The County Council would recommend that a land instability risk assessment be undertaken as part of the assessment for geology and soils.
35. **Mitigation & Residual Effects:** Section 10.9 (pp.162-164) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme with reference to management of the impacts of the scheme on geology and soils. The County Council is broadly content with the approach proposed, with reference to the identification of mitigation measures.

Part G: Cultural Heritage – Chapter 11 (pp.166-181) of the Environmental Scoping Report

36. **Definition of Study Area:** Section 11.2 (p.166) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on heritage assets. Paragraph 11.2.1 (p.166) reports that the study area would extend some 500 metres beyond the perimeter of the land affected by the proposed scheme. The County Council concurs with the proposed extent of the study area for cultural heritage, subject to there being no substantial alterations to the proposed scheme.
37. **Description of Baseline Conditions:** Section 11.4 (pp.170-172) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. The designated and undesignated heritage assets that are situated within the specified study area are shown on Figure 2.1, with details of those assets recorded in Appendix F (Gazetteer of Heritage Assets) (pp.302-320) to the Environmental Scoping Report. The County Council is broadly content with the heritage baseline that has been defined and described in Section 11.4 of the Environmental Scoping

Report, but notes that a number of assets are missing from the gazetteer presented in Appendix F, although they are shown on Figure 2.1. The missing heritage assets that need to be included within the gazetteer are the one Grade I Listed Building, the five Grade II* Listed Buildings, and five of the Grade II Listed Buildings that have been identified as being located within 500 metres of the land covered by the proposed scheme.

38. **Proposed Method of Assessment:** Section 11.5 (pp.172-175) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme. In both cases potential is identified for the scheme to impact upon known heritage assets, including features of archaeological interest, on unknown archaeological assets, and upon the context and setting of a range of heritage assets. The County Council is broadly content with the range of issues that have been identified as requiring assessment with respect to the archaeological, built and cultural heritage.
39. Section 11.6 (p.175) and section 11.7 (pp.175-179) of the Environmental Scoping Report discuss the way in which the assessment of impacts on the archaeological, built and cultural heritage would be undertaken. Paragraph 11.7.1 (pp.175-176) reports that the assessment would initially take the form of a desk based exercise, with the need for further archaeological investigation determined on the basis of the findings of that preliminary work. Paragraph 11.7.6 (pp.178-179) reports on the range of assessments that would inform the EIA process, which would include the desk-based assessment, archaeological evaluation and trial trenching or geo-physical surveys (where necessary), the preparation of statements of significance for the nearby Registered Parks & Gardens and assessment of their settings, and assessment of the settings of those heritage assets potentially affected by the scheme. Where the applicant has indicated that the need for further investigations, and the form and focus of those investigations, would be determined in consultation with relevant bodies, and the County Council would welcome the opportunity to participate in those discussions.
40. **Mitigation & Residual Effects:** Section 11.9 (pp.179-180) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme with reference to management of the impacts of the scheme on archaeology and the built and cultural heritage. The County Council is broadly content with the approach proposed, with reference to the identification of mitigation measures, and would welcome the opportunity to comment on any schemes of investigation and evaluation prepared in light of the findings of the initial assessment.

Part H: Materials & Waste – Chapter 12 (pp.182-195) of the Environmental Scoping Report

41. **Definition of Study Area:** Section 12.2 (p.182) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on material resources and waste. The County

Council concurs with the proposed extent of the study area for materials and waste, subject to there being no substantial alterations to the proposed scheme.

42. **Description of Baseline Conditions:** Section 12.4 (pp.186-189) of the Environmental Scoping Report provides an account of baseline conditions in terms of material resources and waste that are relevant to the proposed scheme. For material resources consideration is given to the availability of relevant materials at the national level. For waste arisings and waste management capacity information is provided for construction, demolition and excavation waste and for hazardous waste at the Surrey level. The County Council would direct the applicant to the recently published waste capacity assessment that has been prepared to inform the review of the Surrey Waste Plan as a source of current information on waste arisings and existing management capacity within the county.
43. **Proposed Method of Assessment:** Section 12.5 (p.189) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme. Paragraph 12.5.2 (p.189) identifies the issues to be addressed as, the market for the key construction materials required for the scheme, the wastes expected to arise from the construction phase of the scheme, and the capacity of existing waste infrastructure. The County Council is broadly content with the range of issues that have been identified as requiring assessment with respect to materials and waste.
44. Section 12.6 (pp.189-191) and section 12.7 (pp.191-194) of the Environmental Scoping Report discuss the way in which the assessment of impacts on materials and waste would be undertaken. The County Council is broadly content with the approach that has been outlined with reference to the assessment of the scheme's effects on demand for material resources and on the management of waste arisings.
45. **Mitigation & Residual Effects:** Section 12.9 (p.194) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme with reference to management of the impacts of the scheme on demand for materials and on waste arisings. The County Council is broadly content with the approach proposed, with reference to the identification of mitigation measures.

Part I: People & Communities – Chapter 13 (pp.196-223) of the Environmental Scoping Report

46. **Definition of Study Area:** Section 13.2 (p.196) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on communities and the human population. The County Council recommends that the study area include those elements of the local road network, for example the B2215 in Ripley, that would be affected as a consequence of the changes made by the scheme.

47. **Description of Baseline Conditions:** Section 13.4 (pp.200-205) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. The aspects of the community covered by the description of baseline conditions includes residents, businesses and community assets, agricultural land (which would be better addressed under the geology and soils chapter), development land (in terms of land subject to proposals for development, or identified as suitable for development through Local Plans), and vehicular and non-vehicular users of the local road network. The County Council is keen to ensure that full consideration is given to the impacts of the proposed works on the wider local road network and its users, and would encourage the applicant to include baseline traffic information for all potentially affected road links as part of the assessment.
48. **Proposed Method of Assessment:** Section 13.5 (pp.205-207) of the Environmental Scoping Report identifies the main impacts that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme. Consideration would be given the potential effects of land take, severance and changes in amenity for residents and community assets (paragraphs 13.5.1 to 13.5.8, pp.205-206), and on local businesses, and agricultural and development land (paragraphs 13.5.9 to 13.5.14, p.206). For users of the local road network, consideration is given to the length of journeys, to patterns of travel, to amenity, to severance, to views, and to the likelihood of stress (paragraphs 13.5.15 to 13.5.22, pp.206-207). The County Council is broadly content with the range of issues that have been identified as requiring assessment with respect to the impacts of the scheme on the community.
49. Section 13.6 (p.207) and section 13.7 (pp.207-221) of the Environmental Scoping Report discuss the way in which the assessment of impacts on the community would be undertaken. The County Council is broadly content with the approaches that have been outlined with reference to the assessment of the scheme's effects on residents, businesses and community assets (paragraphs 13.7.5 to 13.7.33, pp.208-214), on agricultural land and development land (paragraphs 13.7.34 to 13.7.41, pp.214-215), and on vehicular and non-vehicular users of the local road network (paragraphs 13.7.42 to 13.7.73, pp.216-221).
50. **Mitigation & Residual Effects:** Section 13.9 (p.221) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme. The County Council would expect appropriate mitigation or compensatory measures to be identified in respect of each of the aspects of the community adversely affected by the proposed scheme.

Part J: Climate – Chapter 14 (pp.224-237) of the Environmental Scoping Report

51. **Definition of Study Area:** Section 14.2 (pp.224-226) of the Environmental Scoping Report defines the extent of the area that would be covered by the assessment with reference to the impacts of the proposed development on the climate. The County Council concurs with the proposed extent of the study area for climate change, subject to there being no substantial alterations to the proposed scheme.

52. **Description of Baseline Conditions:** Section 14.4 (pp.229-231) of the Environmental Scoping Report provides an account of baseline conditions at the proposed application site, and in the surrounding area. The County Council concurs with the approach that is proposed to define the baseline for the scheme with reference to the issue of climate change, in terms of emissions of greenhouse gases.
53. **Proposed Method of Assessment:** Section 14.5 (p.232) of the Environmental Scoping Report identifies the main impact that it is proposed be addressed through the assessment, for both the construction and operational phases of the scheme, which in this instance comprises the global atmosphere. The County Council agrees that the applicant has identified the key impact of concern with reference to the climate.
54. Section 14.6 (p.232) and section 14.7 (pp.232-233) of the Environmental Scoping Report discuss the way in which the assessment of impacts on the climate would be undertaken. The proposal to provide a quantified assessment of the scheme's likely contribution to greenhouse gas emissions is welcomed by the County Council.
55. **Mitigation & Residual Effects:** Section 14.10 (pp.234-235) of the Environmental Scoping Report identifies the mitigation measures that would be deployed during the construction and operational phases of the scheme. The County Council is content with the approach to mitigation of the greenhouse gas emissions that has been proposed by the applicant.

Part K: Final Comments

56. We hope that the above comments are of value to the process of defining the scope of the EIA for the proposed scheme, and would welcome the opportunity to engage further with the applicant as the development of the scheme and the associated assessment progresses. Please do not hesitate to contact us should you require any further information, or wish to seek clarification of any of the comments that we have made.

Yours sincerely

Caroline Smith
Planning Development Manager

Enclosures: Defra, 'Technical Paper: the metric for the biodiversity offsetting pilot in England' (2012)
Surrey Nature Partnership, 'Biodiversity Opportunity Area Policy Statement TBH06 Wisley, Ockham & Walton Heaths'

Biodiversity Offsetting Pilots

Technical Paper: the metric for the biodiversity offsetting pilot in England

March 2012



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Technical Paper – metric for the biodiversity offsetting pilot in England

1. Biodiversity offsets are conservation activities designed to deliver biodiversity benefits in compensation for losses, in a measurable way. Biodiversity offsets are distinguished from other forms of ecological compensation by the requirement for measurable outcomes: the losses resulting from the impact of the development and the gains achieved through an offset are measured in the same way.
2. A metric is a tool that allows biodiversity losses and compensation to be measured. This technical paper describes the metric that will be used in the biodiversity offsetting pilots in England. It has developed by Natural England in consultation with a range of experts.
3. This is version 2 of this paper. It updates an earlier version that was published in July 2011. The changes to the paper have been made in the light of ongoing discussions with stakeholders and potential participants in the biodiversity offsetting pilots. The paper also reflects the new strategy for Biodiversity in England – Biodiversity 2020¹.
4. This paper:
 - explains what a metric is and describes the metric we will use in the biodiversity offsetting pilots
 - explains what ‘multipliers’ are, and how they can be used to manage risks involved in expanding and restoring habitats
 - explains how multipliers can be used to take account of the difference in time between the impact of a development and the delivery of biodiversity benefits in an offset project
 - sets out our approach to dealing with hedgerows and species.
5. This paper explains the rationale and thinking behind the approach we have taken, setting out the issues that we have considered in developing the metric and our conclusions.
6. Separate guidance is available for offset providers and developers that would like to participate in the biodiversity offsetting pilot. This separate guidance is a step-by-step guide to using the metric. This guidance, and other background papers, can be found at: <http://www.defra.gov.uk/environment/natural/biodiversity/uk/offsetting/>.

¹ <http://www.defra.gov.uk/publications/2011/08/19/pb13583-biodiversity-strategy-2020/>

Background

7. Biodiversity offsets are conservation activities designed to deliver biodiversity benefits in compensation for losses, in a measurable way. Biodiversity offsets are distinguished from other forms of ecological compensation by the formal requirement for measurable outcomes: the losses due to impact, and gains achievable through the offset, are measured in the same way, even if the habitats concerned are different.
8. Biodiversity in its entirety is impossible to measure so a 'metric' is used to represent, and provide a measure of, overall biodiversity.
9. Metrics are surrogates², or combinations of measurements, that together provide an assessment of the biodiversity value of a particular area. The metric allows the biodiversity impact of a development to be quantified so that the offset requirement, and the value of the compensatory action, can be clearly defined. Metrics are transferable between sites and habitats, allowing an impact on one habitat type to be offset with conservation action elsewhere, or involving a different habitat type and/or quality of habitat.
10. There are a number of different types of metrics used in offsetting schemes around the world. Some use single attributes but most use multiple attributes. In many cases, metrics also make use of a quantity measurement, for example land area adjusted in some way for quality (Eftec, 2010). There are no "off the shelf packages" suitable for all situations. The mechanism used depends on the characteristics of the biodiversity interests and the scheme's objectives.
11. Examples of single-attribute metrics (or surrogates) include measures of vegetation density; cover, or biomass; density of seedlings; index of vegetation structural diversity. Multiple attribute metrics make use of a number of different measures to come up with a single figure or index. Multiple attribute metrics by their nature are more complex and potentially more accurate as a measure of biodiversity value.
12. Perhaps the best known metric system is "habitat hectares". This approach was originally developed for use in Victoria, Australia and is described in Parks, Newell & Cheal, (2003), and forms the basis for a number of different metrics currently being developed and used. Habitat hectares is an example of a multiple attribute metric that has been developed specifically for offsetting. The attributes measured in the habitat hectares approach are: large trees, tree (canopy) cover, understory strata, lack of weeds, recruitment, organic litter, logs, patch size, neighbourhood, and distance to core area.

² "Surrogates are measurements that act as a substitute for a complete measurement of the total biodiversity found within a particular area.

Habitat hectares assesses these various attributes against 'benchmarks' representing the average characteristics of mature stands of native vegetation of the same community type in a 'natural' or 'undisturbed' condition.

13. The habitat hectares system used in Australia is intensive in terms of the input required to assess the habitat. It requires trained operators to ensure the required levels of consistency. Consultants have to pass an exam before they are allowed to submit assessments (Cara Reece pers. com.).

14. In the USA, where offsets schemes have been running for 30 years, there are a broad range of metrics in use. The majority of assessments in offsetting schemes in the USA make use of an area measurement and a multiplier, and sometimes an approximate quality assessment based on expert opinion (Briggs et al. 2009, BOPP 2009).

Metrics for biodiversity offsetting in England

15. Biodiversity offsetting, where conservation activities are designed to deliver biodiversity benefits in compensation for losses, in a measurable way, are one way of providing compensation for biodiversity loss. We believe that a consistent framework for biodiversity offsetting has the potential to improve the implementation of planning policy requirements for biodiversity compensation.

16. Applying biodiversity offsetting in this way in England would be a new and innovative approach, and there are many aspects which we don't fully understand yet. There are a number of issues that need to be clarified before we decide exactly whether, and how, we can make best use of biodiversity offsetting in England. That is why we are working with local authorities and other partners to test biodiversity offsetting in 6 pilot areas.

17. The principles we have used to develop an approach to biodiversity offsetting in England are set out in the Guiding Principles for Biodiversity Offsetting Document, available on Defra's website. The principles include the following:

Offsetting should:

- not change existing levels of protection for biodiversity
- expand and restore habitats, not merely protect the extent and condition of what is already there
- contribute to enhancing England's ecological network by creating more, bigger, better and joined areas for biodiversity (as discussed in *Making Space for Nature*³)
- be managed at the local level as far as possible

³ <http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>

- be as simple and straightforward as possible, for developers, local authorities and others
- be transparent, giving clarity on how the offset calculations are derived and allowing people to see how offset resources are being used.

18. The approach to the metric we will use for the biodiversity offsetting pilot is described in these papers, and reflects these principles.

19. The proposed system is a variation of the habitat hectares approach and draws heavily on the work done by Treweek et al. for the Defra scoping study on offsets (2009).

Habitat type

20. The metric we propose for the biodiversity offsetting pilots is based on habitats. Development sites need to be mapped and divided into habitat parcels. The offset requirement can then be worked out on a habitat basis. The same basic approach can then be used to work out what level of compensation an offset project is able to deliver.

21. Habitats are pre-assigned to one of three habitat type bands (**Figure 1** below). Habitats are assigned to these bands on the basis of their distinctiveness. Distinctiveness includes parameters such as species richness, diversity, rarity (at local, regional, national and international scales) and the degree to which a habitat supports species rarely found in other habitats (Treweek et al 2010). Details of the distinctiveness bands can be found in **Appendix 1 - Distinctiveness Bands for the Biodiversity Offsetting Pilot**, which is available on Defra's website.

22. One of the guiding principles for developing our approach to offsetting is that it should result in an improvement in the extent or condition of the ecological network. To do this the focus of habitat restoration or creation through offsetting should be on priority habitats⁴. Where development is taking place on habitats in the low distinctiveness band, the offset actions should result in expansion or restoration of habitats in the medium or, preferably, high distinctiveness band. At no time should an offset result in "trading down", for instance in the replacement of habitat of high distinctiveness with creation or restoration of a habitat of medium distinctiveness. Habitats that are of high distinctiveness would generally be expected to be offset with "like for like" i.e. the compensation should involve the same habitat as was lost.

23. Some very valuable habitats are either very rare, difficult/impossible to recreate, or both. Whilst development on these habitats would be unlikely, if a local planning authority did decide that a development should go ahead on this type of habitat, any compensation

⁴ Section 41(S41) of the Natural Environment and Rural Communities (NERC) Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. Further information about this list can be found here: <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>

would have to be bespoke, and managed on a case by case basis. It would be for the local planning authority to decide if the offsetting mechanism could be used.

24. **Figure 1** shows the habitat bands we are using for the biodiversity offsetting pilots.

Figure 1: Habitat type bands

Habitat type band	Distinctiveness	Broad habitat type covered	Type of offset
High	High	Priority habitat, as defined in Section 41 of the NERC Act ⁵	Same band type, and ideally like for like
Medium	Medium	Semi natural	Within band type or trade up
Low	Low	E.g. Intensive agricultural– but may still form an important part of the ecological network in an area.	Trade up

25. As per the guiding principles, decisions about exactly where offsets should be targeted geographically, and towards which conservation priorities, should be taken at the local level as far as possible. In line with this principle, local authorities in pilot areas, working with their partners, could decide to add conditions to the metric to reflect their particular circumstances and priorities, as part of the development of their offsetting strategy. For example, they may decide that a particular habitat is especially important in their area, and therefore would like any offsets provided to compensate for loss of that particular habitat to comprise expansion or restoration of that habitat. They may decide that in their area a particular habitat is in a higher distinctiveness band than that suggested by the national guidance. Where changes to the standard approach are made, the rationale would have to be clearly set out, and the information about the difference available to all potential participants, at the start of the process.

5

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>

26. In the pilot we want to learn more about how often local authorities want to make these kinds of adjustments, and how it might work in practice.

27. Each band of habitat distinctiveness has a number associated with it as in **Figure 2** below. This is the starting point for calculating the number of “units” of biodiversity per hectare a particular habitat is worth.

Figure 2: Habitat distinctiveness⁶

Habitat distinctiveness	
High	6
Medium	4
Low	2

Habitat condition

28. Different sites and habitats will be in different conditions when they are lost to development, and in addition, offsetting projects will not always involve taking a habitat in poor condition and improving it to good condition. We therefore propose that the metric we use for the biodiversity offsetting pilots takes account of habitat condition, as well as habitat distinctiveness.

29. Condition assessment requires that we have agreed standards and a related methodology for measuring habitat condition. There is currently no standard habitat condition assessment tool, although various methods are used for specific purposes.

30. Perhaps the best known condition assessment tool is Common Standards Monitoring (CSM). This methodology has been devised specifically for monitoring Sites of Special Scientific Interest (SSSIs) and as such it is (a) based around a subset of the most important habitats and (b) is designed to give a very specific output – namely to answer the question “is the site in favourable condition?”. It categorises sites into ‘favourable’, ‘favourable recovering’ and ‘unfavourable’.

31. Whilst suitable for assessing SSSIs, these categories would not work well in the metric described here. They are not evenly spread, and there can be a very wide range within the favourable recovering category. In addition, they may describe the management of the site, rather than the actual condition of the habitat.

^{6 6} Based on the paper “Biodiversity Offsets”, Treweek et al.

32. The Higher Level agri-environment Scheme (HLS) has a condition assessment tool which better meets the design criteria for our approach to offsetting. The condition assessment for HLS is based on habitat condition, rather than management, and the categories are spread evenly in a way which fits with the design of the offsetting metric. For most habitat types the HLS Farm Environment Plan handbook provides a clear and transparent methodology which divides condition into one of 3 categories. The methodology was widely consulted on when it was devised. We therefore propose to use this methodology to assess the habitat condition in the offsetting pilot. Part of the aim of the pilot will be to see how this works in practice.

33. An assessment of the condition of the habitat can be combined with the distinctiveness band to give an overall score in biodiversity units per hectare, as set out in **Figures 3 and 4** below.

Figure 3: Condition weighting⁷

Habitat Condition	
Good	3
Moderate	2
Poor	1

Figure 4: Matrix showing how condition and distinctiveness are combined to give the number of biodiversity units per hectare⁸

		Habitat distinctiveness		
		Low (2)	Medium (4)	High (6)
Condition	Good (3)	6	12	18
	Moderate (2)	4	8	12
	Poor (1)	2	4	6

⁷ Based on the paper "Biodiversity Offsets", Treweek et al.

⁸ Based on the paper "Biodiversity Offsets", Treweek et al.

Using the metric to measure compensation provided

34. The measurement of the biodiversity value of impacted sites determines the offsetting requirement. It is also necessary to measure the offsetting potential of proposed offset sites, so that providers can calculate how many units they can offer.

35. Offset providers can either expand⁹ or restore¹⁰ habitat to deliver units of biodiversity.

36. In consultation with stakeholders, the definition of “restore” that we are using for the offsetting pilot has been expanded beyond the definition used under the previous England Biodiversity Strategy to include “restoration” as the term might more commonly be interpreted, i.e. improve the condition (where it is poor) of the existing habitat resource.

37. The rationale for expanding the definition in this way is:

- that a site in poor condition might continue deteriorating for ever because there was no requirement or incentive for a change in management - and yet in conservation terms putting that site into better management would be a key priority
- that it is likely that an offset (particularly those covering a relatively large area, able to act as compensation for more than one development) would often be something more complex than a single action on a single unit of land - for example it might contain a mosaic of habitats and parcels across which a number of actions may have been undertaken including recreation and restoration. Excluding restoration that aimed to improve condition would make this very complex.

38. The number of units of biodiversity an offset can provide could be based on either:

(a) a **future target value**, i.e. you have a piece of land and a management plan for conservation action you will take on it. In this case, the number of units available would be the difference between the current condition and the target future condition. We expect that this type of offset is what will be offered in the biodiversity offsetting pilots.

(b) the habitat's **current condition**, i.e. you have already implemented the conservation work needed. In this case there would need to be a record of the initial condition of the habitat, before the work was undertaken, so that additionality could be demonstrated, and the number of units provided could be calculated. This is the approach that a 'habitat bank' would take – creating a 'bank' of habitat, from which units could be sold to developers as and when they were needed.

⁹ expansion (creation): establish priority habitat on land where it is not present and where no significant relicts of the habitat currently exist

¹⁰ restoration: improve the condition of the existing habitat resource

39. On the offset provision side therefore, the value of an offset site in terms of biodiversity units is a function of:

- the size of the site,
- the habitat type band it is assigned to (distinctiveness) and,
- its quality: the condition of the habitat at the start of the offset project, and its condition at the end.

40. Where an offset provider is undertaking work for a third party, and charging them for it, they will need to agree a fee. This should cover the cost of the work being undertaken, and management that lasts at least as long as the impact of the development, and ideally in perpetuity.

Differences in size between the impacted site and the offset

41. In international literature about biodiversity offsetting, “currency based multiplier” is the term commonly used to describe the difference between the size of an area of an impacted site and the size of an area covered by the offset. This difference comes about because of the difference in quality between the site impacted, and the offset provided. For example, if a habitat of low distinctiveness is impacted and is offset with action on a habitat of high distinctiveness, theoretically the area needed to offset can be less than the area impacted.

42. As a simple example, if the impacted site is worth 10 biodiversity units per hectare, and the offset site worth 30 units per hectare, 3 hectares of impacted site could be offset with 1 hectare of offset. This is referred to as a ‘fraction multiplier’.

43. The Business and Biodiversity Offsets Partnership (BBOP)¹¹ recommend that, because of the number of uncertainties in terms of currency and what is being exchanged, the area ratio should never go below 1:1. However their guidance is aimed at particular situations and it may be that it is not applicable to England. For instance where a development is taking place on 20 hectares of habitat of low distinctiveness, it does not seem reasonable to expect a developer to have to contribute 20 hectares of habitat to a habitat creation or restoration scheme where the biodiversity value per hectare may be considerably greater than the impacted site.

44. Discussions with stakeholders support the view that fraction multipliers are acceptable in the English situation, and that we should not enforce a minimum 1:1 ratio.

¹¹ The Business and Biodiversity Offsets Partnership (BBOP) is a partnership between companies, governments and conservation experts to explore biodiversity offsets. See <http://bbop.forest-trends.org/> for more information.

Dealing with Risk

45. Offset providers will be required to deliver the number of biodiversity units they have committed to provide, and will bear the risk of failing to do so. There are two main types of risk that offset providers may face:

Delivery risks: The risks associated with the actual delivery of the offset due to, for instance, uncertainty in the effectiveness of restoration or habitat creation/management techniques.

Spatial risks: These reflect ecological risks deriving from the change in location of the habitat or resource. For example, it may be that recreating a type of habitat in a new location may reduce its biodiversity value.

46. Where risks cannot be mitigated, some form of insurance is likely to be needed. This could take the form of an increase in the area of habitat creation/restoration provided for a given number of units. Or, where an increase in the area of land available for the offset is not possible, you could reduce the number of units available on a given hectare of land. Where a change in the number of units/area provided is used to manage risk a **multiplier** can be used to determine the number of units available from a given area.

Multipliers

47. The aim of a multiplier is to correct for a disparity or risk. In practice this is very difficult to achieve, not least because of uncertainty in the measurement of the parameters and the complexity of gathering the required data. This means that multipliers are a complex element of offsetting. There are a great number of different views on how and when they should be used.

48. The use of multipliers is discussed in a BBOP consultation document (Ekstrom et al., 2008). The main findings of that document were:

- that multipliers have received very little attention in the ecological literature to date, (particularly those dealing with spatial risk) although this is now starting to change. Where research has been undertaken it tends to suggest that the multipliers used to date are too low to achieve no net loss.
- that multipliers are widely considered in offsetting systems around the world, and tend to be based on rules of thumb loosely based on some science.

49. As an example of a piece of research that argued that multipliers used are often too low, a paper by Moilanen et al. (2009) concluded that for some ecological restoration and reconstruction very high ratios were needed. However, the conclusion of the BBOP paper is that where there are real risks around the methods and certainty of restoration or creation then the Moilanen framework is applicable; but for some other situations, (averted risk, habitat banks and where restoration techniques are tried and tested), lower ratios can be used.

Delivery risks and multipliers

50. As discussed above, offsets will involve either restoration or expansion of habitats, and both are likely to have risks associated with them. Some habitats are more difficult than others to restore or expand, and there will therefore be different levels of risk for different habitats. However, for any particular habitat, restoration is likely to be lower risk than expansion.

51. Development on areas of habitat that fall into the high habitat distinctiveness band will often need to be offset with conservation action to expand or restore the same habitat type (like for like compensation). These habitats are likely to be more difficult to expand or restore than others, and as a result avoiding development on such habitats can effectively reduce the risks associated with habitat creation.

52. There is a developing body of evidence about the likelihood of success or failure of expansion or recreation projects for a number of different habitats, including the time that such habitats would take to develop (TEEB 2009, Rey Benayas et al., 2009, Fagan et al., 2008, for instance). Once there is an estimate of the failure risk, it is possible to work out the necessary multiplier to achieve a suitable level of confidence (Butcher pers. com., Moilanen 2009, Treweek & Butcher, 2010). The work of Moilanen provides a basis for different multipliers of various levels of risk. We have used this work to come up with categories of difficulty of restoration/expansion, and associated multipliers, as set out in **Figure 5** below.

53. At **Appendix 1** below we have assigned habitats to these broad categories using expert opinion. These assignments have had some input from Natural England specialists but it is important to note that this is meant purely as an indicative guide. The starting position with regard to substrate, nutrient levels, state of existing habitat etc will have an impact on the actual risk factor, which may need to be taken into account.

Figure 5: Multipliers for different categories of delivery risk

Difficulty of recreation/restoration	Multiplier
Very High	10
High	3
Medium	1.5
Low	1

The limits of multipliers in managing delivery risks

54. If the worst case risk is realised (i.e. the restoration or expansion fails to deliver), a multiplier will not solve the problem. In terms of the overall outcome it will make little difference whether the offset is the same, twice or five times the size of the impacted site, if the offset fails to develop into the target habitat or required condition. A simple multiplier is therefore not going to be appropriate in all cases, and some projects will require a more complex approach to ensuring the biodiversity outcomes are delivered.

55. For example, Moilanen et al. (2009) recommend that where the uncertainty is high, to achieve a more reliable outcome a 'hedge betting' solution should be applied where by a number of different restoration or offsetting solutions are used across a number of different sites.

Spatial risks and multipliers

56. Offsets are likely to deliver greatest benefits if they are positioned strategically. In the biodiversity offsetting pilot, this means offset projects that are in line with the strategies for using offsetting developed by the local planning authorities working with their partners. These will identify the priority habitats for the area, and priority locations for contributing to the ecological network, as outlined in the Natural Environment White Paper and Making Space for Nature. Locating offsets strategically will greatly reduce the risk of an offset being delivered in a spatially less favourable location than the impacted site.

57. In situations where, for whatever reason, an offset is delivered in a location which doesn't contribute to the ecological network as identified in the local offsetting strategy, a local authority could choose to require offset providers to apply a multiplier to manage the risk of the compensation failing to deliver the required level of compensation for biodiversity loss. (They could also decide that the project wasn't acceptable as compensation). Figure 6 sets out a suggested approach for offset providers to follow if they choose to use a multiplier to manage this risk.

Figure 6: Proposed multipliers to deal with spatial risk

Location parameters	Multiplier
Offset is in a location identified in the offsetting strategy	No multiplier required
Offset is buffering, linking, restoring or expanding a habitat outside an area identified in the offsetting strategy	2
Offset is not making a contribution to the offsetting strategy	3

Insurance

58. A further approach to managing risks is insurance. An offset provider could take out insurance against their failure to deliver the right number of units, in addition to, or instead of, using multipliers.

59. Financial insurance would provide a source of funds for re-attempting the offset project that had failed, thus still allowing the offset provider to meet their obligation in terms of units of biodiversity. The insurance premiums paid by offset providers would likely reflect the type of habitat creation/restoration scheme being undertaken, and therefore its specific risk of failure. In **Appendix 1** to this document, habitats have been assigned to broad risk categories both for expansion (recreation) and restoration.

60. The pilot will help us to learn more about how offset providers choose to manage their risks.

Multipliers and time

61. In delivering offsets there may be a mismatch in the timing of impact and offset, i.e. the difference in time between the negative impact on biodiversity and the offset reaching the required quality or level of maturity, which results in loss of biodiversity for a period of time.

62. This issue could be managed by encouraging the creation of offsets ahead of the impact taking place, either through the setting up of habitat banks or, for projects with a long lead in, by starting the offset work well ahead of the development.

63. However, particularly in the early stages of introducing a new approach to offsetting, many offsets are likely to be developed concurrently with the impact taking place. This will be the case in the biodiversity offsetting pilots. Even where the offset has been started in advance, the time taken for habitats to mature means that there will almost inevitably be a time lag. Where a time lag does occur, a multiplier can be applied to take account of it.

64. Discounting over time is an economic technique used to compare costs and benefits that occur in different time periods based around the principle that, generally, people prefer to receive goods and services now rather than later (more details on discounting can be found in the Treasury Green Book Guidance¹²). Whilst for individuals the evidence for a preference to consume today is good, the evidence as to why society should do this, the ecological basis for it is more complex (for discussion see Annex 5 REMEDE 2008, NOAA 2006).

¹² http://www.hm-treasury.gov.uk/data_greenbook_index.htm

65. Discussions with stakeholders indicate that they support the use of a multiplier to account for the temporal risk in the approach to offsetting we use in England. This is because it would:

- incentivise habitat banking: if the habitat is established there is no need to apply multipliers to manage delivery risks, and to take account of time differences. So more units will be available from a particular area of land.
- create a disincentive for damaging habitats that take a long time to recreate or restore (i.e. many habitats in the 'high' distinctiveness band), by increasing the area of offset needed to compensate for the loss.

66. Where time discounting is used in offset or compensation schemes, for instance in the US and in Defra's Environmental Liability Directive guidance, they tend to use a standard discount rate, for example 7% or 3%, discussed in NOAA 2006 and 3.5%, Defra, 2009. In England, the Treasury Green Book recommends a discount rate of 3.5% to reflect the value society attaches to 'consumption' (i.e. enjoyment of goods and services) at different points in time. It is therefore recommended that this is the rate (3.5%) that should be used for time discounting calculations within an English offsetting scheme.

67. **Figure 7** shows the multipliers that derive for a number of time periods using a discount rate of 3.5 %

Figure 7: Multipliers for different time periods using a 3.5% discount rate

Years to target condition	Multiplier
5	1.2
10	1.4
15	1.7
20	2.0
25	2.4
30	2.8
32	3

68. The following are the parameters within which the time discounting should operate for the biodiversity offsetting pilot.

69. The number of years that time discounting should take into consideration is from the point of impact to the estimated time that it will take for the habitat to reach the pre-agreed target quality (i.e. the point at which the agreed number of units is delivered). For simplicity and to allow upfront estimates of the offsetting provision this will require some guidelines. TEEB 2009 provides a good starting point, and **Appendix 2** has a table of estimated timescales from that publication. The actual figure will need to be calculated on a case by case basis for each offset management plan, taking into account the habitat type, and the amount of restoration or expansion being undertaken.

70. The calculations around the time discount multiplier should cover the whole period concerned. The calculations should assume that there is a quality jump from the baseline condition to the target condition once the relevant number of years has elapsed. The calculations therefore do not need to take into account increasing quality in the habitat, and do not need to be re-done annually.

71. Offsets should last at least as long as the impact of the development, and ideally in perpetuity. However, to be practical, there needs to be a limit on application of the discount rate used for time preference. We therefore propose that the maximum multiplier used to take account of temporal risk is x3.

72. We think that offset providers participating in the pilot should apply a temporal multiplier to their projects when calculating how many units of biodiversity they are able to offer.

Hedgerows

73. Hedgerows are a feature almost unique to the UK and there is no experience of dealing with them in offset schemes elsewhere that we can draw on. Hedgerows' contribution to biodiversity in the landscape is far greater per unit of area than even the most biodiversity rich habitats because of their role in provision of nest sites, corridors, feeding sites, shelter belts etc. They cannot simply be treated as other habitats and accounted for on a hectare basis. It is therefore necessary to come up with a mechanism to account for hedgerows in our approach to offsetting that both recognises their unique contribution to biodiversity whilst at the same time meeting our guiding principle of simplicity.

74. Although this description is written to describe how we deal with hedgerows the conclusions and approach could equally apply, in theory, to other field boundary features such as hedge banks and rows of trees.

75. There is little if any science to draw on that compares the value of a hedgerow to other habitats. Even if such evidence did exist, it is likely that the exact value would be so dependent on a wide range of factors as to make its use as a generalisation difficult. Consequently it is recommended that hedgerows are treated as a separate case out with the main metric system.

76. Hedgerows are in the high distinctiveness habitat type band, and we believe there should be a requirement for “like-for-like” offsetting.

77. It is proposed that in the offsetting pilot, the hedgerow offset is treated as a separate habitat type band alongside the main offset requirement i.e. an area of grassland with hedgerows being developed on might have an offset requirement of XX units of grassland offset plus YY metres of hedgerow offset.

78. In terms of the offset requirement, for most habitats it is proposed that the offset should be either expansion or restoration. For hedges it is proposed that only expansion (in effect planting new hedges) is appropriate. This is because of the complexity of defining restoration and assigning metres of offset requirement to hedge restoration work.

79. The amount of hedgerow required to offset each metre of hedgerow destroyed will depend, just as with habitats, on the quality of the hedgerow lost as a result of development.

80. The Higher Level agri-environment Scheme Farm Environmental Plan handbook provides a good model for condition assessment for hedgerows that assigns hedges to one of three quality bands (see **Appendix 3**). Any difference in the quality of hedgerow in the offset and the hedgerow lost would be dealt with by a simple multiplier as shown in **Figure 8** below:

Figure 8: Multiplier required for different conditions of offset provision

Condition of hedgerow lost	Multiplier applied
Good	3
Moderate	2
Poor	1

81. Unless you are dealing with a well-established habitat bank, (and this will not be the case in the pilots) this will apply to all hedgerows provided as offsets.

82. Finally it is worth considering green lanes/double hedgerows. Whilst they are likely to be impacted only very rarely, partly on account of their association with rights of way, if they are the offset should be a double hedge rather than a single hedge. The reason for making this distinction is that double hedges are known to be particularly important for wildlife (Walker et al., 2005, Walker et al., 2006).

Species and offsets

83. Some stakeholders have expressed a desire to see species treated more explicitly in the metric. This approach has not been taken for the offsetting pilot. The reasons for this are:

- One of the guiding principles for our approach to the offsetting pilot is that there will be no change to existing levels of protections for our biodiversity. So existing protections for habitats and species (such as those made under the EU Habitats and Species Directive), and the processes that go with them, are not part of the offsetting pilot.
- It is apparent that most of the species issues that arise are localised. Different species will be the main issue in different areas. We have sought to avoid designing details that will apply in very few situations, and which would require a significant degree of local interpretation.

84. With this as background the way species are dealt within the biodiversity offsetting pilot is as follows:

- Where there is an existing legal process for protecting species this takes precedent (as with habitats) and is the mechanism by which impacts are addressed. Local discretion could then be used to decide whether the mechanisms in place for offsets provision (habitat banks etc) can be harnessed as a way of delivering any required compensation.

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Appendix 1: Risk factors for restoring or recreating different habitats

* N.B: These assignments are meant purely as an indicative guide. The starting position with regard to substrate, nutrient levels, state of existing habitat etc will have a major impact in the actual risk factor. Final risks should be agreed locally as part of setting up the offset.

Habitats	Technical difficulty of recreating	Technical difficulty of restoration
Aquifer Fed Naturally Fluctuating Water Bodies	Very high/impossible	Medium
Arable Field Margins	Low	n/a
Blanket Bog	Very high/impossible	High
Calaminarian Grasslands	High	Medium
Coastal and Floodplain Grazing Marsh	Low	Low
Coastal saltmarsh	Medium	Medium
Coastal Sand Dunes	Very high/impossible	Medium
Coastal Vegetated Shingle	High	High
Eutrophic Standing Waters	Medium	Medium
Hedgerows	Low	Low
Inland Rock Outcrop and Scree Habitats	Very high/impossible	Medium
Limestone Pavements	Very high/impossible	High
Lowland Beech and Yew Woodland	Medium	Low
Lowland Calcareous Grassland	Medium	Low

Lowland Dry Acid Grassland	Medium	Low
Lowland Fens	Medium	Low
Lowland Heathland	Medium	Medium
Lowland Meadows	Medium	Low
Lowland Mixed Deciduous Woodland	Medium	Low
Lowland Raised Bog	Very high/impossible	Medium
Maritime Cliff and Slopes	Very high/impossible	High
Mountain Heaths and Willow Scrub	High	Medium
Oligotrophic and Dystrophic Lakes	Medium	Medium
Open Mosaic Habitats on Previously Developed Land	Low	Low
Ponds	Low	Low
Purple Moor Grass and Rush Pastures	High	Medium
Reedbeds	Low	Low
Saline lagoons	Low	Low
Traditional Orchards	Low	Low
Upland Calcareous Grassland	High	Medium
Upland Flushes, Fens and Swamps	High	Medium
Upland Hay Meadows	Medium	Low

Upland Heathland	Medium	Medium
Upland Mixed Ashwoods	Medium	Low
Upland Oakwood	Medium	Low
Wet Woodland	Medium	Low
Wet Heath	High	High
Wood-Pasture & Parkland	Medium	Low

Appendix 2: Feasibility and timescales of restoring: examples from Europe

Ecosystem type	Time-scale	Notes
Temporary pools	1-5 years	Even when rehabilitated, may never support all pre-existing organisms.
Eutrophic ponds	1-5 years	Rehabilitation possible provided adequate water supply. Readily colonised by water beetles and dragonflies but fauna restricted to those with limited specialisations.
Mudflats	1-10 years	Restoration dependent upon position in tidal frame and sediment supply. Ecosystem services: flood regulation, sedimentation.
Eutrophic grasslands	1-20 years	Dependent upon availability of propagules. Ecosystem services: carbon sequestration, erosion regulation and grazing for domestic livestock and other animals.
Reedbeds	10-100 years	Will readily develop under appropriate hydrological conditions. Ecosystem services: stabilisation of sedimentation, hydrological processes.
Saltmarshes	10-100 years	Dependent upon availability of propagules, position in tidal frame and sediment supply. Ecosystem services: coastal protection, flood control.
Oligotrophic grasslands	20-100 years +	Dependent upon availability of propagules and limitation of nutrient input. Ecosystem services: carbon sequestration, erosion regulation.
Chalk grasslands	50-100 years +	Dependent upon availability of propagules and limitation of nutrient input. Ecosystem services: carbon sequestration, erosion regulation.
Yellow dunes	50-100 years +	Dependent upon sediment supply and availability of propagules. More likely to be restored than re-created. Main ecosystem service: coastal protection.
Heathlands	50-100 years +	Dependent upon nutrient loading, soil structure and availability of propagules. No certainty that vertebrate and invertebrate assemblages will arrive without assistance. More likely to be restored than re-created. Main ecosystem services: carbon sequestration, recreation.
Grey dunes and dune slacks	100-500 years	Potentially restorable, but in long time frames and depending on intensity of disturbance. Main ecosystem service: coastal protection, water purification.
Ancient woodlands	500 – 2000 years	No certainty of success if ecosystem function is sought – dependent upon soil chemistry and mycology plus availability of propagules. Restoration is possibility for plant assemblages and ecosystem services (water regulation, carbon sequestration, erosion control) but questionable for rarer invertebrates.
Blanket/Raised bogs	1,000 – 5,000 years	Probably impossible to restore quickly but will gradually reform themselves over millennia if given the chance. Main ecosystem service: carbon sequestration.
Limestone pavements	10,000 years	Impossible to restore quickly but will reform over many millennia if a glaciation occurs.

Appendix 3: Condition assessment for high environmental value hedges from FEP handbook

No condition assessment is required for hedgerows that have been planted, laid or coppiced within the last five years.

Criteria:

1. Height: The hedgerow must meet a minimum threshold of 2 min height. Assess the height of the woody component of the hedgerow from the base of the stems to the top of the shoots of the woody species. This should be assessed along the whole length of the hedgerow and the most common height used. Gaps are not included, nor are hedgerow trees. Where a bank is present, the height of the bank must be excluded.
2. Width: The hedgerow must meet a minimum threshold of 1.5 m in width. Assess the width of the woody component between the shoot tips at the widest point. This should be assessed along the whole length of the hedgerow and the most common width used. Gaps are not included.
3. Gappiness: Assess the horizontal gappiness of the woody component. Gaps are complete breaks in the woody canopy of the hedgerow (see **Figure below**). No more than 10% of the hedgerow length should be occupied by gaps and no one gap should be greater than 5 m wide (this excludes access points and gates).Where dormice or target species of bat are present in the hedgerow there must be no gaps.

Number of missed/failed criteria	Condition assessment category	Probable management level
0	A	Maintain
1	B	Maintain or restore
2 or more	C	Resore

Surrey Biodiversity Opportunity Area Policy Statement

Biodiversity Opportunity Area TBH06: Wisley, Ockham & Walton Heaths	
Local authorities: Elmbridge, Guildford	
Aim & justification The aim of Biodiversity Opportunity Areas (BOAs) is to establish a strategic framework for conserving and enhancing biodiversity at a landscape-scale, making our wildlife more robust to changing climate and socio-economic pressures. BOAs are those areas where targeted maintenance, restoration and creation of UK Biodiversity Action Plan (BAP) Priority habitats will have the greatest benefit towards achieving this aim. Recognition of BOAs directly meets National Planning Policy Framework policy for the planning system to contribute to international commitments for halting the overall decline in biodiversity, by establishing coherent ecological networks that are more resilient to current and future pressures (para. 109). Designation of BOAs in local plans will also fulfil NPPF requirements to plan for biodiversity at a landscape-scale across local authority boundaries; and identify & map components of the local ecological networks (para. 117). Explanatory <i>BOAs identify the most important areas for wildlife conservation remaining in Surrey and each include a variety of habitats, providing for an 'ecosystem approach' to nature conservation across and beyond the county. By working with larger, more dynamic ecosystems, it will be possible to create a wider range of habitats and their variants, which will in turn increase the ability of the landscape to support the largest variety of species.</i>	
1. Overview This Biodiversity Opportunity Area includes an almost continuous area of historic commons with some farmed land, from Ockham in the south to the outskirts of Weybridge in the north. The M25/A3(T) interchange fragments the BOA considerably at Ockham and Wisley Commons. The BOA is adjacent to the Wey floodplain (R06) at Byfleet and the Mole (R05) along much of the eastern margin. Area: 1180.8 ha	
2. Natural Character Areas Thames Basin Heaths (NCA 129), Thames Basin Lowlands (NCA 114)	
3. Profile 3.1 Physiology Bagshot Sands, Sand & Gravel, Alluvium, River Terrace Deposits. The BOA occupies a series of gently undulating river terraces dividing the catchments of the Rivers Wey and Mole. [Naturally wet very acid sandy and loamy soils; Freely draining slightly acid loamy soils; Freely draining slightly acid sandy soils; Freely draining very acid sandy and loamy soils Loamy soils with naturally high groundwater] 3.2 Biodiversity 3.2.1 Statutory protected sites Natura 2000 (SPA/SAC): Thames Basin Heaths SPA SSSI: Ockham & Wisley Commons	

Surrey Biodiversity Opportunity Area Policy Statement

LNR: Ockham & Wisley

3.2.2 Local Sites

SNCI: 5

IBA/IPA: Thames Basin Heath(land)s (Birdlife/Plantlife)

3.2.3 NERC Act S.41

Habitats of Principal Importance (Priority habitats):

Heathland, Acid grassland, Wet woodland, Arable field margins

Species of Principal Importance (Priority species):

Plants: Annual knawel, Chamomile, Copse-bindweed, Cornflower, Glandular eyebright, Pillwort*, Red-tipped cudweed*, Rusty fork-moss, Pitted frillwort, Large-celled flapwort, Millimetre moss*

Fungi/Lichens: -

Invertebrates: Grayling, Silver-studded blue, Small heath, Blue pepper-pot beetle, Heath tiger-beetle*, Poplar leaf-rolling weevil, Shining guest ant, Hornet robber-fly, Southern yellow splinter (crane-fly), Mottled bee-fly

Vertebrates: Bullfinch, Cuckoo, Grey partridge*, Lesser redpoll, Linnet, Nightjar, Skylark, Song thrush, Spotted flycatcher, Reed bunting, Tree pipit, Tree sparrow*, Woodlark, Yellowhammer; Adder, Common lizard, Grass snake, Sand lizard, Slow-worm, Common toad; Brown long-eared bat, Harvest mouse, Hedgehog, Noctule bat, Soprano pipistrelle bat

3.2.4 Further important species interest: Bog hair-grass, Common cudweed, Corn spurrey, Dwarf gorse, Heath cudweed, Lemon-scented fern, Lesser water-plantain, Loose silky-bent, Marsh St. John's-wort, Needle spike-rush, Meadow thistle, Petty-whin, Shepherd's-cress, Shoreweed, Royal fern, Whorl-grass; *Amara infima* (a ground beetle), Bog bush-cricket, *Tipula livida*, *Limonia inusta* (both crane-flies), White-faced dragonfly*, Wood cricket; Dartford warbler, Hobby

3.2.5 Ancient woodland: x individual woodlands

3.2.6 Landscape scale conservation activity: SyWT Grazing Project

3.3 Archaeology

Hengi-form Monument at Red Hill, Bell Barrow on Cockcrow Hill, Bowl Barrow west of Cockcrow Hill

3.4 Access

3.4.1 Publically-accessible Natural OS: Ockham Common & Chatley Heath, Wisley Common, Snake's Field/Bolder Mere (SyWT/SCC); Walton Common (part - Elmbridge BC)

3.4.2 Long-distance PRow, etc: -

3.5 Key ecosystem services

Agricultural production; Timber production; Carbon sequestration; Flooding regulation; Pollination services; Recreational (walking, equestrian, golf); Spiritual uses

* probably extinct/extinct in BOA

Surrey Biodiversity Opportunity Area Policy Statement

3.6 Socio-Economic 3.6.1 Employment profile: Agriculture and silviculture sector; Leisure sector (golf, hospitality, equestrian) 3.6.2 LEP: Enterprise M3							
4. Objectives & Targets TBH06/O1: SSSI units to achieve favourable condition. T1: All by 2020 TBH06/O2: SNCI protected by planning policy & in positive management. T2: All by 2020 TBH06/O3: Priority habitat restoration & creation. • Heathland/T3a: 7.75 ha by 2020 • Acid grassland/T3b: 7.25 ha by 2020 • Wet woodland/T3c: x ha by 2020 TBH06/O4: Priority species recovery. • T4: By 2020, evidence of at least stabilisation & preferably recovery in the local populations of listed Priority species: <table><tr><td>Annual knawel</td><td>Pillwort</td><td>Heath tiger-beetle</td></tr><tr><td>Nightjar</td><td>Woodlark</td><td>Sand lizard</td></tr></table>	Annual knawel	Pillwort	Heath tiger-beetle	Nightjar	Woodlark	Sand lizard	
Annual knawel	Pillwort	Heath tiger-beetle					
Nightjar	Woodlark	Sand lizard					



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21st December 2017

Dear Ms Boyle

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11
Application by Highways England for an Order granting Development Consent for the M25 Junction 10/A3 Wisley Interchange Improvement
Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Thank you for the opportunity to comment on the scoping consultation with regard to the above scheme.

Surrey Heath Borough Council, along with ten other Local Authorities, is impacted by the Thames Basin Heaths Special Protection Area (TBHSPA) and the need to provide avoidance measures to mitigate the impact of residential development on the TBHSPA.

The avoidance measures are set out in the Thames Basin Heaths Supplementary Planning Document <http://www.surreyheath.gov.uk/residents/planning/planning-policy/supplementary-planning-documents/thames-basin-heaths-special>

These measures have been agreed by Natural England and the eleven Local Authorities. The measures include a 400m exclusion zone and the need to provide avoidance measures for residential development within a 5-7km radius of the TBHSPA.

Great Place • Great Community • Great Future

The avoidance measure is through the provision of Suitable Alternative Natural Greenspace (SANG).

The proposed M25 junction/A3 Wisley Interchange Improvement will require the loss of at least 8 hectares of TBHSPA. This loss will have to be re provided as new TBHSPA elsewhere.

Surrey Heath Borough Council raise concerns that the re provision of the new TBHSPA could impact on the on the avoidance measures required in respect of the new TBHSPA. It may require a new 400m buffer zone or lead to an extension of the 5-7km zone where avoidance measures are required. It could also impact in respect of the provision of new SANG. This could impact on an authority's ability to achieve avoidance measures and therefore on housing delivery.

The Scoping Opinion should therefore identify where the new TBHSPA will be provided and that avoidance measures can be achieved.

In addition there needs to be a robust assessment of the proposed interchange improvements on air quality and soil quality on the TBHSPA in the vicinity of the proposal.

Yours Sincerely

Jane Ireland
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10th January 2018

Dear Gail,

M25 Junction 10 / A3 Wisley Interchange Improvement EIA Scoping – TfL's comments

Thank you for consulting with TfL.

The following comments are made by TfL City Planning officers on a 'without prejudice' basis and are intended to ensure that this policy document is in line with relevant London Plan transport policies and reflects the draft Mayor's Transport Strategy. You should not interpret them as indicating any subsequent Mayoral decision and these comments do not necessarily represent the views of the GLA.

TfL's initial comments relate to the lack of a separate traffic and transport section in the scoping opinion. Whilst there is some acknowledgement of the need for strategic transport modelling in terms of air quality and noise, there is no detail on the methodology.

TfL would expect strategic highway modelling using fully calibrated and validated models to webTAG, as well as demand response modelling to measure induced traffic from the capacity increase and to quantify the traffic and environmental impacts of this scheme. Some more substantive text on their proposed modelling / assessment approach would be welcomed.

I trust that the above provides you with an understanding of TfL's current position on EIA Scoping Opinion. Please do not hesitate to contact me if you have any questions or need clarification on any of the points raised.

Yours sincerely,

Lucy Simpson

Principal Technical Planner – TfL Borough Planning

Email: LucySimpson@tfl.gov.uk

Direct Line: 0203 054 7039

From: [Danielle Thomas](#) on behalf of [Dig](#)
To: [M25 Junction 10](#)
Subject: RE: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation
Date: 19 December 2017 10:31:21
Attachments: [image001.png](#)

Good morning,

With regards to your below request, this is not Wales & West Utilities area. This falls within Southern Gas Network's area, contact details for them below:

Email: plantlocation@sgn.co.uk

Telephone: 0845 070 3497

If you have any further questions please don't hesitate to contact me. Many thanks

Kind Regards,

Danielle Thomas
Plant Protection Team
Administrator Assistant

Telephone: **02920 278 912**

Email: Danielle.Thomas@wwutilities.co.uk

Wales & West Utilities Ltd | Wales & West House | Spooner Close | Celtic Springs | Newport | NP10 8FZ



From: M25 Junction 10 [<mailto:M25Junction10@pins.gsi.gov.uk>]
Sent: 13 December 2017 15:52
To: M25 Junction 10
Subject: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation

Dear Sir/Madam

Please see the attached letter on the proposed M25 Junction 10/A3 Wisley interchange improvement.

Please note the deadline for consultation responses is 11 January 2018, and is a statutory requirement that cannot be extended.

Kind regards

Ian Wallis
EIA and Land Rights Advisor
Major Applications and Plans
The Planning Inspectorate, 3D Temple Quay House, Temple Quay, Bristol BS1

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From: [Graham Parrott](#)
To: [M25 Junction 10](#)
Cc: [Martin Knowles](#)
Subject: M25 Junction 10/ A3 Wisley Interchange improvement - EIA scoping report notification and consultation
Date: 11 January 2018 14:57:18

Dear Sir/Madam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017(the EIA Regulations) – Regulations 10 and 11

Application by Highways England for an Order granting Development Consent for the M25 Junction 10/A3 Wisley Interchange Improvement

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Thank you for consulting Waverley Borough Council on the above. As requested in your letter dated 13 December 2017 we confirm that at this stage of the process we have no comments to make. However, as the scheme progresses through the DCO process and more information is made available this may change and we request that you continue to consult with us throughout the process.

Yours faithfully

Graham Parrott
Planning Policy Manager
Waverley Borough Council
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Ms Gail Boyle
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5th January 2018

Dear Ms Boyle,

Your ref: TR010030-TR010030-000008

Our ref: N/A

Location: M25 Junction 10/A3 Wisley Interchange Improvement

Proposal: Environmental Impact Assessment Scoping Opinion Report submitted by Highways England relating to the M25 Junction 10/A3 Wisley Interchange Improvement.

Thank you for your consultation on the above Scoping Opinion sent by email dated 13th December 2017. Officers have considered the proposal and wish to draw the applicant's attention to potential highway mitigation measures being considered by Woking Borough Council and Surrey County Council to improve junction performance along the A245, especially at the A245 Byfleet Road/Seven Hills Road Junction. The potential mitigation measures study (Woking Local Plan, Potential Mitigation, Document No. 53613T44/07, dated 4th October 2017) is a draft and the conclusions may vary.

In addition to the above potential mitigation measures being considered along the A245, the Council wish to draw the applicant's attention to a joint study by Surrey County Council, Woking Borough Council and Guildford Borough Council titled: 'Guildford and Woking Transport Infrastructure: A3 Economic Impact Assessment, March 2015'. The study explores the potential economic benefits to businesses and residents of improving the A3 corridor. This study has a direct bearing on M25 Junction 10/A3 Wisley Interchange Improvements.

We request that the aforementioned documents are considered and that the potential impact of the proposals on the surrounding network (including during the construction phase) form part of the scope of any Environmental Statement submission.

Yours faithfully,

Will Flaherty

Senior Planning Officer

For further information please contact Will Flaherty on 01483 743457 (Direct Line) or william.flaherty@woking.gov.uk



Town Planning

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CS:
Received
07 FEB 2018

Application No : /
Date : 31st January 2018

**TOWN AND COUNTRY PLANNING ACT 1990
THE TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2015**

NO OBJECTIONS TO CONSULTATION FROM ADJOINING LOCAL AUTHORITY

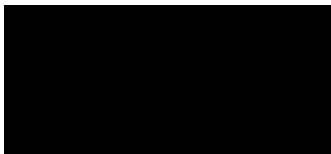
Take notice that the Council of the London Borough of Bromley, as an adjoining local planning authority in exercise of its powers under the above Act, has raised **NO OBJECTIONS** to the following development referred to in the documents received on 13th December 2017.

at : Highways England M25 Junction 10/A3 Wisley Interchange Improvement Surrey County Council

Proposal: Application by Highways England for an Order granting Development Consent for the M25 Junction 10/A3 Wisley Interchange Improvement CONSULTATION BY THE PLANNING INSPECTORATE

Subject to the following conditions and for the reasons set out below:-

Signed:



CHIEF PLANNER

On behalf of the London Borough of Bromley Council