
Appendix G: Ecology and Nature Conservation

South Wokingham Distributor Road Options Appraisal – Ecology and Nature Conservation Technical Note

October 2013

Introduction

This technical note presents the findings of an appraisal of the South Wokingham Distributor Road with respect to potential ecology and nature conservation constraints. Using the desk study information provided by Thames Valley Environmental Records Centre (TVERC), Berkshire and South Buckinghamshire Bat Group, Binfield Badger Group, Berkshire Ornithological Club, Wokingham Borough Council and freely available aerial photography, potential ecology and nature conservation constraints have been identified associated with three aspects of the proposed South Wokingham Distributor Road scheme which comprise the following:

- Three proposed route options for the Proposed South Wokingham Distributor Road: Route Option A (including Route Option A Alternative Links A1, A2 and A3), Route Option B (including Route Option B Alternative Link B1) and Route Option C (including Route Option C Alternative Link C1);
- Six Local Study Areas where improved access across the railway is proposed; and
- Proposed improvements to Waterloo Road / Peacock Lane.

Figures A1a 'Overall Study Area and Environmental Constraints Plan' and A1b 'Aerial Photography View' present the three aspects of the scheme in relation to environmental designations and general context. Figure A5 specifically relates to the study area of the Waterloo Road / Peacock Lane improvements. This technical note specifically relates to Figures A6 – A11 which presents key ecological and nature conservation features.

These three aspects to the scheme are described in further detail below:

Proposed South Wokingham Distributor Route Options:

- Route Option A – Route Option A starts at the A321 Finchampstead Road at the junction with Oakley Drive. It runs approximately west to east, immediately south of the railway and ends just North of the railway line, approximately 300m east of the crossing of Waterloo Road. The proposed route will cross Emm Brook, Public Rights of Way 9 and 10, Easthampstead Road and Waterloo Road.
- Route Option B – Route Option B begins in the same location as Route Option A, on the A321 Finchampstead Road at the junction with Oakley Drive, and runs broadly east, diverting south round the existing detention pond. The route also ends in the same location as Route Option A, just north of the railway line, and crosses the Emm Brook, Public Rights of Way 9 and 10, Easthampstead Road and Waterloo Road.
- Route Option C – This route runs broadly west to east, south of Route Options A and B. It also begins in the same location, on the A321 Finchampstead Road at the junction with Oakley Drive. Route Option C ends north of the railway, in the same location as Route Options A, B and the alternatives. Route Option C crosses the Emm Brook east of Chapel Green, Public Rights of Way 9 and 10, Ludgrove School private access, Heathlands Road, Easthampstead Road and Waterloo Road.

Alternative Alignments in relation to the Route Options

- Route Option A Alternative Link 1 – A link between Route Option B and Route Option A at Knoll Farm. This link provides an alternative route for Route Option A which does not require land from Knoll Farm.
- Route Option A Alternative Link 2 - Link between Route Option A and Route Option B to the west of the existing detention pond. This link provides an alternative route for Route Option A to the south of the

detention pond which enables the Easthampstead Road junction to be located further south at the proposed Route Option B Easthampstead Road crossing.

- Route Option A Alternative Link 3 - Link between Route Option A and Route Option B. This link provides an alternative route from Route Option A passing through the existing detention pond to the proposed Route Option B Easthampstead Road crossing.
- Route Option B Alternative Link B1 –This link provides an alternative more southern and straight alignment for Route Option B east of Tesco which does not require land acquisition from Knoll Farm.
- Route Option C Alternative Link C1- Link between Route Option C to the south of the existing detention pond to Easthampstead Road, traveling down Easthampstead Road to re-join Route Option C. This link provides an alternative route for Route Option C to access Easthampstead Road which avoids the Ludgrove School private access and Heathlands Road crossings.

Local Study Areas

Six local study areas (A to F) have also been considered within this note and are identified on Figure A1b.

Footbridges across the railway are proposed at each location. These are likely to have steps and lifts/ramps to provide disabled access. For the purpose of this assessment, at each local study area potential constraints within the highway boundary for minimum of 150m north of the railway and 150m radius south of the railway have been identified.

- Local Study Area A is centred over the A321 Finchampstead Road, over the roundabout intersection with Oakley Drive, and is approximately 140m long.
- Local Study Area B is centred at the Knoll Farm, to the south of Gipsy Lane, and is approximately 60m long.
- Local Study Area C is centred at an existing footbridge over the railway line, to the south of Gipsy Lane, to the east of Local Study Area B, and is approximately 60m long.
- Local Study Area D is centred on the Easthampstead Road Level Crossing, and is approximately 70m in length.
- Local Study Area E is centred over the Waterloo Road Level Crossing, and is approximately 80m in length.
- Local Study Area F is approximately 340m in length, at the point of the South Wokingham Distributor Road roadbridge over the railway line, from below to a point approximately 150m north of the railway line.

Waterloo Road / Peacock Lane Proposed Improvements:

The proposed improvements commences on the corner of Waterloo Road, just north of the woodland parcel to the west, and continues east along Waterloo Road and Peacock Lane until its cessation approximately 300m east of Easthampstead Park. All works are due to be completed within the highway boundary with the exception of works at the junction between Waterloo Road, Old Wokingham Road and Peacock Lane, where some additional land would likely be needed to the south west.

Definitions

Given the relative proximity of the proposed distributor road routes, six local study areas and improvements to Waterloo Road / Peacock Lane, which share some of the same existing baseline, they are herein collectively termed '**the overall study area**'. Where there are differences, they will be referred to as Route Option A, Route Option A Alternative Link A1, A2, or A3, Route Option B, Route Option B Alternative Link B1, Route Option C, Route Option C Alternative Link C1, Local Study Area (A – F) or Waterloo Road / Peacock Lane improvements respectively.

In relation to the three route options, and their respective alternatives, where they share the same existing baseline, they will herein be referred to as '**the Site**'.

In relation to this technical note, the areas encompassing the full extent of each of the proposed route options plus a 15m buffer area around each route (30m in total), are hereafter referred to as the respective '**Route Study Areas**'.

The term '**Local Study Areas**' will be used to refer to the six areas where work is proposed to improve access across the railway.

The advice presented within the summary of constraints at the end of this technical note must be considered both generic and preliminary at this stage and will need updating when more information becomes available regarding the likely infrastructure scenarios. For ease of reading, the constraints identified within this technical note are colour coded in relation to a 'traffic light system' according to their significance on the scheme. Below identifies the colour coding:

- **Red** – Constraint to Development.
- **Amber** – Constraint to Planning/Major Cost Implication
- **Green** – Manageable constraint through scheme adaptation/mitigation measures/surveys (some cost implications).

Text left in black is not considered to represent any form of constraint and provides background information and/or recommendations to further avoid environmental impacts and/or to enhance the existing environment.

The approach to the desk study process is set out beneath, and the results of the desk study process are displayed on Figures A6-A11.

Methodology

To identify potential constraints for each Route Option, the Local Study Areas and proposed improvements of Waterloo Road / Peacock Lane with respect to ecology and nature conservation, initially aerial photography was viewed to ascertain the habitat types likely to be affected.

Following this, data obtained from the previously mentioned data sources, and freely available information were reviewed to inform consideration of whether designated sites in the vicinity of the Route Study Areas may be affected by the proposed works, and whether protected species or species of conservation concern known to occur in the local area might be affected by the work given the habitats likely to be present.

The majority of data was considered within a 2km search area around the Route Study Areas; this was applied to protected species, designated sites and habitats, but in the case of bats (a highly mobile species) a 5km search area was used. The search area was also extended to 10km for European designated sites¹.

The following information was requested from TVERC, and is considered the most up-to-date information available for this area:

- Records of statutory and non-statutory sites designated for nature conservation value, biodiversity action plan (BAP) priority habitat; and
- Records of legally protected and notable species (including BAP species and species of conservation concern).

To supplement this information, a number of local recording groups within Berkshire were contacted who were known to hold data for this area, which are not held by TVERC. These include:

- Binfield Badger Group;
- Berkshire and South Buckinghamshire Bat Group; and
- Berkshire Ornithological Club.

¹ The search area is based on the route options under consideration at the time of the data requests [February 2013], this includes an almost full search radius of 2km from the four route options considered in this technical note (for all Route Options, the maximum displacement from the original route is 120m, which is in relation to Route Option 3), but there is a minimum of a 1km search radius around some areas of the road improvements (Waterloo Road / Peacock Lane) (see Figure A7), and a similar reduction in relation to bats. The minor reduction in search radius is not considered to reduce confidence in the conclusions reached in this technical note.

A number of GIS layers were provided by TVERC; these were used in the production of the figures, and include:

- Biodiversity Opportunity Areas (BOA) Site Boundaries;
- Local Wildlife Site (LWS) Boundaries; and
- UK BAP Habitats.

In addition, a list of the datasets, as provided by Wokingham Borough Council, used in the production of this Technical Note is provided below:

- Thames Basin Heaths (TBH) Special Protection Area (SPA) 400m Linear Mitigation Zone;
- TBH SPA 5km Linear Mitigation Zone; and
- TBH SPA 7km Mitigation Zone.

In addition to the above, the Multi-Agency Geographic Information for the Countryside (MAGIC) website and Nature on the Map website were interrogated for information regarding the presence of European designated sites (Special Areas of Conservation (SAC) and SPA) and internationally designated RAMSAR sites within 10km of the Route Study Areas.

Protected and notable species records for the last ten years were used in the desk based study, unless otherwise specified. All of the data supplied by TVERC, Binfield Badger Group, Berkshire and South Buckinghamshire Bat Group and Berkshire Ornithological Club were considered; however old records (greater than ten years) are not reported upon / reproduced in this report, unless otherwise stated. Figures have been produced using a combination of all sources of data, which are specified where relevant.

Constraints with respect to the Local Study Areas were restricted to protected species and designated sites within the immediate vicinity and surrounding area (100m radius) of the proposed works; this is due to the relatively minor extent and geographically restricted nature of the proposed works at these locations.

A review of the route options; Route Options A-C plus the Alternative Links for Routes A-C, and the proposed improvements of Waterloo Road / Peacock Lane has been undertaken to consider potential ecological constraints. Potential ecological constraints for the Local Study Areas (A-F) have been considered in relation to the proposed works at each of these areas

Relevant Legislation and Planning Policy

Legislation:

- Conservation of Habitat and Species Regulations 2010 (as amended);
- Wildlife & Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities Act 2006;
- Hedgerow Regulations 1997; and
- Protection of Badgers Act 1992.

Planning Policy:

- National Planning Policy Framework (NPPF);
- Wokingham Borough Council Local Development Framework- Core Strategy (adopted January 2010); and
- Office of the Deputy Prime Minister (OPDM) Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and Their Impact Within the Planning System.

Desk Study

Route Options

The location of each of the route options and Local Study Areas is displayed on Figure 1b. A summary of the key habitats present along each of the options is provided below.

Route Option A

Route Option A begins by crossing a hedgerow / line of trees and enters an area of pasture as it heads south-east. The route then turns sharply north-east through the same pasture, and through a patch of trees with scattered scrub, crossing Emm Brook. As it approaches the railway line, it runs approximately parallel to the track, through pasture, a patch of scattered trees with buildings and associated gardens, further pasture and a small parcel of woodland. From here it continues on the same course, entering agricultural land through which the route continues, crossing Easthampstead Road. East of Easthampstead Road the route crosses further agricultural land with hedgerows, part of Emm Brook and other wet ditches, and a few scattered trees, and heading roughly east until it crosses Waterloo Road. East of Waterloo Road, the route swings north in an arc, and travels through arable land and hedgerows to its endpoint south of the railway line.

Route Option A Alternative Link A1

Route Option A Alternative Link A1 at the western end of the route, runs from a patch of trees with scrub, through pasture, crossing a hedgerow into agricultural land, where it re-joins Route Option A.

Route Option A Alternative Link A2

Route Option A Alternative Link A2 runs from approximately the centre of Route Option A, vaguely south, through exclusively agricultural land, where it joins Route Option B.

Route Option A Alternative Link A3

Route Option A Alternative Link A3 runs from a point just east of the Route Option A Alternative Link 2 start point, and runs vaguely south-east across agricultural land, crossing part of Emm Brook and a hedgerow, and a further hedgerow at the point it meets Route Option B at the Easthampstead Road.

Route Option B

Route Option B immediately crosses a hedgerow / line of trees, as for Route Option A, and traverses through pasture before it swings north-east through a patch of trees with scattered scrub, crossing Emm Brook. Here it gently swings south-east through pasture, another patch of trees with scrub, through further pasture, scattered trees, a hedgerow and into agricultural land. It continues through this agricultural land, approximately east, then swinging sharply south, crosses part of Emm Brook, before again swinging sharply north through agricultural land, and a hedgerow, crossing Easthampstead Road. To the east of Easthampstead Road, it continues vaguely east through agricultural land, crossing several hedgerows, wet ditches and scattered trees, passing within approximately 25m of Wood's Farm. Finally, crossing Waterloo Road, the route swings north in an arc, and travels through arable land and hedgerows to its endpoint south of the railway line.

Route Option B Alternative Link B1

Route Option B Alternative Link B1 also Option B immediately crosses a hedgerow / line of trees, as previously, and traverses south-east through pasture before it crosses another hedgerow, hardstanding, further pasture and lines of trees. It then enters agricultural land and re-joins Route Option A.

Route Option C

Running south-east, Route Option C crosses a line of trees / hedgerow several times and some pasture. It then crosses an access track, runs past a building and the associated gardens, and scattered trees as it swings east. It then runs through further pasture, crossing Emm Brook, along the edge of a parcel of woodland

(truncating it in two places), across an access track several times, through agricultural land and across part of Emm Brook again. It then crosses an un-named road, as it swings south-east, and a line of trees, further agricultural land, and travels through Long Patch private residence and associated garden, across Heathlands Road, through further pasture and scattered trees before it crosses Easthampstead Road. Here, Route option C swings north-east and crosses several agricultural fields with scattered trees and hedges, crosses Waterloo Road, and finally swings north in an arc through arable land and hedgerows to its endpoint south of the railway.

Route Option C Alternative Link C1

Route Option C Alternative Link C1 begins just south of Emm Brook approximately half-way along the length of Route Option C. This Link travels through agricultural land, approximately north-east to the point where it joins Easthampstead Road, having just crossed a few scattered trees. It then runs along the route of Easthampstead Road for approximately 390m, where it re-joins Route Option C.

Summary of Ecology and Nature Conservation Constraints

Potential ecological constraints are set out in Table 1 overleaf and are also presented on Figure A6-A11; a number of potential issues are equally applicable to all route options and the proposed improvements of Waterloo Road / Peacock Lane; this is highlighted where applicable. Potential ecological constraints within the immediate vicinity and surrounding area of the six Local Study Areas are shown in Table 2.

Where there is the potential for protected species or habitats to be present within an area under review for the proposed works, the standard procedure is to perform an extended Phase 1 habitat survey of the site or in this case, the relevant Route Study Areas. This will classify habitats present along the proposed route options in line with current survey guidelines (JNCC, 2010) and enable a full assessment of the suitability of habitat present to support protected species. It would also identify any specific survey data requirements, for example if specific faunal surveys are required, to enable a full consideration of the ecological effects associated with the works. Recommendations in Tables 1 and 2 have been made on the assumption that an extended Phase 1 habitat survey will proceed before final recommendations can be made on the options for the proposed South Wokingham Distributor Road or the proposed improvements of Waterloo Road / Peacock Lane.

Table 1: Potential Constraints Relating to Ecology and Nature Conservation for the Route Options and Improvements of Waterloo Road / Peacock Lane

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
Habitats		
Statutory designated sites	<p>The desk study indicated that one European designated site lies within 10km of the Study Area (see Figure A6); this is Thames Basin Heaths Special Protection Area (SPA).</p> <p>The desk study also showed that there are two UK statutory designated sites within 2km of the Study Area (see Figure A7):</p> <ul style="list-style-type: none"> ■ Holt Copse and Joel Park Local Nature Reserve (LNR); and ■ Wyckery Copse Site of Special Scientific Interest (SSSI); <p>All of the route options, plus Waterloo Road / Peacock Lane lie within the 5km Mitigation Zone of Thames Basin Heaths SPA, as supplied by Wokingham Borough Council. Of the route options, the furthest south; Route Option C is the closest to the SPA; a distance of approximately 3110m, and Route Option A1 is the furthest away a distance of approximately 3225m; all route options lie to the north of the SPA.</p> <p>The location of the Waterloo Road / Peacock Lane improvements lies 2530m north of the SPA.</p> <p>The closest UK designated site to the route options is Holt Copse and Joel Park LNR, a distance of approximately 1325m north of the western point of all route options.</p> <p>The location of the Waterloo Road / Peacock Lane improvements lies 1030m west of Wyckery Copse SSSI.</p>	<p>European designated sites are afforded a high level of protection under European and UK legislation as well as further protection through the planning system. Given the distance between the proposed route options, and the designated sites it is considered unlikely that there would be a direct effect upon these sites, providing standard pollution control measures are implemented. It is anticipated that measures to control noise, air quality and visual disturbance will be implemented to protect sensitive receptors including, but not specifically, statutory designated sites.</p> <p>The nearest European designated site is the Thames Basin Heaths SPA, although all route options, fall within the 5km mitigation zone for the site, this (and the other mitigation zones) primarily relates to mitigation required if residential development is proposed (to mitigate potential effects in relation to increased recreational pressures).</p> <p>Whether the proposed development would have an effect on European designated sites, or closer UK designated sites should be fully considered irrespective of which route option is selected, and consultation with the local authority may be required. In the first instance, once outline plans have been prepared, it is recommended that a screening note is prepared to identify whether there are any mechanisms by which statutory sites could be affected; this should be provided to the local authority for agreement, and only if any mechanisms are identified would further work be required. Preliminary consideration of Route Options A-C (including Alternative Links) indicates that the proposals are unlikely to affect the SPA.</p> <p>Given the localised nature of the works, it is not considered likely that proposals to improve Waterloo Road / Peacock Lane would affect the Thames Basin Heaths SPA.</p>
Non-statutory designated sites	<p>The desk study revealed that there are seventeen Local Wildlife Sites (LWS) within 2km of the proposed routes, one Proposed LWS, and one Biodiversity Opportunity Area (BOA) (see Figures A7 and A8).</p> <p>Route Options A, B and the Alternative Links for A and B do not bisect or abut any non-statutory designated site or BOA. The closest LWS to either Route Option is Woodland near Ludgrove</p>	<p>These sites receive no statutory protection but require consideration in the context of the National Planning Policy Framework (NPPF) policies, and local planning strategies.</p> <p>Due to the distance between Route Options A, and B, and the Alternative Links for these, and the nearest non-statutory designated site, they would likely be able to proceed, assuming standard noise and pollution control mitigation measures were implemented.</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
	<p>School LWS 240m and 70m south of Route Option A and Route Option B (the Alternative Links for both these are 225m for Route A Link A1, 240m for Route A Link A2, 325m for Route A, Link A3, 75m for Route B Link B1 and 340m for Route C Link C1).</p> <p>Route Option C bisects the entire length of the Woodland near Ludgrove School LWS when the 15m buffer on either side of the route is considered, approximately a third of the woodland is lost. Aside from this LWS, Route Option C does not bisect or abut any further non-statutory designated sites; the next closest is Big Wood Proposed LWS to the west.</p> <p>The proposed improvements at Waterloo Road / Peacock Lane lies adjacent to Big Wood Proposed LWS for part of the route length. The exact extent of encroachment into this parcel will depend on the extent of the works and the exact Proposed LWS boundary.</p>	<p>Route Option C would require the loss of a portion of the Woodland near Ludgrove School LWS. It is therefore highly likely that, should this option, proceed substantial measures would be needed to mitigate effects upon retained sections of habitat, and compensate for habitat loss to satisfy planning policy relevant to non-statutory designated sites. The objective of compensation would be to avoid net loss in habitat area or quality, and avoid, or mitigate where avoidance is not possible, the effects upon species using these habitats.</p> <p>The proposed improvements of Waterloo Road / Peacock Lane would potentially affect Big Wood Proposed LWS due to the proximity of the Proposed LWS to the works area. The extent of encroachment is dependent on the exact boundaries of both the Proposed LWS and the works, but based on the information available it is considered likely that working methods could be developed to incorporate avoidance / mitigation measures to satisfy relevant planning policy. Where direct effects cannot be avoided, provision of compensatory habitat nearby should be provided (see also recommendations in relation to ancient woodland).</p>
Ancient Woodland	<p>There are fifteen parcels of ancient woodland within the 2km search area, as shown on Figure A7; most of these form part of either a LWS or a LNR, such as Big Wood which is both Ancient Semi-Natural Woodland (ASNW) and Plantation on Ancient Woodland Site (PAWS) and forms part of the Proposed LWS.</p> <p>None of the route options bisect or abut any parcels of ancient woodland; the closest parcel to these routes is Big Wood, approximately 330m east of the options.</p> <p>The improvements to Waterloo Road / Peacock Lane would however occur immediately adjacent to Big Wood which supports ancient woodland and is also designated an LWS (route abuts ancient woodland for approximately 530m). Improvements in this location could have direct and indirect effects upon ancient woodland; the magnitude of any potential effects is however dependent on the exact extent of works in relation to the woodland boundaries.</p>	<p>Although ancient woodland receives no specific statutory protection the NPPF clearly states that loss and deterioration of irreplaceable habitat, including ancient woodland, should be avoided unless <i>'the need for, and benefits of, the development in that location clearly outweigh the loss'</i>. In the first instance options which avoid effects upon, or loss of ancient woodland should be explored.</p> <p>In this case, it is considered likely that any of the route options would be able to proceed with minimal disturbance to ancient woodland, given the distance between the options and the nearest parcel of ancient woodland.</p> <p>The proposed improvements of Waterloo Road / Peacock Lane would however, potentially affect Big Wood ancient woodland parcel due to the proximity of the woodland parcel to the works area. The exact extent of encroachment is dependent on the exact boundaries of both the woodland parcel and the works. Providing that designs avoid direct loss of habitat (i.e. land take to permit improvements is primarily south of the existing road) it may be possible to satisfy relevant planning policy through implementation of mitigation measures, and where direct effects cannot be avoided, provision of compensatory habitat nearby. In such instances where avoidance cannot be achieved, and mitigation measures are deemed necessary, the</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
		creation of larger areas of new woodland to replace this resource in the longer term may be required; the specification of such mitigation and compensation measures would need to be agreed with the local authority.
Hedgerows	<p>Aerial photography indicates that hedgerows are present within all of the Route Study Areas, some of which also contain mature trees. Hedgerows can provide habitat for protected species (see beneath), can act as connective corridors across the landscape, and they can themselves be inherently of value.</p> <p>All of the Route Options will bisect, affect or require removal of part, or all, of hedgerows present within the Study Areas. The degree to which hedgerows will be affected along each of the routes will depend on the exact extent of each route. Route Option C will likely affect the most hedgerows due to the longer length of this route. Only Route Option A Alternative Link A1 will have no direct effect upon hedgerows, but whichever route this forms part of, will have an effect.</p> <p>The proposed improvements of Waterloo Road / Peacock Lane will also potentially affect existing hedgerow which lies to the south of the road, for part of the route.</p>	<p>Under the Hedgerow Regulations (1997) it is an offence to remove an 'important hedgerow' (as defined within the Hedgerow Regulations) without applying to the local planning authority for permission. Therefore it may be necessary to identify whether 'important' hedgerows are present on any of the route options (surveys should be undertaken between May to September (May and June optimal)).</p> <p>Hedgerows are also listed as a Habitat of Principal Importance (HPI) under Section 41 of the NERC Act 2006. Under Section 40 of the NERC Act local planning authorities should have regard for the conservation of these habitats when carrying out their duties, including determining planning applications. During the extended Phase 1 habitat survey the extent of HPI should be considered, and where possible hedgerow habitat should be retained. Where effects cannot be avoided, compensatory planting may be necessary to avoid a net loss of hedgerow habitat.</p>
Biodiversity Action Plan Habitat	<p>Using data supplied by TVERC and HBIC, Biodiversity Action Plan habitats within the 2km search area include Eutrophic Standing Waters, Grassland (possibly unimproved), Lowland Dry Acid Grassland, Lowland Meadows, Lowland Mixed Deciduous Woodland, Lowland Wood Pastures and Parkland, Ponds, Rivers and Wet Woodland.</p> <p>In addition, BAP habitats within the search area from Nature on the Map include Traditional Orchards, Habitat Action Plan Woodland and Ancient Woodland (semi-natural and replanted).</p> <p>BAP habitats, as supplied by TVERC, are shown on Figure A8.</p> <p>All of the route options would affect BAP habitats, including rivers, lowland mixed deciduous woodland and grassland. Specifically the routes would affect the following habitats:</p> <ul style="list-style-type: none"> ■ Route Option A: lowland mixed deciduous woodland, grassland, and rivers; 	<p>The majority of UKBAP habitats are also HPI under the NERC Act 2006, under Section 40 of this Act local authorities have a duty to have regard to the conservation of biodiversity, with specific attention to HPI.</p> <p>During the extended Phase 1 habitat survey it is recommended that consideration is given to the likely presence or absence of UKBAP and local BAP habitats, and the effect the proposed works may have upon these habitats. UKBAP and local BAP habitat types are broad ranging, therefore it is unlikely that all effects will be avoidable, for example all route options may require the loss of hedgerows which are likely to qualify as UKBAP habitat / HPI (see above). In addition all options will transect other habitats identified as BAP, as provided within the data supplied by TVERC.</p> <p>Based on the information available all route options (except Route Option A Alternative Link A2 if undertaken on its own) would directly affect HPI habitat, mainly either grassland or lowland deciduous woodland, with river also affected which may also satisfy the relevant</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
	<ul style="list-style-type: none"> ■ Route Option B: lowland mixed deciduous woodland, grassland, and rivers; ■ Route Option C: lowland mixed deciduous woodland, grassland, and rivers; ■ Route Option A Alternative Link A1: grassland; ■ Route Option A Alternative Link A2: no additional habitats; ■ Route Option A Alternative Link A3: rivers; ■ Route Option B Alternative Link B1: lowland mixed deciduous woodland ■ Route Option C Alternative Link C1: lowland mixed deciduous woodland <p>Route Option C would affect a greater extent of lowland mixed deciduous woodland, but grassland to a much lesser extent than either of the other routes. The greater extent of lowland deciduous woodland affected by Route Option C is as a result of the presence of Woodland near Ludgrove School LWS.</p> <p>The improvements to Waterloo Road / Peacock Lane would also potentially have indirect effects upon lowland mixed deciduous woodland (Big Wood ancient woodland parcels and Proposed LWS) and grassland; the magnitude of any potential effects is however dependent on the exact extent of works in relation to the habitat boundaries.</p>	<p>criteria. No one particular route option affects considerably more or less HPI habitat than the others; but Route Option C affects more lowland deciduous woodland, and less grassland, with Route Options A and B affecting more grassland than woodland in comparison to Route Option C. It should be noted that due to the proximity of Route Option A to the existing conurbation of Wokingham, this option is likely to lead to the least habitat fragmentation, with Route Option C likely to lead to the greatest.</p> <p>The proposed improvements of Waterloo Road / Peacock Lane will also likely affect parcels of HPI habitat, although none of the parcels would be bisected in the same way as for the main route options. As previously, the exact extent of encroachment is dependent on the exact boundaries of both the habitat parcels and the works, but it is considered likely that mitigation measures may be considered appropriate in this instance (see also recommendations in relation to ancient woodland).</p> <p>Once extended Phase 1 habitat survey data is available it is recommended that proposals are adjusted to retain habitat of greater value where possible (taking into account other species issues too). However, where avoidance is not possible habitat loss should be calculated and proposals should be designed to compensate for loss through the creation of new habitats where possible.</p>
Species		
Badger (Potential for badger to be present within the Route Study Areas.)	<p>Aerial photography indicates there is suitable habitat for badgers within all of the Route Study Areas.</p> <p>Data supplied by Binfield Badger Group and TVERC identified badger records within the Study Areas, as shown on Figure A9. Both sett and road traffic accident records were returned, all records are shown to a 1km resolution, due to the sensitivity of sett information.</p> <p>No route options (or the Waterloo Road / Peacock Lane) span 1km grid squares in which badgers have been recorded within the last ten years (but all the route options, and the road improvements span 1km grid squares which have historical badger records within them). The closest record within the last ten years is approximately</p>	<p>Badgers (and their setts) are afforded protection under the Protection of Badgers Act 1992.</p> <p>In parallel to the extended Phase 1 habitat survey, a badger survey is recommended to establish the presence or absence of badgers from each route option and their immediate vicinity. Badger surveys can be completed throughout the year, however the winter period is generally considered optimal, as during the summer months vegetation may obscure setts or other evidence of activity.</p> <p>If badger setts will be affected by the proposed works it may be necessary to relocate setts (where effects cannot be avoided). This may only occur legally under licence from Natural England), and generally to avoid unnecessary disturbance during breeding, closure</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
	150m north of all the route options (distance from route options to nearest point on 1km grid square, due to confidentiality of records).	<p>may only occur between August – November once suitable alternative sett provision has been supplied (artificial replacement sett or alternative).</p> <p>Given the linear nature of the proposed works, it is also recommended that suitable crossing points be provided for badger to avoid fragmentation of badger habitat. Depending on the results of the surveys, it may be appropriate to install multiple badger tunnels to avoid the loss of current pathways between setts and foraging habitat (specifications should follow those in the Design Manual for Roads and Bridges, DMRB).</p>
Bats (Potential for roosting bats to be present in trees within the Route Study Areas / foraging over the Route Study Areas)	<p>Aerial photography indicates that mature trees are present in hedgerows, and woodland parcels to be affected by all of the route options. These trees may have the potential to support roosting bats.</p> <p>Bats are a highly mobile species, capable of traversing long distances each night; as such, the search area of interest for this species group is 5km. Within this area, bat roosts for at least eight species are known to exist (see Figure A10).</p> <p>Data provided by TVERC and Berkshire and South Buckinghamshire Bat Group, indicate that bats are present within the vicinity of all of the route options; both roosts and activity records were returned, as shown on Figure A10.</p> <p>Pipistrelle sp. <i>Pipistrellus sp.</i> roosts are present to the north of the routes; these are shown to a 1km resolution, but are closest to Route Option A, and furthest from Route Option C (see Figure A10). Common pipistrelle <i>Pipistrellus pipistrellus</i>, brown-long eared <i>Plecotus auritus</i> and soprano pipistrelle <i>Pipistrellus pygmaeus</i> bats have been recorded 75m north of Route Option A (205m, 285m Route Options B and C respectively).</p> <p>A noctule <i>Nyctalus noctula</i> roost is present within the 1km grid square which contains the proposed improvements of Waterloo Road / Peacock Lane. No other activity records were present within the immediate vicinity of these proposed works.</p> <p>Due to their high mobility, and the quality and type of existing habitat, bats are potentially present throughout the whole of the respective Study Areas, and the proposed improvements. Proposals to bisect hedgerows or other habitat features of interest such as woodland belts or parcels, could potentially affect bat activity. Given</p>	<p>All UK bat species are protected under the Conservation of Habitat and Species Regulations 2010 (as amended) with additional protection afforded in relation to disturbance under the Wildlife & Countryside Act 1981 (as amended). This affords protection to individual bats and their roost sites.</p> <p>All route options would likely affect foraging habitat likely to be used by bats and in the absence of mitigation, could lead to fragmentation of habitat available to this species group. Furthermore, aerial photography shows potentially suitable roosting opportunities in mature trees / woodland located along each route option. The proposed works could lead to loss of the roosts, should they be present here.</p> <p>In addition, the proposed improvements of Waterloo Road / Peacock Lane has the potential to affect trees which support roosting bats.</p> <p>Given the high level of protection afforded to this species group, preliminary recommendations are as follows:</p> <ul style="list-style-type: none"> ■ A ground level inspection should be completed to confirm whether trees present have the potential to support roosting bats (November-February inclusive), noting further emergence / return surveys may be required to confirm presence or likely absence of roost should potential be identified (May-August). ■ If the presence of bat roosts is confirmed then removal of trees to facilitate the road development would be subject to licensing by Natural England, and removal of trees should be avoided. ■ Bat activity surveys should be completed to confirm whether linear features or habitats present currently provide foraging habitat for bats (April-September inclusive).

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
	the abundance of both scattered trees and woodland areas adjacent to each of the routes, there is potential for a number of these to offer suitable features for roosting bats.	<ul style="list-style-type: none"> Efforts should be made to retain linear features or habitats shown to support bats. Compartmentalisation of suitable habitat should ideally be avoided, this may require the design and construction of suitable crossing features, culverts / bridges (specification and location to be determined by survey data).
Birds (Potential for nesting birds to be present within the Route Study Areas in trees and hedgerows. There may also be ground nesting birds within the arable fields.)	<p>Multiple bird records were returned from TVERC, and Berkshire Ornithological Club, as shown on Figure A11. Several of these have been recorded within the 1km grid squares which contain the Route Options (and adjacent squares, given the mobile nature of birds), including some which are listed on Schedule 1 of the Wildlife and Countryside Act such as, red kite <i>Milvus milvus</i> and fieldfare <i>Turdus pilaris</i>, among other species. The 1km grid squares which contain the road improvements at Waterloo Road / Peacock Lane (and / or the adjacent 1km grid squares) also contain red kite and fieldfare. Schedule 1 species are afforded additional protection in relation to disturbance, therefore further survey may be required if the presence of Schedule 1 species is suspected.</p> <p>All of the Route Options (except Route Option A Alternative Link A2) will affect hedgerows present within the respective Study Areas. Woodland and / or scattered trees may also be affected. Arable / agricultural land is also present on each of the routes which can be a favoured nesting habitat of some ground-nesting birds such as Lapwing <i>Vanellus vanellus</i> and Skylark <i>Alauda arvensis</i> which are also listed on the red list for Birds of Conservation Concern (BoCC), and have both been recorded, among others, in the vicinity of the route options.</p> <p>Habitats present along the route options may all provide potential for breeding birds; this is most extensive for Route Option C due to the longer length of this route.</p>	<p>Suitable habitat occurs within the search area for nesting birds; all nesting birds, their nests and eggs are protected under the Wildlife & Countryside Act 1981 (as amended).</p> <p>During the extended Phase 1 habitat survey the extent of suitable bird nesting habitat should be considered, and the potential for Schedule 1 species to be present also assessed. Consideration to the presence of habitat with potential to support wintering birds will also be given during the extended Phase 1 habitat survey. Irrespective of the route option selected, or whether improvements of Waterloo Road / Peacock Lane proceeds, mitigation to minimise the risk of an offence with regard to nesting birds will be required (for example seasonal timing of works during August to February inclusive to avoid the main bird nesting period), and landscaping should be designed to avoid a net loss in available nesting habitat.</p>
Dormouse (Potential for dormice to be present within hedgerows or trees within the Route Study Areas)	<p>Using datasets provided by both TVERC and HBIC, no records were found for dormouse <i>Muscardinus avellanarius</i> within 2km of the proposed route options. Aerial photography does however indicate that a relatively well connected network of hedgerow habitat is present in the vicinity of the route options, and woodland is also present in parcels throughout. Both of these habitat types may be suitable for dormice.</p> <p>All proposed route options, and Waterloo Road / Peacock Lane improvements will affect hedgerows which are likely to provide suitable habitat for dormouse. Route Option C is likely to affect the</p>	<p>The dormouse is protected under the Conservation of Habitat and Species Regulations 2010 (as amended) with additional protection afforded under the Wildlife & Countryside Act 1981, Schedule 5. They are also a Species of Principal Importance (SPI) under Section 41 of the NERC Act 2006, and a UKBAP species.</p> <p>During the extended Phase 1 habitat survey the extent of suitable dormouse habitat should be considered and following this, a specific survey is likely to be required to confirm presence / likely absence. Dormouse surveys entail the deployment of artificial nest tubes which are then checked on multiple occasions during the summer period</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
	<p>greatest area of suitable habitat on account of effects upon the Woodland near Ludgrove School LWS (mixed deciduous woodland). In respect to the proposed improvements of Waterloo Road / Peacock Lane, Big Wood proposed LWS and ancient woodland parcels may provide suitable habitat for dormouse. The degree to which this habitat will be affected, and whether or not this will affect the species within the woodland cannot be determined at this point, and is dependent on the exact extent of the works, and the woodland parcel boundaries.</p>	<p>when this species is active (May-October).</p> <p>In the event that dormice are confirmed to be present in the area, avoidance and mitigation measures would be required to minimise the risk of disturbance, killing and injury due to the high level of protection afforded to this species. If works require the removal of habitat occupied by this species (generally hedgerows, scrub and woodland) this would require a licence from Natural England and like for like habitat replacement would be expected (which may need to be planted a number of years prior to removal of habitat to enable establishment).</p>
<p>Great crested newts (Potential for great crested newts to be present in ponds within 500m of the Route Study Areas, and using suitable terrestrial habitat within the Route Study Areas)</p>	<p>Using datasets provided by TVERC, several great crested newt <i>Triturus cristatus</i> records were returned within 2km search area. The closest record lies approximately 60m north of Route Option A, as shown on Figure 9. In addition, a great crested newt record was returned within 25m of the route of the proposed improvements of Waterloo Road / Peacock Lane. Records for great crested newts were returned within 250m of all the Route Options, Alternative Links (except Route Option B Alternative Link B1 and Route Option C Alternative Link C1), , and the proposed improvements at Waterloo Road / Peacock Lane, as shown on Figure A9.</p> <p>Aerial photography and OS mapping indicates that all route options (and Waterloo Road / Peacock Lane) fall within 500m of ponds or water bodies which may provide suitable aquatic habitat for this species. The standard 500m buffer is applied to terrestrial habitats surrounding known breeding ponds. This buffer represents the distance a great crested newt may be assumed capable of travelling between breeding seasons (and during the breeding season, between ponds); and denotes the area of terrestrial habitat they may therefore occupy during the winter months. If present in the vicinity, great crested newts could use suitable terrestrial habitat within the respective Study Areas for hibernation as well as commuting between ponds during the breeding season.</p>	<p>Great crested newts are protected under the Conservation of Habitat and Species Regulations 2010 (as amended) with additional protection afforded in relation to disturbance under the Wildlife & Countryside Act 1981.</p> <p>All route options and Waterloo Road / Peacock Lane improvements lie within 500m of water bodies that may support great crested newts and therefore this species may be present in association with suitable terrestrial habitat along all routes.</p> <p>It is recommended that the habitats present within the respective Study Areas are assessed for their suitability as great crested newt terrestrial habitat, and ponds within 500m are assessed for their suitability as great crested newt breeding ponds (against the Habitat Suitability Index (HSI)). This survey may be undertaken at any time of year, although aquatic vegetation is more prevalent during the summer months (if completed over winter a precautionary approach may be applied).The need for a specific survey to confirm presence / likely absence should then be considered; if required this would involve multiple visits between late March and early June to search for the presence of great crested newts in suitable breeding ponds.</p> <p>If great crested newts are found in ponds within 500m of the route options, a mitigation strategy would be required to minimise the risk of killing and injuring great crested newts during construction and to ensure no net loss of suitable habitat in the local area, and to include measures to avoid fragmentation of suitable habitat (such as culverts / tunnels which newts could move through beneath the road). Mitigation of this type would be licenced by Natural England and would need to be implemented during the period that newts are active (i.e. broadly between March-September).</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
Invertebrates (Potential for invertebrate species of conservation concern to be present within the Route Study Areas.)	<p>Using datasets provided by TVERC, the desk study shows several records for protected invertebrate species within the search area, as shown on Figure A9. Stag beetle <i>Lucanus cervus</i> has been recorded less than 700m from each of the route options; the closest of which is approximately 360m north of the Route Option A. There is the potential that suitable habitat exists adjacent to the route options for this species. Stag beetle is a UKBAP species and an SPI.</p> <p>Several other SPI species were recorded within the 2km search area including Buff Ermine <i>Spilosoma luteum</i>, Powdered Quaker <i>Orthisua gracilis</i> and Knot Grass <i>Acronitca rumicis</i>, which were all recorded 170m north of Route Option A, almost at the westerly extent.</p> <p>No invertebrate records were returned within the immediate vicinity of the proposed improvements at Waterloo Road / Peacock Lane. It is however possible that ancient woodland and BAP habitats present within the vicinity of this route may potentially support protected or notable invertebrate species.</p> <p>At this stage it is uncertain which route hosts habitat which may of greater or lesser value for invertebrates.</p>	<p>It is recommended during the extended Phase 1 habitat survey that habitat present is surveyed to assess the potential for invertebrate species of conservation concern to be present. This could be completed during the extended Phase 1 habitat survey during the summer months, if a targeted invertebrate survey is required, this would generally be completed between April-August although should be focussed towards the species / habitat in question.</p>
Otter (Potential for Otter to be present in association with wet ditches within the Route Study Areas and in the vicinity of the Route Study Areas.)	<p>No records were returned within the last ten years for otter <i>Lutra lutra</i>, within the search area using datasets from TVERC.</p> <p>Aerial photography also indicates there may be suitable wooded areas, and scrub near to aquatic habitat to that may provide suitable resting places for otters. All of the route options cross Emm Brook, which provides contiguous habitat to Dinton Pastures Country Park; an area with suitable habitat which is being enhanced for otter.</p> <p>The proposed improvements of Waterloo Road / Peacock Lane does not affect any watercourses, and otters are not considered to be a likely constraint to these proposals.</p>	<p>Otters are protected under the Conservation of Habitat and Species Regulations 2010 (as amended) with additional protection afforded in relation to disturbance under the Wildlife & Countryside Act 1981.</p> <p>It is recommended that an otter survey is completed to identify whether this species is present in the relevant Study Areas for the route Options and hence whether this may constrain proposals for the proposed route. Otter survey is not seasonally constrained, however may be limited by dense vegetation during the summer months.</p>
Plants	<p>Using datasets provided by TVERC, records indicate there are higher plants of interest present within the 2km search area, as shown on Figure A9; these are all Wild Service Trees <i>Sorbus torminalis</i>.</p> <p>Although none have been recorded within proximity to the route options, there are habitats along each of the routes that have potential to contain plant species of interest; for example, the</p>	<p>During consideration of potential effects upon habitats associated with the respective route options, the effects upon specific plant species of conservation concern should also be considered.</p> <p>If the presence of rare or legally protected plant species is suspected (due to the presence of suitable habitat) targeted survey may be required. The timing of such a subsequent survey would be seasonally constrained to between May – July, and further</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
	<p>ancient woodland. The closest record of interest supplied by TVERC is approximately 330m north of the proposed road improvements at Waterloo Road / Peacock Lane, which is 960m east of the Route Options.</p> <p>All Route Options traverse through several BAP habitats; with Route Option C also running through an LWS, and the proposed improvements at Waterloo Road / Peacock Lane running alongside BAP habitat, ancient woodland and a Proposed LWS. All of these habitats / sites may potentially support higher plants of interest, and which the respective routes will affect, should they proceed. Further assessment is necessary in order to determine whether protected plant species will be affected by any of the proposed route options or the proposed improvements.</p>	<p>constrained dependent on the habitat type in question.</p>
<p>Reptiles (Likely presence of widespread reptiles in suitable habitat within the Route Study Areas)</p>	<p>The data search conducted by TVERC highlighted the presence of grass snake <i>Natrix natrix</i> and slow worm <i>Anguis fragilis</i>, within the 2km the search area, as shown on Figure A9.</p> <p>The closest reptile record to any of the route options is a slow worm, 170m north of Route Option A. Grass snake has also been recorded within the 2km search radius, along with many other slow-worm records.</p> <p>No reptile records are present within the immediate vicinity of the proposed road improvements at Waterloo Road / Peacock Lane.</p> <p>Aerial photography indicates there may be suitable habitat within the respective Study Areas, through which the proposed routes may be established; this is the case for all route options. This includes arable / agricultural land with hedgerow margins, scrub habitat and grassland.</p>	<p>Reptiles are protected by the Wildlife & Countryside Act 1981 as amended, all native species are also SPI.</p> <p>It is recommended that during the extended Phase 1 habitat survey the extent of suitable reptile habitat is recorded, and following this, a specific survey is completed to confirm presence / likely absence of reptiles. Based on aerial photography specific survey is likely to be required irrespective of which route option is preferred. Reptile survey involves the deployment of artificial refugia which are then checked on multiple occasions during the survey season (late-March to September inclusive).</p> <p>If reptiles are confirmed to be present it may be necessary to instigate a programme of trapping and translocation in advance of works to prevent the risk of killing and, or injury during construction. Translocations are not completed under licence, but do require the approach to be set out clearly in a method statement to be agreed with the local authority. Receptor habitat of suitable size and quality must be identified, and animals trapped and moved during a sufficient period of time (up to 90 days, or more if a large population is present) prior to construction. Translocation of this type may only proceed when reptiles are active, March-September inclusive.</p>
<p>Water Vole (Potential for water vole to be present in wet ditches within the Route Study Areas)</p>	<p>Datasets provided by TVERC indicate there are no water vole <i>Arvicola amphibius</i> records present within the search area during the last 10 years.</p> <p>All of the route options cross Emm Brook (except Route Option A Alternative Links A1 and A2), which provides contiguous habitat to</p>	<p>Water voles are fully protected under the Wildlife & Countryside Act 1981 as amended.</p> <p>As for otter, it is recommended that a water vole survey is completed to confirm whether water vole is present in the Emm Brook and associated ditch network. Water vole survey entails two visits to the</p>

Potential Constraint	Description	Relevant Legislation and Policy / Preliminary Recommendation
and in the vicinity of the Route Study Areas.)	<p>Dinton Pastures Country Park; an area in which water vole have previously been recorded.</p> <p>The proposed improvements of Waterloo Road / Peacock Lane does not affect any watercourses, and water vole are not considered to be a likely constraint to these proposals.</p>	<p>survey area to search for signs of activity during the period March-October inclusive.</p>
<p>UKBAP / Berkshire BAP Species</p> <p>(Potential for other species of conservation concern to be present, protected under planning policy)</p>	<p>Using data provided by TVERC and HBIC, the desk study indicated that a number of UKBAP species are present in the search area. The majority of UKBAP species are also SPI under the Natural Environment and Rural Communities Act 2006, under Section 40 of this Act local authorities have a duty to have regard for the conservation of biodiversity, with specific attention to SPI.</p> <p>The above sections within this table detail more specific findings and recommendations in relation to these species.</p>	<p>During the extended Phase 1 habitat survey, it is recommended that consideration is given to the likely presence or absence of UKBAP species; for example common toad <i>Bufo bufo</i> and West European hedgehog <i>Erinaceus europaeus</i> for which records were returned within the desk study. Appropriate recommendations for UK and Berkshire BAP species will be made, if appropriate, following the outcome of the extended Phase 1 Habitat survey.</p>

Local Study Areas

As described within the methodology section, each local study area has been considered alongside all the available information; potential ecological constraints are set out below in Table 2. Many potential constraints are equally applicable to all local study areas at this point; this may be refined following an extended Phase 1 habitat survey. Some constraints applicable to the route options described above are not considered likely constraints here as a result of the reduced scale of proposed works within these areas.

Table 2: Potential constraints with respect to Ecology and Nature Conservation for the six Local Study Areas

Topic	Description / Recommendations	Local Study Area ²					
		A	B	C	D	E	F
Habitats							
Statutory designated sites	No European designated sites, UK statutory designated sites, non-statutory designated sites or biodiversity opportunity areas lie close to the local study areas to be affected by the proposed works (Figures A6-A8). Therefore, constraints associated with these features are considered unlikely.	N/A	N/A	N/A	N/A	N/A	N/A
Non-statutory designated sites		N/A	N/A	N/A	N/A	N/A	N/A
Ancient Woodland	No ancient woodland parcels lie close to the local study areas to be affected by the proposed works (Figure A7). Therefore, constraints associated with this feature are considered unlikely.	N/A	N/A	N/A	N/A	N/A	N/A
Hedgerows	Hedgerows may be present near to all Local Study Areas. Where present in near vicinity to proposed works hedgerows should be retained and protected wherever possible. Consideration should be given to the distribution and condition (i.e. species rich, or poor) of hedgerows during the extended Phase 1 habitat survey. Further survey may be required, see Table 1 for full recommendations.	X	X	X	X	X	X
Biodiversity Action Plan Habitat	UK BAP habitat, as supplied by TVERC, is present within the area in which local study areas B and E are located. These are all grassland parcels (Figure A8). The quality and extent of this habitat would be determined during the extended Phase 1. Subject to the results of the survey, in the first instance it is recommended that the proposals are adjusted to retain habitat of greater value where possible (taking into account other species issues too). However, where avoidance is not possible habitat loss should be calculated and the proposals should be designed to compensate for any loss through the creation of new habitats where possible.	N/A	X	N/A	N/A	X	N/A
Species							
Badger	No badger (with the exception of local study area A for which the 100m radius covers part of a 1km grid square in which badgers were recorded) records were returned within a 100m radius of the local study areas within the last ten years. However, suitable habitat may be present within the local study areas for this species, which is frequently recorded in association with road verge embankments. It is recommended that the extended Phase 1 habitat survey includes a search for evidence of badger activity (setts) in proximity to the proposed works (Figure A9). If setts are	X	X	X	X	X	X

² In case of black and white printing, a single and double cross system has been used to represent the presence / absence of potential constraints for each local study area, in line with the colour coded system. Note: no instances of 'red' constraints (Constraints to Development) within Table 2. Key to table when printed in black and white: Green = X; Yellow = XX; and Red = XXX.

Topic	Description / Recommendations	Local Study Area ²					
		A	B	C	D	E	F
	present which will be affected by the proposed works, mitigation measures may be necessary which may require licence from Natural England. See Table 1 for further recommendations regarding this species.						
Bat	The presence of roosting bats is a potential constraint for all local study areas; mature trees or built structures (such as bridges) with the potential to support roosting bats are present within the vicinity of all local study areas, and have the potential to be affected by the works (Figures A1b and A10). The potential for roosting bats to be present within the local study areas, and affected by the proposed works, would be assessed during the extended Phase 1 habitat survey. Should trees or built structures with the potential to support roosting bats be present within the vicinity, further survey will be required to determine the presence or likely absence of roosts, and level of bat activity. See Table 1 above for full recommendations.	XX	XX	XX	XX	XX	XX
Birds	Breeding birds are a potential constraint for all local study areas, and habitat suitable for wintering birds may be affected by local study area F specifically; the potential for suitable habitat to be present will be determined during the extended Phase 1 habitat survey (Figure A11). Depending on the results, works may be timed to avoid damage to active nests (see Table 1), or could potentially occur under the watching brief of a suitably qualified ecologist. Alternatively, should Schedule 1 species be present, further mitigation measures may be required.	X	X	X	X	X	X
Dormouse	No dormouse records were returned within a 100m radius of the local study areas within the last ten years. However, suitable habitat may be present within the local study areas for this species (Figure A9). Consideration of the effect of the proposed works on this species will be given once the results of the extended Phase 1 habitat survey are available and the presence or absence of suitable habitat is better understood. Further survey may be required; see Table 1 for full recommendations.	X	X	X	X	X	X
Great crested newt	Great crested newt records within the last ten years are present within 500m of local study areas C, D and F (<200m from local study area D). Ponds are present within 500m of all local study areas (Figure A9). See Table 1 for the full details on the habitat requirements for this species. If any suitable terrestrial habitat is present within the works area for any of the areas, it is recommended that should suitable terrestrial habitat for this species occur within the local study area, effects upon the habitat are avoided. If this is not possible a full presence / absence survey of ponds within a 500m radius of the local study areas may be necessary. Mitigation measures may then be required following this survey in order to avoid the works proceeding which may potentially result in the contravention of legislation with regards this species, see Table 1 for potential mitigation measures.	XX	XX	XX	XX	XX	XX
Invertebrates	Protected invertebrates species have been recorded within the 1km grid square which covers the part of the 100m radius of local study areas B and C (see Figure A9). Many protected invertebrate species have been recorded 135m and 250m respectively from B and C. Consideration of the	X	X	X	X	X	X

Topic	Description / Recommendations	Local Study Area ²					
		A	B	C	D	E	F
	effects of the proposed works, at all local study areas, on this group should be given during the extended Phase 1 habitat survey (Figure A9). If suitable habitat is present within the local study areas, further survey may be required, and should the loss of habitat occur as a result of the works, compensation may be required. See Table 1 for full recommendations.						
Plants	No protected plant records were returned within a 100m radius of the local study areas within the last ten years. However, suitable habitat may be present within the local study areas for this group; for example, within the BAP Habitat within local study areas B and E. Consideration of the effect of the proposed works on this species group should be given during the extended Phase 1 habitat survey (Figure A9). Further survey may be required; see Table 1 for full recommendations.	X	X	X	X	X	X
Reptiles	No reptile records were returned within a 100m radius of the local study areas within the last ten years. However, suitable habitat may be present within the local study areas for this species group. Consideration of the effect of the proposed works on this species group should be given during the extended Phase 1 habitat survey (Figure A9). Further survey may then be required to establish the presence or likely absence of reptiles; see Table 1 for full recommendations. Due to the reduced scope of works in comparison to the route options, it is possible that targeted mitigation / avoidance may be achieved through appropriate timing of works and or the presence of a watching brief during removal of small areas of habitat if reptiles are found to be present. The appropriate approach would be determined following completion of further survey.	X	X	X	X	X	X
Otter and Water Vole	The 100m search radii for local study areas A, B, D, E and F all have water courses or drainage ditches linked directly to, or within the wider catchment of Emm Brook. Only local study area E directly encompasses a watercourse (Figure A9). Consideration as to the degree of suitable habitat within the local study areas should be given during the extended Phase 1 habitat survey. Where the proposed works may encroach upon suitable habitat, further survey may be required to determine the presence / likely absence of otter and water vole. See Table 1 for full recommendation of survey requirements for these species.	X	X	N/A	X	X	X
UK BAP Species	During the extended Phase 1 habitat survey, it is recommended that consideration is given to the likely presence or absence of UKBAP species. See Table 1 for recommendations regarding these species.	X	X	X	X	X	X

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