

## Chapter 8 Ecology and Nature Conservation

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## 8.1 Introduction

### **8.1.1 OVERVIEW**

8.1.1.1 This Chapter assesses the impact of the proposed Kent International Gateway development on ecology and nature conservation within the defined zone of influence of the development, as described below. In particular it considers the potential impacts of habitat loss and general habitat fragmentation on the local biodiversity, with specific consideration of potential impacts to mammal and bird species.

8.1.1.2 The development involves large scale re-grading of the site as well as modifications to the existing railway line and embankments. These works will necessitate the stripping of semi natural vegetation from the site during the construction phase. Once operational, the development will generate noise levels above the current baseline and an increase in night-time lighting levels above the level that currently exist at the site. Both of these aspects will have impacts on the ecology of the site and (with respect to lighting) the surrounding area.

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## 8.2 Legislation and Guidance

### 8.2.1 LEGISLATIVE FRAMEWORK

8.2.1.1 Animal and plant species that are considered to be threatened as a result of their rarity, vulnerability or persecution are afforded protection through a combination of UK and European law. For most species, protection is provided through inclusion in Schedules within The Wildlife and Countryside Act, 1981 (as amended by the Countryside and Rights of Way Act, 2000 and Natural Environment and Rural Communities Act 2006) and The Conservation (Natural Habitats etc) Regulations, 1994. Habitats of national and international importance are also protected by law through statutory designation under these acts of parliament.

8.2.1.2 The following additional legislation is relevant to species and habitats found on the Kent International Gateway Site:

- The Salmon and Freshwater Fisheries Act 1975
- The Protection of Badgers Act 1992; and
- The Wild Mammals (Protection) Act 1996.

8.2.1.3 Detailed information relating to the legal protection of species and habitats relevant to the site can be found in Appendix 8D.

### 8.2.2 PLANNING POLICY

8.2.2.1 Planning policy at the national, regional, county and local level is discussed in Chapter 3: Planning Context. In addition to these policies, reference has been made to the UK Biodiversity Action Plan (UKBAP) and the Kent Biodiversity Action Plan.

8.2.2.2 The UK Biodiversity Action Plan was developed in response to the Convention on Biological Diversity (Rio Summit) 1992. It describes the UK's biological resources and outlines individual species and habitat action plans. Three broad habitat action plans are relevant to the proposed development site, these are; broad-leaved, mixed and yew woodland, rivers and streams and standing open water and canals. In addition, species action plans exist for great crested newts, bats and several red-listed bird species.

8.2.2.3 Kent Biodiversity Action Plan (BAP) outlines specific habitats and species in Kent for which objectives and targets have been set for their protection and enhancement. This includes policies to protect and enhance habitats and species in accordance with the UK Biodiversity Action Plans. For the proposed development site the following habitats and species for which action plans exist have been identified as present: hedgerows, woodland, standing water (including ditches), bats, some bird species and great crested newt.

8.2.2.4 The Kent BAP states that where impacts on habitats cannot be avoided, mitigation through the provision of replacement habitat will be necessary and opportunities to improve the environment will be sought. Features of particular value are those which can act as "stepping stones" and provide a continuum of planting, for example hedgerows, copses and around ponds.

8.2.2.5 A summary of the scheme's compliance with legislation and planning policy is provided in Table 8.4. in Section 8.5 of this Chapter.

### 8.2.3 GUIDANCE

8.2.3.1 This assessment has been undertaken with reference to the Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM, 2006) and IEMA's 'Guidelines for Baseline Ecological Assessment' (1997). Best practice guidance is available for survey techniques and mitigation measures for a number of species and habitats, and the following guidance has been adhered to in the preparation of this assessment:

- Joint Nature Conservation Committee (1993) Handbook for Phase 1 habitat survey: A Technique for Environmental Audit.
- Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10.

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- Herpetofauna Groups of Britain and Ireland (1998) Evaluating local mitigation/translocation programmes: Maintaining Best Practice and lawful standards. HGBI advisory notes for Amphibian and Reptile Groups (ARGs). HGBI, c/o Froglife, Halesworth. Unpubl.
  - English Nature (2006) The dormouse conservation handbook, second edition.
  - Rob Strachan and Tom Moorhouse (2006) Water vole conservation handbook.
  - English Nature (2001) Great crested newt mitigation guidelines
  - Mitchell-Jones, A.J. (2004) Bat Mitigation Guidelines. English Nature.
  - BSI (2005) BS5837:2005 Trees in relation to construction – Recommendations.
  - Environment Agency. General Guide to the Prevention of Pollution: PPG1
  - Anderson, P (2003) Habitat Translocation, a best practice guidance. CIRIA C600.

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## 8.3 Assessment Methodology and Significance Criteria

### 8.3.1 SCOPE OF THE ASSESSMENT

8.3.1.1 A Scoping Report was produced in March 2007 which included consultation with Kent County Council, Natural England and the Wildlife Trust. The result of this scoping exercise is that the following issues have been scoped in and out of this Ecological Impact Assessment:

#### Ecological issues scoped in to the assessment

- Indirect impacts on non-statutory ecological sites: There is the possibility for indirect impact to occur to two strips of protected 'species rich' roadside verge (protected in the Local Planning Policy under ENV42) and to the River Len to the south of the scheme which would include two Local Wildlife Sites (LWS) (Len Vale Farm LWS and River Len Millpond and Carr LWS).
- Direct impact on non-statutory protected or BAP Habitats: The site includes semi-natural broad-leaved woodland. Whilst surveys indicate that the woodland is not of UK BAP Priority habitat quality, this habitat is included within the Kent LBAP. A group of trees protected by a TPO are present on the site (this designation is predominantly awarded for landscape reasons).
- Direct impacts on legally protected, BAP priority or other notable species: The following protected and notable species have been identified as present on, or directly adjacent to, the site: badgers (*Meles meles*), bats (Chiroptera.), several red-listed and UK BAP birds, great crested newts (*Triturus cristatus*) and reptiles (common lizard, *Lacerta vivipara*, slow worm *Anguis fragilis* and grass snake *Natrix natrix*).
- Indirect impacts on legally protected, BAP priority or other notable species outside of the application boundary: Potential impacts to bats, great crested newts, reptiles, birds and badgers could occur as a result of the development.
- Impacts on water courses and water quality.

#### Ecological issues scoped out of the assessment

- Direct or indirect impacts on nationally or internationally designated ecological sites<sup>1</sup>; and
- Direct impacts on any statutory or non-statutory designated sites.

### 8.3.2 EXTENT OF THE STUDY AREA

8.3.2.1 Extent of desk study: A search radius of 2km from the site boundary has been employed for a desk top study of available species records and habitat data. This has been extended to a 5km radius for a search of bat records, in recognition of the landscape scale habitat requirements of these species.

8.3.2.2 Extent of field study: The field study has been undertaken over the application site. The survey was extended to cover a 30m zone beyond the red-line boundary where access has allowed, in order to determine whether there are any badger setts close to the site boundary which could be impacted by development of the site.

8.3.2.3 Extent of impact assessment: The extent of the impact assessment has been defined as the zone of influence<sup>2</sup>. This zone has been determined through review of the baseline ecological conditions in comparison with scheme designs, the construction method statement, and consideration of the proposed activities (in construction and operation) and through liaison with other specialists involved in assessing the impacts in other disciplines. The zone of influence has been reviewed and amended as the application scheme has evolved.

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<sup>1</sup> Natural England recommended that an assessment of potential impacts to the Hollingbourne Downs SSSI is included within the Environmental Statement; after due consideration, the SSSI has subsequently been removed from the zone of influence and full justification is given in Appendix 8C:Table 1

<sup>2</sup> The areas/resources that may be affected by the biophysical changes cause by activities associated with a project (IEEM, 2006).

8.3.2.4 The zone of influence is presented in Figure 8.1 and described in section 8.4. Habitats or species that have been scoped out of the zone of influence are presented in Appendix 8C:Table 1 along with detailed reasons as to why they have been scoped out.

**Consultation**

8.3.2.5 The following statutory and non-statutory consultees have been consulted to inform the impact assessment:

- The Environment Agency (EA);
- Natural England (NE);
- Kent County Council;
- Kent Wildlife Trust'
- Kent and Medway Biological Records Centre; and
- Kent Bat Group.

8.3.2.6 Full details of consultation responses are presented in Appendix 8B of the original ES chapter, and within the separate Phase 1 report (WSPE, 2006) and are summarised within the baseline conditions (section 8.4 of this Chapter).

**8.3.3 METHOD OF BASELINE DATA COLLATION**

8.3.3.1 Baseline data has been obtained through desk study, consultations and a series of site surveys.

**Desk Study**

8.3.3.2 The desk study has involved the following processes:

- A review of relevant planning policy (as described in Chapter 3) and the UK and Kent BAPs.
- Information requests to relevant organisations for any biological records or habitat data from the application site and a 2km study radius from the site (extended to 5km for information relating to bats). Information was obtained during 2004 and 2005 and the consultation with the local records centre and bat group was updated in spring 2007.

8.3.3.3 Consultation meetings with the Kent Wildlife Trust and Kent County Council in spring 2007.

**Phase 1 Habitat Survey**

8.3.3.4 Due to the evolution of the application site boundary and of landowner access permissions, Phase 1 Habitat Surveys of the application site were carried out over several separate visits during which the dominant plant species were recorded and habitats classified according to their vegetation types. Survey results have been presented in the standard Phase 1 Habitat survey format with habitat descriptions and a habitat map with Target Notes (Joint Nature Conservation Committee, 1993). Notes and limitations relating to the surveys can be found in Appendix 8E. Surveys were undertaken between May 2004 and June 2006 to reflect the acquisition of options on land within the red-line boundary. The dates of these visits are listed in table 8.1 below:

**Table 8.1: Phase 1 Habitat Survey Dates**

Dates of Phase 1 habitat surveys	Survey Extent
24 – 25 May 2004	Land east of Chrismill Road (including M20/A20 roundabout verges and 100m strip along the south-side of the M20 Ashford Road).
21 -23 June 2005	Remainder of application site with the exception of: Common Wood, Glenrowan House, Land at the Lodge and Bridge Farm
6 April 2006	Common Wood
28 June 2006	Glenrowan House, Land at the Lodge and Bridge Farm
16 September 2008	White Heath Farm and surrounds
4 <sup>th</sup> June 2008	Re-survey of all three watercourses on site.

8.3.3.5 Access was restricted for parts of the railway embankment, which have been surveyed from appropriate vantage points adjacent to the railway line and therefore confidence in survey data from these areas is lower.

8.3.3.6 During the Phase 1 Habitat Surveys, species protected by UK and European legislation, listed in the UK BAP or in the LBAP and habitats suitable for supporting such species were recorded. Features which could form habitat corridors, ecological networks or other important resources (such as foraging or breeding habitat) for species of interest were also considered during the survey. Details for the methodology of this survey can be found in Appendix 8A of the original Environmental Statement. For ease of reference, the Phase 1 Habitat Survey Plan has been reproduced within Figure 8.2.

### Protected Species Surveys

8.3.3.7 A number of protected species surveys have been undertaken on the site and these are summarised in the Table below. The methodology for these surveys is described within the Phase 1 Report and appended protected species reports (Appendix 8A).

**Table 8.2: Protected Species Survey Dates**

Survey	Dates of survey	Summary of methodology	Result
Badger Surveys	May 2004, June 2005, April 2006, June 2006, April 2007	Search for setts, foraging signs, dung pits, latrines and prints across site.	Present
Otter Survey	May 2004, June 2005, April 2006, June 2006.	Search for spraints and prints along all water courses.	Absent
Water vole survey	May 2004, June 2005, April 2006, June 2006.	Search for feeding stations, prints, latrines along all water courses	Absent
White-clawed crayfish	May 2004, June 2005, April 2006, June 2006.	Search for suitable habitat.	Absent (habitat not suitable)
Re-assessment of watercourses on site	June 2008	Re-survey of all watercourses to further characterise habitats, re-assessment for presence/absence of, and suitability for, protected species; water vole, white-clawed crayfish and otter.	Water vole – habitat sub-optimal and no positive evidence. White clawed crayfish – habitat unsuitable Otter – likely absent.
Water vole survey	September, 2008	Specific site survey to re-survey all water courses for presence/absence of water vole.	Absent
Dormouse survey	September 2005 April – October 2006	Nut search, dormouse nest tube and nest box survey in all appropriate habitat	Absent
Breeding Bird Survey	April 2007 – July 2007	Four visits during the breeding season	Present

Bat Surveys	August 2005, June, July and August 2006, September 2008.	Internal and external building inspections, grading of trees, emergence surveys of buildings and trees, activity surveys.	Present
Amphibian Surveys	March – June 2005, March – June 2006 and March – June 2007.	Bottle trapping, torching, egg search and netting of all accessible ponds within 500m of the site.	Present
Reptile Survey	August and September 2006	Survey of appropriate habitat using artificial refugia.	Present
Invertebrate Appraisal	April 2007. June-October 2008	Site walkover by entomologist. Detailed surveys concentrated in areas of likely invertebrate value.	Present

### 8.3.4 VALUATION OF BASELINE DATA

8.3.4.1 The ecological value of existing habitats and species has been determined using the seven-point evaluation scale below, whereby receptors are assessed for their importance in a geographical context. This valuation has been applied to features for which information has been received through field survey or from consultation. This scale has been developed with reference to the Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM, 2006):

- International;
- UK or National (i.e. England/Northern Ireland/Scotland/Wales);
- Regional;
- County/Metropolitan;
- District/Borough;
- Local or Parish;
- Site (ie. at the scale of the Application site); and
- Not ecologically valuable.

8.3.4.2 Species or habitats that are afforded legal protection have been identified. It should be noted that legal protection does not necessarily infer biological value.

### 8.3.5 ASSESSMENT CRITERIA

#### Assigning a threshold value

8.3.5.1 In the process of ecological impact assessment (EclA), it is important to select the appropriate features for inclusion in the assessment. A threshold value of local or parish value has been set and all ecological receptors within the zone of influence that are of local value or higher have been included for consideration within the EclA. In order to document how the value of each receptor has been arrived at, the Valuation section of this chapter (section 8.5) discusses all the habitat types present on the site, and all of protected species which could potentially be present, or which consultees have requested are included in this revision of the ES. Table 8.4 at the end of Section 8.5 lists all of the habitats/species with an ecological value below the threshold value of local (parish) and which are therefore not considered further within the ES chapter.

#### Characterising the potential impact

8.3.5.2 Based on an understanding of the baseline conditions and of the scheme proposals, potential impacts to valuable receptors have been considered, taking into account both the construction and operational phases. Impacts have been assessed against the predicted future baseline as described in sub-section 8.4 and have been characterised with reference to ecological structure and function of the feature in question, for instance the fragility/stability of an ecosystem and its connectivity to other features or resources.

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8.3.5.3 The following parameters have been referred to in assessing impacts on ecological structure and function. Should any of these parameters be unknown, this has been clearly stated:

- Positive or negative;
- Magnitude;
- Extent;
- Duration;
- Reversibility; and
- Timing and frequency.

8.3.5.4 There are no relevant approved development proposals and plans in the local area and therefore an assessment of potential cumulative impacts on sensitive habitats or features cannot be undertaken.

#### **Assigning significance**

8.3.5.5 For the purposes of this assessment, an ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. If an impact is found not to be significant at the level at which the resource or feature has been valued, it may however still be significant at a more local level. An impact that is of significance at a level below a local level, or is deemed to be not-significant, will be scoped out of the impact assessment, unless there are legal implications associated with the impact, in which case these will be clearly stated.

#### **Confidence in Prediction of impact on sensitive receptor**

8.3.5.6 The following four point scale has been adopted to describe the degree of confidence in the assessment of the impact on ecological structure and function. This confidence level relates to the likelihood that a construction or operational event or activity will lead to the described ecological impact on a sensitive receptor.

- Certain/near-certain – probability estimated at 95% chance or higher;
- Probable - probability estimated above 50% but below 95%;
- Unlikely - probability estimated above 5% but below 50%; or
- Extremely unlikely – probability estimated at less than 5%.

## 8.4 Baseline Conditions

### 8.4.1 DEFINING THE ZONE OF INFLUENCE

8.4.1.1 The zone of influence has been determined in consultation with Kent County Council, Kent Wildlife Trust and Natural England and is shown on Figure 8.1. The zone of influence includes all of the land within the application boundary plus the River Len and part of Honey Hills Wood, pasture and Golf Course local wildlife site. Local populations of bats and birds are also considered within the zone of influence.

8.4.1.2 All other protected sites identified during the desk study have been scoped out of the zone of influence and are presented in Appendix 8C along with justifications. This includes potential impacts to Snarkhurst Wood LWS and to The Hollingbourne Downs SSSI which were identified by Maidstone Borough Council and Natural England respectively as potential sensitive receptors within the formal scoping response.

### 8.4.2 ECOLOGICAL CONDITIONS

#### DESK STUDY

8.4.2.1 The ecological constraints identified during the desk study are illustrated on Figure 8.1. Copies of the consultation responses are attached at Appendix 8B of the original ES chapter and summarised in Table 8.3 below.

**Table 8.3: Summary of Consultee Responses (initial data collection stage)**

Consultee	Comments
English Nature (EN)	EN provided information on LWS sites, ancient woodland and protected species.
Environment Agency (EA)	The EA provided information for LWS within the 2km study area and protected species records.
Maidstone Borough Council	The Council stated that the site has no designations within the boundary (but one TPO exists for a group of trees on the site). Contacts details were provided for other relevant consultees.
Kent County Council	The Council provided information for Local Wildlife Sites in the 2km study area. A list of relevant contact details for further consultation was also provided.
Kent Wildlife Trust	The Kent Wildlife Trust referred to the Kent and Medway Biological Records centre for species records.
Kent and Medway Biological Records Centre	The Centre provided a comprehensive list of protected fauna and flora records.
Kent Mammal Group	Records of dormice from the Kent Mammal Group were passed to the Kent and Medway Biological Records Centre in July 2005, and are included within their data search (see above).
West Kent Badger Group	The badger group identified two badger records within study area and stated that there is suitable habitat for badgers within the site boundary, in particular the railway embankments and near the streams.
Kent Bat Group	The Group provided bat roost, hibernation and feeding records. No records fall within the development boundary.
Kent Reptile and Amphibian Group	The Group provided records for grass snake and common lizard within the 2km study area.

#### Protected Habitats

##### *On-site*

8.4.2.2 One group of trees on the site (in the north-west of the Site, directly east of Water Lane) is protected by a Tree Preservation Order (TPO). These are located within an arable field in the north-west of the site. The TPO has been awarded for the landscape value of the trees.

8.4.2.3 There are no other designated sites within the proposed development boundary.



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## Off-site

8.4.2.4 There are no statutory designated sites within a 2km radius of the application site. The nearest statutory designated site is the Hollingbourne Downs Site of Species Scientific Interest (SSSI) which lies approximately 2.3km north east of the development and will not be affected by the development.

8.4.2.5 Several sites with county level ecological designations are within a 2km radius of the site, including eight Local Wildlife Sites (LWS) and several areas of ancient woodland (a Kent Biodiversity Action Plan Habitat). Two of the LWS's could potentially be indirectly impacted by the development through changes in water quality and therefore these two sites have been included within the zone of influence and are described below.

8.4.2.6 The River Len Mill Pond and Carr, Leeds is a LWS that has been designated for its diverse insect population. This LWS is situated 0.3km south of the proposed development boundary.

8.4.2.7 The Len Vale Farm Pasture and Leeds Churchyard LWS has been designated for its grassland habitat and is situated 1.4km south west of the proposed development boundary.

8.4.2.8 There are two protected roadside verges directly south-east of the application site (and off-site). These are mapped within the Local Plan Proposal Maps (Local Plan 2002) as roadside verges of nature conservation or amenity value (Figure 8.1) and as such are protected under Local Policy.

8.4.2.9 There are no other non-statutory designated sites or notable habitats within the zone of influence of the application site.

### Protected and Notable Species

8.4.2.10 Badger (*Meles meles*): There are three badger records within the search area. These are 1km records that originate from the area of land around Leeds Castle, south of the application site. There are no badger records from the study site itself.

8.4.2.11 Water vole (*Arvicola terrestris*): There are records for water vole to the south-east of the site, associated with the River Len and Leeds Castle open water. There are no water vole records from the study site itself.

8.4.2.12 Dormouse (*Muscardinus avellanarius*): There are dormouse records from the large woodlands to the north of the development site (Snarkhurst Wood, Howe Court Wood and Longham Wood) and two 1km<sup>2</sup> records from the area of Horish wood to the north-west of the site and to the south-east of the site around Leeds Castle Estate woodland. There are no dormouse records from the study site itself.

8.4.2.13 Brown hare (*Lepus europaeus*): There is a record of brown hare from the Leeds Castle Estate. There are no brown hare records from the study site itself.

8.4.2.14 Birds: A large number of bird records were received for the 2km area around the application site. These include 23 Kent BAP species, of which six are also UK BAP species (song thrush, skylark, grey partridge, common starling, house sparrow and linnet).

8.4.2.15 Bat: Bat records for the area include a number of roost records within 2km of the site both north and south of the application site boundary. There is a concentration of foraging records over Bearsted (which is possibly due to recorder bias). Recent records from surveys at Leeds Castle undertaken by the Kent Bat Group show that there is a large summer roost of soprano pipistrelles and serotines in a building on the Castle Estate. They have also repeatedly recorded Daubenton's bats foraging over water in the Estate and have two records of a noctule flying overhead in the area.

8.4.2.16 Amphibians: Three great crested newt records exist for the search area and one 1km<sup>2</sup> record covers the site itself (see Figure 8.1).

8.4.2.17 Reptiles: There are reptile records for the area. There are two grass snake (*Natrix natrix*) records south of the site and adder (*Vipera berus*) and common lizard (*Lacerta vivipara*) have been recorded in Hollingbourne (just outside of the 2km search area).

### FIELD STUDY

8.4.2.18 The baseline conditions as established through field surveys are described within the valuation section (section 8.5) below.

### FUTURE BASELINE



8.4.2.19 The future baseline of the application site is considered to be similar to the existing baseline with continued current agricultural land management practices. The majority of the habitats on the site are currently actively managed farmland that are subject to either grazing or crop cultivation. This would continue to be the case should the development not proceed. In addition, the vegetation along the railway line would continue to be managed to the existing network rail standards. Two areas of woodland are not actively managed (Common wood and Chrismill Shaw). Being a climax community, mature woodland is a relatively stable ecosystem and woodland cover over a similar nature to that currently present would remain in these areas should the development not proceed.

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## 8.5 Valuation

### 8.5.1 OVERVIEW

8.5.1.1 Detailed habitat descriptions for the site can be found in the Phase 1 Habitat Survey report in Appendix 8A of the original ES chapter. The likely value of each of the sensitive receptors on the application site is discussed below and summarised in Table 8.4.

### 8.5.2 PROTECTED AND NOTABLE HABITATS (OFFSITE)

#### HONEYHILLS WOOD, PASTURE AND GOLF COURSE LWS

8.5.2.1 This site is adjacent to the application site situated immediately west of the proposed development boundary and with a small area of land between the development boundary and the M20 in the north. The site is designated for its grassland, scrub and woodland habitats of county nature conservation importance. The part of the site that is of relevance to the application is the small area of scrub and wetland habitat surrounded by dense hedgerows that occurs directly north of Clayswood. This site is a receptor site for great crested newts formed as mitigation for the CTRL scheme in this area. Newt surveys undertaken in 2005 and 2006 have shown that great crested newts are present in this area and the site is of high quality for this species. The site is a non-statutory designated site that is considered to be of **County** importance.

#### RIVER LEN SYSTEM, INCLUDING LEN VALE FARM AND RIVER LEN MILLPOND AND CARR LWS.

8.5.2.2 The River Len is fed by chalk headlands in the North Downs and runs south from Lenham and west to join the River Medway at Maidstone. The River supports two Local Wildlife Sites approximately 1km south and south west of the application site and these are of importance for their aquatic habitats and invertebrate populations. The River Len and associated riverside wildlife sites are considered to be of **County** importance.

### 8.5.3 OTHER HABITATS (ON-SITE HABITATS)

#### SEMI-NATURAL BROADLEAVED WOODLAND

8.5.3.1 There are three large areas of semi-natural broadleaved woodland on the site; The Belt, Chrismill Shaw and Common wood and these make up a total of 4.6 hectares of semi-natural woodland.

8.5.3.2 The Belt (Target Note 15 on Figure 8.2) is a mature English oak (*Quercus robur*) and ash (*Fraxinus excelsior*) woodland of under 2ha containing a high proportion of mature and over mature trees of native and naturalised species. One English oak within the boundary of the woodland is of potential veteran tree status as defined within the Veteran Trees Initiative specialist survey handbook (English Nature, 1997). The typical four layered woodland structure does not exist throughout the woodland due in large part to domestic livestock and wild mammal browsing. The under storey and ground flora has been disturbed by cattle grazing but species typical of well established woodland are present, including bluebell (*Hyacinthoides non-scriptus*), dog's mercury (*Mercurialis perennis*), wild garlic (*Allium ursinum*) and wood anemone (*Anemone nemorosa*). Livestock were present in 2005 – 2007, but had been removed in 2008.

8.5.3.3 Chrismill Shaw (Target Note 1) lies to the east of Chrismill Road and is less than 1ha in size. This woodland shows no signs of cattle grazing and as a result has a better developed ground flora and understorey than 'The Belt' and primrose (*Primula vulgaris*) is frequent throughout. This woodland contains far fewer mature tree specimens but is dominated by suckering English elm (*Ulmus procera*) which can be indicative of old or ancient woodlands. A dry ditch and several damp depressions throughout the woodland, combined with the presence of water figwort (*Scrophularia auriculata*) suggest that the woodland has historically contained wet woodland areas.

8.5.3.4 Common wood is present in the south west of the site at Target Note 17. This is secondary mixed woodland of just under 2ha that contains some planted species but is characteristic of a semi-natural lowland woodland. A small number of very mature English elm trees are present towards the centre of the woodland and in the north-eastern corner is a small clearing containing scattered bracken growing over bluebells indicating the presence of pockets of acidic soils.

8.5.3.5 None of the woodland habitat on the application site is mapped within the Ancient Woodland Inventory (as supplied by KMBRC) and none shows signs of historical coppicing or pollarding. Ancient woodland is defined as an area that has been wooded since 1600 AD and only woodland over 2ha in size was included in the original inventory

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(produced by the Forestry Commission). The oldest available map of the area (obtained from the Kent Records Centre) is dated from 1707 and is a copy from an earlier map dated 1621. This map does not show the presence of woodland within any of the areas that are currently wooded within the application boundary and the woodlands cannot therefore be demonstrated to be ancient woodland according to the standard definition of this habitat. However, the woodland on site is identified on maps dated from 1840 and 1909. On both of these maps Chrismill Shaw is marked as semi-natural woodland whilst The Belt and Common Wood are marked as plantation woodland.

8.5.3.6 On the basis of the woodland habitats present and the mapped evidence of historic land use, none of the woodlands are considered to qualify as ancient woodland under the standard definition of this habitat. However, all three woodland sites can be demonstrated to be at least 150 years old and the woodland at Chrismill Shaw is likely to have been semi-natural woodland since this time. (The semi-natural woodland at The Belt and Common Wood are considered to be more recent as these woodlands are marked as plantation in the 1840 map).

8.5.3.7 The woodland on site is not considered to be of county importance because each woodland area is relatively small (between 0.8 ha and 2.8 ha) and is fragmented by intensively managed farmland. The quantity of this habitat on site is not significant at a county scale because Kent contains over 3,900 ha of woodland of which 78% is broadleaved and 53% is ancient semi-natural woodland.

8.5.3.8 Approximately 750 ha of Kent's woodlands are managed as Kent Wildlife Trust nature reserves and 18,000 ha are currently selected as Local Wildlife Sites (LWS). None of the woodland on site is designated as an LWS or ancient woodland site and the woodlands are not currently under active positive wildlife management (although there has been selective felling of some timber trees in The Belt).

8.5.3.9 The woodlands, however, are well established, contain at least one potential veteran tree and provide suitable habitat for bats, great crested newts and badgers, all of which have been recorded in the past 3 years using the woodland on the application site. At a landscape scale the onsite woodland is dwarfed by the nearby large LWS woodlands on the Downs (Longham Wood, Snarkhurst Wood and Honeyhills Wood) and the complex of woodlands in the Len Valley to the south. However, the small on-site woodlands do provide a 'stepping stone' of woodland habitat in the relatively un-wooded area between the M20 and A20. In particular, the semi-natural woodlands contribute significantly to the permeability of the landscape by forming vegetated corridor along a north-south axis across the centre of the application site. This is the most substantial vegetated corridor across the site. Overall it is considered that the woodlands are of importance at a scale greater than the local (parish) level due to their high quality and their role in providing an ecological corridor through the site. The semi-natural woodland on site is therefore considered to be of **borough** importance.

#### **PARKLAND HABITAT**

8.5.3.10 The semi-improved field at Target Note 16 contains many scattered trees forming just over 4ha of a parkland type habitat. The majority of these trees are mature and two have been identified as over mature and potentially of veteran status (see Figure 8.2). There is a diverse mix of tree species within this field, with species such as common lime, cherry (*Prunus sp.*), horse chestnut, sycamore and beech all present. The eastern boundary of the field also contains several mature and semi-mature trees such as oak, turkey oak (*Quercus cerris*), field maple, hazel and a eucalyptus (*Eucalyptus sp.*)

8.5.3.11 Both the maturity of the trees and the diversity of species present contribute to the value of this parkland habitat. This area has been cattle grazed and as such the grassland is nutrient enriched (despite the steeply sloping land) and this reduces the value of the parkland habitat to below that which would be likely to qualify as 'Kent or UK Priority Habitat' under the 'wood pasture and parkland' category. However, the maturity of the trees means that this habitat is of at least **borough** importance because the age of the trees means it is not easily recreated.

#### **PLANTATION WOODLAND**

##### **Semi-mature, broad-leaved plantation woodland (on-site)**

8.5.3.12 Semi-mature, broad-leaved plantation woodland is present within the railway embankments and in a small patch to the north of the railway directly north of the semi-natural woodland areas of 'The Belt' and 'Chrismill Shaw'. In the east of the site, the dominant species is English oak with an understorey of bramble, goat willow, hawthorn and ash. The ground flora is generally not well developed containing species such as common nettle, cleavers, bristly ox-tongue (*Picris echioides*) and bramble. The plantation woodland becomes interspersed with bramble and hawthorn scrub along the railway bank and consists predominantly of semi-mature ash, sycamore and oak trees with hazel and

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elder. This woodland habitat extends along the southern part of Water Lane where it is present on a very steeply sloping bank on either side of the lane.

8.5.3.13 Plantation woodland is generally less diverse than semi-natural woodland and the broad-leaved plantation on site comprises a very small area (approximately 2.6ha) which would not be considered significant at greater than site level if it were considered in isolation. However, the value of this woodland is elevated due to its location within habitat matrices which form two of the main habitat corridors through the site (see sections 8.5.3.67 – 8.5.3.72 on habitat connectivity). Furthermore, this woodland comprises native tree species (of greater ecological value than no-native species) and will increase in ecological value with time, as the semi-mature trees develop and mature. As such the value of this habitat type is considered to be of **borough** value.

#### **Immature, broad-leaved plantation woodland (off-site)**

8.5.3.14 Immature broad-leaved plantation woodland is present around the periphery of the site, within the Highways Agency land (and therefore outside of the application boundary). This plantation is very young (estimated at less than 10 yrs old) and consists of a mix of the following species; hawthorn, oak, ash, field maple, hazel, dog rose, guelder rose (*Viburnum opulus*) and privet (*Ligustrum vulgare*). The density of the plantation is relatively high and it forms a low, thick wooded strip at the base of the embankments. There are some open areas present where the immature trees have not out-shaded the grassland groundflora and species such as ox-eye daisy (*Leucanthemum vulgare*), wood forget-me-not (*Myosotis sylvatica*), creeping buttercup (*Ranunculus repens*) and ground ivy are present with some area of broadleaved dock (*Rumex obtusifolius*), creeping thistle (*Cirsium arvense*) and teasel

8.5.3.15 The immature, broad-leaved plantation woodland is of a lower value to wildlife than the more mature woodland, providing a smaller range of ecological niches for organisms to occupy. None-the-less, the plantations are of native tree species and do provide nesting and foraging habitat for birds and support insect populations. Although still relatively young in age with little structural diversity, with good future management these immature broadleaved plantations could potentially develop into moderate woodland corridors, although it should be noted that their location alongside a highway limits the extent to which mature and overmature trees will be encouraged. This immature highway planting is considered to be of value at a **site** scale only.

#### **SCATTERED TREES (INCLUDING MIXED PLANTATION WOODLAND HABITAT)**

8.5.3.16 In several locations across the site, individual trees are present. These are marked on the Woodland & Trees Parameter Plan (PRC-Group, 2009). The majority of the mature trees located within the site are broadleaved species such as oak, ash, horse chestnut and common lime. Mature conifers and other exotic species are also present and these tend to be associated with the residential properties adjoining and within the site. A group of nine semi-mature oak trees at Target Note 28 are protected by a Tree Preservation Order (for their visual amenity value) and have been retained within the arable field. These are drawn specimens (i.e. tall and thin) with many of the lower limbs having been removed and occur in isolation of any understorey or ground flora. The mixed plantation woodland depicted north of Common wood is a shelterbelt of semi-mature native and non-native species including sycamore, scotts pine and horse chestnut and is included within this valuation of scattered trees.

8.5.3.17 The ecological value of scattered trees is dependent on a number of factors such as the species (i.e. native or non-native), their age (generally ecological value increases with age), their location (trees forming linear corridors are generally of greater value than similar trees in isolated areas), and their context (i.e. relative to the local area).

8.5.3.18 An indication of overall species mix and age composition can be gained from a review of the 63 individual trees recorded in the tree survey. Although this analysis does not include species groups (some of which are 'scattered trees' as opposed to the woodland areas), this is considered to be a reasonable method of deriving an indication of the value of the scattered trees on site. Approximately 85% of these individual trees are native and approximately 75% are mature (or older). An assessment of the value of the trees on site for roosting bats has identified a total of 122 trees that present moderate potential for roosting bats or higher (WSPE Bat Report, 2006a) and this includes 48 that are 'scattered trees, the remainder falling within woodland areas'<sup>3</sup>. Arboricultural classifications (categories A, B, C and R) do not relate to ecological value and therefore have not been referred to in this chapter.

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<sup>3</sup> Positive evidence of bats roosting within the trees on site has not been recorded to date, despite specific survey and inspection of trees (WSPE Bat Report, 2006a), although it should be noted that conclusive identification of tree roosts is difficult in the field and that such roosts are transient in nature, therefore an assessment of roosting potential is considered a more robust mechanism of assessing tree roosting habitat value.

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8.5.3.19 Significant tree-belts (predominantly mature oak) are formed at target note 5 and 7, and these form ecological corridors along a north-south axis through the site (see Figure 8.3). Also of particular ecological significance are the scattered trees within the semi-improved grassland habitat that is directly south of The Belt, and east of Common wood. This combination of trees and grassland is considered to be Parkland habitat, and is described separately below.

8.5.3.20 A review of aerial photography of the area (see Figure 8.3) enables a visual assessment to be made of the relative abundance of scattered trees within and surrounding the application site. In the context of the local area (i.e. at a parish scale), the scattered tree cover on site are not considered to be significant, and this is due to the high abundance of scattered trees within parkland to the north-west of Bearstead (HoneyHills golf course) and immediately south of the site (Marriot Country Club/ the river Lenn corridor), combined with the high proportion of woodland coverage in the area (including Snarkhurst Wood, Longham Wood and Honeyhills Wood).

8.5.3.21 Overall, based on the information described above, the scattered trees on site are considered to be of value at a **local** scale, providing shelter, nesting and roosting habitat for a range of vertebrate and invertebrate species, including bats. The trees within the parkland area are of a greater, **borough**, ecological value.

## **HEDGEROWS**

8.5.3.22 The UK BAP Priority Habitat description for hedgerows (revised 2007), now classifies all hedgerows that are over 20m long and less than 5m wide, comprising at least 80% or more of native woody species as Priority Hedgerows. As such, all of the hedgerows on site qualify as Priority Habitat. However, the ecological value of the hedgerows differs across the site, falling into two categories; species rich and species poor. These are described below.

### **Species rich hedgerows**

8.5.3.23 There are three species rich hedgerow on site, located along two wildlife corridors: along the western side of Chrismill Road and on either side of Water Lane. These contain a diversity of woody species including English oak, crab apple (*Malus sylvestris*) and horse chestnut with hawthorn, midland hawthorn (*Crataegus laevigata*), bramble, dog rose, hazel and goat willow. These hedges are gappy in places and the hedge bases are not species rich, consisting of nettle and bramble.

8.5.3.24 These hedgerows do not qualify as 'important hedgerows' under the Hedgerows Act, 1997 but they do qualify as species rich hedges under the Kent ancient and/or species rich hedgerow BAP which defines such hedgerows as boundaries ancient in origin or of particular value as habitat for species. This is because of the number of woody species the hedgerows contain.

8.5.3.25 In the context of the amount of this habitat identified within Kent county as a whole (over 1,144km as described in the Kent ancient and/or species rich hedgerow BAP) the species rich hedgerows on site are not considered to be of county or borough significance per se and their importance is considered to lie in their function as wildlife corridors through the site. In this capacity, the species rich hedges are positioned along old lanes and combine with the adjacent woodland and mature tree habitats to form coherent and well established green corridors along two north-south axis on the site (Water Lane and Chrismill Road). Given the paucity of comprehensive green corridors across the existing site, these corridors are considered to be of importance at a **local - borough** scale, since they provide a route for wildlife to travel through the site into the wider countryside.

### **Species Poor Hedgerows**

8.5.3.26 The site also contains species poor hedges around some of the arable field boundaries. These are typical of intensively farmed areas and include a high proportion of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), and wild privet (*Ligustrum vulgare*). Other woody species include bramble and roses (*Rosa sp.*). The ground flora at the base of the hedges is not species rich and includes such species as common cleavers, hogweed (*Heracleum sphondylium*), mugwort (*Artemisia vulgaris*) and common nettle. The majority of these hedgerows contain only one or two woody species and have been highly managed (by cutting), especially adjacent to the arable fields. The ground flora of the hedges have been affected by nutrient enrichment due to the close proximity to the arable fields. The hedgerows along Musket Lane are located along a hedgebank but have been grubbed out in places, leading to fragmentation.

8.5.3.27 The species poor hedgerows do not form a significant cohesive ecological network across the site, for three reasons;

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- 1) the very large field sizes across the site mean that there are few hedgerow boundaries;
  - 2) many of the field boundaries do not support hedgerows (instead they are delineated by tree-lines, railway embankment or ditches)
  - 3) where hedgerows do occur, they tend not to form a continuous connection between semi-natural habitats, rather they are fragmented by houses or lead to fences (i.e. non-vegetated field boundaries).

8.5.3.28 The species poor hedgerows on site are not considered to be of significant ecological value at a site scale or higher, since they do not provide a significant habitat resource in themselves, and do not provide connectivity across the site. For the purposes of this impact assessment, they are therefore considered to hold a value of **less than site** scale.

## **PONDS**

8.5.3.29 There are three ponds on site; two formal ponds in the gardens of residences on the site and one field pond. Whilst the ponds are different in character and species composition, all of the ponds can be broadly considered to form the function of farm ponds due to their rural setting within an arable and pastoral landscape. The three ponds contain common amphibian species such as smooth newts, palmate newts and frogs (but not great crested newt or common toad). Only one of the ponds is considered to be of potential invertebrate value (CPA, 2007), this is the small field pond opposite Barty Farm and directly north of Glenrowan House. This pond will not be impacted by the scheme.

8.5.3.30 Whilst ponds are mentioned within the Kent Habitat Action Plan for standing open water, ponds within the wider landscape (i.e. outside of important sites or landscapes) are not targeted in the Kent Action Plan.

8.5.3.31 Ponds were included on the UK BAP Priority Habitat list in 2007 and the ponds on site have been assessed against the qualifying criteria for UK BAP priority ponds. None of the ponds have been found to be of UK BAP priority quality. For example, none of the ponds on site have been found to support an Annex 1 habitat type or a species of 'high conservation importance' (UK BAP priority species/ fully protected species/ red data book species) or are expected to support an exceptional assemblage of species (CPA, 2007 and WSPE/CPA, 2008).

8.5.3.32 However, the balancing pond adjacent to the M20 by the Water Lane bridge (and off-site) is considered to hold potential invertebrate value (CPA, 2007) and a UK BAP priority species was found hunting nearby (grass snake). For this reason, this pond has been allocated a precautionary value of UK BAP Priority status. This pond falls outside of the application boundary and is entirely enclosed in Highways Agency fencing. It will not be impacted by the scheme.

8.5.3.33 Whilst the overall quality of the ponds is not considered to be exceptional in any way, they do contribute to the overall diversity of the local landscape and, together with a number of off-site ponds in the local area, they provide a network of habitats for amphibians and aquatic invertebrates (albeit non-legally protected or UK BAP species). This network is significant in the context of large-scale national declines in farmland ponds over the past 50-100 years, and is of particular significance due to the local presence of great crested newt (which have not been identified within ponds on site, but have been recorded from ponds within 250m of the site boundary), since they present a potential future opportunity for great crested newt to expand their breeding range. The ponds on site are therefore considered to be of **Local** importance.

## **WET FIELD DITCHES (WATERCOURSES)**

8.5.3.34 Three watercourses cross the site; These are referred to in this chapter as

- watercourse 1: the Lilk, at TN 29,
- watercourse 2: TNs 18, 25 and 26; and
- watercourse 3: TN7.

8.5.3.35 The three watercourses are described in detail below;

### **Water Course 1: The Lilk (TN29)**

8.5.3.36 This is a steep-sided, wet drainage ditch running through a large arable field in the far west of the site. This ditch is approximately 410m long and the channel width ranges between around 0.25m to 1m. The water depth is variable and was recorded as approximately 5cm in June 2005 (and dry in places). In June 2008 the ditch was

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recorded to be up to 30cm deep in places to approximately 5cm in others, but with a 0.5m deep 'pool' where the water discharges into the stream from the northern culvert (see below). The substrate is silt with some gravel at the far south end. There is a small amount of well maintained bramble and blackthorn scrub and one immature ash tree alongside the ditch and ploughing has occurred right up to the top of the ditch banks on either side. The steep banks of the ditch comprise improved grassland and ruderal species typical of disturbed ground such as nettle, hogweed, cow parsley and false-oat grass. The only truly aquatic vegetation recorded is duckweed (*Lemna lemna*) although some species indicative of wet or boggy ground are present, such as greater willowherb (*Epilobium hirsutum*) and horsetail sp. (*Equisetum sp.*).

8.5.3.37 The stream flows from north to south. To the north (upstream) the stream is culverted by a 1m diameter concrete culvert for c.170m under motorway and CTRL. To the south (downstream) the stream is culverted for c.60m under the London –Ashford mainline railway. The stream then flows south through residential housing for c.120m, then is culverted under Roundwell Road which is a single carriageway road (c.20m) before emerging into 'The Lirk' at Pond Bay and feeding into a large pond at Majors Wood, directly north of the A20.

8.5.3.38 The nearest ecologically sensitive site to this stream is the Len Vale Farm Pasture etc., Bearstead SINC which is c.1.7km downstream (and 4 culverts) as the stream flows (c. 1.2km as the crow flies).

#### **Watercourse 2: (TNs 18, 25 and 26)**

8.5.3.39 This watercourse comprises three sections of wet ditches, interrupted by culverts. The water flows from north to south through arable land and alongside Barty Farm. The total length is approximately 445m and the ditch ranges in depth from <5cm up to approximately 0.5m (although this depth was observed in only one location on one survey visit - June 2008). The ditch channel width varies between approximately 0.3m – 1.5m and the substrate is predominantly silt.

8.5.3.40 The northernmost section (TN26) flows from a culvert at the M20 to the railway line. It has very steep banks and, although dry in June 2005, it was wet during the June 2008 visit and is very likely to contain water throughout the winter months (inferred by the presence of aquatic vegetation). The ditch supports a dense growth of bulrush, nettles, hedge bindweed, willowherb and lesser water parsnip in the channel and native grasses on the steep banks. Artificial meshing (geo textile) is present which appears to be lining the ditch extending to the top-of-bank. This is likely evidence of previous engineering / intervention at this ditch. There are outfalls from the M20 into this ditch.

8.5.3.41 The central section (TN25) of the ditch starts to the south of the railway line at Bartys' Farm where it flows through the edge of a small pony paddock. Here it is densely shaded by a line of semi-mature oak trees and intermittent patches of scrub on the banks.

8.5.3.42 The southern section (TN18) is a shallow, wet ditch approximately 10cm deep in June 2005 and dammed at one point to create a drinking pool for cattle. In 2005 the ditch had gently sloping, cattle-poached banks and contained aquatic and marginal vegetation such as sweet-grass species (*Glyceria sp.*), lesser water parsnip (*Berula erecta*), hard rush and creeping buttercup. There was some occasional goat willow and hawthorn scrub along the banks. In June 2008 the surrounding land had been turned over to arable crops. The ditch supported a far more continuous cover of both in-stream and bankside vegetation (including hard rush, creeping buttercup and improved grassland species). The water depth was still very shallow in most places (approx 10cm) with a deeper area at the old 'cattle pool' of approximately 0.5m depth.

8.5.3.43 To the north the ditch is culverted by a 1m diameter concrete culvert for c.130m under the M20 and Channel Tunnel Rail Link. The water level was recorded at approximately 0.6m directly south of the culvert during June 2008. In centre of site the ditch is culverted for c.90m under the Maidstone – Ashford mainline railway. Then culverted again for c. 5m under a farm track. To the south of the site the ditch is culverted under Roundwell Road, although this part of the ditch is more ephemeral in nature (and has been dry during all site visits made to the area, including June 2005, April 2006 and June 2008).

8.5.3.44 The nearest ecologically sensitive site is the Len Vale Farm Pasture etc., Bearstead SINC which is c.2.1km (and 4 culverts) downstream as the stream flows (c.800m as the crow flies).

#### **Watercourse 3: TN 7**

8.5.3.45 A seasonally wet ditch (c230m) running from the M20 in the north to farm buildings and a garage in the south. This ditch has steep banks, and is wooded along the majority of the length with the result that it is heavily shaded. The ditch has a varied channel width from approximately 30cm up to 2-3m in places. However, no water has been observed in these wider sections and it is not clear whether the 'channels' here have been created by water

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erosion or are a feature of the tree-lined hedgebank. The ditch is dry for what appears to be over 50% of the ditch length (visibility was restricted during surveys due to hedgebank/overhanging trees and tall nettles) and has substrate of fine silt with patches of gravel. Where water is present it consistently collects in shallow pools ranging in depths from <5cm up to 20cm or so with no apparent aquatic vegetation, only common nettle and cow parsley. The pools become more frequent moving in a northerly direction along the ditch eventually forming a continuous stream in the final on site section (c. 60m), where the tree cover stops (near the M20). Along this stretch, aquatic species were present including water figwort and fools watercress (*Apium nodiflorum*) and the substrate here is stone and gravel.

**8.5.3.46** To north the ditch arises from a culvert at the Highways Agency boundary, and the ditch receives outfalls from the drainage system associated with the M20 and the motorway services at Junction 8. To the south the ditch flow ceases before it reaches Chestnuts farm. A small length of wet ditch flows from a culvert under Ashford road south of this location and into Pine Lodge Caravan Park.

8.5.3.47 The nearest ecologically sensitive site is River Len Millpond and Carr, Leeds SINC which is (c.800m south as the crow flies). It is not clear whether the on-site drain is hydrologically linked to the drains south of Ashford road which feeds into the river Len.

#### **Valuation of wet ditches**

8.5.3.48 All of the ditches arise from culverted stretches under the M20 and are culverted under the railway line (on site) and under the A20 (at the southern boundary of the site). The ditches are not permanently wet and they receive discharge from the M20 and associated motorway services as well as run-off from the on-site arable landscape. The ditches do not support protected species (see section 8.5.4 below) and do not provide strong corridors through the landscape (although in the case of watercourse 3, the associated tree-line is a strong wildlife corridor). Ploughing occurs up to the top of bank on at least one side of each of these ditches, compromising the bankside biodiversity. These factors are considered to limit the value of the ditches to below borough value and a value of **local** importance has been allocated to the wet field ditches on the site.

#### **SCATTERED AND CONTINUOUS SCRUB (EXCLUDING RAILWAY EMBANKMENTS)**

8.5.3.49 Scattered scrub is present in several locations across the site and is shown indicatively on Figure 8.2. The most significant area of this habitat type is along the railway embankment, and this is discussed separately under ecological corridors below.

8.5.3.50 Other areas of scattered scrub existing along the road verges adjacent to the M20 (off-site within the Highways Agency land), and in one corner of common wood, where the woodland grades into scrub habitat and scattered bracken. In isolation, these small areas of habitat are of value only at a **site scale**.

8.5.3.51 The scrub adjacent to Common Wood is best assessed in the context of the woodland since it forms a part of the woodland ecosystem, and it is therefore has therefore been included within the assessment of common wood (which is of **borough** value).

#### **DRY DITCHES**

8.5.3.52 Three dry ditches are present within the site boundary. A small dry ditch is present on the eastern side of the field boundary shown as Target Note 5, Figure 8.2. This ditch is shallow and dominated by cleavers and nettles. A dry ditch within the semi-natural woodland called 'The belt' is the result of previous installation of underground infrastructure (a gas main) and is no more than a grassy depression containing species such as meadowsweet (*Fillipendula ulmaria*), creeping cinquefoil (*Potentilla reptans*) and perforate St. John's-wort (*Hypericum perforatum*).

8.5.3.53 The ditch along the western end of Common Wood is also dry. This ditch is a continuation of the wet ditch at Target Note 18 and the water dries up as the ditch enters the field boundary marking the edge of the farmland. This dry section of ditch comprises bare, silty earth with some bulrush, meadow sweet, lesser celandine and nettles. The banks of the stream support a small amount of Rhododendron and two mature weeping willows (*Salix sp.*) and there is a dried out pond at the bend of the stream.

8.5.3.54 Although of less value than the wet ditches, the dry ditches on site provide linear landscape features, that are either tree lined (Target Note 5) or within woodland habitat. These ditches add to the ecological value of the tree-line/woodland by providing a micro-habitat (for example, greater ground cover and accumulation of leaf litter) within these linear features which is likely to encourage dispersal of small fauna (such as small mammals or amphibians) through the woodland. These ditches are of **site** value only.

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## TALL RUDERAL AND EPHEMERAL/SHORT PERENNIAL HABITAT

8.5.3.55 The triangular shaped field at Target Note 27 in the north of the site appears to be an area of set-aside arable land and a wide range of plant species have colonised the area. This area contains large patches of tall ruderal habitat and this occurs in a mosaic with areas of barer earth which support a more ephemeral plant community. These two habitats are best described together due to lack of clear boundaries between them. Tall dense patches of goat's rue (*Galega officinalis*), ribbed melilot (*Melilotus officinalis*), forget-me-not (*Myosotis sp.*), common fleabane (*Pulicaria dysenterica*), hemp agrimony (*Eupatorium cannabinum*), teasel, goat's-beard (*Tragopogon pratensis*) and greater bird's-foot trefoil (*Lotus pedunculatus*) occur alongside short, rabbit grazed and barer areas supporting cut-leaved crane's-bill (*Geranium dissectum*), glaucous sedge (*Carex flacca*), common centaury (*Centaureum erythraea*), scarlet pimpernel (*Anagallis arvensis*) and common cat's ear (*Hypochaeris radicata*).

8.5.3.56 This field has been used for motor-cross or a similar sport and as such there are well defined tracks of bare earth around the field. Between 2006 and 2008 there has been a substantial increase in the amount of bramble scrub and young tree saplings within the field, with the result that parts of the field have been encroached by continuous scrub.

8.5.3.57 This field provides good habitat for invertebrates, reptiles (common lizard and slow worm recorded in 2005), and foraging birds.

8.5.3.58 Small patches of tall ruderal habitat exist across the site, predominately at the corner of fields, and at the edges of hardstanding areas. For example; tall ruderal habitat is present to the rear of Woodcut Farm yard; around the mast located north of Crismill Shaw, adjacent to the railway line; along the southern railway embankment and within the field located to the rear of the Biffa Yard (within the Leeds Castle Land). Typical species of this habitat are bristly oxtongue, creeping thistle, teasel, curled dock (*Rumex crispus*), mugwort and common nettle.

8.5.3.59 Ruderal herbs are opportunists and consequently are able to colonise new areas quickly. For this reason these 'communities are common and widespread in similar situations across waste ground in the UK, and will be common within the Maidstone area. However, this habitat type normally occurs only in small patches and the substantial size of field at Target Note 27, combined with the results of invertebrate and reptile surveys for this section means that this habitat type is considered to be of **local** value.

## SEMI-IMPROVED GRASSLAND

8.5.3.60 Semi-improved grassland occurs in four situations across the application site and immediate environs. The road verges of the M20 and A20 support areas of grassland that are generally relatively species rich. These are all off-site, but are directly adjacent to the site. Along the M20 in particular, the road verges have a good diversity of grass and herb species, including wild onion (*Allium vineale*), scarlet pimpernel (*Anagallis arvensis*), shepherds purse (*Capsella bursa-pastoris*), foxglove (*Digitalis purpurea*), grass vetchling (*Lathyrus nissolia*), birds foot trefoil (*Lotus corniculatus*), goats beard, meadow fox tail (*Alopecurus pratensis*), creeping bent (*Agrostis stolonifera*) and cock's foot (*Dactylis glomerata*). Two of these verges are mapped within the Local Plan Proposal Maps (Local Plan 2002) as roadside verges of nature conservation or amenity value (Figure 8.2) and as such are protected under Local Policy. No information regarding the specific reason for the designation of these verges has been received from the council. Along the M20, the semi-improved grassland comprises course grasslands (false oat grass, couch grass (*Elytrigia repens*) and barren brome (*Anisantha sterilis*)) but also contains a wide range of herb species which are associated with disturbed ground and roadsides such as teasel, bristly oxtongue, wild carrot (*Daucus carota*), alexanders (*Smyrnium olusatrum*) and creeping cinquefoil (*Potentilla reptans*). Common lizards and slow worms have been recorded along these verges (WSPE Reptile Report, 2005).

8.5.3.61 The areas of grassland at in the off-site mitigation land' on the southern side of the A20, the two fields south of woodcut farm (TN4) and the sloping 'parkland' field at TN16 were all grazed by livestock at the time of survey (2006), limiting the extent to which grass and herb species could be identified. However, they have been allocated as semi-improved grassland (as opposed to improved grassland) as precautionary measure, since species such as smooth tare (*Vicia tetrasperma*), common vetch (*Vicia sativa*) and small flowered crane's-bill (*Geranium pusillum*) were recorded, suggesting a more diverse sward than intensively improved fields. The parkland at TN16 is described further under Parkland.

8.5.3.62 The semi-improved grassland area next to Common Wood is a privately owned parcel of land used for amenity purposes and as such the grassland is subject to relatively regular mowing. The grassland is relatively herb

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rich with species such as field wood-rush (*Luzula campestris*), common mouse-ear (*Cerastium fontanum*) and yarrow (*Achillea millefolium*). There is a large patch of sweet violet (*Viola odorata*) in the north-eastern corner of the field.

8.5.3.63 The semi-improved grassland areas are typical of pasture across Kent and indeed lowland Britain and are not especially species rich. However, this grassland is likely to support species of small mammal and terrestrial invertebrates in an otherwise largely sub-optimal (arable dominated) environment. In addition, some of the grassland areas provide reptile habitat (WSPE Reptile Survey, 2005). For these reasons the semi-improved grassland has been classified as of **local** value.

#### **PROTECTED ROADSIDE VERGE**

8.5.3.64 The protected roadside verges that are immediately outside of the application boundary support semi-improved grassland. Field survey has not identified any greater diversity of species amongst these two roadside stretches than at other verges across the scheme (which are described under semi-improved grassland below). Consultation with the Kent Wildlife Trust and Maidstone Borough Council has not revealed the reasons for designation for these verges and there is no survey evidence to support that the verges are of greater than site value for the species diversity they support. The verges are protected under Local Policy but are not considered to be of any different ecological value to the semi-improved grassland described above, i.e. **local**.

#### **PARKLAND HABITAT**

8.5.3.65 The semi-improved field at Target Note 16 contains many scattered trees forming just over 4ha of a parkland type habitat. The majority of these trees are mature and two have been identified as over mature and potentially of veteran status (see Figure 8.2). Both the maturity of the trees and the diversity of species present contribute to the value of this parkland habitat. This area was cattle grazed at the time of survey (2006) and as such the grassland is nutrient enriched (despite the steeply sloping land) and maintained very short and this reduces the value of the parkland habitat to below that which would be likely to qualify as 'Kent or UK Priority Habitat' under the 'wood pasture and parkland' category. However, the maturity of the trees and their situation within semi-improved grassland means that this habitat is of **borough** importance (primarily due to a combination of the age of the trees and value to invertebrates, birds and bats).

#### **CONSIDERATION OF CONNECTIVITY OF EXISTING HABITATS (HABITAT MATRIX ASSESSMENT)**

8.5.3.66 Four key ecological corridors have been identified across the site through a combination of on-site survey, an appreciation of the site topography and a review of aerial photography of the area. These are depicted on Figure 8.3.

8.5.3.67 The most important corridor is considered to be the railway embankments. These create a wildlife corridor of between 20 and 60m in width that extends across the full extent of the site (east to west) and through the wider countryside. The vegetated railway embankment is therefore of importance at a scale greater than that of the site or local area and is considered to be of **borough** importance due to its probable function as a wildlife corridor for a variety of species in the wider landscape. The total area of this habitat is approximately 6ha.

8.5.3.68 The two linear woodlands of Chrismill Shaw and the Belt (which join along the railway embankment in the north) create a functional corridor which runs north-south through the centre of the site, and is relatively well connected (in landscape terms) with the large woodlands directly north of the site, and the scattered trees and woodland associated with the golf course and river Len directly south of the site.

8.5.3.69 The other two key corridors also cross the site in a north-south direction. The tree-lined land of Water Lane in the west of the site is a relatively old and well established corridor, whilst the tree line that follows the ditch at watercourse 3 presents a short corridor of mature trees, that is only the width of the application site.

8.5.3.70 Examples of the kind of species that may utilise such corridors include small invertebrates and mammals, which may rely on the continuous food source and shelter that the embankment provides, or bat species, which may rely on the embankment as a navigational aid.

8.5.3.71 When considered together, these ecological networks are of a **borough** importance to wildlife since they allow movement of species through the application site into the wider countryside.

#### **REMAINING HABITATS**

8.5.3.72 Amenity grassland, buildings and hardstanding and arable fields were found to be of low ecological value within the Phase 1 habitat survey and are therefore not discussed in detail here. (The value of the arable fields and buildings are discussed below in the context of protected species they may support).

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#### 8.5.4 PROTECTED AND NOTABLE SPECIES

##### BADGERS

8.5.4.1 There is badger activity within Common Wood in the west of the site which contains one outlier sett (with one entrance) and a larger, possibly subsidiary sett (with two holes) is present just south of the woodland along the bridle path on the southern boundary of the site. No evidence of badger activity has been identified across the rest of the site although it is likely that badgers travel across the suitable arable, pastoral and woodland habitat on the site.

8.5.4.2 Badgers are present elsewhere in the local area and have been recorded present within 4km of the site boundary both to the east and west of the application site (NBN accessed June 2009) and at least two sets are present south of the application site within the Leeds Castle estate.

8.5.4.3 Badger populations in the UK are stable and badgers are common in southern England. Whilst Common Wood is clearly an important resource for the local badger population, the presence of this species in the wood is of importance in the **site scale** only.

8.5.4.4 However, there are legal implications associated with the presence of badger setts that must be considered as part of any proposals for development in the area and for this reason badgers are considered within this EIA.

##### BROWN HARE

8.5.4.5 This species has been recorded from the local area (at least 1km north-east of the site, north of the M20) and one sighting of the species was recorded within the application site during ecological surveys undertaken between 2005 and 2006. The brown hare population in the UK is widespread but has undergone a substantial decline since the 1960s and for this reason the species is a UK BAP priority species. In Kent, numbers have declined dramatically and the distribution in the county is now limited to five natural areas in Kent, which includes the North Downs.

8.5.4.6 The species has an affinity for open farmland habitats and as such the application site provide suitable habitat for this species. However, it is considered that brown hare are not present in significant numbers on the site (since only one recording of the species during substantial field work on the site over two years, which involved dawn and dusk surveys, and no other positive field evidence of hares has been identified) and that the sighting of brown hare is likely to have been an individual passing through the site. For this reason the brown hare population on the site is considered to be of **local** importance only.

##### BATS

8.5.4.7 The full results of the bat surveys on the site can be found in Appendix 8A of the original ES chapter. The surveys identified two bat roosts on the site; Glenrowan House contains a common pipistrelle (*Pipistrellus pipistrellus*) summer roost and a well used brown long-eared roost (*Plecotus auritus*), and End Cottage contains a common pipistrelle roost.

8.5.4.8 A total of 122 trees within the survey area were found to be potentially suitable for roosting bats, of these nine were assessed as having high potential. Emergence surveys were undertaken on trees with high potential for bats and no bats were recorded emerging from these trees, although two soprano pipistrelle bats were seen to emerge from a mature oak that lay just outside the survey area. However, because identification of tree roosts is difficult in the field (and that such roosts are often transient in nature), we consider that it is more robust to base an assessment of tree roosting habitat value for bats on the number of trees that present roosting opportunities (120) rather than actual roosts recorded.

8.5.4.9 Soprano pipistrelle, common pipistrelle, serotine, noctule, brown long-eared and unidentified Myotis bat species were recorded during activity surveys; and the surveys indicated the site was principally of importance for common pipistrelle bats.

8.5.4.10 Bat activity appeared to be concentrated in the following areas:

- 1) The area to the south of Chrismill Shaw, above a pile of felled conifer trees;
- 2) Chrismill Shaw;

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3) The Belt, particularly in the south of this woodland;

4) The Buildings around Barty Farm; and

5) Along the railway, to the north of the Belt.

8.5.4.11 Of these, the areas to the south of Chrismill Shaw were of prime importance with constant foraging by serotine and pipistrelle bats throughout every survey session in both 2005 and 2006. Myotis bats were also recorded in this area. It is likely that the bats were attracted to the high level of invertebrates and the sheltered nature of this area.

8.5.4.12 Kent is an important county for the serotine bat, whose distribution is thought to be restricted to the south of England (the 2006 colony counts undertaken as part of the National Bat Monitoring Programme (NBMP) indicate that about 50% of recorded serotine colonies were in Kent). A Kent BAP is currently being developed for this species and, whilst it is not thought that existing monitoring data is currently sufficient to accurately determine population trends, the 2005 annual report of the NBMP states that data from the southeast appeared to show a distinct downward slope that approached statistical significance (JNCC, 2005). The presence of consistent serotine foraging along Chrismill Shaw relatively soon after dusk suggests that serotine bats roost nearby to the site and are relatively dependent on this part of the site for foraging and/or commuting.

8.5.4.13 Bat records for the area include a number of roost records within 2km of the site both north and south of the application site boundary. There is a concentration of foraging records over Bearsted (which is probably due to recorder bias). Recent records from surveys at Leeds Castle undertaken by the Kent Bat Group show that there is a large summer roost of soprano pipistrelles and serotines in a building on the Castle Estate. They have also repeatedly recorded Daubenton's bats foraging over water in the Estate and have two records of a noctule flying overhead in the area.

8.5.4.14 Overall the site contains foraging and commuting habitat that could be important to all/any bat colonies roosting in the area, including soprano pipistrelle and serotine bats known to roost within Leeds Castle. The specific features of the site that are considered to be of most value are those in which the highest levels of activity have been recorded (as listed above) and these areas are considered to be of **borough** importance for bats.

## **BIRDS**

8.5.4.15 A breeding bird survey was undertaken during the period April – June 2007. Sixty four bird species were recorded, comprising an assemblage of mostly common and widespread farmland and woodland species. Four Wildlife & Countryside Act (1981) Schedule 1 (part 1) species; Mediterranean gull, fieldfare, redwing and Cetti's warbler, were recorded during the survey, but were not breeding on the site. Ten UK Red List species together with seventeen UK Amber List species of national conservation concern were recorded breeding or foraging in the survey area (twelve of these species are listed in the UK and/or Kent Biodiversity Action plans). Of the ten Red List species, nine are confirmed breeding on the site, these are skylark (c.6 territories), song thrush (c.6 territories), spotted flycatcher (one pair), starling (c.30 pairs), house sparrow (c.55 pairs), tree sparrow (one pair), linnet (c.20 pairs), bullfinch (unknown) and reed bunting (one pair). In addition, the most significant Amber-listed species were cuckoo (also a UK BAP species), swallow and house martin.

8.5.4.16 The majority of Red List/BAP species were found nesting in woodland, trees, scrub or hedge habitats. The survey identified that the most diverse avifauna was present around the Barty Farm complex and associated habitats.

8.5.4.17 Most species recorded are widely distributed in suitable habitat both regionally and nationally and no significant population of any species of conservation concern were present on site, rather the bird species on site are part of the wider population in the area. However, the size of the site and habitats present on the site mean that it supports a relatively diverse species assemblage including breeding red list species such as house sparrow, starling and linnet. For these reasons the site is considered to be of **borough** importance for bird species.

## **REPTILES**

8.5.42 A population of common lizards and slow worms are present within the tall ruderal habitat at Target Note 27 and along parts of the off-site semi-improved grassland along the Highways Agency land along the M20. A grass snake has been recorded at Target Note 31 in the centre of the site. All three of the species recorded on site are widespread and may even be abundant in suitable habitats in Kent (KRAG and KWT, 2003) and as such the presence of these species on the site is not unexpected. However, these reptile species have been included on the recent revision to the UK BAP Priority species list (2007) due to concerns over recent population declines and increased

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pressures from development and a 'general tidying up' of the countryside which can lead to the removal of suitable rough grassland, scrub and compost heaps used by these species. In light of the new UKBAP status of these reptiles combined with consultees concerns that the full extent of the reptile population may not have been accurately characterised during the 2005 surveys, the site has been allocated a precautionary value of **local** importance.

8.5.44 A repeat reptile survey will be undertaken in September 2009, to update the findings of the 2005 reptile surveys and inform the creation of a detailed reptile mitigation strategy with respect to confirming exclusion fence positions, extent of the reserved receptor land that will be used and the appropriate number of trapping days. The basic principles of the reptile mitigation strategy are outlined within this ES chapter). There are associated legal implications with the presence of reptile species

### **GREAT CRESTED NEWTS**

8.5.45 Great crested newts have been found to be present within five ponds surrounding the site and absent from a further 6 ponds on and adjacent to the site. The ponds in which great crested newts are present are as follows;

- two ponds immediately off-site and adjacent to the M20 to the north-east of the application boundary; both with a moderate population (referred to as ponds 6 and 7 within the great crested newt reports),
- one pond on the west side of Thurnham lane, with a low population (referred to as pond 10 within the great crested newt reports)
- one pond on the east side of Thurnham lane close to the railway line, with an unknown population size (only presence/absence surveys conducted) (referred to as pond 8 within the great crested newt reports); and
- one pond to the east of Chrismill Road, with a low population (referred to as pond 4 within the great crested newt reports)

8.5.46 Habitat exists within the site boundary for the terrestrial and hibernation phases of the newt's life cycle i.e. hedgerows, woodland and semi-improved grassland and it is reasonable to assume that great crested newts will be present in these habitats on the site. The total approximate area of suitable great crested newt habitat on site has been estimated at 27ha. This has been derived by combining the areas of woodland, scrub, tall ruderal, semi-improved grassland and ephemeral perennial habitat across the site. This has included areas of habitat beyond 500m from the ponds, since the suitable habitat available is very linear in nature and interspersed with large areas of unsuitable arable land and therefore it has been assumed that individual newts might travel further than 500m to reach suitable refugia.

8.5.47 Great crested newts are widespread in Kent (Krag and KWT, 2003) although the species is very vulnerable in Europe as a whole and has experienced massive historic decline across the UK, with continued gradual decline (UK BAP, 2008). For these reasons great crested newts are a UK BAP species. The species is experiencing declines in Kent due to loss of suitable breeding ponds and fragmentation of terrestrial habitat and for this reason the species is also a Kent BAP species.

8.5.48 Due to the ecology of great crested newts, populations breeding in ponds that are close to each other are genetically linked and therefore the newts within the five breeding ponds have been considered as one larger population, albeit that genetic exchange between the cluster of ponds near Thurnham lane will be far more frequent than with the single pond near Chrismill Road). For this reason, the population of newts on the site are considered to be important at the **local** level. Valuation of a higher importance is not appropriate due to the widespread nature of the species and unexceptional populations found on the site.

### **INVERTEBRATES**

8.5.4.18 The invertebrate value of habitats within the Application Site has been appraised through habitat analysis and targeted species sampling. A total of 277 invertebrate species have been recorded on the site, none of which are Legally Protected, Red Data Book, or UK BAP priority species.

8.5.4.19 One UK BAP species 'for Research Only' was recorded on site (the Cinnabar, a ubiquitous species) and two Nationally Notable species (the wasp spider and the ivy bark beetle). Both of these species are likely to be more widespread than currently recorded. A further 16 Locally Notable species are present on the site.

8.5.4.20 None of the habitats on site are considered to be of importance at a district scale or higher.

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8.5.4.21 Of the habitats sampled, the adjoining woodlands known as The Belt and Chrismill Shaw (plus the section of adjoining plantation woodland along the railway line at this point) and the solitary mature trees present in the parkland area on the site are all assessed as of high **local** invertebrate value, in particular for the saproxylic species assemblages that they support (species dependent on dead or dying wood).

8.5.4.22 Common wood is also of high **local** invertebrate value primarily because of the abundance and quality of 'edge-habitat' present at the woodland, comprising interfaces between woodland, scrub, grassland and ditch habitats.

8.5.4.23 The triangular field of ruderal and ephemeral habitat with bare ground that is present at TN27 is also assessed to be of high **local** value due to the extremely high value of bare ground and ruderal habitats.

8.5.4.24 All remaining terrestrial habitats on site (including grassland and hedgerows) are considered to be of site value or lower for invertebrate species.

8.5.4.25 It has not been possible to allocate an invertebrate value to the aquatic habitats on site due to the limitations of the invertebrate survey (poor weather leading to insufficient sample sizes). Nevertheless, it is the opinion of the specialist invertebrate surveyors (CPA) that the larger part of the Kent International Gateway site is clearly of low or insignificant invertebrate interest and that proposed development has the potential to create opportunities for mitigation that may actually improve the overall value of the area.

8.5.4.26 Overall the site provides several habitats of **local** invertebrate value.

### **WATER VOLE**

8.5.4.27 Water vole have been found to be absent from the site. No field evidence of water vole has been discovered during the systematic survey of 2008, or any of the previous site survey visits (e.g. the Extended Phase 1 habitat Surveys). Furthermore, the habitat provided by the watercourses is of very limited suitability for water vole, with very few burrowing opportunities, poor availability of food plants, very shallow and widely fluctuating water levels influenced by drainage from the M20 and a lack of connectivity to suitable riparian or terrestrial habitat (being set within large arable fields and fragmented from off-site watercourses by culverts passing under the M20, the railway and the A20).

8.5.4.28 Because recent land-use changes have altered the character of the southern section of watercourse 2 since its assessment for the Environmental Statement, and because access was not granted to this location during the 2008 water vole survey, water vole cannot be confirmed to be absent from this location. However, water vole have historically been absent from this stretch of water (which was heavily cattle poached and grazed on both banks for the duration of 2005 and 2006, rendering the banks devoid of vegetation and unsuitable for burrowing or foraging). Furthermore, the current sub-optimal nature of the habitat, combined with the absence of water voles from the rest of the site, the lack of connectivity to off-site watercourses and the intensively farmed nature of the immediately surrounding habitat (arable farming) make it highly unlikely that water vole are present along this part of the water course.

### **OTTER**

8.5.4.29 The watercourses on site provide very limited opportunities for otter as they do not represent attractive hunting grounds or contain features of potential value as holt sites (i.e. undisturbed or sheltered areas). They are shallow and seasonally dry and as such are very unlikely to support significant numbers of fish on which otters would feed. Bankside scrub and vegetation, where present, is not sufficiently dense to provide laying up sites within watercourses 1 and 2. The hedgebanks at watercourse 3 are potentially more suitable for this purpose, but the ditch is so rarely wet in this location that it is considered unlikely otters would travel through it (see 4.3.2 below).

8.5.4.30 Watercourses are sometimes used by otters even when they do not appear suitable, but this is normally to facilitate movement between two more suitable watercourses. The large number of culverts along each watercourse, both on-site and up and downstream of the site reduces the likelihood that otters would pass through the site (although it is recognised that culverts do not generally provide an absolute barrier to otter). In particular, the ditches are extensively culverted under the M20 and CTRL which is directly north of the site. In addition, the ditches are separated from more suitable otter habitat downstream of the site by a number of culverts, including under the A20 which runs along the south of the site. All visible culverts were observed to be round, concrete or metal 1m diameter tubes.

8.5.4.31 Finally, the absence of records of otters from within 2km of the site boundary further reduces the likelihood that otters would be found in this locality.

**WHITE CLAWED CRAYFISH**

8.5.4.32 The site does not provide suitable habitat for this species. Although the watercourses on site are likely to be hard and with a low pH, (being at least partially fed from the chalk streams running off the downs), all three watercourses receive run-off from the M20, the adjacent intensively farmed arable land and, in the case of water course 3, the Junction 8 services. For this reason it is considered highly likely that the BOD content of the water is too high for this species. In addition, the watercourses on site are all very silty, which is likely to adversely affect the delicate gills of crayfish. Furthermore, the ditches appear to be susceptible to seasonal fluctuations and it is considered highly likely that they dry out completely during periods of drought. Whilst crayfish can occur in very shallow water, they are unlikely to survive periods of drought (Holdich, 2003).

8.5.4.33 The habitat requirements for this species are described within the Natural England publication; Ecology of the White-Clawed Crayfish (Holdich, 2003). Within this document, the following five 'micro-habitats' are described as being particularly associated with the distribution of white-clawed crayfish in habitats with flowing water;

- Undermined, overhanging banks.
- Sections exhibiting heterogeneous flow patterns with refuges.
- Under cobbles (juveniles) and rocks in riffles, and under larger rocks in pools.
- Among roots of woody vegetation, accumulations of fallen leaves and boulder weirs.
- Under water-saturated logs

8.5.4.34 Of these habitat types, only 1 small (2m section) of watercourse 1 can be described to contain riffles. The watercourses 1 and 2 do not generally support overhangs<sup>4</sup>, refuges, cobbles and rocks, riffles, woody roots or substantial leaf litter or saturated logs.

8.5.4.35 It is therefore concluded that the absence of suitable habitat, combined with the presence of unsuitable qualities such as high levels of silt, potential drought, and likely high BOD levels make it highly unlikely that white-clawed crayfish would be present within the site.

**Table 8.4: Value of ecologically sensitive receptors identified within the zone of influence of the proposed development.**

Sensitive Receptor	Value	Relevant Policies and Legislation	Distance from site	Included within Impact Assessment?
<b>Protected and Notable Habitats</b>				
River Len System (including two LWS)	County	KMSP Kent and Medway Structure Plan (KMSP) EN7: this policy presumes against development on designated wildlife sites.	1km	Yes
Honeyhills wood pasture and parkland LWS	County	Kent and Medway Structure Plan (KMSP) EN7: this policy presumes against development on designated wildlife sites.	Directly adjacent	Yes
Semi-natural broadleaved woodland	Borough	KMSP EN8: it is strategic policy to increase tree cover in Kent. New development should seek to link remnant ancient woodland and create new woodland, in particular through natural succession instead of planting. EN9: tree cover and hedgerow network should be maintained and enhanced. Semi-natural woodland will be protected. Potentially UK BAP (Chrismill Shaw) in relation to ancient woodland priority habitat, and Kent BAP (The Belt and Common Wood) in relation to	On site	Yes

<sup>4</sup> Watercourse 3 is very overshadowed by a hedgebank and trees, however, the bank profile does not include overhangs, presumably because there is insufficient flow to lead to erosion or undercutting at the banks underneath the rootstocks.

Plantation broadleaved woodland - mature	borough	woodland on ancient woodland sites priority habitat. KMSP EN8: it is strategic policy to increase tree cover in Kent. New development should seek to link remnant ancient woodland and create new woodland, in particular through natural succession instead of planting. EN9: tree cover and hedgerow network should be maintained and enhanced. Semi-natural woodland will be protected..	On-site	Yes –as part of the ecological connectivity assessment
Plantation broadleaved woodland - immature	site	KMSP EN8: it is strategic policy to increase tree cover in Kent. New development should seek to link remnant ancient woodland and create new woodland, in particular through natural succession instead of planting. EN9: tree cover and hedgerow network should be maintained and enhanced. Semi-natural woodland will be protected..	On and immediately adjacent to site	No
Scattered trees	Local (borough for parkland area)	KMSP EN8: it is strategic policy to increase tree cover in Kent. New development should seek to link remnant ancient woodland and create new woodland, in particular through natural succession instead of planting. EN9: tree cover and hedgerow network should be maintained and enhanced. Semi-natural woodland will be protected..	On site	Yes- in relation to bats, invertebrates, birds and connectivity
Habitat corridors (including railway embankment and other corridors identified on Figure 8.3)	Borough	KMSP EN8: it is strategic policy to increase tree cover in Kent. EN9: tree cover and hedgerow network should be maintained and enhanced.	On site	Yes
'Parkland' habitat (complex of mature trees and pasture)	Borough	KMSP EN8: it is strategic policy to increase tree cover in Kent. EN9: tree cover and hedgerow network should be maintained and enhanced.	On site	Yes
Species rich hedgerows	Local-borough	EN9: tree cover and hedgerow network should be maintained and enhanced. Kent BAP in relation to ancient and/or species rich hedgerows.	On site	Yes
Species poor hedgerows	site	EN9: tree cover and hedgerow network should be maintained and enhanced. Kent BAP in relation to ancient and/or species rich hedgerows.	On-site	Yes –as part of the ecological connectivity assessment
Ponds	Local	n/a	On site (and in local area)	Yes
Wet field ditches	local	n/a	On site	Yes
Dry ditches	Site	n/a	On site	No
Semi-improved grassland	Site	n/a	local	Yes – in the context of invertebrates, reptiles, amphibians and brown hare
Scattered scrub (excluding the railway embankment)	site	n/a	On site	No
Tall ruderal and ephemeral/short perennial	local	n/a	On site	Yes – in the context of protected species.
Roadside verges	Site*	Protected under planning policy ENV42	Directly adjacent	Yes

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**Protected and Notable Species**

Badgers	Site*	Protection against killing/injury and destruction of setts. Protection of Badgers Act, 1992	On site	Yes
Brown Hare	Local	UK BAP	On site	Yes
Bats	Borough	Wildlife and Countryside Act, 1981 and Conservation (Natural Habitats etc.) Regulations 1994. KMSP EN8	On site	Yes
Birds	Borough	Wildlife and Countryside Act, 1981, KMSP EN8, UK BAP and Kent BAP	On site	Yes
Reptiles	local	Wildlife and Countryside Act, KMSP EN8	On site	Yes
Great Crested Newts	local	Wildlife and Countryside Act, 1981 and Conservation (Natural Habitats etc.) Regulations 1994. KMSP EN8, UK BAP and Kent BAP.	On site	Yes
Invertebrates	local	KMSP EN8	On site	Yes
Water voles	Absent		Absent	No
Otters	Absent		Absent	No
White clawed crayfish	Absent		Absent	No
dormouse	Absent		Absent	No

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## 8.6 Assessment of Impacts

### 8.6.1 OVERVIEW OF IMPACTS

The potential impacts that could arise as a result of the development and in the absence of mitigation are summarised in Table 8.5 below. The following discussion of potential impacts and proposed mitigation has been informed by the habitat balance sheets presented in Table 8.6 and 8.7 below.

**Table 8.5: Summary of impacts**

#### **Construction Impacts**

##### **A: Impacts of direct habitat loss**

Impact A1: Fragmentation of semi-natural woodland habitat

Impact A2: Loss of connectivity across site

Impact A3: Enhancement and creation of parkland habitat

Impact A4: Loss of existing water course

##### **B: Indirect habitat degradation impacts**

Impact B1: Damage to retained vegetation including woodland, parkland, species rich hedges and part of Honeyhills wood, pasture and golf course LWS.

Impact B2: Disturbance of roadside verge habitat.

Impact B3: Construction Lighting impacts to wildlife

Impact B4: Construction Noise impacts to wildlife

##### **C: Impacts to protected species**

Impact C1: badger

Impact C2: brown hare

Impact C3: bat

Impact C4: bird

Impact C5: reptile

Impact C6: great crested newt

Impact C7: invertebrate

##### **Hydrological Impacts**

##### **D: Hydrological impacts (that effect ecological receptors)**

Impact D1: Impacts to the River Len

Impact D2: Decrease in water quality

Impact D3: Water pollution events

##### **Operational Impacts**

##### **E: Operational Impacts**

Impact E1: Lighting impacts to bats and birds

Impact E2: Noise impacts to bats and birds

## 8.6.2 HABITAT BALANCE SHEETS – ALL VALUES ARE APPROXIMATE

Table 8.6: Habitat Balance Sheet

Habitat type	Existing landscape (Ha)	Built Scheme (Ha)	of which retained (Ha)	of which new (Ha)	Balance (Ha)	Notes
pond	<0.1	1.5	0.0	1.5	+1.5	See also overall wetland habitat creation in 'Table 8.7: special features' below.
semi improved grassland	14	23	6.5	16.5	+11	Created grassland habitat will be of a higher value than that lost, due to the adoption of an appropriate long-term ecological management plan. (c.f. the existing intensive grazing regime).
improved grassland	5	0.0	0.0	0.0	-5	See 'semi-improved grassland' above, which will mitigate this loss.
amenity grassland	1	0.0	0.0	0.0	-1	See 'semi-improved grassland' above, which will mitigate this loss
broad leaved semi natural woodland	4.5	3.5	3.5	0.0	-1	For clarity and to assist with the assessment of impacts to established woodlands, all newly created woodland habitat has been included as broad-leaved plantation woodland habitat category. However, it is intended that all new woodland will eventually develop into semi-natural woodland.
broad leaved, plantation woodland	2.5	22	1.5	20.5	+19.5	Newly created woodland habitat shown in this category comprises all areas of new tree planting. Planting will consist of native species except at key landscape mitigation points, where some faster growing species will be adopted. This category includes new woodland blocks, linear features and solitary trees, providing ecological connectivity across the site. All new planting will be managed under a long-term ecological management plan.
continuous scrub	1	0.0	0.0	0.0	-1	See 'broad leaved, plantation woodland' above, which will mitigate this loss.
introduced shrub	<0.1	0.0	0.0	0.0	-<0.1	See 'broad leaved, plantation woodland' above, which will mitigate this loss.
tall ruderal and ephemeral/ short perennial	5	2	0.0	2	-3	
arable	81	0.0	0.0	0.0	-81	This habitat is not replaced within the proposed scheme.
buildings and hardstanding	3	63	<0.1	63	+60	
<b>Totals (Hectares)</b>	<b>117</b>	<b>117</b>				This total includes the 'off-site mitigation land' that will be converted to parkland

**Table 8.7: Special Features – All Values are Approximate and to the nearest 0.5 Ha.**

Habitat type	Existing landscape	Built Scheme	of which retained	of which new	Balance	Comments
wetland habitat (ponds and draw-down areas) (Ha)	<0.1 Ha	3.2 Ha	<0.1 Ha	3.2 Ha	+ 3.1 ha	Created wetland habitat has the potential to be of a higher value than that lost due to ecologically sensitive design, adoption of a long-term management plan, an increase in the amount of permanent standing water, much wider semi-natural banks/buffer zones, reed bed and other wetland habitat creation.
seasonally wet ditches (Meters)	1174m	1000m	0m	1000 m	- 174 m	The creation of an additional 1.9 Ha of pond habitat, combined with appropriate design and management of re-aligned streams will mitigate this loss.
parkland habitat (Ha)	5 Ha	10 Ha	5 Ha	5 Ha	+5 ha	Created and retained parkland habitat will be of a higher value than existing parkland, due to the adoption of an appropriate long-term ecological management plan. (c.f. the existing intensive grazing regime).
overall woodland coverage (Ha)	7Ha	25.5 Ha	5 Ha	20.5Ha	+18.5ha	
railway line vegetation (Ha)	5 Ha	3 Ha	0.5 Ha	1.5 Ha	- 2 ha	Loss of connectivity resulting from the loss of this habitat type will be mitigated through new planting along the railway embankment where possible (0.5Ha), extensive green roof (1.75ha) and off-set by improved connectivity of habitat elsewhere across the site (e.g. via tree planting and along watercourses).
Species rich hedgerows (Meters)	520m	270m	270m	(see comment)	- 250 m	see 'broad leaved, plantation woodland' above, which will include hedgerow planting and will therefore mitigate this loss.
Existing solitary trees	63 individuals	52 individuals	11 individuals	N/A	N/A	This is an approximation of individuals outside of woodland habitat taken from the tree surveys. This does not take into account groups of trees, but over 75% of tree groups have been retained. Newly planted solitary trees are counted in hectares within the 'broad leaved, plantation woodland' above; therefore no meaningful net balance can be derived.
Terrestrial habitat suitable for great crested newts	27	52	11.5	40.5	+25ha	This has been calculated by combining all rough grassland, scrub and woodland habitats across the site. This includes some habitat over 500m from a breeding pond due to the linear nature of the available suitable habitat (in between large arable fields).
'Suitable' bat foraging habitat	27	51	11	39	+24ha	This has been calculated by combining woodland, S-I grassland (including parkland), scrub tall ruderal and wetland areas) to give a crude approximation of the likely 'valuable' foraging area on site. Bats will however forage over a wide range of habitats including arable fields and car parks.
Extensive green roof	0	2	0	2	+2 ha	

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### 8.6.3 CONSTRUCTION IMPACTS

#### A: DIRECT HABITAT LOSS

##### Impact A1: Fragmentation of semi-natural woodland habitat of borough importance.

8.6.3.1 The majority of semi-natural woodland will be retained on site. It has been necessary to route access roads through the Belt and Chrismill Shaw. These have been positioned to result in a minimal loss of woodland habitat. At the Belt, the road passes through the narrowest point of the woodland, and at Chrismill Shaw, the road passes through the southern end of the woodland. In this way, direct fragmentation and habitat loss impacts have been minimised as far as possible in the design.

8.6.3.2 The unmitigated impact of the loss and fragmentation of woodland can be characterised as a negative impact that is certain to result in the permanent, non-reversible loss of about 1ha of mature semi-natural woodland habitat of borough importance. This will bring about a direct loss of available woodland habitat resources, but due to the small areas of woodland loss, the woodland ecosystems on site will remain viable and it is not expected that there would be an overall loss in biodiversity within any of the three woodlands.

8.6.3.3 The creation of roads through the woodlands will lead to fragmentation of the existing woodland habitat, and isolation of parcels of woodland at the northern end of the Belt, and at the southern end of Chrismill Shaw. As a result of existing baseline surveys it is considered that the most significant species groups that are likely to be impacted through habitat loss or fragmentation effects are; bats, great crested newts, birds of conservation concern and invertebrates. The width of the 'gap' that will be created by the new roads is approximately 10m wide. Due to their mobility, this will not provide an impermeable barrier to birds, most bat species (but see impact E), and most invertebrate species, all of which are evidently already dispersing across roads between parcels of woodland habitat, scattered trees and other suitable habitat across the site and wider countryside. The roads are likely to provide a barrier to great crested newt movement through the site, and this is assessed under impact C6.

8.6.3.4 The woodland habitat has been valued to be of borough value. Since the majority of this habitat will be retained on site, the effects of woodland habitat loss are not considered to be significant at a borough scale. However, the small-scale habitat loss, combined with fragmentation affects are considered to be significant at a local scale. In the absence of mitigation the adverse impacts to the semi-natural broadleaved woodland habitat are considered to be of certain negative **Local** significance.

8.6.3.5 Depending on the method and timing of felling activity, individuals from legally protected species groups could potentially be directly injured or killed, or their place of shelter disturbed during the woodland clearance process. This would be of **legal** significance. Legal implications associated with felling of the woodland are assessed under sub-section C under impacts to relative protected species.

##### Mitigation A1

8.6.3.6 Direct compensation for the effects of habitat loss and fragmentation of the woodlands will be delivered through new woodland planting. This is discussed further below. In addition, the mitigation measures described in A2, in relation to habitat connectivity, also provide a degree of mitigation and compensation for the fragmentation of the woodlands on site.

8.6.3.7 New woodland planting will be undertaken across the site and this will be of predominantly native species, managed under the site-wide ecological management plan regimes, which will be designed to maximise benefits to wildlife.

8.6.3.8 The majority of the woodland planting will be undertaken in accordance to the phased nature of the development, since planting will occur after site levelling works. However, two particular areas of woodland creation will be undertaken at the existing ground level and therefore will be created as part of the initial enabling works on the site. These are the block of woodland directly south of the Belt, and the strip of woodland directly west of Chrismill Shaw. These newly created woodland areas will receive combinations of the following additional enhancement measures, during their creation, in order to maximise their value and, if possible, accelerate their development into established woodland habitat;

- translocation of top soils from the sections of the Belt and Chrismill Shaw that will be removed (primarily to the area adjacent to Chrismill Shaw)
- translocation of selected tree root stock from trees that will be felled during site clearance

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- translocation of deadwood material from the existing woodland that would otherwise be removed off-site
  - 'digging in' some selected tree trunks, to provide future standing deadwood habitat within the newly created woodlands.

8.6.3.9 These measures will be implemented under an ecological management plan which will be prepared using guidance within documents such as Anderson, 2003 (CIRIA C600) and Rackham, 1976. The translocation of sub soils etc will be supplemented by a low level of native species planting from nursery stocks.

8.6.3.10 The objectives of these additional enhancement measures are:

- a) accelerated establishment of species-rich woodland ground flora that is not readily re-creatable by reseeding;
- b) the retention of locally native genetic plant stock;
- c) accelerated establishment of invertebrates, fungi and microflora associated with the tree root balls and subsoils, and with transferred dead wood; and
- d) augmentation of Chrismill Shaw and the Belt and consolidation of the wooded corridor at Chrismill Road.

8.6.3.11 Long term maintenance of all of the woodlands on site will be undertaken by the Estate Management Company. In contrast to the existing situation, the primary objective of all maintenance or management of the woodland will be nature conservation benefit. Public access into the woodlands will not be encouraged and, in most instances will be actively prohibited primarily for security reasons.

8.6.3.12 A management plan will be created which will involve a three year period of establishment maintenance in all areas of newly planted woodland. Measures such as the removal of undesirable and non-native or invasive species and the replacement of failed planted trees or shrubs may be needed in addition to traditional woodland management (Anderson, 2003).

8.6.3.13 The newly created woodland areas will be monitored over at least a 10 year period and this should preferably be in conjunction with the above maintenance agreement in order that corrective measures can be implemented if necessary.

#### **Residual Impact A1**

8.6.3.14 There will be a net increase in woodland coverage across the site of over 18ha (including hedgerow and woodland planting). This will bring about benefits in terms of connectivity through the site and biodiversity gains. There will be a loss of biodiversity in the short to medium term associated with the loss of 1ha of the mature woodland habitat on site that can only be partially compensated for by woodland creation (because the habitat lost is over 150 years old, in comparison with the immature, newly planted woodlands), but this will be minimal since the overall integrity of each woodland block will be retained and augmented with new planting. Furthermore, none of the newly created woodland will be subject to cattle grazing (as has historically occurred in the Belt) and all three woodlands on site will be brought under management specifically for nature conservation benefit. The positive management and long-term security of the woodland on site is a positive benefit of the scheme proposals that helps to further offset the negative impact of woodland habitat loss. It is considered that the residual impact in the presence of the mitigation proposed is reduced to a probable negative **site-scale** significance.

#### **Impact A2: Loss of habitat connectivity across the site**

8.6.3.15 The scheme proposal involves large scale re-levelling of the land across the entire site. This will include re-levelling of the existing railway embankments and cuttings which will result in a loss of existing vegetation, including along ecological corridors. Most significantly, this includes the loss of the existing plantation woodland and scrub vegetation currently forming a vegetated corridor through the site. The southern bank of the railway line will be allowed to become re-vegetated in the long-term.

8.6.3.16 In addition, although the scheme does not bring about the permanent loss of any other key corridors identified across the site, there will be a temporary loss of key corridors along parts of Water Lane and at water course 3. There will also be a more widespread loss of permeability of the site (to the movement of wildlife) due to the introduction of over 60ha of buildings and hardstanding, which present a greater barrier to species movement than the existing arable and improved fields, and which fragment vegetative corridors, including some of the key corridors (for example, where watercourse 3 is crossed by a road).

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8.6.3.17 The unmitigated impact of the loss of this connectivity can be characterised as a negative impact that is certain to result in the temporary, reversible loss of ecological corridors of both borough (railway line) and local (other key corridors) importance and a permanent loss in the quality (maturity, width, continuity) of ecological corridors of local importance. The most significant impact of this loss is fragmentation of a borough-wide ecological corridor which could potentially affect the connectivity of important resources for individual species groups.

8.6.3.18 Therefore, in the absence of mitigation, the overall significance of this impact is considered to be of certain, negative, **borough** significance.

#### **Mitigation A2**

8.6.3.19 The above impact will be mitigated for by re-instatement of the existing ecological corridors, and enhancement of these corridors through new planting, and though the positioning of SUDs and watercourses to produce more robust and comprehensive ecological networks through the site than currently exist. The removal and subsequent replanting will be timed to ensure minimal disturbance to connectivity through the site by working in the out of season times.

8.6.3.20 At the railway embankment, new planting will occur along the southern bank (north of Ind-E), on the northern bank (south of IND-02) and on both sides of the new section of railway in the far west of the scheme. Planting will comprise semi-mature stock with a high proportion of native tree and scrub species, reflecting the assemblage of species that will be lost and focusing in particular on those species that will provide food and shelter for a wide range of fauna. The eventual species mix along the railway bank will include species from the following species list:

oak (*Quercus robur*), ash (*Fraxinus excelsior*), hawthorn (*Crateagus monogyna*), blackthorn (*Prunus spinosa*), wayfaring tree (*Viburnum lantana*), hazel (*Corylus avellana*), elder (*Sambucus nigra*), goat willow (*Salix caprea*), dog rose (*Rosa canina*) and bramble (*Rubus fruticosus* agg.).

8.6.3.21 In addition, the western end of the railway line will be enclosed by an extensive green/brown roof to provide approximately 1.75ha of semi-natural vegetation (wildflowers and grasses typical of ruderal and ephemeral and short perennial habitat types), which will contribute significantly to the overall connectivity of the railway corridor, in particular for insects, birds and bats.

8.6.3.22 The key corridors across the site will be augmented by the significant areas of new woodland, meadow grassland and wetland habitats that will be provided. These have been grouped together where possible to provide wide corridors of semi-natural vegetation (generally over 100m wide), which present a greater diversity of ecological niches than are present in the existing scheme. The extent of this augmentation of the existing corridors has been depicted diagrammatically in figure 8.3 and is also demonstrated on the landscape framework drawing. In addition to consolidation of the key ecological corridors identified on figure 8.3, the new scheme also delivers a greater connectivity of habitat around the perimeter of the site (due to more or less continuous bands of semi-natural vegetation that are far wider than the existing hedgerows and tree-lines).

#### **Residual Impact A2**

8.6.3.23 Whilst the width of the vegetation along the railway line in the built scheme will be half that of the existing width in places, this is considered sufficient to maintain the viability of this important corridor as a network for wildlife. The wider fragmentation and temporary loss of ecological corridors across the site will be compensated for by a combination of replacement planting and enhancement through additional habitat creation. This is considered sufficient to off-set any negative impacts to connectivity across the site due to the scale at which the compensation and enhancement planting will be delivered.

8.6.3.24 . It is considered that the development will bring about an overall **neutral** impact to habitat connectivity across the site.

#### **Impact A3: Enhancement and creation of Parkland habitat**

8.6.3.25 The scheme will deliver a new area of parkland habitat (rough acid grassland with occasional standard trees). This will comprise approximately 4.6ha to the south of the A20. The scheme will also enable an existing area of parkland to be brought under positive wildlife management. The intension is for both areas of habitat to aspire to achieving UK BAP Priority Habitat status.

8.6.3.26 The existing and proposed parkland areas are over greensands and are highlighted within the Kent Wildlife Trust inventory as areas appropriate for species rich acid grassland restoration (K-LIS web pages). Acid grassland will therefore be promoted in the parklands through implementation of an appropriate management strategy which would

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be developed in consultation with the Kent Wildlife Trust. It is anticipated that the management strategy would involve an infrequent mowing regime over a number of years. Mowing would be undertaken annually in autumn after all plants have set seed and the clippings from mowing would be removed and composted or retained to create reptile hibernacula. Mowing would be on a rotational basis with some areas being left uncut each year in order to provide over-wintering habitat for invertebrates. Mowing within the wildlife areas and across the scheme as a whole will take into account the presence of reptiles on the site (i.e. undertaken in warm weather conditions and in stages to allow reptiles to move away from the mower). Monitoring of the grassland sward every two years will be undertaken to inform future management practices.

8.6.3.27 Grassland, if required, will be supplemented by low intensity seeding to increase biodiversity, these will be sourced from local grassland sites through either seed collection or haycut methods, or from a specialist supplier such as (Flora Locale).

8.6.3.28 New tree planting in the newly created parkland area to the south will comprise a small number of oak trees (to ensure that the majority of the area remains unshaded to allow development of a species rich grass sward. The trees will receive after care as part of the management plan for the site, to ensure that they become established and remain healthy into maturity.

8.6.3.29 Once established and reaching maturity, the trees in both parklands will be left unmanaged where possible in recognition of the wildlife value of over-mature trees and dead standing wood. Some limited planting of new, native trees will be undertaken if required in order to provide a good age range of trees within the parkland area. This area will be used as a receptor site for reptiles during the course of the development and the creation of reptile hibernacula and refugia will be undertaken at a localised area using mature wood reclaimed from The Belt and arisings from grass cutting. Access on to the parkland areas will be restricted to that required for management purposes only.

8.6.3.30 One or two small wildlife pond will be created in the parkland to the south of the M20 (c. 5m in diameter), in recognition of the biodiversity value of small field ponds for reptiles amphibians and invertebrates in the local area.

8.6.3.31 These habitat creation and enhancement measures will bring about a positive impact of **local** significance by creation a total of 9.6ha of parkland habitat that will be secured in the long-term and will be of value to a wide range of species.

8.6.3.32 No mitigation or residual impacts are relevant to this impact.

#### **Impact A4: Loss of ponds and wet field ditch habitat**

8.6.3.33 Without mitigation, the development proposals will result in the certain loss of 1 pond at Barty Farm (approximately less than 1ha in size), the culverting of approximately 194m of a field ditch, and the re-alignment of a further 1km of field ditches (see ref). These aquatic habitats are of **local** value and their loss and re-alignment could lead to a negative impact of **local** significance if not sensitively engineered. (N.B. hydrological impacts are discussed separately under impacts D1-D3).

#### **Mitigation A4**

8.6.3.34 Mitigation for impacts to aquatic habitats on the site will be delivered through the creation of 5 drainage ponds (over 3.2ha total area, including 1.4ha permanent standing water), restoration of one wildlife pond (c. 0.1ha) and ecological enhancement to the 1km of re-directed meandering watercourses.

8.6.3.35 The scheme design involves a sustainable urban drainage system which comprises 5 large off-line drainage ponds which contribute open water habitat to the scheme. The ponds will be designed to include features that specifically benefit wildlife. They will have a varied profile with a broad drawdown zone to provide summer marsh and mud habitats in addition to deeper, clay-lined permanent water areas. Gently sloping banks will be created along some pond margins where wetland grasses will be encouraged. Where possible, topsoil will not be added to the pond margins or banks as this can encourage vigorous growth of invasive species and lead to nitrification of the pond.

8.6.3.36 The planting of single tree specimens, such as willow or alder will be considered if appropriate to create a shaded micro-climate over some parts of the ponds and provide a valuable wood habitat directly adjacent to the water. Where tree planting is not possible, small amounts of dead wood (reclaimed from felled trees on the site) will be provided along part of the pond margins in order to provide suitable shelter for fish nurseries, aquatic invertebrates and other aquatic fauna. (The dead wood can be wired down to prevent risk of movement during flood events).

8.6.3.37 Planting of aquatic species will be kept to a minimum to allow for natural colonisation of the ponds. However, in order to quickly obtain an 'established' look, some planting of native species of local provenance may be

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undertaken in key areas immediately visible to the public if required. If planting is to occur, it will involve translocation of aquatic species from appropriate wetland habitats close to the site (and with the necessary permission). For example, the ponds immediately north-west of the site are of good quality and could provide a useful source of local species. However, this will be subject to further ecological assessment to ensure that exotic or undesirable species are not transferred into the new pond.

8.6.3.38 The existing dry depression to the south-west of Chrismill Road will be restored to a wildlife pond. The depression contains willow species (*Salix* sp.) and has wooded margins. Habitat creation measures here will include the installation of a lined, permanently wet pond and selective thinning of the retained woody margins to increase light to the new pond. The wildlife pond is ideally situated within the ecological corridor of Chrismill Road, which is a focus for woodland retention and creation and will enhance the foraging quality of this corridor for bats. The pond is also intended to provide an additional and more permanent breeding pond for great crested newts which are known to be present in a seasonal off-site pond 100m east of the wildlife pond. The wildlife pond is linked to the existing seasonal off-site pond by a tree-belt which will be retained. This link will be strengthened by the installation of amphibian tunnels into Chrismill Road to increase the permeability of this narrow lane to newts. The wildlife pond will be surrounded by suitable terrestrial newt habitat to the west and east. Proposed enhancement to the parkland area will benefit great crested newts and other amphibians using the new pond.

8.6.3.39 In contrast to the existing field ditches on the site, which are set within arable land and are ploughed to within 1m of the top-of-bank, the re-directed drainage channels will have semi-natural vegetated banks and the drainage channels will meander through landscape corridors with a focus on species rich grassland restoration and with new planting of predominantly native tree species. It is anticipated that this will enhance the quality of the ditches for wildlife. The re-directed drainage channels will be greater in length than the original channels.

#### **Residual Impact A4**

8.6.3.40 The substantial increase in area of aquatic habitats on the site, all of which will be under positive management for wildlife, is considered to bring about a positive residual impact that will be significant at least at a **local** scale.

### **B: INDIRECT DEGRADATION OF HABITAT**

#### **Impact B1: Damage to retained woodland, parkland, species rich hedges and adjacent Honeyhills wood, pasture and golf course LWS.**

8.6.3.41 The construction of the scheme requires substantial re-grading of the soil levels and will involve high numbers of heavy plant movements over a total of seven years across the site. Without proper protection, significant impacts to retained vegetation on and adjacent to the site could occur in this time such as; churning of soil by plant tyres/tracks, compression of tree roots, damage to tree and hedge limbs, pollution of foliage by salt-spray or dust deposition or pedestrian erosion of woodland/ grassland vegetation. Any such impacts could prevent the long-term retention of these habitats within the scheme which would compromise the delivery of the ecological mitigation measures discussed within this chapter. Furthermore, damage to these habitats could bring about further adverse impacts to the wider countryside and, in the case of Honeyhills LWS, could lead to degradation of habitats that are of county importance.

8.6.3.42 In the absence of robust mitigation and based on experience of similar large schemes, the likelihood of degradation impacts to retained vegetation occurring at some point during the seven year construction period is high.

8.6.3.43 Without mitigation, the impact of damage to retained habitat during construction would be negative and could range from probable **local - county** significance if it leads to degradation of Honeyhills LWS or prevents the successful retention and enhancement of on-site habitats of principal importance to the mitigation strategy (such as the woodland and parkland areas).

#### **Mitigation B1**

8.6.3.44 Preventative measures will be adopted to ensure that ecological features are appropriately protected throughout the construction process. All works in the vicinity of trees or hedgerows to be retained will be undertaken to BS5837:2005 guidelines, including the erection of robust protective fencing encompassing root protection areas of all trees. The robust protective fencing will also be erected to prevent any access from the construction site into all of the retained habitat areas (i.e. Common Wood, the parkland area, the belt, Chrismill Shaw etc). These areas will be clearly marked as sensitive ecological areas and access by construction staff or vehicles will not be permitted.

Boarding or fine mesh netting will be used in all areas where vehicular spray could impact retained vegetation, and will

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be used as a precautionary measure along the boundaries of Honeyhills LWS along the north-west of the application boundary.

8.6.3.45 Details of the protection of sensitive ecological areas will be defined within a Construction Environmental Method Statement, the implementation and monitoring of which will be overseen by an Environmental Manager, who will be responsible for the safe retention of the sensitive ecological areas. The success of protective measures will be reviewed every two months to ensure that all areas are adequately protected.

8.6.3.46 All site staff will receive a tool box talk on the various ecological sensitivities of the scheme as part of their site induction and be asked to work on site following the directions prescribed in a site method statement.

#### **Residual Impact B1**

8.6.3.47 The measures above will be implemented such that all retained habitats are adequately protected during the construction phase. The residual impact will therefore be **probable neutral**.

#### **Impact B2: Disturbance of roadside verge habitat**

8.6.3.48 A total of 120m protected roadside verge that is outside of the development boundary could be temporarily negatively impacted by the development through construction dust and spray from passing heavy plant. The significance of such an impact is considered to be of site level or lower. However, the verges are protected by local policy and have been scoped into the impact assessment.

#### **Mitigation B2**

8.6.3.49 Standard measures to prevent vehicular spray to roadsides will be implemented during the construction such as wash-down of tyres and appropriate sheeting of heavy goods vehicles. In addition, a low fine mesh fence will be installed around the protected road verges to prevent further dust impacts and to demarcate the areas as ecologically sensitive for retention.

#### **Residual Impact B2**

8.6.3.50 The residual impact will be a non-significant impact and the implementation of the above mitigation will ensure compliance with local policy.

#### **Impact B3: Construction Lighting impacts to wildlife**

8.6.3.51 During the construction phase of the operation there is potential for lighting to adversely impact upon the ability of wildlife to move and forage on site. The ability of crepuscular and nocturnal species to feed and breed on site may be restricted providing a **negative** effect of **local** significance.

8.6.3.52 It is not possible to accurately predict the likely effects of inappropriate light spill on ecological receptors on site during this phase of operations due to uncertainty of positioning of lighting columns. Worst case scenario is that lighting impacts may cause a reduction in continued ecological functionality of the site over several years of construction.

#### **Mitigation B3**

8.6.3.53 With the implementation of an appropriate and well designed lighting strategy and plan it would be possible to mitigate any adverse effects by controlling lighting areas to non sensitive ecological sites and avoidance of night time working practices during sensitive wildlife periods.

#### **Residual Impact B3**

8.6.3.54 The adoption of best practice guidance during construction enforced through an appropriate CEMP should minimise the risk of potential light pollution events and reduce the severity of any event. This means that the residual negative impact would be of significance at the **site** scale only.

#### **Impact B4: Construction Noise impacts to wildlife**

8.6.3.55 The area of the site is situated alongside the M20 motorway and has increased noise levels than would generally be expected for a rural location. The background noise levels are high and the tolerance from wildlife to these noise levels has developed over a number of years.

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8.6.3.56 The increase in noise levels during the construction phase will be minimal and be localised on site. Therefore it is considered to be a minimal change to the baseline. The likely impacts are a negative effect at **site** level.

#### **Mitigation B4**

8.6.3.57 Mitigation would be regular maintenance of equipment to ensure compliance with decibel levels in relation to construction.

#### **Residual Impact B4**

8.6.3.58 The adoption of best practice guidance during construction enforced through an appropriate CEMP should minimise the risk of potential noise pollution events and reduce the severity of any event. This means that the residual negative impact would be reduced to a **less than site** scale significance.

### **C: IMPACTS TO PROTECTED SPECIES**

8.6.3.59 The application site contains populations of bats, reptiles, great crested newts and badgers, all of which will be impacted by habitat loss. In addition, individuals from legally protected species groups could potentially be directly injured or killed, or their place of shelter disturbed during site clearance process. The ecological significance of such impacts to each species group is discussed below. In addition, the legal implications of such impacts are highlighted where appropriate.

#### **Impact C1: Impact to Badgers**

8.6.3.60 Badgers within setts identified in Common Wood will be impacted through a loss of foraging habitat in the form of pastoral land around Barty Farm (although it should be noted that surveys have not identified any foraging activity on the site outside of Common Wood itself). The existing setts are over 40m from the proposed construction footprint.

8.6.3.61 Badgers are common in Kent and are generally considered to be relatively adaptable to changes in land use brought about by development. Without mitigation, the impact is therefore considered to be of probable negative significance at the site scale or lower. However, badgers are protected by law and provision must be made to ensure existing legislation is adhered to.

#### **Mitigation C1**

8.6.3.62 A badger survey will be undertaken prior to the onset of construction activity in Phase 3 of the development (in the vicinity of Common Wood) to determine whether new setts have been excavated near to the development footprint. If necessary, badger fencing will be erected along the boundary of the construction works to prevent badgers from entering the construction area. Should any setts be identified within 30m of the construction footprint, an appropriate EPS licence will be obtained prior to the onset of works. Best practice guidance in relation to badgers and development will be adhered to at all times, and will be detailed within the Construction Environmental Method Statement.

8.6.3.63 The wildlife area in the centre-south of the final scheme will provide sufficient resources for the badgers to remain within the local area in the long term.

#### **Residual impact C1**

8.6.3.64 The residual ecological impact to badgers is considered not significant. The above mitigation would prevent any legal impacts to badgers as a result of the development scheme.

#### **Impact C2: Impacts to Brown Hares**

8.6.3.65 A Brown hare has been sighted on one occasion on the site and this species are likely to pass through the site and perhaps forage within some parts of the site. It is difficult to ascertain the extent of 'suitable habitat' for hares on site, since they occur within open landscapes utilising the arable fields, grasslands and hedgerows. Therefore, the vast majority of the existing could potentially be used by the species, although the single sighting indicates that hare are not prevalent across the site.

8.6.3.66 This is a very mobile species and individuals are highly unlikely to become injured or killed during construction, even if they are present on site during site clearance activities. However, the loss of available habitat resource and potential fragmentation of the wider landscape arising from the scheme is likely to contribute to the

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existing conservation pressure on this species, which is declining across Kent. For this reason, the proposals are considered to bring about an adverse impact of probable negative **local** significance, without mitigation.

#### **Mitigation C2**

8.6.3.67 The main thrust of the mitigation for brown hare revolves around the measures to improve habitat connectivity across the site (described under mitigation A2). Since a comprehensive network of ecological corridors has been established across the site, it is not considered that there would be any residual impacts to the dispersal of brown hares through the local area.

8.6.3.68 Additional mitigation for this species will be provided through the creation of a rough acid grassland area directly south of the A20 and the favourable management of the parkland area (to promote long grassland). These areas will provide good quality foraging habitat for mammals in the form of grasses and herbs. In addition, the wider grassland and woodland on the site will provide suitable habitat for this species.

#### **Residual Impact C2**

8.6.3.69 Dispersal through the site is not prevented, and there will be no net loss in grassland or woodland habitat for this species (and approximately x% of the site remains available to the species). It is therefore considered that the residual impact to brown hares is of probable negative **site-scale** significance.

#### **Impact C3: Impacts to bat species.**

8.6.3.70 In the absence of mitigation, the scheme will bring about a temporary loss of foraging habitat and a permanent loss of existing or potential roosting sites. There could also be direct impacts to individual bats during site clearance activities.

##### *Foraging habitat*

8.6.3.71 A total of approximately 16ha of foraging habitat will be temporarily lost as a result of the development, this constitutes approximately 60% of the total suitable foraging habitat on site. Of particular importance is the known key foraging area for serotine bats identified along Chrismill Road, part of which will be temporarily lost and disturbed during the construction of the road and site-levelling works. It should be noted that, due to the sequential, phased nature of the construction process, not all of this foraging habitat will be removed at exactly the same time.

8.6.3.72 In the absence of mitigation the proposed scheme could bring about a temporary (2-7 years) loss of foraging and tree roosting habitat that can be quantified as a maximum of 60% of suitable habitat across the site. (although this does not include consideration of the ephemeral and ruderal habitats that are likely to dominate the site during the 7 year construction phase, following the initial ground-levelling exercises, which will generate some foraging habitat).

8.6.3.73 It is considered that this temporary loss of foraging habitat is unlikely to result in a permanent impact on the conservation status of local bat populations, although it may necessitate individual bats to travel further from their roosts to suitable foraging grounds.

##### *Roosting sites*

8.6.3.74 Two roosts have been confirmed on site and these will both be retained in the scheme (a common pipistrelle non-maternity roost). There will however be a loss of 16% (20/120) of trees of moderate to high potential for roosting bats. Whilst further surveys have not confirmed bat roosts within these trees, it is likely that a proportion of them will be used by bats at some point in the year.

8.6.3.75 The temporary loss of approximately 16% of the available tree roosting opportunities from the landscape is considered to be a significant adverse effect on the local bat population (which has been valued to be of local importance).

##### *Commuting corridors*

8.6.3.76 The construction of the site will lead to a temporary reduction in available commuting routes across the site. However, the major blocks of woodland, and some linear tree features will be retained throughout the construction process and it is considered that these will be sufficient to enable continued foraging and commuting along linear routes across the site. Therefore, the impact to commuting bats is not considered to be significant at a local scale or higher.

8.6.3.77 Adverse impacts to bats have the potential to affect the conservation status of local populations of at least five bat species (Soprano pipistrelle, common pipistrelle, serotine, noctule, brown long-eared and unidentified *Myotis*).

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Of these species, the most significant impact is to serotine bats for which Kent is a stronghold and for which a BAP is being developed due to recent concern over potential population declines across the county. As a worst case scenario the development could bring about the short-term decline of bat species within the local area, during the construction phase. If this impact extends to serotine bats then this would be a temporary negative impact of borough significance.

8.6.3.78 The site clearance works has the potential to lead to disturbance of bat roosts within trees and will therefore require a suitable suite of inspections/survey and felling supervision. If evidence of roosting bats is discovered, a European Protected Species Licence would be required before site clearance activity can proceed. The clearance works could potentially lead to killing or injury of individual bats which, in a worst case scenario, would lead to a negative impact of certain negative **local** significance and would have associated legal implications.

### **Mitigation C3**

8.6.3.79 The mitigation for bats involves long-term measures to ensure the viability of bat populations within the site and short-term measures to compensate for the loss of roosting opportunities and to prevent killing and injury during site clearance works. All of the mitigation relating to bats will be detailed within a method statement to support the CEMP for the scheme.

#### *Ensuring long-term viability of bat populations within the site*

8.6.3.80 Foraging habitat: The proposed landscape strategy and habitat creation on the site has been designed to offset the loss of foraging habitat for bats through the creation of new woodland and scrub corridors, species rich grassland areas and new drainage ponds and streams, all of which will provide foraging habitat for bats and allow for movement of bats across the site into the wider countryside. These measures are discussed in more detail above. Of particular importance is the woodland retention, creation and restoration of a wildlife pond along the key serotine foraging area at Chrismill Road. The area of available foraging habitat in the built scheme will be less than the existing, but some areas are likely to be of greater quality in the long term (especially over the wetland habitats and long-grass areas).

8.6.3.81 In addition to habitat creation, detailed input into the lighting strategy is necessary in order to ensure that ecological corridors and wildlife areas remain as dark as possible to allow for the continuation of foraging by all bat species on the site. This is discussed further under operational impacts (Impact E).

8.6.3.82 Roosting sites: A number of buildings will be retained in the development. These include both of the bat roosts identified on site (Glenrowan House and End Cottage) and the buildings associated with Barty Farm, including the Oast house and the Dairy farm buildings. Bats have not been found roosting within the buildings at Barty Farm, but these buildings contain many features that provide suitable conditions for roosting bats, and enhancements will be made to the roof voids of these buildings to provide additional roosting habitat for bats on the site. (Modifications may include minor amendments to lead flashing or ventilation tiles to enable access for bats into the roof voids, or the creation of internal dark recesses in voids, using baffle boards and other techniques).

8.6.3.83 All of these buildings will be maintained by the estate management company to ensure that they remain suitable for bats in the long-term.

8.6.3.84 Woodcrete bat boxes will be installed at suitable locations throughout the site and at least one 'bat tower' will be built within an area of woodland creation in the location of Chrismill Road prior to the onset of site clearance works. The best examples of roost opportunities identified within trees during the site clearance work will be retained and translocated into retained or new woodland creation areas.

8.6.3.85 Monitoring of all roost sites will be undertaken for five years after their installation.

#### *Measures to prevent killing and injury during site clearance works*

8.6.3.86 The recommendations within the bat report (WSPE, 2006) should be followed to ensure that bats are not harmed during site clearance works. This will involve update survey inspections, precautionary soft-stripping of all suitable buildings and a programme of survey and supervised soft-felling of all suitable trees on the site which are not going to be retained. All building demolition and tree felling will be undertaken in the appropriate seasons of spring and autumn to prevent impacts to hibernating or breeding bats.

#### *Temporary provision of replacement tree roosting opportunities*

8.6.3.87 Prior to the onset of tree felling across the site, 40 bat boxes will be erected within existing woodland on site. This will ensure that there is adequate provision for tree roosting bats during the construction phases of the scheme (long-term tree roosting mitigation will be delivered through new tree planting and retention of good cavities from felled trees).

**Residual Impact C3**

8.6.3.88 The residual impacts of loss of roosting and foraging habitat across the site is not considered to be significant at anything other than the **site** scale.

**Impact C4: Birds**

8.6.3.89 The site is of borough importance for its assemblage of bird species which include a total of 27 bird species of high and medium conservation concern.

8.6.3.90 All parts of the site provide suitable habitat for one or more species of birds, including the arable fields which are of value to skylark, and the woodland, grassland, hedgerows and farm buildings (some of which has been retained). The impact to birds can be characterised as a permanent loss of approximately 60ha of semi-natural mixed farmland habitat (supporting a bird assemblage of borough importance) plus the potential killing and injury of birds (if site clearance was to be undertaken outwith the appropriate season and contrary to ecological advice). The impact, without mitigation, is considered to be of probable **negative borough significance**.

**Mitigation C4**

8.6.3.91 All site clearance works of potential nesting habitats will be carried out outside of the bird nesting season which generally runs from March – August inclusive. (This will include both clearance of semi-natural habitats such as trees, hedgerows and grassland and demolition of buildings suitable for nesting birds).

8.6.3.92 Because the habitat requirements of each bird species are different, the mitigation measures required are species specific. Mitigation for birds will be delivered through a combination of native landscape planting, woodland, parkland and grassland habitat creation and erection of artificial nest boxes of a variety of designs within retained trees and buildings throughout the site. A large thrust of the breeding bird mitigation will be delivered through the new landscape planting on the site and, for skylark, the rough grassland habitat creation in the parkland area and the 'mitigation land' to the south of the A20. The Table 8.6 below summarises which species will be targeted by each of these measures.

**Table 8.6: Summary of appropriate species specific bird mitigation options for the 8 Red-List species recorded breeding on site.**

Common name	Status	Thrust of mitigation and compensation
House Sparrow and Starlings	UKBAP, Red-Listed	Retention of woodland and some buildings which support nesting birds.  Installation of artificial nest boxes/ structures in retained woodland and buildings.  Will also benefit: tit species, swallows (amber-listed) and house martins (amber listed)
Spotted flycatcher and tree sparrow	UKBAP,RED, KBAP	It is considered unlikely (but not impossible) that spotted flycatcher and tree sparrow will remain as breeding species once the site is redeveloped. This is because they depend on the wider farmland environment and its management to provide foraging habitat and the correct invertebrate prey species.  Nonetheless, specially designed nest boxes for both species are available and these will be mounted onto trees in retained woodland on the site, as a mitigation measure. Post development monitoring surveys will identify whether such mitigation has been successful and this information in itself is of significant value to future planning decisions and conservation schemes.

Common name	Status	Thrust of mitigation and compensation
Reed bunting	UKBAP, Red-Listed, KBAP	It is considered likely that the single pair recorded breeding on the site can be supported within the proposed wetland habitat creation which has been developed in combination with the drainage strategy and which will include small permanent ponds, in addition to long grassland and scrub habitats.
Linnet and Bullfinch	UKBAP, Red-Listed, KBAP	Habitat mitigation and compensation for scheme is sympathetic to the foraging requirements of these two species and elements such as the creation of species-rich grassland areas and native woody species planting will benefit linnet and bullfinch respectively.  Specific compensation for the loss of tall ruderal habitat (of value as a food source to these species and to other finches, sparrows and skylark), will also be provided along the extensive green roof over the railway line.  Artificial nest box provision is not applicable for these two species.
Song Thrush	UKBAP, Red-listed, KBAP.	This species typically occurs within mixed parkland and garden habitats with trees, shrubs and open areas. They would therefore be expected to use the 'parkland' areas that will be created within the scheme design, as well as along the landscape planting areas (which will be planted with predominantly native species).  Artificial nest box provision is not applicable for this species.
Skylark	UKBAP, Red-listed, KBAP	A low breeding density of skylark will be displaced by the development. This species is a ground nesting bird normally associated with farmland in lowland England, although it also nests within grassland and heathland habitats. Recent increases in winter cereal crops (sown in autumn) compared to traditional spring-sown crops is considered to be the greatest factor in skylark decline within Kent (KCC,2004: Species Fact sheet for skylark [online]), although the three main causes of decline across the UK as stated in the UKBAP are linked to losses and/or changes in management of grassland (UK Biodiversity Steering Group, 1995: UK BAP for Skylark [online])  The acid grassland creation proposed in the scheme will provide a net increase in approximately 9.4ha of parkland habitat that will be managed in a way that is appropriate for breeding skylarks (i.e. large areas of open grassland and an annual cut in autumn). Additional breeding opportunities for this species will also occur within the remaining grassland areas on site, all of which will receive a similar management regime. However, the strong association between skylarks and farmland landscapes (at least in this region of the UK) reduces confidence that skylarks would adopt the long-grassland habitats created on site for breeding. Post development monitoring surveys will identify whether such mitigation has been successful and this information in itself is of significant value to future planning decisions and conservation schemes.

8.6.3.93 All Red-listed bird species breeding on the site have been considered within the mitigation proposals. Furthermore, mitigation measures focussing on habitat creation (woodland, parkland and wetland creation in addition to the wider hedgerow and tree planting across the site) will benefit the wider bird assemblage that has been recorded using the site by providing year-round shelter and foraging opportunities through native species planting which will partially compensate for the habitat loss experienced at the site. However, due to the scale of the development

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footprint, it is inevitable that a large proportion of arable farmland habitat will be lost as part of the proposals. Even with the inclusion of the mitigation measures described in table 8.6, it cannot be predicted with confidence that the existing assemblage of farmland birds will be retained on the site

8.6.3.94 The tall ruderal/short ephemeral habitat within the centre of the site (north of the railway line) has been found through survey to be of particular importance for foraging birds (providing seed and invertebrate food for skylark, sparrows and finches). As a result, areas of tall ruderal/short ephemeral vegetation including bare ground areas will be incorporated into the development on an extensive green roof over the railway line, providing approximately 1.75ha of this habitat. It should be noted that this habitat type will also occur naturally during the construction phases of the development, providing temporary 'flushes' of seed and invertebrate abundance throughout the development of the scheme.

#### **Residual Impact C4**

8.6.3.95 All impacts of killing or injury to nesting birds will be avoided through appropriate seasonal timing of site clearance works. Species specific mitigation for the nine key BAP/Red-list species identified during surveys will be provided. With the inclusion of these measures it is considered probable that the scheme could continue to support song thrush, starling, house sparrow and reed bunting. There is a lower confidence that mitigation measures will be sufficient to retain tree sparrow, spotted flycatcher, linnets, bullfinch and skylark breeding on the site due to the dependence of these species on open farmland habitat. However, the collation and dissemination of post-development monitoring results (which will identify whether such mitigation has been successful) will provide valuable feedback for planning decisions and conservation schemes.

8.6.3.96 . This is considered to be a residual impact of negative **local** significance. Mitigation would prevent any legal impacts to birds.

#### **Impact C5: Impact to reptiles**

8.6.3.97 In the absence of mitigation the scheme could bring about the loss of a population of common lizard, slow worm and grass snake of potentially local value and this is considered to be a negative impact of possible **local** significance. Without mitigation, the impact is certain to be locally significant. The impact will also have legal implications and mitigation measures must be implemented to ensure that reptiles are not killed or injured as a result of the development.

#### **Mitigation C5**

8.6.3.98 A repeat reptile survey will be undertaken in September 2009, to update the findings of the 2005 reptile surveys and inform the creation of a detailed reptile mitigation strategy with respect to confirming exclusion fence positions, extent of the reserved receptor land that will be used and the appropriate number of trapping days.

8.6.3.99 A capture and translocation programme will be undertaken within the suitable habitat in the development envelope (approximately 4ha) prior to the onset of construction and in accordance with Herpetofauna Groups of Britain and Ireland Guidelines (HGBI, 1998). This will involve the allocation of a receptor site, the erection of reptile proof fencing and the capture and translocation of reptiles over a minimum of 60 days between March and September. A potential trapping period of 'one full season' (i.e. March to September) has been allowed for within the scheme programme. This will enable 120 suitable trapping days or more to be undertaken, in the unlikely event that this should be necessary. The preferred receptor site will be the restored and created parkland areas (9.6ha). Should these areas become full, additional receptor sites can be made available within the remaining proposed areas of grassland habitat creation. All of these areas of grassland were previously grazed by livestock and therefore not suitable to support reptile populations. Necessary habitat creation and enhancement will be undertaken in all receptor areas prior to the start of the translocation process. These areas of land form part of the acid grassland habitat creation proposed at the site and will be managed to benefit reptiles irrespective of whether reptiles are actively translocated onto them.

8.6.3.100 Once all phases of construction work on the site are completed, the reptile fencing should be removed and reptiles should be allowed to recolonise all suitable areas of grassland on the site and future mowing of the site will take into account the presence of these species.

8.6.3.101 Further detail of mitigation measures for reptiles can be found within the separate protected species report (WSPE, 2005).

#### **Residual Impacts C5**

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8.6.3.102 The residual ecological impact on reptiles is considered certain to be of significance at the **site scale or lower**. The above mitigation would prevent any legal impacts to reptiles as a result of the development scheme.

#### **Impact C6: Great crested newts**

8.6.3.103 In the absence of mitigation the construction of the scheme could bring about the death or injury of great crested newts within suitable terrestrial habitat on site, the temporary loss of approximately 16ha of suitable terrestrial habitat and the fragmentation of terrestrial habitat in Chrismill Shaw from an off-site breeding pond (in the centre-south of the scheme). The great crested newts on the site are of local value only. Furthermore, because no breeding ponds will be lost as a result of the scheme it is unlikely that the scheme will result in the complete loss of any local population, although a decline in population density could arise. It is therefore considered that the impact of the development to great crested newts is certain to be of significance at the **site scale or lower**, without mitigation measures. However, there are **legal** implications associated with the killing or injury of this species as for this reason mitigation measures must be put in place to prevent an offence from occurring.

#### **Mitigation C6**

8.6.3.104 Great crested newts will be excluded from the development site through a capture and translocation exercise. This will be undertaken alongside the reptile translocation exercise and will involve the erection of amphibian proof fencing (also referred to as reptile fencing). An EPSL licence will be required to undertake the translocation and will be obtained in advance of the works. This will include a method statement detailing the planned mitigation works. The translocation will be undertaken in accordance with English Nature guidelines (EN, 2001) and will take into account the findings of surveys undertaken in spring/summer 2007. The newts will be retained within or adjacent to the application site and will be allowed to recolonise suitable habitat within the final scheme on completion of all construction phases.

8.6.3.105 Amphibian tunnels and bridges will be incorporated into Chrismill Road and the service road that cuts through Chrismill Shaw to increase the opportunities for newts to travel between the existing off-site breeding pond north into Chrismill Shaw and west into the newly created pond directly west of Chrismill Road.

8.6.3.106 The habitat creation and enhancement works that will be undertaken across the scheme will benefit newts, which occupy terrestrial habitats such as scrub, long grassland and woodland for much of the year. The retention of wildlife corridors will ensure the long-term permeability of the site to newts dispersing across the wider countryside.

#### **Residual impact C6**

8.6.3.107 The residual ecological impact to great crested newts is considered certain to be of significance at the **site scale or lower**. The above mitigation would prevent any legal impacts to reptiles as a result of the development scheme.

#### **Impact C7: Impacts to Invertebrates**

8.6.3.108 The habitats that have been identified to be of value to invertebrates in the scheme are as follows;

- Semi-natural broadleaved woodland
- Solitary Mature trees
- Tall ruderal/ ephemeral and short perennial habitat
- Aquatic habitats

8.6.3.109 Whilst there will be no impacts to Common Wood, the fragmentation and partial loss of woodland at the Belt and Chrismill Shaw would result in a negative impact on invertebrates (through habitat loss) of permanent **site** significance only. This is because the majority of both woodlands will be retained, and therefore existing invertebrate populations within these woodlands will be retained on site.

8.6.3.110 Approximately 20-25% of the existing solitary trees on site will be lost, but these will be replaced with new native species planting to provide a net increase in tree cover across the site. Furthermore, the scheme will not bring about the isolation of any retained (or newly planted) trees, since semi-natural habitats on the site have been deliberately grouped together to provide coherent ecological networks through the site. For these reasons the potential impacts (of habitat loss and isolation) to invertebrates reliant on solitary mature trees is not considered to be significant at any scale.

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8.6.3.111 The complete loss of tall ruderal habitat will result in a negative impact on invertebrates of permanent **local** significance. However, it should be noted that the longevity of this habitat on the existing site is not secured even in the absence of development, since it is not currently subjected to any land management regime and is therefore turning to birch scrub. Furthermore, ephemeral and ruderal habitats are likely to dominate the site during the 7 year construction phase, following the initial ground-levelling exercises meaning that the short-term impacts to invertebrates are likely to be neutral.

8.6.3.112 The scheme will bring about an overall increase in aquatic habitats on site. Specifically, there will be an increase of 1.4ha of standing water. Although there will be a loss of one pond, two new wildlife ponds will be created as part of the scheme, in addition to the five large SUDs ponds. The overall net gain in aquatic habitat is expected to bring about a net increase in invertebrate abundance and diversity. However, there will be a temporary adverse impact to aquatic invertebrates whilst the watercourses are being re-aligned and it is possible that the species assemblage of the watercourses may be temporarily impoverished whilst the watercourses become re-established. This is considered to be a negative impact of temporary **local** significance.

8.6.3.113 Therefore, overall the scheme has the potential to bring about a permanent, negative impact to invertebrates of **local** significance.

#### **Mitigation C7**

8.6.3.114 The mitigation measures for invertebrates within the woodlands and trees on site relate to the native species planting, woodland creation and retention of deadwood habitat on site that has already been discussed in previous sections.

8.6.3.115 Mitigation for the loss of tall ruderal /ephemeral and short perennial habitat will be delivered via the extensive green roof over the railway line. There will still be a net loss of 3ha of this habitat type, but this does at least secure the presence of this habitat type within the site in the long term.

8.6.3.116 Additional mitigation for burrowing invertebrate species which utilise bare ground (such as solitary ground nesting bees) will be incorporated into the site, in the region of the retained buildings at Barty Farm. For example, 'insect banks' comprising bundles of hollow straws and sand/concrete mixes and other such structures will be installed on site (developed in consultation with Buglife International and the Wildlife Trust).

8.6.3.117 The watercourses have been designed to be of ecological value, with meandering courses and sloped, vegetated banks, and the aquatic habitats will be planted with native aquatic vegetation. These measures will ensure that the aquatic habitats on site are of greater value to invertebrates, and it is expected that they will support a higher abundance and diversity of invertebrates than the existing site.

8.6.3.118 In addition to the mitigation for adverse impacts to invertebrates described above, the other ecological measures implemented across the site will bring about benefits to invertebrates in the following ways;

- The creation of approximately 15ha of grassland across the scheme will lead to a 6ha increase in this habitat type. More importantly, the grassland will be managed specifically for wildlife (e.g. involving annual or biannual mowing and removal of arisings) with the intention that the value of this habitat to invertebrates will be greatly increased. Whilst it is not possible to predict what resulting invertebrate assemblage will be attracted to the site, it is anticipated that there will be a net increase in both species abundance and diversity as a result of these measures
- the woodland and grassland mosaic created within the landscape proposals will provide a replacement habitat resource that is comparable to the 'edge habitat' currently provided by hedgerows on the site.

#### **Residual Impact C7**

8.6.3.119 With the adoption of the mitigation measures above, it is expected that the residual impact to invertebrate populations on site will be **neutral**.

#### **HYDROLOGICAL IMPACTS**

8.6.3.120 As agreed with the Environment Agency, it will not be possible to design the drainage strategy in detail at this stage of the scheme design and this is due primarily to the extensive cut and fill exercise that will be undertaken across the site, which will significantly alter the existing soil filtration rates. However, it is possible to agree a number of principles relating to the surface water and ground water drainage of the site that help to identify the potential impacts to sensitive aquatic environments within the zone of influence of the development. Further detail of the drainage strategy can be found in Chapter 10 of this ES.

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8.6.3.121 The outline drainage can be summarised as follows; roof water (which is clean) will be captured and discharged directly into the SUDs ponds, which will then drain back into the watercourses. Water run-off from car parks and roads (which can contain petrol pollutants) will flow into trapped gullies and pass through a petrol interceptor before being released into the SUDs ponds (or, in some instances a storm cell). Finally, the run-off from the intermodal area (which has the highest risk of containing contaminants and pollutants from machinery and containers) will be captured by an impermeable membrane and directed via petrol interceptors into a storm cell, before being discharged into watercourse 2.

#### **Impact D1: Construction-related Water pollution events**

8.6.3.122 The construction process could potentially lead to pollution of the watercourses through contaminated run-off which would discharge into the existing drainage ditches on the site (and eventually in to the River Len system). Potential pollution events include leaks and spills from construction activities, the introduction of hydrocarbons and other contaminant from site plant, or sediment loads from dust deposition or uncovered temporary mounds during the extensive cut and fill exercise. Pollution through run-off could be a particular concern during periods of heavy rainfall.

8.6.3.123 It is not possible to accurately predict the most likely ecological impact of a pollution event to the watercourses as this will depend largely on the scale and nature of the pollution event and could range from negative local-county significance. It is considered that in the absence of mitigation, it is almost certain that pollution events through surface water run-off would occur at some point during the seven year construction period and this impact has therefore been allocated a likelihood level of 4. As a worst case scenario, pollution events could lead to a reduction in water quality of sufficient scale to negatively impact the River Len system and lead to a temporary loss of biodiversity within the system. Due to the high quality of the River Len and presence of two Local Wildlife Sites along the Len to the south of the scheme, this would be an impact of **county** significance.

#### **Mitigation D1**

8.6.3.124 The implementation of an appropriate temporary drainage system will be required as part of the CEMP in order to minimise the potential risk of increased sedimentation reaching nearby controlled waters. The temporary drainage system will include settlement ponds of appropriate capacity to allow sediment to settle out before discharge. Temporary run-off settlement ponds are particularly beneficial in that they allow for isolation and on-site treatment of sediment-laden surface run-off before release to the natural aquatic environment. Provided adequate sedimentation and dilution of pollutants is achieved by the temporary ponds, it is likely that discharge of surface water to the River Len will be acceptable. Alternatively, water from settlement ponds can be removed by tanker for treatment off-site.

8.6.3.125 It should be noted that, under the new powers given to the Environment Agency in the Anti-Pollution Regulations 1999, the Environment Agency is able to stop construction at any time, should a significant risk be posed to the environment.

8.6.3.126 The CEMP will also include the following measures to effectively control the risk of pollution of controlled waters:

- Construction vehicles and other equipment will be regularly maintained to reduce the risk of hydrocarbon contamination;
- Washdown facilities will be appropriately managed to effectively contain contaminants and regulate the volume and quality of water discharged to the natural environment;
- Heavy goods vehicles carrying materials likely to generate dust will be appropriately sheeted in order to prevent effects on local residents, workers and ecological receptors; and
- All potentially polluting substances such as oils and chemicals will be stored on adequately bunded areas of hard standing.

8.6.3.127 The Environment Agency's Pollution Prevention Guidance Notes (PPGs) will be adhered to throughout the development of the CEMP, in particular:

- PPG 1 General Guide to the Prevention of Water Pollution;
- PPG 5 Works In, Near or Liable to Affect Watercourses;
- PPG 6 Working at Construction and Demolition Sites;

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- PPG 8 Safe Storage and Disposal of Used Oils; and
  - PPG 20 Dewatering Underground Ducts and Chambers.

#### **Residual Impact D1**

8.6.3.128 The adoption of best practice guidance during construction enforced through an appropriate CEMP should minimise the risk of potential pollution events and reduce the severity of any event, should one occur, by containing it within the on-site receptors. This means that the residual negative impact would be of significance at the **site** scale only.

#### **Impact D2: Operational Impacts to the River Len (downstream)**

8.6.3.129 It is a requirement of any drainage strategy to ensure that any increases in surface water drainage are attenuated on-site and that there are no adverse impacts to the water quality down stream of the site. This is governed by Environmental Agency, who will approve the detailed drainage strategy.

8.6.3.130 Because of the design of the drainage strategy (in accordance with standard EA requirements), there will be no net change in flow downstream of the scheme.

8.6.3.131 The potential risks to the downstream watercourses relate to the water quality and, should high water quality (i.e equal to existing water quality or higher) not be achieved, this could result in degradation of the River Len downstream and a potential reduction in biodiversity.

8.6.3.132 However, such impacts are considered unlikely for the following reasons;

- There are existing outfalls from the M20 and the motorways services at Junction 8 into each of these watercourses, and therefore the existing baseline for water quality will include vehicle/road related contaminants.
- The existing ditches will receive a certain amount of nutrient loading from the existing land-use on site (intensive arable farming)
- The drainage across the site has been designed to safeguard water quality through a system of trapped gullies, petrol interceptors and storm cells and SUDs ponds, with the purpose of removing any potential contaminants from surface water prior to its return to the watercourse.

8.6.3.133 None-the-less, it is recognised that the introduction of the intermodal area onto the site does increase the risk of a pollution event occurring from the site along water course 2 which could affect the stream that flows through east Bearsted, entering the River Len west of Green Hill road.

8.6.3.134 There is no potential for such an event to adversely impact either of the County Wildlife Sites that are associated with the River Len to the south of the application site (Len Vale Farm Paster etc. and River len Millpond and Carr), since they are both upstream of the point at which water from the site discharges into the river.

8.6.3.135 It is not clear whether the increased risk of a pollution event to the River Len originating from the application site would be significant in the context of the other pollution risks at discharge points along these (or other) tributaries, such as pollution risks from the M20 itself, or pollution risks from the residential and commercial properties that lie between the application site and the River Len. However, it is considered that the introduction of the intermodal area brings about an increased risk of pollution to the river Len *in combination* with existing activities in the area and this is a negative impact of possible **borough** significance.

#### **Mitigation D2**

8.6.3.136 A number of mitigation measures to maintain water quality and avoid pollution events are inherent in any drainage strategy. However, two additional and special measures will be adopted for this scheme to minimise the risk of adverse impacts to the River Len.

- 1) A penstock or other such control will be included in the drainage scheme to enable the discharge from the intermodal area to be isolated from the watercourse should a pollution event occur at the intermodal area.
- 2) Regular monitoring of the water quality at the point of discharge from the site will be undertaken in the first year of the development (and compared to the water quality as it enters the site) as a precautionary safeguard to enable confirmation that the drainage strategy is meeting the expectations of the Environment Agency.

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8.6.3.137 It will also be the responsibility of the management company to undertake emergency remedial measures in the event of a pollution event (please refer to the drainage strategy).

#### **Residual Impact D2**

8.6.3.138 It is considered that the additional precautionary measures described above reduce the likelihood that an on-site pollution event could bring about a downstream adverse impact to the River Len, since they will contain any contaminants within the on-site receptors for immediate remediation. The residual negative impact is therefore considered to be of significance at the **site** scale only.

#### **Impact D3: Decrease in on-site water quality (operational phase).**

8.6.3.139 The roads, intermodal area and service areas in the scheme will generate sources of potential surface water pollution which, in the absence of mitigation, would be likely to be of a scale that would adversely impact the biodiversity within the on-site water courses that are associated with the drainage strategy (i.e. the ditches and drainage ponds). Since this biodiversity is considered to be of potential local significance, this would be an impact of **local** significance (although the impact would be contained on site).

#### **Mitigation D3**

8.6.3.140 As for impacts to off-site water resources, potential impacts to surface water quality will be mitigated through the use of road side swales, petrol interceptors, storm cells and SUDs ponds. The latter will contain areas of permanently standing water in which aquatic emergent vegetation will be established (such as reeds) and these will further assist maintenance of high water quality on site. These mechanisms will be sufficient to maintain water quality on site at the existing levels (and this is a requirement of the drainage strategy).

8.6.3.141 The mitigation measures that will be adopted with respect to operational pollution events are similar to those described under mitigation D1 for a construction-related pollution event, and are also described within the drainage strategy chapter.

8.6.3.142 It is accepted that, should any major pollution events occur, these will be contained on site within the SUDs prior to remediation and in such instances temporary loss of water quality on-site is inevitable. This is an important part of the purpose of the SUDs and is an inherent risk associated with the scheme. This would be an unlikely impact (i.e. a pollution event is unlikely to occur) of negative **local** significance.

#### **Residual Impact D3**

8.6.3.143 The adoption of such measures should minimise the risk of potential pollution events and reduce the longevity of any event, should one occur. But it is unlikely that the ecological impact of such an event, should it occur, can be reduced below that of a negative **local** significance

### **OPERATIONAL IMPACTS**

#### **IMPACT E1: OPERATIONAL IMPACTS TO WILDLIFE**

8.6.3.144 The strategy for the lighting design for the scheme has used current best practice guidance and technology. It has been designed to be compliant with the minimum lighting requirements indicated in relevant guidance documents, to ensure the safety of employees and security of property, to reduce costs on long-term maintenance, ensure that energy efficiency is maximised, whilst ensuring that light spill, glare and upwards lighting to surrounding receptors are minimised and are in accordance with an E1/E2 Environmental Zone. The Lighting Strategy has therefore been designed to represent best environmental, economical and health and safety value taking into account the above factors.

#### **Impact E1 Operational lighting impacts to wildlife**

8.6.3.145 During operational phase the lighting impacts may cause the site to become isolated and fragmented in the landscape to the movements of crepuscular and nocturnal species. This would serve to isolate meta populations and reduce interaction between population groups providing greater risks to reduction in populations through reduction in gene 'sourcing'. The continued ecological functionality of the site may be compromised causing a reduction in biological diversity and health of on site populations. The likely impacts are a negative effect of **borough** significance.

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### **Mitigation E1**

8.6.3.146 With the implementation of an appropriate and sensitive lighting scheme all potential negative effects can be adequately mitigation. Mitigation for wildlife will be required to provide dark corridors for movement through the site for foraging and commuting species. All areas considered sensitive for wildlife should be screened or sheltered from light spill by use of planting of semi natural vegetation or use of hooded lights. In areas considered important for access through the site use of motion sensors on light columns should be used if appropriate and if safe to do so.

### **Residual Impact E1**

8.6.3.147 The adoption of best practice guidance during construction enforced through an appropriate CEMP should minimise the risk of potential light pollution events and reduce the severity of any event. This means that the residual negative impact would be of significance at the **site** scale only.

### **Impact E2 Operational Phase Noise Impacts to Wildlife**

8.6.3.148 During this phase the impacts to wildlife would be caused by malfunctioning of equipment. Wildlife become habituated to noise levels and the site has a continued ambient level due to proximity to M20. The effect would be a likely negative impact at **site** level only.

### **Mitigation E2**

8.6.3.149 Mitigation would be regular maintenance of equipment to ensure compliance with decibel levels in relation to operations. The siting of machines and fans away from sensitive wildlife areas will also help to reduce effects.

### **Residual Impact E2**

8.6.3.150 The adoption of best practice guidance during construction enforced through an appropriate CEMP should minimise the risk of potential noise pollution events and reduce the severity of any event. This means that the residual negative impact would be of significance at **less than site** scale only.

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## 8.7 Limitations and Assumptions

### 8.7.1 DATA LIMITATIONS

8.7.1.1 It has not been possible to allocate an invertebrate value to the aquatic habitats on site due to the limitations of the invertebrate survey (poor weather leading to insufficient sample sizes). Nevertheless, it is the opinion of the specialist invertebrate surveyors (CPA) that the larger part of the Kent International Gateway site is clearly of low or insignificant invertebrate interest and that proposed development has the potential to create opportunities for mitigation that may actually improve the overall value of the area.

8.7.1.2 There are no other known plans or projects within the area of Hollingbourne/ Thurnam that have recently been approved or for which an application has been made or is reasonably foreseeable. Furthermore, because of the proposed land use at the scheme, there will be no significant increase in visitor pressure on existing sensitive ecological receptors in the area as a result of the scheme. For these reasons, cumulative impacts on ecological resources within the zone of influence of the application site have not been assessed.

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## 8.8 Summary

8.8.1.1 The site contains a range of habitats that are of varying value to wildlife. These include habitats of borough and local importance to wildlife. In addition, the site contains seven protected species or protected species groups and the site is considered to be of borough importance to two of these species groups and of local importance to a further four species/species groups.

8.8.1.2 The majority of the habitats of ecological value on the site have either been retained or replaced in the scheme design. This includes the retention of the majority of the existing woodland habitat and the maintenance of connectivity across the site.

8.8.1.3 However, due to the large scale of the development (approximately 60ha of new built environment), some negative ecological impacts have been unavoidable. These have been mitigated and compensated for in the scheme.

8.8.1.4 In addition to direct mitigation and compensation measures, ecological enhancement has been sought where possible (such as the restoration of ponds, and the existing parkland type habitat to potential BAP priority habitat status) to provide net biodiversity gains in particular habitats/ecosystems. It is considered that, on balance, these enhancement measures contribute to the overall biodiversity of the site and help to off-set some of the residual negative ecological impacts of the scheme.

8.8.1.5 8.7.4 Table 8.8 as follows summarises the potential effects of the development on ecology and nature conservation.

**Table 8.8: Summary of Effects Table for Ecology and Nature Conservation**

Impact ref	Description of Likely Significant Effects	Confidence level	Significance of Impacts	Summary of Mitigation/Enhancement Measures	Residual Confidence	Residual Effects
A1	Permanent loss of 1ha semi-natural woodland habitat and associated fragmentation	certain	Negative local	Salvage translocation of soils and deadwood materials into new woodland creation areas. Augmentation of existing woodland and net increase in woodland coverage across scheme of c. 18ha Long-term management of woodlands for wildlife value.	probable	Negative Site scale
A2	Temporary loss (seven years) and permanent degradation of ecological connectivity across the site	certain	Negative borough	Re-instatement of railway embankment vegetation with semi-mature stock using native species rich mix to reduce temporary loss to 3 years. Creation of extensive green roof over 1.75ha of railway embankment. Augmentation of existing woodland and net increase in woodland coverage across scheme of c. 18ha – much of this will be structural planting such as hedgerows and tree-lines	probable	Neutral
A3	Creation and Enhancement of 9.4ha parkland habitat.	certain	Positive Local	No mitigation relevant	certain	Positive Local
A4	Permanent loss of 1 pond and 194m drainage ditch. Re-alignment of remaining of drainage ditch.	certain	Negative Local	Ecological input into creation of four drainage ponds (a total of 1.9ha) Restoration of one wildlife pond (0.1ha) Ecological enhancement to re-aligned drainage ditches.	Probable	Positive Local
B1:	Damage to retained woodland, parkland, species rich hedgerows and part of Honeyhills Wood, Pasture and Golf Course LWS.	probable	Negative local - county	Works in vicinity of trees to BS5837:2005. Clear signing of sensitive ecological areas Boarding or fine mesh to protect from vehicle spray or dust deposition. CEMP to include measures for protection of habitats.	probable	Neutral
B2	Temporary disturbance to	possible	Negative Site scale or	Erection of low, fine mesh barrier to prevent dust or vehicle spray impacts to vegetation.	N/A	Neutral

	approximately 120m protected roadside verge habitat that is outside of the application boundary		lower			
B3	Construction lighting impacts to wildlife	Probable	Negative Local	Measures include the adoption of a construction lighting strategy designed specifically to minimise lighting levels within allocated wildlife areas and the avoidance of night-time construction work.	Certain	Negative Site
B4	Construction Noise impacts to Wildlife	probable	Negative Site	Measures include regular maintenance of equipment to ensure compliance with decibel levels	Certain	Negative less than site scale
C1	Permanent loss of foraging habitat and potential for future impacts to sett resource.	probable	Negative site scale or lower	Badger survey repeated prior to onset of site clearance works. If new setts arise within 30m of site boundary, an EPS licence will be obtained Best practice guidance in relation to badgers and development to be followed.	Certain	Neutral
C2	Permanent reduction in available habitat resource for Hares	probable	Negative Local	Maintenance of connectivity through site, creation of specific mitigation areas including the two parkland areas and other grassland throughout the site that will be managed in a way that will be more suitable for hares than currently exists on site.	Probable	Negative site scale
C3	Temporary Loss of bat resources comprising 16ha foraging habitat and some trees suitable for roosting	certain	Negative Local	Habitat creation and landscape planting to replace suitable foraging habitat and maintain connectivity. Retention of existing roosts, enhancement of other retained buildings to create additional roosting space and creation of a woodland 'bat tower'. Installation of bat box roosts as a temporary measure provide continuity of tree roosting opportunities whilst new planting matures. . Supervised demolition and felling of buildings and trees on site involving rolling programme of pre-clearance surveys.	probable	Negative site scale
C4	Loss of habitat resource (summarised as c 80ha) for Birds of conservation concern	Possible	Negative Borough	Landscape planting of native species Woodland/parkland/grassland restoration Inclusion of dead wood habitat Installation of a variety of bird nest boxes into	Probable	Negative Local

C5	Loss of habitat resource for reptile population	certain	Negative Local	trees and retained buildings on site. Capture and translocation programme. Reptiles will be released into 5.8 ha of newly created grassland habitat.	certain	Negative site scale or lower
C6	Loss of terrestrial great crested newt habitat and potential fragmentation from a breeding pond.	certain	Negative Site scale or lower	Capture and translocation programme. Newts will be released to areas within or directly adjacent to the application site. Net increase in available terrestrial habitat. Newt tunnels across one road, widespread bridges elsewhere Restoration of ponds.	certain	Negative Site scale or lower
C7	Invertebrates	Probable	Negative Local	Compensation through extensive green roof, parkland, woodland and grassland retention and enhancement and through increase in aquatic habitats. Specific measures to compensate for loss of bare ground habitat for burrowing insects	Probable	Neutral
D1	Water pollution events	Possible temporary.	Negative County	Appropriate temporary drainage system including temporary run-off settlement ponds. Adoption of standard pollution control measures within CEMP. Adherence to Environment Agency's pollution prevention guidance notes.	Probable	Negative at site scale
D2	Impacts to the River Lenn System	Possible temporary.	Negative Borough	In addition to standard procedures incorporated within drainage strategy - a penstock or other such control will be included to enable isolation of run-off from the intermodal area should a pollution event occur. Regular monitoring of the water quality at the point of discharge from the site will be undertaken in the first year of the development as a precautionary safeguard to enable confirmation that the drainage strategy is meeting the expectations of the Environment Agency	Probable	Negative at site scale
D3	Decrease in on-site water quality	Possible temporary.	Negative Local	As for D1. (major pollution events will be contained on site within the SUDs prior to remediation and in such instances of temporary loss of water quality on-site is inevitable).	Unlikely	Negative Local
E1	Operational Lighting	Probable	Negative	Measures include the adoption of a sensitive	Certain	Negative

	impacts to wildlife		Borough	lighting strategy designed specifically to minimise lighting levels within allocated wildlife areas		site
E2	Operational Noise impacts to wildlife	Probable	Negative Site	Prevention of 'alarms' in train movements.	Certain	Negative Less than site scale

