Appendix D

ECOLOGICAL CONSTRAINTS STUDY

New Thames Crossing, East of Reading

Ecological Constraints Study

On behalf of **Wokingham Borough Council**

WOKINGHAM BOROUGH COUNCIL

Project Ref: 37006/3003 | Rev: 01 | Date: October 2016

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1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates LLP (PBA) was instructed to provide environmental support for a Strategic Outline Business Case (SOBC) for the New Thames Crossing, East of Reading. To inform this, an ecological constraints study was commissioned.

1.2 Proposed Development

1.2.1 The New Thames Crossing (hereafter referred to as the 'Proposed Development') is proposed on the east side of Reading town centre, linking A4155 Henley Road/Caversham Park Road junction (via Caversham Lakes access road) north of the river, with Thames Valley Park roundabout south of the river. It is anticipated to span from approximate grid reference SU736 756 in the north to approximate grid reference: SU741 741 in the south, crossing the River Thames at SU741 745.

1.2.2 To the north of the River Thames, the Proposed Development largely follows the alignment of the Caversham Lakes access road. This runs from Henley Road in the north to the British Rowing Facility located approximately midway along the alignment at grid reference SU740 749. The Proposed Development then crosses the Redgrave and Pinsent Rowing Lake and the River Thames. To the south of the river, the Proposed Development extends across an area of open grassland bisected by a woodland lined stream, to reach an existing roundabout located on Thames Valley Park Drive.

1.2.3 For the purposes of this study, an area encompassing the alignment of the Proposed Development with a 50 m radius has been used. This area is hereafter referred to as 'the Site'. The location of the Site is shown on Figure 1: Site Location Plan.

1.2.4 Within the wider landscape, to the north of the River Thames the Site is set within a series of old gravel pits (Henley Road Gravel Pits). These extend from north to south between Henley Road to the River Thames, and from east to west between Caversham and Sonning. Henley Road Gravel Pits are designated as a Local Wildlife Site and noted primarily for the number of over-wintering wildfowl they support.

1.3 Approach to Study

1.3.1 The ecological constraints study was informed by the following activities:

- A desk study: on-line resources including the Multi Agency Geographic Information for the Countryside (MAGIC, www.magic.gov.uk) website were used to gather information on statutory designated sites and habitats located within 2 km of the Site. This was supplemented by additional habitat data and information pertaining to non-statutory designated sites provided by Thames Valley Environmental Records Centre (TVERC); and

- A site walkover survey: broad habitat types were identified and described with reference to habitat classifications as detailed in the Phase 1 Habitat Survey Handbook (JNCC, 2010). Habitats present were also assessed to determine their potential to support protected species or species of conservation concern[1].

[1] In this case, notable species were defined as species listed in accordance with Section 41 of the Natural Environment and Rural Communities (NERC) Act, 'Species of Principle Importance'.

1.3.2 These activities were completed by Johanna Fewtrell (ACIEEM) in October 2016.

1.4 Aims of Study

1.4.1 The aims of the study were to:

- Provide an assessment of ecological constraints and opportunities associated with the Proposed Development, including in relation to designated sites, valued habitats, protected species and species of conservation concern (hereafter referred to as 'key biodiversity resources'), with the potential to occur at or near the Site;
- Identify those 'key biodiversity resources' where the Proposed Development has the potential to cause a significant effect (to inform a TAG Unit A3 Environmental Impact Assessment for Biodiversity);
- Provide recommendations as to how any ecological constraints may be overcome; and
- Provide outline ecological enhancement recommendations that may be delivered as part of the Proposed Development.

2 Current Conditions

2.1 Overview

2.1.1 The following section sets out the current conditions at the Site. To establish the context of the Site, desk study records were identified from within 2 km of the Site, extended to 10 km for European designated areas.

2.2 Statutory Designated Sites

2.2.1 No internationally designated sites were identified within 10 km of the Site.

2.2.2 Three statutory designated sites with local designations for nature conservation were identified within 2 km of the Site: Ali's Pond Local Nature Reserve (LNR), Clayfield Copse LNR and Highwood LNR. Of these, Highwood LNR was the closest, located approximately 1.6 km south east of the Site. Highwood LNR is described as containing a number of exotic trees species, which once formed an arboretum. The reserve also supports areas of mixed lowland woodland and heathland; a variety of bird species have been recorded associated with these habitats. Further details relating to all of the nearby LNRs are provided in **Annex A**.

2.2.3 The Site was also located within Impact Risk Zones (IRZ) for three Sites of Special Scientific Interest (SSSI). Although it was not possible to determine the SSSI's to which each IRZ was attributed (due to the resolution at which the mapping is available), none were located within 2 km from the Site boundary. The IRZ is a tool used to determine whether planning applications are likely to impact on SSSIs. The risks identified for these SSSIs related to the following development types and activities (some of which were attributed to more than one SSSI): discharges of water, airports, helipads and other aviation proposals, and pig & poultry units, slurry lagoons > 750m³ & manure stores > 3500t.

2.3 Non-Statutory Designated Sites

2.3.1 Nine non-statutory designated areas were identified within 2 km of the Site. Of these, the following were located on-site or within 1 km:

- Henley Road Gravel Pit Local Wildlife Site (LWS) and proposed LWS extension. Although Henley Road Gravel Pit LWS and proposed LWS extension are located within the Site boundary, the alignment of the Proposed Development itself is located to the east of these sites. Henley Road Gravel Pit LWS is identified as a large pit located next to the Thames which supports a range of overwintering wildfowl, as well as nationally scarce insects.

- Thames Valley Park East LWS. Thames Valley Park East LWS is located approximately 0.2 km east of the Site, forming part of the River Thames floodplain. It consist of a mosaic of habitats including man-made lakes, wildflower seeded grasslands, ponds, planted scrub, secondary woodland and small areas of wet woodland and swamp habitat.

2.3.2 In addition, a Local Geological Site was also identified within 2 km of the Site (i.e. an area valued for its geological as opposed to ecological interest). Further details are provided in **Annex B**.

2.4 Habitats

Desk Study

2.4.1 A number of Habitats of Principal Importance (HPI) were identified within 2 km of the Site. Of these, two HPI were located within the Site boundary: 'eutrophic standing waters' (associated

largely with the gravel pits and the Redgrave and Pinsent Rowing Lake) and 'deciduous woodland' (present in several small parcels surrounding the waterbodies).

2.4.2 Additional HPI within 2 km of the Site comprised:

- Lowland fens;
- Lowland heathlands
- Lowland mixed deciduous woodland;
- Reedbeds;
- Rivers;
- Traditional orchards;
- Wet woodland; and
- Coastal and floodplain grazing marsh.

2.4.3 Seven portions of Ancient Woodland were identified within 2 km of the Site. Of these, the closest is located approximately 450 m west of the Site, on an island within the Henley Gravel Pits.

Field Survey

2.4.4 The Site comprised three distinct parcels of land:

i. the 'northern parcel', from the northern extent of the Site to the British Rowing Facility

ii. the 'central parcel' from the British Rowing Facility to, and including the River Thames, and

iii. the 'southern parcel'; the land to the south of the River Thames.

2.4.5 Each parcel supported a range of habitat types, which varied in intrinsic ecological value and their potential to support protected or notable species. Parcels of land are shown on Figure 1: Site Location Plan, with photographs provided within **Annex C**. Further details in relation to each of the land parcels are provided below.

2.4.6 The northern parcel of the Site followed the alignment of the Caversham Lakes access road from Henley Road in the north to the British Rowing Facility; with a 50 m buffer either side. Hedgerows of varying quality were present either side of the road, flanked by a strip of amenity grassland along their extent. To the east of the Caversham Lakes access road, habitats largely included: areas of broad-leaved semi-natural woodland, dense scrub and areas of semi-improved grassland, with dense and scattered ruderals. A compound associated with the 'Water Ski Club' was also present. This included a building and associated amenity spaces. To the west of the Caversham Lakes access road, habitats included: areas of semi-improved grassland, dense and scattered ruderals and scrub and broad-leaved semi-natural woodland.

2.4.7 Berry Brook ran west – east across the northern parcel of the Site, crossing underneath the Caversham Lakes access road at grid reference SU737 754. This was shallow and overgrown at the time of survey with the banks were dominated by nettles and scrub, or devoid of vegetation.

2.4.8 Beyond 50 m from the Caversham Lakes access road, to both the east and west, large lakes were present. These were identified within the desk study to comprise the HPI 'eutrophic standing water'. These were largely surrounded by a belt of dense scrub.

2.4.9 The central parcel of the Site comprised land associated with the British Rowing facility. This included the clubhouse building and associated parking, as well as a portion of the rowing lake itself. Between the rowing lake and the River Thames, a peninsula of land was present. Although inaccessible at the time of survey, habitats present included broad leaved semi-natural woodland and scrub. A large pond was also present.

2.4.10 The southern parcel of the Site was dominated by a large area of grassland, managed for amenity purposes at the time of the survey. This was bisected by a 'drain' with a narrow strip of broadleaved semi-natural woodland, orientated from the south-east to north-west, and flowing towards the River Thames. At the southern extent of the southern land parcel, an access roundabout, security facilities and associated parking were present. Other habitats present within the southern parcel included: semi-improved grassland, dense and scattered ruderals and introduced shrub planting.

3 Constraints and Discussion

3.1.1 A summary of the potential ecological constraints associated with the Proposed Development, as informed by the desk study and walkover survey, are set out in Table 3.1 below.

3.1.2 An assessment of each key biodiversity resource has then been made to determine whether the Proposed Development is anticipated to cause a significant effect[2][3]. The results of this assessment will be used to inform a TAG Unit A3 Environmental Impact Assessment for Biodiversity.

Table 3.1: Ecological Constraints and Opportunities

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
Statutory Designated Sites	No direct impacts on statutory designated sites are anticipated as a result of the Proposed Development. Furthermore, it is considered highly unlikely that the Proposed Development would indirectly impact upon either the nearby LNR's or the SSSIs for which IRZ have been identified, largely due to the intervening distances. As a precaution however, given the level of protection afforded to these areas, recommendations made in relation to avoidance of indirect impacts on Henley Road Gravel Pit LWS and nearby HPI (see Section 4) should be adhered to, to ensure these conclusions.	No[4]
Non-Statutory Designated Sites	Henley Road Gravel Pit LWS and proposed LWS extension were identified within the Site. As they are located outside the current alignment of the Proposed Development, direct impacts are not anticipated. Due to the nature of the	Yes – Henley Road Gravel Pit LWS and proposed LWS extension only[5].

[2] Significant effect is defined as '*an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project*' (CIEEM, 2016).

[3] It should be noted that this assessment has been made based on available high level baseline information only; and as such, the assessment as to the likelihood of a significant effect arising should be considered draft. Where further information is required to further inform or confirm this assessment, additional notes have been provided in relation to each key biodiversity resource.

[4] Statutory designated sites have been excluded from the current TAG Unit A3 Assessment as no significant effects are anticipated; however this conclusion should be reviewed as the scheme design evolves (see Section 4).

[5] Henley Road Gravel Pit LWS and proposed LWS extension only have been included within current TAG Unit A3 Assessment. Significant effects on other LWS within 2 km are not anticipated; however this conclusion should be reviewed as the scheme design evolves (see Section 4).

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
	Proposed Development however, indirect impacts as a result of construction and / or operation related activities may arise. As such, and to ensure compliance with the protection afforded to them through local planning policy, further recommendations are made (see Section 4). Although additional non-statutory designated sites were identified within 2 km of the Site, only one of these was located within 1 km. As such, it is considered highly unlikely that the Proposed Development would have any impact (direct or indirect) upon these sites, largely due to the intervening distances. Again, recommendations made in relation to indirect impacts on Henley Road Gravel Pit LWS and nearby HPI (see Section 4) should be adhered to, to ensure these conclusions	
Ancient Woodland and HPI	A series of habitat parcels identified as HPI 'eutrophic standing water' and 'deciduous woodland' were identified on and in close proximity to the Site. As the parcels of eutrophic standing water are located outside the current alignment of the Proposed Development, direct impacts are not anticipated; however, indirect impacts as a result of construction and / or operation related activities may arise. Furthermore, a single parcel of deciduous woodland was located immediately to the east of the Caversham Lakes access road. As such direct and/ or indirect impacts may arise. As the LPA has a duty to have regard for HPI in determining planning, further recommendations in relation to these areas are made (see Section 4). Numerous other portions of HPI and ancient woodland were identified within 2 km of the Site. Although it is	Yes - eutrophic standing water and deciduous woodland located on and in close proximity to the Site only[6].

[6] Eutrophic standing water and deciduous woodland located on and in close proximity to the Site only have been included within the current TAG Unit A3 Assessment. Significant effects on other HPI within 2 km of the Site are not anticipated; however this conclusion should be reviewed as the scheme design evolves (see Section 4).

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
	considered highly unlikely that the Proposed Development would have any impact upon these, largely due to the intervening distances, recommendations made in relation to indirect impacts on Henley Road Gravel Pit LWS and nearby HPI (see Section 4) should be adhered to, to ensure these conclusions.	
Other 'On-Site' Habitats	Numerous habitat types were identified on the Site. These varied in intrinsic ecological value and their potential to support protected or notable species (see below). Of the habitats identified, the following were identified as, or have the potential to qualify as HPI: ▪ Hedgerows (these might also qualify as 'Important' under the Hedgerows Regulations, 1997); ▪ Eutrophic standing waters; ▪ Open mosaic habitats on previously developed land; and ▪ Lowland mixed deciduous woodland. As outlined for 'Ancient Woodland and HPI' above, the LPA has a duty to have regard for HPI in determining planning and as such, further recommendations are made (see Section 4). Additional recommendations have been made to ensure the scheme can be compliant within national and local planning policy, within which there is a presumption that there will be 'no net loss' in biodiversity arising as a result of Proposed Development.	Yes[7]

[7] Significant effects on 'on-site' habitats are possible however further surveys and confirmation on scheme design are required to confirm which of these habitats types should be included individually within future TAG Unit A3 Assessments (see Section 4). As a precaution, 'on-site habitats' have been included as a single category on the current TAG Unit A3 Assessment.

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
European Protected Species (EPS)	The habitats on site were identified to have the potential to support the following EPS: ■ Bats: the varied aquatic and terrestrial habitats were identified to have the potential to support foraging and commuting bats. Of particular note were the hedgerows and aquatic habitats which provided strong linear features suitable for commuting and foraging. A small number of roosting opportunities were identified within mature trees on site. A number of other mature trees within the Site were noted to be of the age and structure whereby they could also support potential roosting features. ■ European otter *Lutra lutra*: the varied aquatic habitats and the broadleaved semi-natural woodland were identified to have the potential to support both transitional and resting European otter. Given the high level of protection afforded to these species, further recommendations are made with regards to targeted survey to ensure the Proposed Development complies with the legislation through which they are protected (see Section 4). n.b. it is considered unlikely that the habitats present support the following EPS: (i) Great crested newts *Triturus cristatus*. Although extensive	Yes[8]

[8] Significant effects on EPS are possible however further surveys and confirmation on scheme design are required to confirm which of these species should be included individually within future TAG Unit A3 Assessments (see Section 4). As a precaution, EPS have been included as a single category on the current TAG Unit A3 Assessment.

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
	aquatic habitat was identified on site and within close proximity, given its fluctuation and liability to flooding as well as the anecdotal evidence of fish, it was considered unlikely to be suitable for great crested newts; and (ii) Hazel dormice *Muscardinus avellanarius*. Although the hedgerows, broadleaved semi-natural woodland and scrub habitats have the potential to support hazel dormice if present within the local area; given the historic use of the Site (for gravel extraction), the regular use of the Site by vehicles and pedestrians, and the location of the Site on the outskirts of urban development, it is considered unlikely that the habitats on site are suitable for use by this species.	
Nationally Protected Species	The habitats on site were identified to have the potential to support the following nationally protected species: ■ Badgers *Meles meles*: although no setts or other badger activity was noted at the time of the survey, the broadleaved semi-natural woodland may be suitable for sett building, with the more open areas of grassland providing foraging opportunities for this species. ■ Breeding and over-wintering birds: the varied aquatic and terrestrial habitats were identified to have the potential to support breeding and overwintering birds. Waterfowl, associated with the aquatic habitats, were identified to be present at the time of survey, with	Yes[9]

[9] Significant effects on nationally protected species are possible however further surveys and confirmation on scheme design are required to confirm which of these species should be included individually within future TAG Unit A3 Assessments (see Section 4). As a precaution, nationally protected species have been included as a single category on the current TAG Unit A3 Assessment.

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
	other species of common birds also recorded. ■ Reptiles: the varied terrestrial habitats were identified to have the potential to support common and widespread reptile species. Of particular note were the grassland, scattered ruderal and scrub, and matrix habitats. Given the high level of protection afforded to these species/species groups, further recommendations are made with regards to targeted survey to ensure the Proposed Development complies with the legislation through which they are protected (see Section 4). n.b. it is considered highly unlikely that the habitats present support water voles *Arvicola amphibius*. Although extensive aquatic habitat was identified on site and within close proximity, the following factors were considered to significantly limit the likelihood of water voles being present: (i) high levels of disturbance from rowing, fishing and boat traffic, (ii) the varied quality of bankside habitat, including some areas of reinforcement, areas devoid of suitable bankside vegetation etc., and (iii) the presence of American mink *Neovison vison* (via anecdotal evidence).	
Other Notable Species (Species of Principal Importance (SPI))	The habitats on sites were identified to have the potential to support the following SPI: ■ Hedgehogs *Erinaceus europaeus*: the broadleaved semi-natural woodland and more open areas of grassland were	No[10]

[10] SPI have been excluded from the current TAG Unit A3 Assessment as no significant effects are anticipated; however this conclusion should be reviewed as the scheme design evolves (see Section 4).

Key Biodiversity Resource	Constraints and Discussion	Anticipated Significant Effect
	identified to have the potential to support hedgehogs. ■ Invertebrates: the varied aquatic and terrestrial habitats were identified to have the potential to support a range of invertebrate species. Dragonflies and damselflies associated with the aquatic habitats were identified to be present at the time of survey. As outlined for 'Ancient Woodland and HPI' above, the LPA has a duty to have regard for SPI in determining planning and as such, further recommendations are made (see Section 4).	

4 Recommendations

4.1 Scheme Design and Mitigation

4.1.1 In the first instance, it is recommended that a route alignment is sought to minimise impacts on valued habitats with the potential to support protected and notable species. By following the route of the Caversham Lakes access road and strategically locating bridge abutments, direct impacts on designated sites, important habitats, and the species they support, may be reduced and potentially avoided altogether.

4.1.2 Following this, ecological input to support the emerging scheme design and inform mitigation measures should be provided (informed by discussions with the LPA ecologist (see Section 4.2 and the results of targeted surveys (see Section 4.3)). These would aim to avoid where possible, or appropriately reduce adverse impacts on key biodiversity resources to a level sufficient to enable the Proposed Development to proceed in line with relevant legislation and planning policy. Such input would aim to deal with both potential direct and indirect impacts arising as a result of construction and operation.

4.1.3 Direct impacts associated with the Proposed Development could include, for example: loss of valued habitats or killing and injury of individual protected and/or notable species.

4.1.4 Indirect impacts associated with the Proposed Development could include, for example:

- Air quality: construction of the Proposed Development could result in increased dust generation. Furthermore, it is anticipated that once operational, the scheme could result in increased vehicle emissions due to the nature of the Proposed Development. Such emissions could in turn increase nitrogen deposition and other atmospheric pollution in the vicinity of the route.

- Run-off: construction of the Proposed Development could result in surface run-off carrying increased levels of waterborne pollutants, including chemicals and sediments. Once operational, the Proposed Development has the potential to result in both increased volumes of surface run-off, due to the increase in impermeable surface; and increased levels of waterborne pollutants due to the nature of the scheme.

- Noise and vibration: construction related activities could result increased noise and vibration, namely associated with the use of heavy machinery. This could adversely affect the overwintering waterfowl associated with the Henley Road Gravel Pit LWS, as well as other protected and/ or notable species within close proximity to the Site. Furthermore, once operational, there is potential for increased traffic noise to adversely affect these species by leading to long-term disturbance.

- Light spill: it is anticipated that increased light spill may occur as a result of construction of the Proposed Development. As outlined in relation to noise and vibration, this could adversely impact upon the overwintering waterfowl associated with the Henley Road Gravel Pit, as well as other protected and/ or notable species within close proximity to the Site. Furthermore, once operational, permanent street lighting, as well as increased vehicle traffic could potentially adversely affect these species by leading to long-term disturbance.

4.1.5 Key biodiversity resources which may be affected by indirect impacts described above would likely include the on-site or nearby HPI and/ or features for which Henley Road Gravel Pits are designated, as well as protected and notable species present within the local area.

4.1.6 Ecological input to scheme design and mitigation measures will need to be provided in order to ensure the Proposed Development accords with legislation and national planning policy. This process would need to be informed by: (i) liaison with other technical specialists and the wider

design team (e.g. hydrologists, landscape advisors, acousticians, air quality consultants); (ii) consultation with the LPA ecologist (see Section 4.2) and (iii) the results of further surveys (see Section 4.3).

4.2 Consultation

4.2.1 Early consultation with the Local Planning Authority ecologist should be sought to discuss the potential impacts (both direct and indirect) of the Proposed Development. Confirmation should be sought as to the further survey work required to secure a baseline capable of assessing the impacts of the Proposed Development (see Section 4.3), determine mitigation requirements and inform a future planning application.

4.3 Work to Support Scheme Design and Planning

4.3.1 Any future scheme design or planning application support[11] should be informed by the results of a detailed Ecological Appraisal which should be informed by a full desk study and extended Phase 1 habitat survey (JNCC, 2010[12]).

4.3.2 Considering the results of the initial site walkover survey, the following further surveys are likely to be required to support a future planning application for the proposed development:

- Hedgerows – 'Hedgerow Regulations' assessment;
- Bats - roost assessment;
- Bats – activity surveys;
- European otter - presence/ likely absence surveys;
- Badger - presence/ likely absence surveys;
- Breeding bird surveys;
- Wintering bird surveys; and
- Reptile surveys - presence/ likely absence and population surveys.

4.3.3 The results of these surveys should be used to guide scheme design and will also help inform the mitigation requirements.

4.3.4 It should be noted that the requirement and scope of these surveys should be confirmed following completion of the full desk study and extended Phase 1 habitat survey, and consultation with the LPA. Confirmation to scope out great crested newt, hazel dormice and water voles should be made at this time.

4.4 Ecological Enhancement

4.4.1 To ensure compliance with national and local planning policy and TAG Unit A3 Assessment guidance, the Proposed Development should provide at least 1:1 compensation (no net loss) in biodiversity. Where habitat is to be lost to facilitate the proposed works, sufficient habitat should either be reinstalled following completion of the scheme, or sufficient enhancement of retained

[11] Including inputs to planning application documents, TAG Unit A3 Assessments, Environmental Impact Assessment.

[12] JNCC (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit. Joint Nature Conservation Committee.

habitat should take place to ensure no net loss in biodiversity. This could be achieved through the following:

- Incorporation of 'green infrastructure' as part of the bridge design. This could include planting of shade tolerant climbing species on the abutments of the bridge, use of vegetated panelling or fences along the extent of the bridge, or use of vegetated planters;

- Removal of non-native species, particularly those of an invasive nature, e.g. butterfly bush *Buddleia davidii*, throughout the extent of the Site. Where non-native species are removed, they should be replaced with appropriate native planting;

- Restoration and enhancement of the existing hedgerow resource. Hedgerows are present along much of the scheme extent. These could be enhanced with increased native species planting, and use of berry or seed producing species of value to local fauna, and implementation of a hedgerow management schedule;

- Restoration and enhancement of Berry Brook. The on-site portion of Berry Brook was identified to be overgrown and shaded at the time of the ecological site walkover. This could be opened up, regraded and replanted, and managed for the benefit of local wildlife; and

- Incorporation of species specific features suitable on the bridge or within the wider site. For example, incorporation of bird and bat boxes within the fabric of the new bridge or in mature trees to be retained on the Site, and provision of log/brash piles and/or purpose built hibernacula within suitable areas of habitat to create additional sheltering and over-wintering opportunities for reptiles and invertebrates.

5 Conclusions

5.1.1 The Site is located in an ecologically sensitive area. Henley Road Gravel Pit LWS and proposed LWS extension, and a number of parcels of HPI are located within, or adjacent to the Site. The Site supports a variety of aquatic and terrestrial habitats. These varied in intrinsic ecological value and their potential to support protected or notable species.

5.1.2 In the first instance, a route alignment should be sought to minimise impacts on ecology. Once this has been established, ecological input to scheme design and mitigation measures should be provided. This will aim to avoid, or appropriately reduce adverse impacts on key biodiversity resources, both on site and within the surroundings.

5.1.3 Ecological input to scheme design and mitigation measures would be informed by:

i. Liaison with other technical specialists and the wider design team (e.g. hydrologists, landscape advisors, acousticians, air quality consultants);

ii. Consultation with the LPA ecologist (see Section 4.2); and

iii. The results of further surveys (see Section 4.3). This may include surveys for habitats, EPS and nationally protected species.

5.1.4 Outline recommendations for ecological enhancement have also been provided to ensure the Proposed Development is compliant with national and local planning policy and TAG Unit A3 Assessment guidance, within which there is a presumption of no net loss in biodiversity.

6 Figures

Figure 1: Site Location Plan

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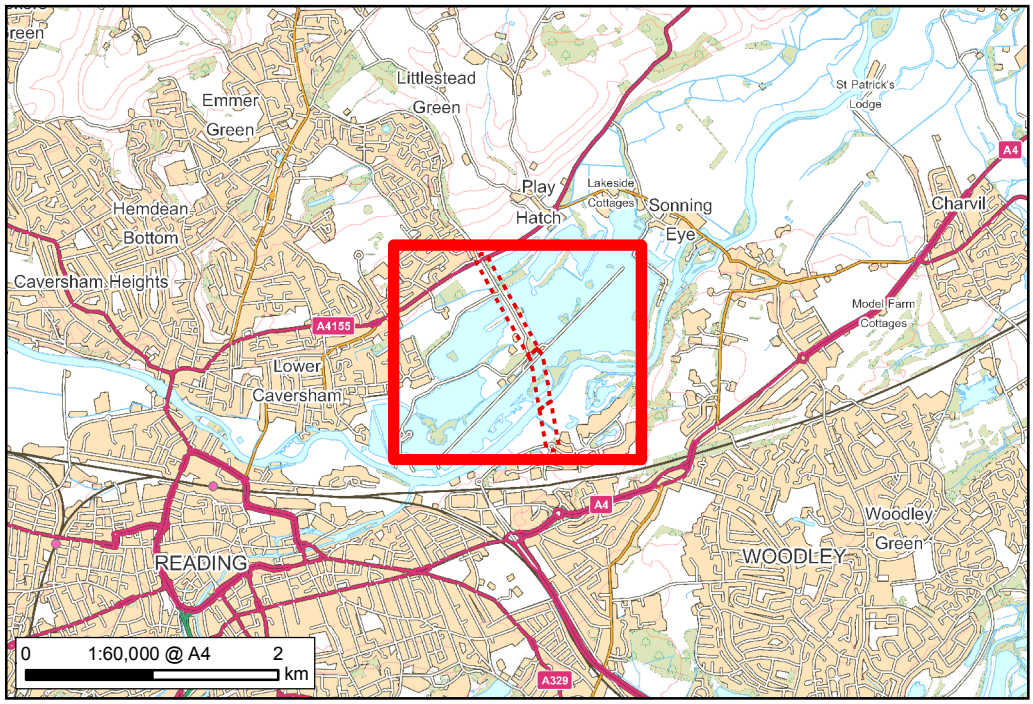

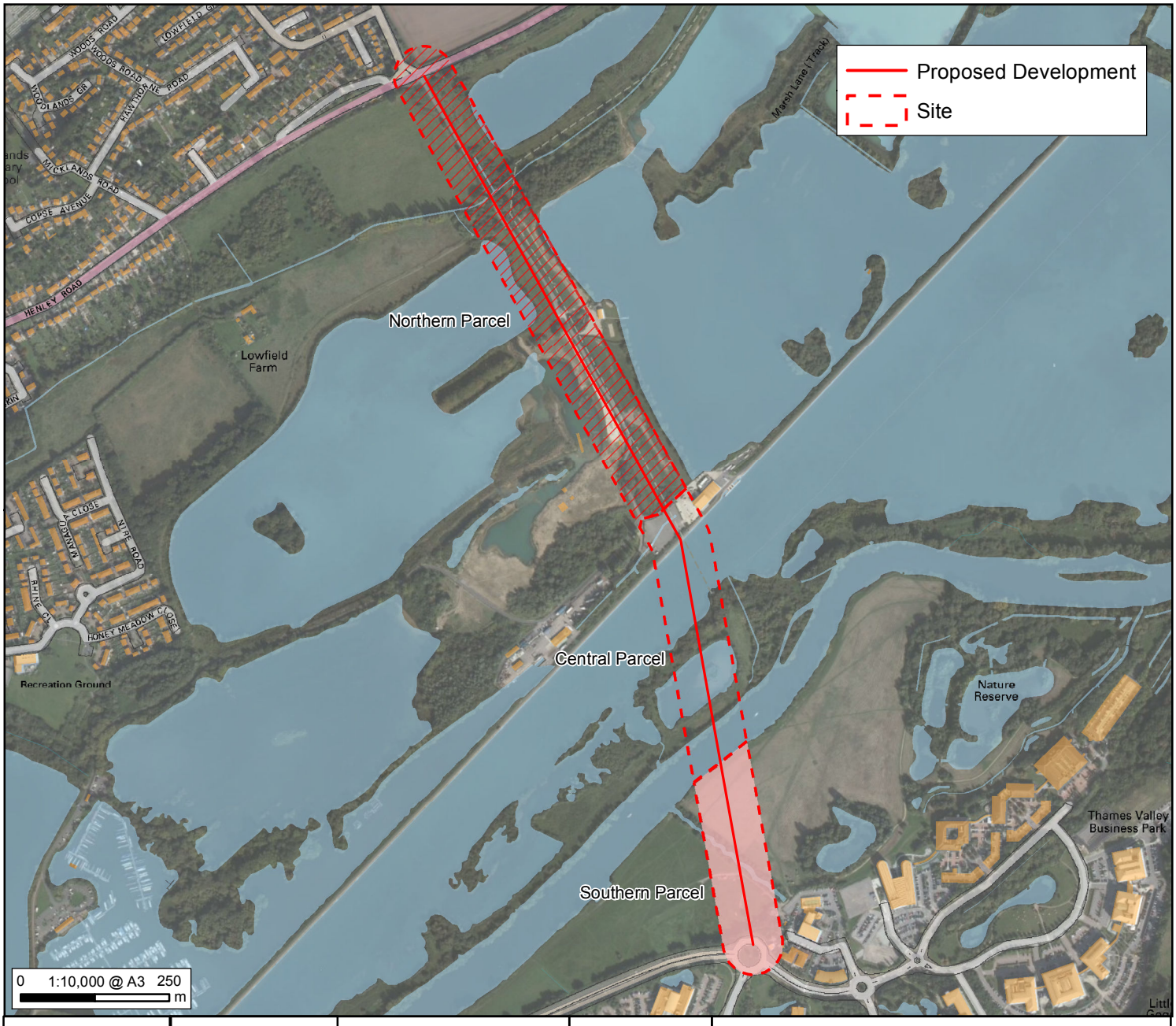

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New Thames Crossing East Reading
Proposed Site Location Plan

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Figure 1 | Rev A

Annex A Statutory Designated Sites

Table A1: Statutory Designated Sites within 2 km of the Site

Name	Status	Brief Description/Reason for Designation	Area (ha)	Approx. Distance and Direction to Site
Ali's Pond	Local Nature Reserve (LNR)	Located in an area surrounded by large private gardens and recreation fields, this are supports 18 species of dragonfly and over 40 species of aquatic/wetland plants. Local BAP species which have colonized the site include Great-crested Newt, Harvest Mouse, Stag Beetle, Song Thrush, Pipistrelle Bat and Ragged Robin.	0.43	1.7 km E
Clayfield Copse	LNR	Ancient woodland with service trees and a wild pear tree, bluebells, common orchids and wood anenomes. There are ancient boundary banks and ditches and plough baulks can be seen in the woodland.	8.65	1.7 km NW
Highwood	LNR	The site has exotic tree species which were part of an arboretum (collection of trees) in the house grounds and include giant redwoods and monkey puzzle. It also contains an example of mixed lowland woodland with an area of heathland. Birds identified include kingfisher, goosander, pochard, shoveler, cormorant, heron, grey wagtail, waxwing, treecreeper and greater spotted woodpecker,	15.23	1.6 km SE

Annex B Non-Statutory Designated Sites

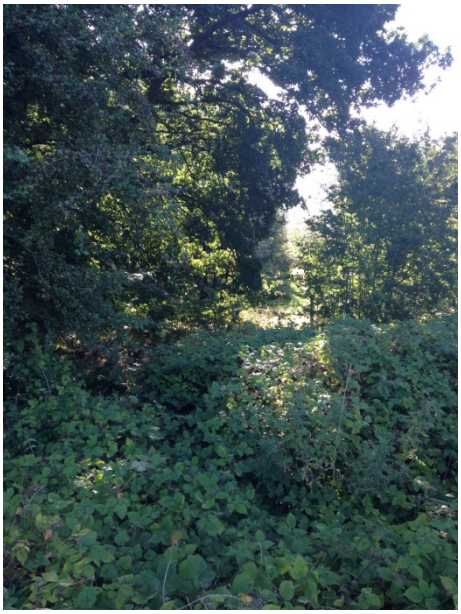
Table B1: Non-Statutory Designated Sites within 2 km of the Site

Name	Status	Brief Description/Reason for Designation	Area (ha)	Approx. Distance and Direction to Site
Henley Road Gravel Pit (and proposed extension site)	Berkshire LWS	Large pit located next to the Thames which supports a range of overwintering wildfowl as well as nationally scarce insects.	53.7	On-site
Thames Valley Park	Berkshire LWS	Thames Valley Park Nature Reserve forms part of the River Thames floodplain and consist of a mosaic of habitats including man-made lakes, wildflower seeded grasslands, ponds, planted scrub, secondary woodland and small areas of wet woodland and swamp habitat. Section 41 Habitats of Principal importance include a small area of wet woodland, fen and eutrophic standing water.	10.57	0.2 km E
Reading Cemetery	Berkshire LWS	A large, old cemetery, bound by a high stone wall, with sections of semi-improved grassland, with more diverse, flower-rich areas. Several mature and immature trees and shrubs are	4.7	1.1 km SW
The Coal, Kennetmouth and Kings Meadow East	Berkshire LWS	The Coal is an old colliery spoil site comprising a central and riverside woodland area and an area of open wayleave. Kennetmouth is a short length of towpath at the confluence of the River Kennet and the River Thames. The site is important for the presence of the nationally scarce vascular plant Loddon lily. Several slender groundhoppers (Tetrix sublata) were also known to be present; colonies of which are often isolated along the Thames Valley. Kings Meadow East is largely used for recreational	3.62	1.1 km SW

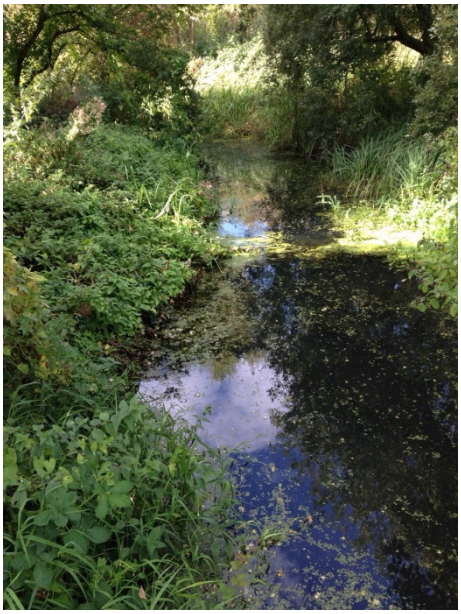
Annex C Ecological Site Walkover Survey

C.1.1 **Table C1** below provides a list of habitat types and associated photographs of habitats present on site. These are displayed on Figure 2: Phase 1 Habitat Plan.

Table C1: Phase 1 Habitat Types

Alphanumeric Code	Habitat Type	Photograph
A1.1.1	Broad-leaved semi-natural woodland. This photograph was taken at the northern extent of the Site, along the boundary with Henley Road.	
A2.1 and A2.2	Dense and scattered scrub. This photograph shows dense willow scrub establishing around one of the lakes.	
A3.1	Scattered broad-leaved trees. This was one of the mature broad-leaved trees identified to have potential roost features which may be used by bats.	

Alphanumeric Code	Habitat Type	Photograph
		
B6	Poor semi-improved grassland. This parcel of semi-improved grassland was located to the west of the Caversham Lakes access road. Scattered ruderal and scrub species were present.	
C3.1	Tall ruderal. This dense ruderal vegetation was located to the east of the Caversham Lakes access road, in an area north of the British Rowing facility.	

Alphanumeric Code	Habitat Type	Photograph
G1	Standing water. This photograph shows one of the eutrophic waterbodies present on, or in close proximity to the Site.	
G2	Running water. This photograph shows the drain that runs through the southern parcel of land, to the River Thames.	
J1.1	Arable. An arable field was located in the northern parcel of land, to the north of Henley Road.	No photograph
J1.2	Amenity grassland. This area of grassland, located within the southern parcel of land was managed for amenity purposes at the time of survey.	

Alphanumeric Code	Habitat Type	Photograph
J1.3	Ephemeral/ short perennial. To the west of the Caversham Lakes access road in the northern parcel of land, an area of recent disturbance was present. This was partially covered by hard-standing, and partially by ephemeral habitat which extended off-site.	
J4	Introduced shrub. Areas of introduced shrub planting were present on site. Those associated with the Thames Valley Business Park were dominated by native species planting.	No photograph
J2.1, J2.2 and J2.3	Intact and defunct hedgerows, and hedges and trees. A variety of hedgerows were present on the Site. This photograph shows those located to the east and west of the Caversham Lakes access road. Many were identified to be native species rich.	
J3.4 and J3.5	Fences and walls. Along with the hedgerows identified above, fences and walls delineated boundaries across the Site.	

Alphanumeric Code	Habitat Type	Photograph
J3.4	Hardstanding. Hardstanding was present across the Site, including the Caversham Lakes access road, car parks, and this area of made ground to the west of the Caversham Lakes access road.	
J3.6	Buildings. Buildings present on the Site were associated with the British Rowing facilities, the Thames Valley Business Park, and the 'Water Ski Club'. This photograph shows the British Rowing club house.	
J4	Bare ground. Areas of bare ground were present on the Site. This photograph shows are area used for car parking.	

C.1.2 Anecdotal sightings of fauna on-site included:

- American mink (*pers comms:* British Rowing staff (23rd September 2016));
- Carp *Cyprinus carpio* (*pers comms:* British Rowing staff (23rd September 2016));
- Heron *Ardea cinerea*;
- Blackbird *Turdus merula*;
- Magpie *Pica pica*;

- Moorhen *Gallinula chloropus*; and
- Wood pigeon *Columba palumbus*.

C.1.3 It was also identified that bird and bat boxes had been included within British Rowing land within the central parcel of the Site (*pers comms:* British Rowing staff (23rd September 2016)).