

7 ECOLOGY

7.1 INTRODUCTION

7.1.1 This chapter of the Environmental Statement has been produced by CSA Environmental to establish baseline ecological conditions and assess potential significant effects that may arise as a result of the project.

7.1.2 This chapter provides information on the existing ecological features at the site, and in the surrounding area (away from immediate area of construction and operation). This includes information of any statutory and non-statutory nature conservation sites, habitats of ecological importance and protected or notable species. The potential significant effects on important ecological features arising from the construction and operation of the project have been assessed based on site visits, desk studies, the collection of field data and consultation with statutory consultees (during the scoping process). Mitigation measures and enhancement measures are outlined where appropriate.

7.2 PLANNING POLICY AND GUIDANCE

Legislation

7.2.1 Legislation of particular relevance to ecology, biodiversity and development are the Conservation of Habitats and Species Regulations 2010 (as amended), which enacts the Habitats and Birds Directives into UK law, the Wildlife and Countryside Act 1981 (as amended) and regarding specific protection of badgers, the Protection of Badgers Act 1992. Legislation relating to specific protected sites, habitats and species is set out under the relevant subheadings under Baseline Conditions below and within corresponding appendices. The Natural Environment and Rural Communities (NERC) Act 2006 requires planning authorities to consider impacts on "species of principle importance for the conservation of biodiversity" when determining planning applications, as described under Biodiversity and Priority Species below. This legislation, as well as the species and habitats they afford protection to have been addressed in this chapter.

7.2.2 Natural England Standing Advice regarding protected species aims to support local authorities and forms a material consideration in determining applications in the same way as any individual response received from Natural England following consultation (except where applications require EIA or may affect a Natura 2000 site).

National Planning Policy

7.2.3 The National Planning Policy Framework (NPPF)¹ sets out the government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 11: Conserving and Enhancing the Natural Environment, paragraph 109, states that the planning system and planning policies should:

- minimise impacts on, and provide net gains in, biodiversity where possible, "contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures"; and
- recognise the wider benefits of ecosystem services.

¹ Department for Communities and Local Government, 2012. National Planning Policy Framework. London: Department for Communities and Local Government.

7.2.4 Under these aims, paragraph 117 states the need to plan for biodiversity at a landscape scale, linked to national and local targets. Paragraph 118 sets out the principles that local planning authorities should apply when determining planning applications:

- refuse planning permission if significant harm cannot be avoided, adequately mitigated, or, as a last resort, compensated for;
- encourage opportunities to incorporate biodiversity in and around developments;
- permission should not normally be permitted where an adverse effect on a nationally designated Site of Special Scientific Interest (SSSI) is likely, either individually or in combination with other developments; and
- refuse planning permission if development will result in the loss or deterioration of irreplaceable habitats, such as ancient woodland and the aged or veteran trees, unless the need for, and benefits of, the development in that location clearly outweigh the loss.

7.2.5 The core theme of the NPPF is a “presumption in favour of sustainable development” (paragraph 14). This does not however apply where Appropriate Assessment under the Birds or Habitats Directives is being considered, planned or determined (paragraph 119). Appropriate Assessment is required where a plan or project may affect a European Special Protection Area (designated SPA and proposed pSPA) or Special Area of Conservation (designated SAC and candidate cSAC), either alone or in combination with other plans or projects. Together SPA and SAC sites form a network of protected sites known as Natura 2000. Designated and proposed Ramsar sites are also attributed the same protection as Natura 2000 sites under the NPPF.

Government Circular 06/2005 Biodiversity and Geological Conservation

7.2.6 Government Circular 06/2005 which is referred to in the NPPF, provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

Local Planning Policy

7.2.7 The Site falls partly within Northampton Borough Council (Hampton Green North) and partly within South Northamptonshire Council (Hampton Green South). The relevant local planning policies are set out below.

Northampton Development Plan

7.2.8 The Development Plan is the name given to the portfolio of planning policies that are used in determining planning applications across Northampton Borough. It will consist of the following documents:

- West Northamptonshire Joint Core Strategy Local Plan (Part 1)². Adopted December 2014.
- Northampton Local Plan (Part 2)
- Northampton Gypsies, Travellers and Travelling Show People Allocations Local Plan

The West Northamptonshire Joint Core Strategy Local Plan (Part 1)

7.2.9 The West Northamptonshire Joint Core Strategy Local Plan (Part 1) was adopted in December 2014. It sets out the long-term vision and objectives for the whole of the area

² West Northamptonshire Joint Planning Unit, “West Northamptonshire Joint Core Strategy Local Plan (Part 1) Adopted” (Adopted December 2014)

covered by Northampton Borough, Daventry District, and South Northamptonshire Councils for the plan period up to 2029, including strategic policies for steering and shaping development, together with strategic site allocations. Policies of relevance to ecology, biodiversity and/or nature conservation are listed below.

- Policy BN1 - Green infrastructure connections

“Green infrastructure corridors of sub-regional and local importance as set out in figure 6 of the joint core strategy will be recognised for their important contribution to sense of place and conserved, managed and enhanced by:

1) incorporating existing and identified future networks into new development proposals;

2) securing contributions from development or other sources for the creation of and future management of the green infrastructure networks;

3) delivering long term management strategies for the sub-regional and local network.

Measures to enhance existing and provide new green infrastructure provision will:

a) be designed and delivered sustainably with prudent use of natural resources;

b) mitigate and adapt to the effects of climate change including through improved flood risk management and as a carbon store;

c) be designed to the highest quality in terms of appearance, access provision and biodiversity enhancement and protection;

d) reflect local character through the planting of native and other climate appropriate species and consideration of natural and cultural heritage features;

e) be supported by a long-term management strategy.”

- Policy BN2 - Biodiversity

“Development that will maintain and enhance existing designations and assets or deliver a net gain in biodiversity will be supported.

Development that has the potential to harm sites of ecological importance will be subject to an ecological assessment and required to demonstrate:

- **the methods used to conserve biodiversity in its design and construction and operation**
- **how habitat conservation, enhancement and creation can be achieved through linking habitats**
- **how designated sites, protected species and priority habitats will be safeguarded**

Development management decisions will reflect the hierarchy of biodiversity and geodiversity designations attaching appropriate weight to the status of the site which would be affected. In cases where it can be shown that there is no reasonable alternative to development that is likely to prejudice the integrity of an existing wildlife site or protected habitat appropriate mitigation measures including compensation will be expected in proportion to the asset that will be lost. Where mitigation or compensation cannot be agreed with the relevant authority development will not be permitted."

- Policy BN3 - Woodland Enhancement and Creation

"Measures to enhance and manage existing woodlands and create new woodlands in West Northamptonshire will be supported. Opportunities will be sought to create new woodland to buffer, extend and relink areas of ancient woodland which have become fragmented. The protection of aged or veteran trees outside ancient woodlands will also be supported. Development that would lead to further fragmentation or result in a loss of ancient woodland, aged and veteran trees will not be permitted unless the need for, and benefits of, the development in that location clearly outweigh the loss. Woodland enhancement and creation along the Yardley Whittlewood Ridge from the village of Yardley Hastings towards Towcester and Brackley will be prioritised in recognition of its importance to the character and biodiversity of West Northamptonshire."

- Policy BN4 - Upper Nene Valley Gravel Pits Special Protection Area

"New development will need to demonstrate through the development management process that there will be no significant adverse effects upon the integrity of the Special Protection Area and Ramsar Site and the species for which the land is designated including the loss of supporting habitat and impacts due to water runoff, water abstraction or discharges from the foul drainage system either as a direct result of the development alone or in combination.

New development will need to demonstrate that the impact of any increased recreational activity (indirect or direct) on the Special Protection Area and Ramsar Site will not have a detrimental impact. Any development that will lead to an increase in recreational activity on the special protection area will be required to include necessary mitigation including development of and implementation of habitat and access management plans.

In order to protect sightlines for birds included within the Special Protection Area and Ramsar Site designations, new development within a 250m zone of the Special Protection Area shown in Figure 7 of the Joint Core Strategy must undertake an assessment to demonstrate that it will not have a significant adverse effect on birds within the Clifford Hill Basin or, if directly adjacent to existing buildings, should reflect surrounding building heights."

Northampton Local Plan (Part 2)

7.2.10 The Council is preparing the new Northampton Local Plan (Part 2) which, when it comes into force, will replace the remaining Saved Policies from the Northampton Local Plan (adopted 1997)³.

Northampton Local Plan (adopted 1997) – Saved policies (2015)

7.2.11 As stated above, the current policies for Northampton are included within the saved policies of the Northampton Local Plan (adopted 1997). There are no saved policies within this document that are of relevance to ecology, biodiversity and/or nature conservation.

The Local Plan for South Northamptonshire

7.2.12 The new Local Plan will replace the previous system of Local and Structure Plans. It will consist of the following documents:

- West Northamptonshire Joint Core Strategy Local Plan (Part 1)⁴. Adopted December 2014.
- South Northamptonshire Local Plan (Part 2A).
- South Northamptonshire Gypsies, Travellers and Travelling Showpeople Local Plan (Part 2B).

The West Northamptonshire Joint Core Strategy Local Plan (Part 1)

7.2.13 Policies within the West Northamptonshire Joint Core Strategy Local Plan (Part 1) that are of relevance to ecology, biodiversity and/or nature conservation are described above.

South Northamptonshire Local Plan (Part 2A)

7.2.14 South Northamptonshire are continuing to work on the South Northamptonshire Local Plan Part 2A which will form part of the new Local Plan when it comes into force. However, the current policies for South Northamptonshire are included within the saved policies (2014) of the South Northamptonshire Local Plan (adopted 1997)⁵ (see below).

South Northamptonshire Local Plan (adopted 1997) – Saved policies (2014)

7.2.15 As stated above, the current policies for South Northamptonshire are included within the saved policies of the South Northamptonshire Local Plan (adopted in 1997). Policies of relevance to ecology, biodiversity and/or nature conservation are listed below:

- Policy EV19

“A proposal for tree felling or pruning will generally not be permitted to a tree in a conservation area or to a tree the subject of a tree preservation order except where the proposal is justified in the interests of good arboricultural practice or other clear environmental benefit.”

- Policy EV21

³ Northampton Local Plan (adopted 1997) – saved policies (2014)

⁴ West Northamptonshire Joint Planning Unit, “West Northamptonshire Joint Core Strategy Local Plan (Part 1) Adopted” (Adopted December 2014)

⁵ South Northamptonshire Local Plan (adopted 1997) – saved policies (2014)

“Development proposals will be expected to retain wherever possible, or failing that to replace, trees, hedgerows, ponds or other landscape features where they make an important contribution to the character of the area.”

- Policy EV24

“Planning permission will only be granted for development where it will not lead to the loss of, or cause significant harm to, regionally important geological and geomorphological sites and county wildlife sites. Where development is permitted the retention and protection and enhancement of such sites may be secured through planning conditions or obligations.”

7.3 ASSESSMENT METHOD

Introduction

7.3.1 The method for this assessment is based on the guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM)⁶. These guidelines provide a robust framework for ecological assessment, which has been approved by all relevant national agencies.

7.3.2 The main aims of this assessment are to:

- Consider the activities and biophysical changes likely to be associated with the proposed development and its zone of influence.
- Identify the baseline conditions within the zone of influence, with particular reference to those important ecological features that are likely to be affected.
- Describe and assess the potential effects on the structure and function of the systems on which these features depend, in the absence of mitigation.
- Describe any mitigation needed to avoid or minimise adverse effects and explain how such actions have been incorporated into the scheme.
- Describe any compensation needed where an effect cannot be reduced to an insignificant level.
- Set out the net anticipated effects of the proposed development, complete with mitigation.

7.3.3 The following documents were reviewed as part of the desk study:

- CSA Environmental’s report entitled “Land at Wootton Fields Northampton: Ecological Appraisal”, dated March 2014, which details survey work undertaken at the Site in 2013.
- Parsons Brinckerhoff’s report entitled “Land South of Brackmills (SUE): Environmental Impact Assessment”, dated March 2013 which details survey work undertaken in 2008 and 2012 of land adjacent to the Site.

Ecological Zone of Influence (Spatial Scope)

7.3.4 The EZoI is defined as the areas/resources that may be affected by the biophysical changes caused by activities associated with the proposed development. Due to the scale and nature of the proposals, the EZoI includes all land within the Site. When assessing

⁶ CIEEM (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2nd edition). Chartered Institute of Ecology and Environmental Management, Winchester.

the potential effects of the development proposals on statutory and non-statutory designated sites the following arbitrary EZoIs have been adopted:

- Internationally designated statutory sites: all land within 10km of the Site boundary.
- Nationally and locally designated statutory sites: all land within 3km of the Site boundary.
- Non-statutory designated sites: all land within 1km of the Site boundary.

7.3.5 In respect of fauna, flora and habitats, the EZoI includes all land within the Site, with a wider 2km desk study area providing contextual records of notable and protected species. In addition, for great crested newts, the EZoI was extended to include all waterbodies within 500m of the Site boundary and for badgers all publicly accessible land within 100m.

Geographic Frame of Reference

7.3.6 The Geographic Frame of Reference method is adopted for this assessment to assign importance to ecological features based on that set out in CIEEM guidelines, where ecological resources are assessed as having importance at the following levels:

- International
- National
- Regional
- County (or Metropolitan, vice-county or other local authority-wide area)
- Local

7.3.7 It should be noted that ecological features which fall short of the threshold for local importance are those considered unable, or very unlikely, to experience significant adverse effects as a result of the proposals. However, these features often have some marginal ecological importance such that they remain relevant when considering overall net gains or losses for biodiversity.

Designated Sites

7.3.8 Some sites are assigned a level of nature conservation importance through designation, and the guidelines recommend that the reasons for the designation need to be taken into account in the assessment. Such designations include:

- Internationally important sites: SACs, SPAs and Ramsar sites, including 'candidate' or 'potential' Sites (i.e. cSACs, pSACs, cSPAs and pSPAs);
- Nationally important sites such as SSSIs and NNRs; and
- Regional/County important sites.

7.3.9 Where a particular site has multiple designations, effects of the proposals are considered in respect of each of the features of each designation, carefully distinguishing between them in accordance with the respective legislation and policy.

7.3.10 The Multi-Agency Geographic Information for the Countryside (MAGIC) (2013) online database was interrogated in August 2016 to identify the following ecological features (based on the EZoI defined above):

- Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites.
- Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature reserves (LNR).
- Other relevant data e.g. Ancient Woodland Inventory.

7.3.11 Northamptonshire Biodiversity Records Centre (NBRC) was contacted for details of any non-statutory designations within 2km (based on the EZoI as designed above).

Habitats & Flora

7.3.12 The importance of areas of habitat, floral species and communities are measured against published selection criteria where available. Habitat types of European (International) conservation importance are listed on Annex I of the Habitats Directive. Habitats that are considered priorities for conservation in England are listed as habitats of principal importance under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Additional locally important habitats are listed in the Northamptonshire Biodiversity Action Plan (NBAP)⁷.

7.3.13 An extended Phase 1 Habitat survey was carried out in August 2016, with full methodologies and results provided in **Appendix 7.2**.

Fauna

7.3.14 The importance of areas for faunal species are measured against published selection criteria where available. Species of European (International) conservation importance are listed on Annexes II, IV and V of the Habitats Directive and Annex I of the Birds Directive. Species that are considered to be priorities for conservation in England are listed under section 41 of the NERC Act 2006. Additional locally important species are listed in the NBAP.

7.3.15 The importance of faunal populations are determined using existing criteria, where available, and contextual information of distribution and abundance, including trends based on historical records.

7.3.16 Certain species have legal protection under Annex IV of the EC Habitats Directive. In the UK other species are protected under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended). Where protected species are present and there is the potential for a breach of the legislation, these matters are considered, but addressed separately from ecological 'importance'.

7.3.17 NBRC was contacted for details of records for protected and notable species within 2km (based on the EZoI as defined above). Northants Bat Group was contacted for records of bats (based on the EZoI defined above). All relevant desk study data are presented in **Appendix 7.1**.

7.3.18 Consideration has been given to ensuring that land use changes do not result in contravention of laws relating to legally controlled plant and animal species under Schedule 9 of the Wildlife and Countryside Act 1981, under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 and under the Weeds Act 1959 (as Amended by the Ragwort Control Act 2003). Where appropriate measures to control such species have been identified.

7.3.19 The following detailed field survey work was carried out between June 2016 and February 2017, with full methodologies and results provided in the relevant Appendices:

- Bats (**Appendix 7.3**)
- Badger (**Appendix 7.4**)
- Dormouse (**Appendix 7.5**)
- Wintering birds (**Appendix 7.6**)

⁷ Northamptonshire Biodiversity Partnership (2009). Northamptonshire Biodiversity Action Plan. 2nd Edition (2008) v. 1.4

- Reptiles (**Appendix 7.7**)
- Great crested newt (**Appendix 7.8**)

7.3.20 A desktop search was also undertaken to identify ponds within 500m as EZoI defined above which may have potential to support breeding great crested newts, using Ordnance Survey mapping, the MAGIC database and aerial photography.

Assessment of Significant Effects

7.3.21 Potential effects on ecological features have been assessed in the context of how the predicted baseline conditions within the EZoI might change between the surveys and the start of construction.

Temporal Scope

7.3.22 Effects have been assessed at the following stages:

- During construction: including any vegetation clearance, ground works and construction of infrastructure, dwelling, community facilities and landscaping of open space;
- In-operation: during occupation of new dwellings and use of community/other facilities;

7.3.23 It is anticipated a work programme will commence from 2019 onwards.

Characterising Effects

- The following attributes are used to describe nature of any significant effects:
- Beneficial (positive) or adverse (negative);
- Extent (e.g. length [ha] or area [km²]) or quantity (e.g. population numbers)
- Duration (e.g. years) or timing (e.g. season)
- Frequency (e.g. no. of operations) and/or reversibility (e.g. irreversible)

7.3.24 The level of significance for effects are defined according to geographic frame of reference as described above (i.e. effect significant at the International, National, Regional, County or Local Level).

Assessment of Cumulative Effects

7.3.25 The following types of actions which can cause cumulative effects were considered:

- Additive/incremental - refers to multiple activities/projects (each with potentially insignificant effects) which when added together give rise to a significant effect due to proximity in time and space. The effect may be additive or synergistic.
- Associated/connected - refers to a development activity which 'enables' another development such as phased development as part of separate planning applications.

7.3.26 The following types of future development projects within the same zone of influence were considered:

- proposals for which consent has been applied which are awaiting determination in any regulatory process;
- projects which have been granted consent but have not yet been started or which have been started but are not yet completed;
- proposals which have been refused permission but which are subject to appeal and the appeal is undetermined; or

- proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority.

Determining Significance

7.3.27 The significance of an ecological effect, whether beneficial or adverse, has been assessed in accordance with the CIEEM guidelines. An effect is considered to be significant if it is sufficiently important to require assessment and reporting.

Assumptions / Limitations

7.3.28 There were no limitations to the survey work in terms of access to the Study Area. All surveys have been undertaken in suitable weather conditions at optimum times of year following recognised guidance.

7.3.29 It should be noted that owing to the seasonality of some species, as well as the ability for some species to quickly colonise sites, the absence of evidence of any particular species from within the Site should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, it is considered that the results of the Phase 1 survey and additional Phase 2 surveys undertaken in 2016 are sufficient to have allowed for the identification of the habitats and the presence or likely absence of legally protected species and other important ecological features within the Site.

7.3.30 Breeding bird surveys were not completed in 2016, with data relied upon from 2013. Given that baseline conditions of habitats and other species have not varied significantly in the intervening time, it is not anticipated that there has been a material change in the importance of the Site in respect of breeding birds.

7.4 BASELINE CONDITIONS

Site Description and Context

7.4.1 The Site itself comprises two parcels of land: Hampton Green North and Hampton Green South. Hampton Green North (c. 6.8ha) is located immediately to the north of The Green (highway) and is dominated by a single arable field. Hampton Green South (c. 18.1ha) was an area formerly landscaped as a golf course immediately to the south of The Green and is dominated by semi-improved grassland and broadleaved plantation woodland. The fields are bound by hedgerows with occasional trees. The habitats present at the Site have not changed significantly to those recorded at the Site in 2013 (see CSA Environmental's report entitled "Land at Wootton Fields, Northampton: Ecological Appraisal", dated March 2014).

7.4.2 The Site is situated on the south-eastern outskirts of Northampton. Agricultural land dominates to the east and south. Brackmills Small Wood Potential Wildlife Site (PWS) is situated adjacent to the northern boundary of the Site with Brackmills County Park (c. 120ha) and Brackmills Industrial Estate beyond. Brackmills Small Wood PWS comprises a small, mature broadleaved woodland. Brackmills Country Park comprises a large area of woodland and grassland wrapping around the Brackmills industrial estate.

Designations

7.4.3 There are no statutory nature conservation designations present on or immediately adjacent to the Site. However, a non-statutory designation, Brackmills Small Wood PWS, is located immediately adjacent to the northern boundary of the Site and several statutory and non-statutory nature conservation designations occur within the data search radii as summarised in Table 7.1 below (for map see **Appendix 7.1**):

Table 7.1: Statutory and Non-Statutory Designations within Search Area(s) [Radii from Survey Area]

Site Name & Designation	Distance & Direction from Survey Area	Brief Description of Designated Site	Level of importance
Internationally Important Designations within 10km			
Upper Nene Valley Gravel Pits SPA/Ramsar	c. 2.0km north	Disused sand and gravel pits extending for c. 35km the River Nene. An extensive series of shallow and deep open waters in association with a wide range of marginal features. Qualifying features: populations of over-wintering and migratory birds; over-wintering populations of bittern <i>Botaurus stellaris</i> and golden plover <i>Pluvialis apricaria</i> and migratory populations of gadwall <i>Anas strepera</i> . See wintering bird survey results below which identify fields adjacent to the Site as providing supporting habitat (feeding) in respect of golden plover and lapwing.	International (European)
Nationally Important Designations within 3km			
Upper Nene Valley Gravel Pits SSSI	c.2.0km north	As above, but including a number of associated habitat areas.	National
Locally Important Designations within 3km			
Barnes Meadow LNR	c. 1.8km north	Three meadows on either side of the Nene; a wide range of grassland and wetland habitats; redundant arm of the Nene, the river itself, Hardingstone Dyke and a variety of ditches and shallow scrapes.	County
Non-statutory Designations within 1km			
Brackmills Small Wood PWS	Adjacent to northern boundary	Mature broadleaved woodland; a sufficient variety of species to meet LWS criteria, however no official survey; Suggested to just meet the Criteria under 'Woodland, Trees and Shrubs: 3ii' as it includes 31 of the woodland plants listed (30 threshold).	County
Brackmills Woods South PWS	c. 0.2km north-east	Plantation and grassland habitat. Part of Brackmills Woods.	Local
Coca Cola field PWS	c. 0.3km north-west	Broad habitat, area of scrub and mixed grasses.	Local
Brackmills track PWS	0.7km north	Trackway; approaches LWS standard for number of neutral grassland species and connectivity to the surrounding habitats.	Local
Brackmills Woods south west PWS	0.6km north-west	Scattered trees over predominantly herb-poor grassland. Site not of LWS standard but may contribute to Green Infrastructure.	Local
Brackmills grassland PWS	0.9km north-east	Grassland of low botanical value, with some areas seeded with wildflower mix, and a marshy area. Lake present stocked with carp. Site not of LWS standard but may contribute to Green Infrastructure.	Local
Brackmills Woods Roundabout PWS	0.9km north-west	Part of Brackmills Woods.	Local
Brackmills Woods West PWS	1km north-west	Recent plantation.	Local
Disused Railway line west of Great Houghton PWS	1.3km north-east	Steep-sided wooded banks, supporting wetland flora and woodland species.	County

Habitats and Flora

7.4.4 The findings of the extended Phase 1 Habitat survey are mapped in **Figure 7.1** at **Appendix 7.2** and described below.

Desk Study

7.4.5 NBRC have provided records for two notable flowering plants: bluebell *Hyacinthoides non-scripta* and fringed water-lily *Nymphoides peltata*. Bluebell was not recorded at the Site at the time of survey, including in any hedgerow or woodland habitats. Fringed water-lily was not recorded at the Site at the time of survey and habitats present at the Site are considered unsuitable for this species.

7.4.6 NBRC have provided records for two notable mosses. Only a single species, lesser screw-moss *Syntrichia virescens*, is of potential relevance to the Site, although is not thought to be present.

Poor Semi-improved grassland

7.4.7 The largest land parcel, Hampton Green South, is understood to have been landscaped for golf course use, with extensive seeding of grassland seed mixes. Hampton Green South is now dominated by poor semi-improved grassland. Given the high levels of alteration of this habitat (i.e. due to its use as a landfill Site and golf course landscaping) the origin of the grassland (i.e. calcareous/neutral/acidic) is difficult to establish, although nutrient levels appear to be high (i.e. vigorous grass/weed growth). The species recorded during the current survey are synonymous with the previous survey undertaken in 2013. The grassland is dominated by common grasses (including cock's-foot *Dactylis glomerata*, perennial rye-grass *Lolium perenne*, Yorkshire-fog *Holcus lanatus* and smooth meadow-grass *Poa pratensis*), supports a reasonable diversity of forbs and has a high frequency of undesirables (predominantly bristly oxtongue *Picris echinoides*). A very low number of neutral and calcareous grassland indicator species are present including bee orchid *Ophrys apifera**, which was recorded along the road verge adjacent to H5. A route at the periphery of the grassland has been trampled by walkers and as such comprises species typical of more disturbed ground including annual meadow grass *Poa annua* and red bartsia *Odontites vernus*.

7.4.8 A total of 64 grassland species were recorded at the Site at the time of survey, well above the threshold of 50 required to meet County Wildlife Selection criteria for both 'calcareous grassland' and 'neutral grassland'. However, the grassland has undergone extensive alteration and supports an abundance of coarse grasses and 'undesirables' and as such the grassland is considered 'poor' in nature. In addition, the grassland is unlikely to meet the criteria for any Section 41 habitat of principal importance or Northamptonshire BAP habitat such as "lowland meadow" or "lowland calcareous grassland". As such, this habitat at the Site is not considered to be of ecological importance beyond the Local Level.

Arable

7.4.9 Hampton Green North is dominated by intensively managed cultivated arable land. A wheat crop was in cultivation at the time of survey (2016). Occasional common arable weeds, including black-grass *Alopecurus myosuroides*, wild-oat *Avena fatua*, common field-speedwell *Veronica persica* and creeping thistle *Cirsium arvense* were recorded within the wheat crop. The narrow, species-poor field margins are dominated by common grasses with occasional tall ruderal species such as common nettle *Urtica dioica*. These field

* It should be noted that bee orchid is an opportunistic orchid species, which appears within grassland swards under moderately disturbed conditions and is often out-competed when grasslands develop. Unlike some other orchid species, bee orchid does not have strong mycorrhizal associations and therefore isn't reliant on well-established, and often important, habitats/conditions.

margins do not meet the criteria for the section 41 habitat of principal importance "arable field margins" because they are not managed specifically to provide benefits to wildlife.

7.4.10 In summary, given this habitat at the Site is dominated by an intensively managed crop monoculture, this habitat is considered to fall short of the threshold for local importance.

Off-site Semi-natural broadleaved woodland

7.4.11 Immediately adjacent to the northern boundary of Hampton Green North is a c 1.5ha of semi-natural broadleaved woodland. This woodland is designated as Brackmills Small Wood Potential Wildlife Site (PWS) and is of older (unlikely ancient) origin than the other surrounding woodland. The canopy is dominated by pedunculated oak and ash. A reasonably developed understory is present comprising common and widespread species, predominantly hawthorn *Crataegus monogyna*. The ground flora comprises common and widespread species typically associated with woodlands and is dominated by ivy *Hedera helix*.

7.4.12 A small number of Northamptonshire ancient woodland indicator species (field maple *Acer campestre*, pendulous sedge *Carex pendula*, hazel *Corylus avellana* and spindle *Euonymus europaeus*) were recorded in association with the woodland. However, these species are commonly found in recently planted woodland and in the absence of any more conclusive evidence, the woodland is not considered to be ancient. "Lowland mixed deciduous woodland" is a priority habitat under the Section 41 list of the NERC Act 2006 and is included within Northamptonshire Biodiversity Action Plan. Taking into account all species recorded during the current survey and the previous survey undertaken in 2013, based on the Selection Criteria for Local Wildlife Sites in Northamptonshire the woodland just meets the Criteria under 'Woodland, Trees and Shrubs: 3ii' as it includes 31 of the woodland plants listed. A minimum of 30 is required to qualify. The woodland is therefore considered to be of ecological importance at the County Level.

Broadleaved plantation woodland

7.4.13 Young broadleaved plantation woodland is present within Hampton Green South. This habitat is primarily located at the periphery of the land parcel and is understood to have been planted, c. 12 years ago, as part of the golf course landscaping. The species composition includes a good variety of predominantly native woody species, although many are not native or of local provenance (e.g. sea-buckthorn).

7.4.14 The ground flora of the broadleaved plantations is generally dominated by common shade-tolerant species including common nettle and cow parsley *Anthriscus sylvestris* as well as species associated with the adjacent grassland. Given the young age of the broadleaved plantation coupled with the species composition of common and widespread species, this habitat is considered to fall short of the threshold for Local importance.

Scrub

7.4.15 Patches of continuous scrub are present at the Site, predominantly at the periphery of Hampton Green South, comprising dense bramble *Rubus fruticosus* agg. and blackthorn *Prunus spinosa*. This habitat at the Site is considered to fall short of the threshold for Local importance.

Tall ruderal

7.4.16 Occasional tall ruderal vegetation, dominated by common nettle, is present at the Site, notably associated with hedgerow H2. This habitat at the Site is considered to fall short of the threshold for local importance.

Hedgerows

7.4.17 There are ten hedgerows present at the Site labelled H1-H10 on **Figure 7.1** at **Appendix 7.2**.

7.4.18 A hedgerow survey was undertaken at the Site in 2013 which found six out of the ten hedgerows at the Site (H1, H3, H4, H5, H6 and H8) to be 'important' when assessed against ecological criteria set out in the Hedgerows Regulations, 1997. The hedgerows appear unchanged from the descriptions set out within the previous reports.

7.4.19 The majority of the hedgerows at the Site are dense and continuous, save for H2 which has large gaps. The hedgerows within the Hampton Green North are managed through flail cutting whilst hedgerows within Hampton Green South appear to have received no recent management, save for those that run adjacent to the road. The ground flora of the hedgerows is generally restricted to common shade-tolerant species. Ancient woodland indicator species such as lords-and-ladies *Arum maculatum*, herb-Robert *Geranium robertianum* and wood avens *Geum urbanum* were recorded in association with most of the hedgerows at the Site save for H7. Bee Orchid was recorded in association with H5.

7.4.20 All hedgerows "consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species" are covered by the UK BAP Priority Habitat 'Hedgerows'. As such, all hedgerows within the site would likely qualify as Priority Habitats. In addition, the Hedgerow Survey Handbook⁸ defines a species-rich hedgerow as that which contains at least 5 woody species which are native somewhere in the UK, and as such all hedgerows at the Site are species-rich. However, only hedgerows H1, H3 and H4 would qualify as Northamptonshire BAP habitats. Based on the detailed hedgerow survey data collected in 2013, the remaining hedgerows would not qualify under the definition of Northamptonshire BAP habitat for hedgerows given that they comprise fewer than five woody species per 30m. None of the hedgerows present at the Site meet the Selection Criteria for Local Wildlife Sites in Northamptonshire.

7.4.21 Given the favourable condition and species-richness of the hedgerows at the Site coupled with the connectivity of these hedgerows within the Site and to the surrounding habitat, the hedgerow network is considered to be of ecological importance at the Local level.

Trees

7.4.22 There are numerous trees present at the Site. These are largely present within the broadleaved woodland, broadleaved plantations and hedgerows and as such are assessed under the corresponding headings above. In addition, a small group of semi-mature/mature willow *Salix* sp. are present towards the western corner of Hampton Green South. In accordance with standard guidelines⁹, none of the trees present at the Site are considered to be veteran or truly ancient. All mature/semi-mature trees at the Site, given their size and age, likely contribute to the biodiversity of the local area and as such are considered to be of ecological importance at the Local Level, unless classified as being of greater importance under the habitats discussed above.

Invasive species

7.4.23 Occasional stands of Japanese knotweed *Fallopia japonica* are present towards the eastern and southern boundaries of Hampton Green South, adjacent to the broadleaved

⁸ Defra (2007). "Hedgerow Survey Handbook: A standard procedure for local surveys in the UK" (2nd Ed).

⁹ Read, H. (2000) "Veteran trees: a Guide to good management". English Nature. Peterborough. adapted from Mitchell, A.F., (1974). "A Field Guide to the trees of Britain and Northern Europe". Collins, London.

plantation. Japanese knotweed is an invasive, non-native species listed under Schedule 9 Part II of the Wildlife and Countryside Act, 1981 (as amended). It is an offence to cause to grow in the wild any plant listed under this schedule.

Fauna

Bats

Desk Study

7.4.24 Northants Bat Group have provided 43 records of bats from within the search area dating from 1981 to 2011 and covering the following species: common pipistrelle *Pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, noctule *Nyctalus noctula*, Natterer's bat *Myotis nattereri*, Daubenton's bat *Myotis daubentonii* and Pipistrelle *Pipistrellus* sp. The closest records occur within a 1km grid-square c. 600m west of the Site and include a Pipistrelle roost dating to 1987; and foraging brown long-eared bat, Daubenton's bat, Natterer's bat and noctule, all dating to 2011. Given the resolution of the data provided, precise locations for these records could not be determined.

Use of the Site

Foraging / commuting

7.4.25 Linear habitats at the Site including hedgerows, woodland edge and wooded belts provide navigational features for commuting bats. These habitats, as well as the semi-improved grassland at the Site also provide foraging opportunities for bats.

7.4.26 Given the bat foraging/commuting potential at the Site, further surveys were undertaken in the form of remote monitoring and bat activity transect surveys, the full results of which are provided in **Appendix 7.3**.

7.4.27 In summary, data from these further surveys confirms use of the Site by at least six species of bat including common pipistrelle, soprano pipistrelle, noctule, *Myotis* sp., brown long-eared bat and barbastelle; as well as *Nyctalus* sp. and *Nyctalus* sp./*Eptesicus* sp. Bat activity at the Site was dominated by common bat species. Common pipistrelle was by far the most frequently recorded bat species at the Site as a whole, although at Monitoring Point (MP) 1 greater numbers of Soprano pipistrelle (average of 9.77 passes per hour) than common pipistrelle (average 5.78 passes per hour) were recorded. Soprano pipistrelle was the second most common bat species recorded at the Site, followed by noctule. Barbastelle *Barbastella barbastellus* was the least recorded species, with only a single contact recorded during the transect surveys (on 30th August along the eastern boundary of Hampton Green North) and nine contacts recorded during the static surveys (four at MP1, four at MP2 and one at MP3). Bat activity recorded during the transect surveys was generally focused along hedgerows and within the woodland/woodland edge with markedly less activity recorded in open areas. The greatest level of activity was recorded within the woodland adjacent to the northern Site boundary and along the eastern boundary of Hampton Green North, thereby suggesting that this boundary is an important navigational corridor for bats travelling to/from the woodland. During the static monitoring surveys the highest number of bat passes was recorded at MP1 located on the woodland edge, closely followed by MP3 located along the hedgerow that dissects Hampton Green South. Markedly fewer bat passes were recorded at MP2 located along the southern boundary of the Hampton Green North (adjacent to The Green) and MP4 located along the south-western boundary of the Hampton Green South (adjacent to Newport Pagnell Road (B526)).

7.4.28 There is potential for the woodland at the northern Site boundary to meet Local Wildlife Site Selection Criteria should it support swarming, breeding and/or hibernation bat roosts. Furthermore, should the woodland be found to support breeding roosts of certain species (such as noctule, brown long-eared bat or barbastelle), the connected continuous hedgerow along the eastern Site boundary could also potentially meet the criteria. The remainder of the Hampton Green North and Hampton Green South are considered unlikely to meet Local Wildlife Site Selection criteria. Nonetheless, given the habitats present and the diversity of bat species recorded at the Site, in combination with the presence of barbastelle (which is considered to be one of the UK's rarest bat species), albeit in very low numbers, the bat foraging/commuting interest at the Site is considered to be of importance at the Local Level.

Roosting

7.4.29 The results of the preliminary ground level roost assessment PRF inspection survey are provided at **Appendix 7.3**. In summary, six trees at the Site have Moderate potential to support roosting bats, six trees at the Site have Low potential and the remaining trees at the Site are of Negligible potential.

7.4.30 However, no bat roosts were confirmed at the Site during bat activity surveys or inspection of trees.

Badger

Desk Study

7.4.31 No records for badger *Meles meles* were returned from NBRC. However, the Hardington SUE ES Chapter¹⁰ reports a large badger sett comprising 35 entrances located c. 0.7km west of the Site, which was recorded to be active in 2012.

Use of the Site

7.4.32 Given the habitats present, the vast majority of the Site offers potential opportunities for foraging badgers. The results of the badger survey are presented at **Appendix 7.4** and generally accord with the findings of the previous survey undertaken at the Site in 2013. In summary, west of the Site and evidence of use of the Site by badgers was recorded in the form of latrines, mammal pathways and a camera trap recording. Badgers are therefore considered to utilise the Site for foraging and could potentially dig setts.

7.4.33 Badgers are common and not considered to be of conservation concern. However badgers and their setts are protected under the Protection of Badgers Act 1992 and are therefore included in the assessment of effects below in the context of this legislation.

Dormouse

Desk Study

7.4.34 Dormice *Muscardinus avellanarius* have a patchy distribution across Northamptonshire, with the only known populations (away from Rockingham Forest) to the south of the county occurring near remnant semi-natural ancient woodland around Towcester to the south-west and across Rockingham Forest to the north-east of the county. The status of dormice in nearby Salcey Forest (c. 4km south) is unknown, with historic positive records but more recent negative records. No records for dormouse were returned from NBRC from within the search radius. However, the Hardington SUE ES

¹⁰ Parsons Brinckerhoff, (2013). Land South of Brackmills (SUE): Environmental Impact Assessment.

Chapter¹¹ includes a record for a single dormouse nest located c. 0.15km west of the Site which was recorded during specific surveys undertaken in 2012. The nest was recorded within a hedgerow which is directly connected with the Site.

Use of the Site

7.4.35 The hedgerows and woodlands at the Site provide potential habitat for dormouse and as such, specific surveys were undertaken at the Site in 2016 (see **Appendix 7.5**). Whilst a single record for a dormouse nest is present within habitat immediately adjacent to the Site, extensive surveying of the Site in both 2013 and 2016 has revealed no evidence of dormouse. As such, dormice are considered likely absent from the Site. It is therefore concluded that the Site falls short of the threshold for local importance for this species

Water Vole and Otter

Desk Study

7.4.36 No records for either water vole *Arvicola amphibius* or otter *Lutra lutra* were returned from NBRC.

Use of the Site

7.4.37 Given the absence of watercourses within/adjacent to the Site, the Site is considered entirely unsuitable for riparian species including water vole and otter. It is therefore concluded that the Site falls short of the threshold for local importance for these species

Brown Hare

Desk Study

7.4.38 No records of brown hare *Lepus europaeus* were returned from NBRC.

Use of the Site

7.4.39 No evidence of brown hare, which is a Priority Species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, was recorded at the Site during the various Site visits. However, the majority of the Site, being dominated by grassland and arable land, provides potential opportunities for brown hare. Therefore, in principle, brown hare could potentially make use of the habitats at the Site. However, given the vast amount of similar habitats available in the wider landscape, the Site is considered unlikely to be of significant importance for this species.

Hedgehog

Desk Study

7.4.40 A single record of hedgehog *Erinaceus europaeus* was returned from NBRC, located c. 1.4km west of the Site, dating to 1995.

Use of the Site

7.4.41 The vast majority of the Site, including the grassland, woodland, hedgerows and scrub, provides opportunities for foraging/sheltering hedgehog. Further opportunities for

¹¹ Parsons Brinckerhoff, (2013). Land South of Brackmills (SUE): Environmental Impact Assessment.

this species are afforded by adjacent off-site habitats including residential gardens to the south-west and agricultural land to the east. However, no confirmed evidence or sighting of hedgehog was recorded and therefore effects cannot be definitively assessed. Measures to ensure small mammals, such as hedgehog, can continue to make use of much of the site have been included herein, such as gaps in fencing of new private gardens.

Harvest Mouse

Desk Study

7.4.42 No records of harvest mouse *Micromys minutus* were returned from NBRC.

Use of the Site

7.4.43 The habitats within Hampton Green North are subject to agricultural management including flailing of hedgerows and intensive management of arable crops. As such, given the management of the habitats present, Hampton Green North is considered sub-optimal for harvest mouse. The majority Hampton Green South, being comprised of tall sward grassland provides potential opportunities for this species which species favours areas of tall grasses as well as reeds, cereals, road side verges, hedgerows, reed beds, dykes and salt marshes where nests can be built. As such, there is potential, in principle, for harvest mouse to be present within Hampton Green South. However, no confirmed evidence or sighting of harvest mouse was recorded and therefore effects cannot be definitively assessed. Measures to ensure small mammals, such as harvest mouse, can continue to make use of much of the site have been included herein, such as provision of attenuation basins with reed habitats.

Birds

Desk Study

7.4.44 NBRC have provided 26 records of 15 bird species from within the search area dating from 1982 to 2014. Those of potential relevance to the Site include redpoll *Carduelis flammea*, cuckoo *Cuculus canorus*, hobby *Falco subbuteo*, kestrel *Falco tinnunculus*, yellow wagtail *Motacilla flava*, spotted flycatcher *Muscicapa striata*, bullfinch *Pyrrhula pyrrhula*, turtle dove *Streptopelia turtur* and lapwing *Vanellus vanellus*.

Use of the Site

7.4.45 The habitats present at the Site offer foraging and sheltering opportunities for common garden, woodland and farmland birds.

7.4.46 Breeding bird surveys undertaken at the Site in 2013 (see **Appendix 7.9**) identified six species of conservation concern that were confirmed breeding at the Site: bullfinch, dunnock *Prunella modularis*, song thrush *Turdus philomelos*, skylark *Alauda arvensis*, yellowhammer *Emberiza citrinella* and common whitethroat *Sylvia communis*. Overall, the breeding bird assemblage at the site was considered to be of importance at the Local level.

7.4.47 Given the proximity of the Site to the Upper Nene Valley Gravel Pits SPA, which is designated for its overwintering populations of bittern *Botaurus stellaris* and golden plover *Pluvialis apricaria* and migratory populations of gadwall *Anas strepera*, there is potential for birds from the SPA to utilise surrounding arable habitat, including that located within the Site, for foraging.

7.4.48 The Supplementary Planning Document for the Upper Nene Valley Gravel Pits SPA¹² States:

“Some species, principally golden plover *Pluvialis apricaria* and lapwing *Vanellus vanellus* spend a proportion of their time away from the SPA feeding or roosting on surrounding agricultural land or the River Nene. Ensuring that key areas are not affected by developments occurring outside the SPA is paramount. Specific species surveys may therefore be required outside the SPA boundaries.”

7.4.49 As such, loss of ‘supporting habitat’ such as feeding areas outside of the SPA is considered a threat to the integrity of the SPA. In a desk study undertaken by Environ in 2010¹³, the Site, with the exception of the woodland in the very north, was classified as being ‘sub-optimal’ for golden plover. The woodland was identified as being unsuitable for golden plover. The majority of the surrounding land was classified as either sub-optimal or optimal for golden plover. As such, wintering bird surveys, including targeted golden plover surveys to locate feeding birds was undertaken at the Site and surrounding fields in winter 2016/17, to establish whether the Site and/or surrounding habitat provides important ‘supporting habitat’ for the SPA.

7.4.50 The results of the wintering bird survey are provided at **Appendix 7.6**. In summary no golden plover or lapwing were recorded at the Site. However, golden plover flocks were recorded within arable fields to the east of the Site during two (possibly three) of the six survey visits (30 November 2016, 20 December 2016 and possibly 31 January 2017). The peak count recorded was c. 380 golden plover on 20 December in a mixed flock with c. 330 lapwings. A single lapwing was also recorded in the arable field to the west of the Site on the same survey visit. In addition, lapwing were recorded on two further occasions in arable fields to the east of the Site, including a flock of 12 individuals on 30 November 2016 and 101 individuals (divided between two separate flocks) on 31 January 2017. The whilst the Site is therefore not considered to provide ‘supporting habitat’ for the SPA, adjacent land to the east does provide the requisite feeding habitat for golden plover and lapwing.

7.4.51 A total of 29 species of bird were recorded within the Site itself including seven species of conservation concern; four Red Listed species (yellowhammer, skylark, linnet *Carduelis cannabina* and song thrush) and three Amber Listed species (dunnock, bullfinch and reed bunting *Emberiza schoeniclus*). Given that the total number of species recorded was 29, in accordance with Fuller, 1980¹⁴ (see Table 7.2 below) the wintering bird assemblage at the Site is of importance at the Local Level.

Table 7.2. Assessment criteria for wintering bird assemblage at site

Importance	Number of wintering bird species
Local	25-54
County	55-84
Regional	85-114
National	115+

Reptiles

¹² “Upper Nene Valley Gravel Pits Special Protection Area: Supplementary Planning Document” (August 2015).

¹³ Environ (2010). “Survey Work to Support the Appropriate Assessment for the West Northamptonshire Joint Core Strategy: Report of Elements 3 & 4”.

¹⁴ Fuller, R.J., (1980), A method for assessing the ornithological interest of sites for conservation. *Biological Conservation* 17: 229-239

Desk Study

7.4.52 NBRC have provided two records of a single reptile species, grass snake *Natrix natrix*, from within the search area, dating to 1958-1964 and 1990. Both records are located within a 1km grid-square c. 0.5km north-west of the Site. Given the resolution of the data provided, precise locations for these records could not be determined.

Use of the Site

7.4.53 Hampton Green North, being dominated by intensively managed arable land provides very limited opportunities for reptiles. However, woodland edge habitats in the very north of the Site provide potential opportunities for this species group. Hampton Green South, comprising extensive tall sward grassland provides potential foraging opportunities for this species group. In addition the hedgerow bases, plantation woodland and various brash piles within Hampton Green South provide numerous sheltering opportunities. As such a presence/likely absence survey was undertaken at the Site in July-September 2016 (see **Appendix 7.7**) during which no reptiles were recorded. This updates the previous reptile survey undertaken at the Site in 2013 which recorded a single adult grass snake. It was therefore suggested that in 2013 grass snake were present at the Site at a very low density. However, the presence of aquatic/wetland habitats at the Site is likely to limit opportunities for this species to hunt. In any case, the current survey suggests reptiles are likely absent from the Site. It is therefore concluded that the Site falls short of the threshold for local importance for this group.

AmphibiansDesk Study

7.4.54 NBRC have provided two records of two amphibian species, common toad *Bufo bufo* and great crested newt *Triturus cristatus*, dating from 1992 and 2007 respectively. The record for common toad is located c. 1.7km north-west. The record for great crested newt is located c. 0.7km south-west.

Use of the Site

7.4.55 Extensive optimal terrestrial habitat, in the form of tall sward grassland, scrub, plantation woodland and hedgerow bases, is available for this species group within the Hampton Green South. These habitat types provide potential foraging and sheltering opportunities for this group. Hampton Green North, being dominated by intensively managed arable land provides far more limited opportunities for this species group. In terms of potential breeding opportunities, a single pond (P2) is present within the Site and a further two ponds (P1 and P3) are present within 500m of the Site boundary. Therefore further assessment was undertaken in 2016 to determine the presence of great crested newt (GCN) and other amphibians (see **Appendix 7.8**).

7.4.56 Despite the HSI assessment of off-site P1 finding the pond to be of 'excellent' suitability for GCN, the eDNA result was negative for this species. The HSI assessment of on-site P2 found the pond to be of 'poor' suitability for GCN and the eDNA result was negative. In addition, P2 only held a very small quantity of water at the time of survey and was found to be dry for much of the year. P3 was dry at the time of survey and as such was excluded from assessment. Given the negative eDNA results, GCN are considered likely absent from the Site. This accords with traditional presence/likely absence surveys undertaken in 2013, which found GCN likely absent from the Site.

7.4.57 A large number of common toad, toad spawn and toad tadpoles were observed within off-site P1 (located within Brackmills Country Park) at the time of the 2013 surveys. The pond was not visited early enough in the year in 2016 to establish whether common

toads continue to be present within this pond. However, given that conditions have not changed significantly since the 2013 survey, P1 is considered to continue to support a breeding population of common toad. Given the proximity of P1 to the Hampton Green North, it is considered likely that common toad utilise the woodland off-site to the north of the Site and potentially the field margins for foraging/sheltering/hibernation. However, no confirmed evidence or sighting of common toad was recorded at the Site and therefore effects on this species cannot be definitively assessed. Measures to encourage amphibians, including common toad, to colonise the Site been included herein, such as provision of aquatic habitats with associated drainage features.

Invertebrates

Desk Study

7.4.58 NBRC have provided 32 records of 27 notable butterflies and moths from within the search area dating from 1882 to 2012. All records returned are given to a 10km grid-square only, save for cinnabar *Tyria jacobaeae* which is located c.0.6km north of the Site.

Use of the Site

7.4.59 Given the extent and type of common habitat types present, the Site is expected to support a range of common invertebrate species, primarily associated with the combination of grassland, hedgerow and woodland habitats. However there is no indication that the Site would support a particularly notable or diverse invertebrate assemblage given the absence of abundant nectar sources, particularly rich/diverse flora or other important invertebrate features (e.g. aquatic habitats, bare ground).

Summary

7.4.60 Important ecological features have been evaluated and assigned a level of ecological importance, as summarised in Table 7.3.

Table 7.3 Evaluation of Important Ecological Features (Sensitive Receptors)

Level of Importance	Important Ecological Features (& potential pathways of impact)
International	No species or habitats are present on-site that are considered to be important at the international level. 1. Off-site Upper Nene Valley Gravel Pits SPA/Ramsar is situated c. 2.0km north of the Site. Potential significant adverse effects on the SPA/Ramsar arising from the development include: from: <ul style="list-style-type: none"> Increased disturbance to water birds (e.g. from increased recreation) (It is considered that the Site does not provide important supporting habitat for the SPA (see wintering bird section above) and as such loss of 'important habitat' outside of the SPA is not a potential adverse effect.)
National	No species or habitats are present on-site that are considered to be important at the national level. 2. Off-site Upper Nene Valley Gravel Pits SSSI is situated c. 2.0km north of the Site. A High Condition Threat Risk has been identified in 8 of the 9 units that make up this SSSI. Lack of, or inappropriate, management is cited as a threat for many of the units. In addition, recreational disturbance (in particular dog walkers) is cited as a threat risk for the Clifford Hills Gravel Pits unit (001) and a 'need to monitor' recreational importance has been highlighted for the Stanwick Gravel Pits (006) and Thrapston Gravel Pits (008) units. Therefore potential impacts arising from the development on this designation include increased recreational disturbance.
Regional	No species or habitats are present on-site that are considered to be important at the regional level.
County	3. Off-site Brackmills Small Wood PWS . Although not considered ancient in origin, the broadleaved woodland is mature. Given its priority habitat status

	<p>and that current survey information suggests it just meets County Wildlife Site Criteria, the woodland is considered to be of importance at the County level.</p> <p>4. Off-site Brackmills Woods South PWS is situated <0.01 north-east of the Site. This designation comprises plantation woodland and grassland habitat and is considered a sensitive feature (i.e. in terms of severance of connectivity, light pollution, recreational pressure, etc.) given its proximity to the Site.</p> <p>The remaining LNRs/LWSs in the local area are well separated from the Site and as such no impacts arising from the Site on these designations are anticipated. Barnes Meadow LNR, Coca Cola Field PWS, Brackmills Track PWS, Brackmills Woods South West PWS, Brackmills Grassland PWS, Brackmills Wood Roundabout PWS, Brackmills Woods West PWS and Disused Railway line west of Great Houghton PWS are therefore excluded from the assessment.</p>
Local	<p>5. On-site Semi-improved grassland. The semi-improved grassland at the Site meets County Wildlife Site Criteria. However, given the extensive alteration and condition, the grassland is not considered to be of ecological importance beyond the Local level.</p> <p>6. On-site Hedgerow Network. Given the favourable condition and species-richness of the hedgerows at the Site coupled with the connectivity of these hedgerows within the Site and to the surrounding habitat, the hedgerow network is considered to be of ecological importance at the Local level.</p> <p>7. On-site Mature/Semi-Mature Trees. All mature/semi-mature trees at the Site, given their size and age, likely contribute to the biodiversity of the local area and as such are considered to be of ecological importance at the Local Level (unless classified as being of greater importance under the habitats discussed above.)</p> <p>8. On-site Bats. Given the habitats present and the diversity of bat species recorded at the Site, in combination with the presence of barbastelle (albeit in very low numbers), which is considered to be one of the UK's rarest bat species, the bat interest at the Site is considered to be of importance at the Local Level.</p> <p>9. On-site Breeding Birds. Six species of conservation concern have been confirmed as breeding at the Site.</p> <p>10. On-site Wintering Birds. 29 species recorded on-site including seven species of conservation concern. Golden plover and lapwing were recorded off-site.</p>
Other	<p>11. Badger. Badgers utilise the Site for foraging and could potentially dig setts. Badgers are common and not considered to be of conservation concern. However badgers and their setts are protected under the Protection of Badgers Act 1992 and are therefore included in the assessment of effects below in the context of this legislation.</p> <p>12. Japanese Knotweed. Japanese knotweed is present in Hampton Green South. This is an invasive non-native species listed under Schedule 9 Part II of the Wildlife and Countryside Act, 1981 (as amended). It is an offence to cause to grow in the wild any plant listed under this schedule. Therefore Japanese Knotweed is included in the assessment of effects below in the context of this legislation.</p>

7.5 ASSESSMENT OF EFFECTS

7.5.1 Within this assessment, an effect is considered to be potentially significant if it could result in a change in the conservation status or degree of integrity of any important ecological feature. The assessment of effects outlined below are based on the Location Parameter Plan, the Land Use Parameter Plan and the Access and Movement Parameter Plan.

Hampton Green North

Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI

Construction Phase

Potential Effects

7.5.2 Given the relative distance of this designation from Hampton Green North, and from identified supporting habitat (winter arable feeding grounds east beyond of Hampton Green South), no significant adverse effects arising from the construction phase of the Hampton Green North development on the integrity of Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI.

Mitigation

7.5.3 None required.

Operational Phase

Potential Effects

7.5.4 Hampton Green North lies within the 3km zone of influence of the SPA and within the 'SSSI Impact Risk Zone', as detailed on MAGIC¹⁵. Natural England considers this designation to be 'at risk' from increased recreational pressure which causes increased levels of disturbance to wintering birds and the habitats they depend on¹⁶. Loss of 'supporting habitat' such as feeding areas for golden plover and lapwing outside of the SPA is also cited as a threat to the integrity of the SPA. However, the Hampton Green North is not considered to provide 'supporting habitat' for the SPA (see 'wintering birds' above) and as such loss of supporting habitat is not considered a potential impact arising from the development. Potential impacts arising from increased recreational pressure are described below.

7.5.5 A Visitor Access Study¹⁷ for the designation clearly shows that visit rates to the SPA tend to increase with proximity to residential development. Most visits are made by people who live within 3km of the SPA, who visit very frequently for relatively short periods of time, with dog walking being the most common main activity. Table 7.4 was used to determine how visitor rates to the SPA might change as a result of the Hampton Green North development which proposes c. 115 residential units. Of the 126 access points identified in the Visitor Access Study, only two within 5km of the Site have been identified as most likely to be utilised by residents from the proposed development. These include Bedford Road Holiday Inn (located c. 2.2km from Hampton Green North – c. 4.7km by car) and the lay-by off Bedford Road, situated between Great Houghton and Little Houghton (located c. 2.2km from Hampton Green North – c. 4.1km by car). These are the closest two access points with formal parking that involve a short direct walk to the SPA. All other access points identified within 5km of the Site either have no formal parking and/or would involve long walks (at least 2.5km or 30 minutes – assuming an average walking speed of 5km/hour) before reaching the SPA. As such, the two access points identified above have been used to estimate visitor rates to the SPA arising from the proposed development (see table 7.4 below).

Table 7.4 Hampton Green North: Visit rates in relation to housing at different distances from an access point (adapted from Liley et al, 2014)

	Distance of access point from site			
	0-500m	500m-1km	1-2km	2-5km

¹⁵ Multi-Agency Geographic Information for the Countryside (MAGIC), (2013). *Interactive Map*. [online] Available at: <http://www.magic.gov.uk/MagicMap.aspx> [Accessed 08 March 2017].

¹⁶ "Upper Nene Valley Gravel Pits Special Protection Area: Supplementary Planning Document" (August 2015).

¹⁷ Liley, D., Floyd, L., Cruickshanks, K. & Fearnley, H. (2014). Visitor Access Study of the Upper Nene Valley Gravel Pits SPA. Footprint Ecology. Unpublished report for the NIA partnership.

Visit Rate (people per day) from 115 houses	5.9	1.5	0.4	0.1
Ratio		3.9	15.0	40.1
Number of access points at distance band likely to be utilised by residents from the proposed development	0	0	0	2

7.5.6 This equates to a potential average increase of 0.29 people per day to the SPA. Total daily visitor rates to the SPA are currently estimated at 2448 person visits per day. The proposed development is therefore estimated to result in an increase of up to 0.01%. Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.7 Hampton Green North lies within the 'SSSI Impact Risk Zone' of Upper Nene Valley Gravel Pits, as detailed on MAGIC, which states that Natural England should be consulted for any residential development with a total net gain in residential units. Additionally, the Site lies within the 3km Zone of Influence of the SPA. As such, Natural England was consulted on the potential effects on the designation and potential mitigation solutions to allow a conclusion of no likely significant effect. The proposed Hampton Green North development will include provision of on-site recreation including part of a circular walking/dog walking route (c. 1.0km), an area of open space/woodland planting in the north of the Site and a play area. Furthermore, as suggested by Natural England, further off-site measures in the form of improvements to Brackmills Country Park will be provided. This will include provision of pedestrian access links from the development directly to the Country Park as well as improvements to the park itself. Suggested improvements include better interpretation and route marking, path improvements, contribution to management, etc., to be agreed with NBC. Improvements to Brackmills Country Park could be secured through a section 106 agreement. The provision of the above on-site open space and off-site improvement measures will deflect visitors away from the SPA, thereby reducing visitor numbers and consequently minimising recreational disturbance to wintering birds at the SPA.

Residual Effects

7.5.8 Subject to the above mitigation measures, no significant residual effects arising from the proposed Hampton Green North development on the Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI are anticipated. Therefore, the scheme is considered to be compliant with policy BN4 of the West Northants Joint Core Strategy (Part 1).

Brackmills Small Wood PWS

Construction & Operational Phases

Potential Effects

7.5.9 Given the distance of the PWS from the extent of development (c.100m), and given the lack of public access to the wood, no significant effects arising from the development are anticipated during construction or in operation.

Mitigation

7.5.10 None required

Residual Effects

7.5.11 Habitats adjacent to the PWS will be extended through the provision of on-site woodland planting. In addition, in combination with the proposed thicket planting and grassland seeding, the mosaic of habitats created will provide a diverse and structurally varied habitat. As such, a beneficial effect significant at the Local level is predicted.

Brackmills Woods South PWSConstruction Phase*Potential Effects*

7.5.12 Given the relative distance of this designation from Hampton Green North, no significant adverse effects arising from the construction phase of the Hampton Green North development on Brackmills Woods South PWS are anticipated.

Mitigation

7.5.13 None required.

Operational Phase*Potential Effects*

7.5.14 This PWS is located c. 0.2km north-east of the Site and forms part of Brackmills Country Park which is located immediately adjacent to the Site. Proposed footpath links as part of the development will provide direct access from the Site to the Country Park. These links will provide a footpath connection from the Site to Brackmills Woods South PWS which will entail a c.300m walk. The proposed development is therefore expected to result in an increase in visitors (walkers and dog walkers) to the PWS and consequent effects include soil compaction and disturbance associated with more human movement. However, although these effects are likely to occur frequently, these are considered low in magnitude. The woodland is already exposed to such disturbances as it is well used by the local community. Based on the above no significant adverse effect arising from the development on this PWS is anticipated.

Mitigation

7.5.15 None required.

Residual Effects

7.5.16 No significant residual effects arising from the proposed development on Brackmills Woods South PWS are anticipated.

HedgerowsConstruction Phase*Potential Effects*

7.5.17 Based on the proposals, the vast majority of hedgerows present at the Site will be retained. However several sections will be lost including:

- c. 50m of H4 to accommodate the new access road off The Green
- two c. 1.5m sections of H2 to accommodate pedestrian links to the adjoining development and to Brackmills Country Park, respectively

- c. 1.5m of H3 to accommodate a pedestrian link to Brackmills Country Park.

7.5.18 This equates to a total loss of c. 55m of species-rich hedgerow. Given that there is estimated to be c. 900m of species-rich hedgerow currently present at the Site, this equates to a total loss of c. 6.1% of species-rich hedgerow. Given the relatively small loss of hedgerow, this loss is considered not significant.

7.5.19 However, damage/destruction of retained hedgerows could occur as a result of construction works occurring too close to the hedgerows or Root Protection Areas. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.20 Retained hedgerows will be protected in line with standard arboricultural practice (BS5837:2012).

7.5.21 The existing hedgerow H2 at the Site is not continuous and has very large gaps. New hedgerow planting at the site will include planting up of hedgerow H2 to infill any gaps that currently exist. This will create c. 150m of new hedgerow and will provide continuous connectivity to Brackmills Small Wood PWS. A minimum of six native species of local provenance will be used in the new hedgerow planting.

Operational Phase

Potential Effects

7.5.22 No potential significant effects arising from the operational phase of the development on retained hedgerows are anticipated.

Mitigation

7.5.23 None required.

Residual Effects

7.5.24 Based on the mitigation set out above, there will be a net gain of c.95m of species-rich hedgerow. Although small gaps in hedgerows will be lost to the development permanently to accommodate new roads and pedestrian links, benefits from the proposed hedgerow planting at the Site include creation of a continuous linear feature along the western boundary of Hampton Green North (save for the small gaps lost to pedestrian links), thereby providing additional direct connectivity between on-site habitats with Brackmills Small Wood PWS.

7.5.25 Subject to the implementation of the above mitigation measures, no significant residual affects arising from the proposed development on hedgerows are anticipated.

Mature/semi-mature trees

Construction Phase

Potential Effects

7.5.26 All semi-mature/mature trees at Hampton Green North will be retained under the proposals.

7.5.27 Damage/destruction of mature/semi-mature trees could occur as a result of construction works occurring within the Root Protection Areas. Replacement tree planting

in such circumstances would take many years to reach an equivalent level of maturity and ecological importance.

7.5.28 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.29 Retained trees will be protected in line with standard arboricultural practice (BS5837:2012).

Operational Phase

Potential Effects

7.5.30 All retained trees at the Site will be incorporated into retained green space. Potential damage through recreational activities (e.g. children climbing trees, new footpaths leading to soil compaction around the base of trees, etc.) is considered unlikely given that the vast majority are protected within hedgerows.

7.5.31 Based on the above no significant adverse effect arising from the development on retained trees is anticipated.

Mitigation

7.5.32 None required.

Residual Effects

7.5.33 7.5.32 No significant adverse residual affects arising from the proposed development on trees are anticipated. On the contrary, given the extent of tree planting proposed at the Site (in the form of the woodland planting in the north and buffer planting in the east), there will be a significant net gain in the tree cover. As such, a beneficial effect, significant at the Local level is predicted.

Bats

Construction Phase

Potential Effects

7.5.34 The construction phase will result in the loss of foraging habitat in the form of intensively managed, open arable land (c. 6.8ha). This habitat is of little importance for bats as concluded by the activity surveys which showed that bat activity in this area was very low and restricted to very occasional passes by a low number of common and widespread species (common pipistrelle, soprano pipistrelle and noctule). As such, no significant effects arising from the loss of this habitat are anticipated.

7.5.35 Approximately 50m of hedgerow H4 will be lost to accommodate the new access road off The Green, thereby resulting in the partial loss of a navigational corridor utilised by a low number of common and widespread bat species. However, this is not anticipated to result in the isolation of roosts or foraging grounds. In combination with the extensive habitat creation at the Site which would provide enhanced foraging and commuting habitat for bats, this partial loss of navigational corridor is not considered significant.

7.5.36 Bat activity was far greater along the eastern boundary and within the off-site Brackmills Small Wood PWS and along the woodland edge that abuts the northern Site

boundary and, to a lesser extent along the southern Site boundary. Activity along these areas was generally restricted to the same common and widespread species listed above, although very low activity by the rare (but nonetheless widespread) barbastelle was recorded along the eastern boundary. Potential adverse effects arising from night working (i.e. noise and light pollution) include disturbance and avoidance of this area by foraging/commuting bats. This could potentially temporarily hinder movement between foraging and roosting areas for bats in the local area i.e. between Brackmills South Woods PWS and surrounding habitats. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.37 Night time working immediately adjacent to the PWS and the eastern boundary of Hampton Green North will be avoided between March and October inclusive, where practicable. This will prevent noise disturbance and night time illumination of the woodland edge and H3 which could adversely affect foraging/commuting bats.

Operational Phase

Potential Effects

7.5.38 Artificial lighting, increased levels of human activity and associated noise arising from the residential areas and road infrastructure are anticipated to have an adverse effect on foraging/commuting bats in the local area. This could permanently hinder movement between foraging and roosting areas for bats in the local area i.e. between Brackmills South Woods PWS and surrounding habitats. These impacts are considered to primarily effect common species, although very low numbers of barbastelle could also be affected. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.39 The lighting scheme for the Site will be sensitively designed so as to avoid light spill along the eastern boundary and PWS woodland edge. In addition, excessive illumination of other boundary features, particularly H4 will be avoided, thereby maintaining the hedgerows and woodland edge as foraging/commuting corridors for bats. Furthermore, a belt of native tree and thicket planting and seeded species-rich grassland along the eastern boundary adjacent to H3 will provide a buffer between the built development and the existing hedgerow. Similarly, Brackmills Small Wood PWS will be buffered from the built-up areas of the development by semi-natural vegetation including native woodland planting and extensive seeding of new species-rich wildflower grassland. This buffer planting along the eastern boundary and in the north of the Site will enhance the foraging potential of these important bat corridors

Residual Effects

7.5.40 Subject to the implementation of the above mitigation measures, no significant residual adverse effects arising from the proposed development are anticipated. On the contrary, the proposed woodland planting and buffer planting proposed will increase the foraging potential of the Site for bats. As such, a beneficial effect significant at the Local level is predicted.

Breeding Birds

Construction Phase

Potential Effects

7.5.41 It is anticipated that a single pair of breeding skylark will be permanently displaced as a result of clearance of the arable field which equates to a loss of c 6.8 ha of skylark breeding habitat. There is also potential for breeding dunnock and other common birds to be disturbed during clearance works of the short sections of hedgerows required for the new road and pedestrian links. Given the very low numbers of species and breeding pairs present at the site, no significant affects are anticipated.

Mitigation

7.5.42 Based on their legal protection, any clearance of potential nesting habitat (i.e. sections of hedgerow and the arable field) should be undertaken outside of the bird nesting season (March-August inclusive), or immediately following confirmation by a suitably qualified ecologist that no active nests are present.

Operational Phase

Potential Effects

7.5.43 Given the higher levels of human disturbance associated with residential development and the introduction of predators such as the domestic cat, the abundance of breeding birds present within the Site could be adversely affected. However, the majority of nesting habitat will be retained and given the species recorded at the Site and the low abundance of these species, no significant adverse effects are anticipated.

Mitigation

7.5.44 Extensive planting of native trees and thicket will be undertaken to provide foraging and nesting habitat for birds. This will include abundant seed-, fruit- and nut-bearing species to provide a high quality foraging resource.

Residual Effects

7.5.45 A single pair of nesting skylark will be displaced under the proposals. However, this is not considered significant given that only a single pair would be displaced. No significant residual adverse effects arising from the proposed development are anticipated. On the contrary, the proposed new woodland and thicket planting will provide an increase in breeding and nesting habitat. As such, a beneficial effect significant at the Local level is predicted.

Wintering Birds

Construction Phase

Potential Effects

7.5.46 Construction works at the Site could temporarily displace over wintering birds including seven species of conservation concern - yellowhammer, skylark, linnet, song thrush, dunnock, bullfinch and reed bunting. These affects are considered temporary and low in magnitude. As such, no significant adverse effects are predicted.

7.5.47 Effects for wintering birds on adjacent land are assessed above in respect of the Upper Nene Valley Gravel Pits SPA.

Mitigation

7.5.48 None required

Operational Phase

Potential Effects

7.5.49 The majority of foraging habitat will be retained. However, given the higher levels of human disturbance associated with residential development and the introduction of predators such as the domestic cat, the abundance of wintering birds present within the Site could be affected. In addition, the permanent displacement of c. 92 yellowhammer and c. 4 bullfinch is anticipated given the more elusive character of these species. Given the abundance of alternative suitable habitat available in the local area, no significant effects are anticipated.

Mitigation

7.5.50 Extensive planting of native trees and thicket will be undertaken to provide foraging habitat for wintering birds. This will provide shelter and will include abundant seed-, fruit- and nut-bearing species to provide a foraging resource for birds throughout the winter. In addition, the proposed buffer planting at the eastern boundary will screen the retained hedgerows, thereby providing adequate cover suitable for the more elusive bullfinch and yellowhammer.

Residual Effects

7.5.51 No significant adverse residual effects are predicted. On the contrary, the proposed new woodland and thicket planting will provide an increase in shelter and foraging habitat. As such, a beneficial effect significant at the Local level is predicted.

Badger

Construction Phase

Potential Effects

7.5.52 No badger setts were recorded on-site, although a main badger sett is known to be present within the local area and badgers have been recorded utilising the Site for foraging. However, given the distance of this sett from the Site (c.0.7km), no direct disturbance to the sett is anticipated. Nonetheless, the construction phase will result in the direct loss of c. 6.8 ha of foraging habitat in the form of arable land. Given the extent of suitable foraging habitat available in the local area, this loss is considered relatively small and not significant.

7.5.53 During construction works, there is potential for badger utilising the site to become trapped in open excavations if these are left open overnight. Given the protection badgers received under the Protection of Badgers Act 1992, appropriate mitigation measures have been set out below.

Mitigation

7.5.54 The following precautionary measures will be implemented which could be secured via a Planning Condition:

- Pre-construction badger survey and monitoring for signs of new sett digging
- Covering any open excavations with wooden boards, or fitting them with appropriate escape ramps, in order to prevent badgers falling into them and injuring themselves or becoming trapped.
- Monitoring of site for any new sett excavation during prolonged remediation, construction or landscaping works.

Operational Phase*Potential Effects*

7.5.55 As badgers can be habitual and retain their territories, they are expected to continue to use the Site during the operational phase for foraging and/or commuting. The layout of the Site allows badgers to do this. No significant adverse effects arising from the operational phase are predicted.

Mitigation

7.5.56 None required.

Residual Effects

7.5.57 Not applicable.

Japanese KnotweedConstruction Phase*Potential Effects*

7.5.58 Japanese knotweed is not present within Hampton Green North. Therefore no potential effects are anticipated.

Mitigation

7.5.59 None required

Operational Phase*Potential Effects*

7.5.60 Japanese knotweed is not present within Hampton Green North. Therefore no potential effects are anticipated.

Mitigation

7.5.61 None required.

Residual Effects

7.5.62 Not applicable.

Hampton Green SouthUpper Nene Valley Gravel Pits SPA/Ramsar/SSSIConstruction Phase*Potential Effects*

7.5.63 Given the relative distance of this designation from Hampton Green South, no significant effects arising from the construction phase of Hampton Green South at the actual Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI are anticipated.

7.5.64 However, given the proximity of land identified as supporting habitat (golden plover and lapwing feeding grounds to the east) there is potential for construction works (noise, dust, lighting) during winter months to disturb wintering birds associated with the SPA, effectively reducing foraging opportunities around the SPA. Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.65 The tree belt on the eastern boundary will be retained during construction to maintain a screen to foraging grounds east of the Site.

7.5.66 Initial clearance and construction works will be timed, as far as practicable, outside of the wintering bird season. During winter, any works will be restricted to daylight hours to reduce disturbance of wintering birds during more sensitive night-time hours.

7.5.67 The above measures would be set out within the Construction Environmental Management Plan (CEMP) for the scheme.

Operational Phase

Potential Effects

7.5.68 Hampton Green South lies within the 3km zone of influence of the SPA and within the 'SSSI Impact Risk Zone', as detailed on MAGIC¹⁸. Natural England considers this designation to be 'at risk' from increased recreational pressure which causes increased levels of disturbance to wintering birds and the habitats they depend on¹⁹. Loss of 'supporting habitat' such as feeding areas for golden plover and lapwing outside of the SPA is also cited as a threat to the integrity of the SPA. However, Hampton Green South is not considered to provide 'supporting habitat' for the SPA (see 'wintering birds' above) and as such loss of supporting habitat is not considered a potential impact arising from the development. Potential impacts arising from increased recreational pressure are described below.

7.5.69 A Visitor Access Study²⁰ for the designation clearly shows that visit rates to the SPA tend to increase with proximity to residential development. Most visits are made by people who live within 3km of the SPA, who visit very frequently for relatively short periods of time, with dog walking being the most common main activity. Table 7.5 was used to determine how visitor rates to the SPA might change as a result of the Hampton Green South development which proposes c. 410 residential units. Of the 126 access points identified in the Visitor Access Study, only two within 5km of the Site have been identified as most likely to be utilised by residents from the proposed development. These include Bedford Road Holiday Inn (located c.2.5km from Hampton Green South – c. 4.7km by car) and the lay-by off Bedford Road, situated between Great Houghton and Little Houghton (located c. 2.4km from Hampton Green South – c. 4.1km by car). These are the closest two access points with formal parking that involve a short direct walk to the SPA. All other access points identified within 5km of the Site either have no formal parking and/or would involve long walks (at least 2.5km or 30 minutes – assuming an average walking speed of 5km/hour) before reaching the SPA. As such, the two access points identified above have been used to estimate visitor rates to the SPA arising from the proposed development (see table 7.5 below).

¹⁸ Multi-Agency Geographic Information for the Countryside (MAGIC), (2013). *Interactive Map*. [online] Available at: <http://www.magic.gov.uk/MagicMap.aspx> [Accessed 08 March 2017].

¹⁹ "Upper Nene Valley Gravel Pits Special Protection Area: Supplementary Planning Document" (August 2015).

²⁰ Liley, D., Floyd, L., Cruickshanks, K. & Fearnley, H. (2014). Visitor Access Study of the Upper Nene Valley Gravel Pits SPA. Footprint Ecology. Unpublished report for the NIA partnership.

Table 7.5 Hampton Green South: Visit rates in relation to housing at different distances from an access point (adapted from Liley et al, 2014)

	Distance of access point from site			
	0-500m	500m-1km	1-2km	2-5km
Visit Rate (people per day) from 410 houses	20.9	5.4	1.4	0.5
Ratio		3.9	15.0	40.1
Number of access points at distance band likely to be utilised by residents from the proposed development	0	0	0	2

7.5.70 This equates to a potential average increase of 1.04 people per day to the SPA. Total daily visitor rates to the SPA are currently estimated at 2448 person visits per day. The proposed development is therefore estimated to result in an increase of up to 0.04%.

7.5.71 In addition to the above, given the proximity of land identified as supporting habitat (golden plover and lapwing feeding grounds to the east) there is potential for recreational disturbance (including dog walking) during winter months to disturb wintering birds associated with the SPA, effectively reducing foraging opportunities around the SPA.

7.5.72 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.73 Hampton Green South lies within the 'SSSI Impact Risk Zone' of Upper Nene Valley Gravel Pits SSSI, as detailed on MAGIC , which states that Natural England should be consulted for any residential development with a total net gain in residential units. Additionally, the Site lies within the 3km Zone of Influence of the SPA. As such, Natural England was consulted on the potential effects on the designation and potential mitigation solutions to allow a conclusion of no likely significant effect. Hampton Green South will include provision of on-site recreation including circular walking/dog walking routes (c. 1.4km) and a play area. Furthermore, as suggested by Natural England, further off-site measures in the form of improvements to Brackmills Country Park will be provided. Suggested improvements include better interpretation and route marking, path improvements, contribution to management, etc., to be agreed with NBC. Improvements to Brackmills Country Park could be secured through a section 106 agreement. The provision of the above on-site open space and off-site improvement measures will deflect visitors away from the SPA, thereby reducing visitor numbers and consequently minimising recreational disturbance to wintering birds at the SPA.

7.5.74 In order to safeguard supporting SPA habitats to the east, the landscape buffer along the eastern boundary will be retained and strengthened through new tree and shrub planting, to screen wintering birds from recreational activities during winter months. This would be secured through detailed design of the landscape scheme at the reserved matters stage, and/or through a suitably worded condition.

Residual Effects

7.5.75 Subject to the above mitigation measures, no significant residual effects arising from the proposed Hampton Green South development on the Upper Nene Valley Gravel

Pits SPA/Ramsar/SSSI are anticipated. Therefore, the scheme is considered to be compliant with policy BN4 of the West Northants Joint Core Strategy (Part 1).

Brackmills Small Wood PWS

Construction & Operational Phases

Potential Effects

7.5.76 Given the distance of the PWS from Hampton Green South (c.300m), no significant effects arising from the development are anticipated during construction or in operation.

Mitigation

7.5.77 None required

Residual Effects

7.5.78 No significant residual effects arising from the proposed development on Brackmills Small Wood PWS are anticipated.

Brackmills Woods South PWS

Construction Phase

Potential Effects

7.5.79 Given the relative distance of this designation from Hampton Green South, no significant adverse effects arising from the construction phase of the development on Brackmills Woods South PWS are anticipated.

Mitigation

7.5.80 None required.

Operational Phase

Potential Effects

7.5.81 This PWS is located c. 0.4km north-east of Hampton Green South. The PWS is accessible via a footpath located c. 0.6km east of Hampton Green South, along The Green. A further 0.7km walk along the footpath is required before the PWS can be reached. This equates to a total walking distance of c.1.0km (c.12 minute walk). The proposed development is therefore expected to result in an increase in visitors (walkers and dog walkers) to the PWS and consequent effects include soil compaction and disturbance associated with more human movement. However, although these effects are likely to occur frequently, these are considered low in magnitude. The woodland is already exposed to such disturbances as it is well used by the local community. Based on the above no significant adverse effect arising from the development on this PWS is anticipated.

Mitigation

7.5.82 7.5.74 None required.

Residual Effects

7.5.83 No significant residual effects arising from the proposed development on Brackmills Woods South PWS are anticipated.

Semi-improved grassland

Construction Phase

Potential Effects

7.5.84 Under the proposals approximately 11.5ha of semi-improved grassland habitat will be lost.

7.5.85 Based on the above, in the absence of mitigation, a permanent adverse effect significant at the Local level is predicted.

Mitigation

7.5.86 A buffer of native planting (c.0.5ha) will be provided along the full length of the eastern boundary. This buffer will comprise a dense band of native tree and thicket planting alongside the existing hedgerow flanked by seeded species-rich wildflower grassland.

7.5.87 The proposed new planting described above will comprise a more diverse and more structurally varied habitat than currently exists at the Site. Furthermore, the newly created habitat will be managed specifically for the benefit of biodiversity. It is proposed that the planting schedule and management for this newly created habitat be set out within a Habitat Management Plan, the design and implementation of which could be secured via a Planning Condition. It is proposed that the Habitat Management Plan be based on the following principles:

- Clear delineation within open space of formal and informal grassland areas to aid management e.g. through erection of timber post, knee rail or fencing;
- Zoned management would produce the best diversity of habitat structure i.e. with areas of grassland closest to the hedgerow/tree/thicket planting left uncut in most years. Areas that are further from the woodland/thicket planting can be managed as grassland habitat (i.e. cut once or twice a year).
- Grassland that is not mown each year will become rough and "tussocky" in character thereby providing a diverse habitat structure and suitable refuge for wildlife. To control scrub and bramble development these tussocky areas may need cutting every 2-3 years between October and February.

Operational Phase

Potential Effects

7.5.88 Not applicable.

Mitigation

7.5.89 Not applicable

Residual Effects

7.5.90 The eastern buffer will provide replacement tree/thicket/grassland habitat of c. 0.5ha, thereby equating to an overall loss of more than c. 11.0ha of semi-improved grassland. Although the newly created habitat will be both structurally diverse and species diverse, this does not compensate for the huge net loss in habitat size. As such, the

proposed Hampton Green South development, will result in an adverse effect at the Local level.

Hedgerows

Construction Phase

Potential Effects

7.5.91 Based on the proposals, the vast majority of hedgerows present at the Site will be retained. However several sections will be lost including:

- c.100m of H8 to accommodate the new road and roundabout off Newport Pagnell Road
- c. 50m of H6 to accommodate the new access road off The Green
- c. 50m of H7 (that dissects Hampton Green South) to accommodate the built development

7.5.92 This equates to a total loss of c. 200m of species-rich hedgerow. Given that there is estimated to be c. 2010m of species-rich hedgerow currently present at the Site, this equates to a total loss of c. 10% of species-rich hedgerow.

7.5.93 In addition, damage/destruction of retained hedgerows could occur as a result of construction works occurring too close to the hedgerows or Root Protection Areas.

7.5.94 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.95 Retained hedgerows will be protected in line with standard arboricultural practice (BS5837:2012).

7.5.96 Approximately 50m of new planting to infill the large gap at the western end of H7 will be undertaken. Nonetheless, hedgerow H7 will remain fragmented given the sections lost to the built development towards the centre and eastern sections of this hedgerow. In addition, c.100m of new hedgerow planting will occur along the southern boundary to replace the sections of H8 lost to the re-profiling of this boundary for the new roundabout and access road of Newport Pagnell Road. A minimum of six native species of local provenance will be used in the new hedgerow planting.

Operational Phase

Potential Effects

7.5.97 Not applicable

Mitigation

7.5.98 Not applicable

Residual Effects

7.5.99 This additional planting will result in a net loss of c.50 metres of species-rich hedgerow. However, given that the new planting will include a variety of species of local provenance and will be managed specifically for the benefit of wildlife, overall this loss in length is considered negligible in extent. Furthermore, the overall network of hedgerows

will be maintained, continuing to provide habitat corridors around and through the Site. As such, based on the mitigation set out above, no significant residual effects arising from the proposed Hampton Green South development are anticipated.

Mature/semi-mature trees

Construction Phase

Potential Effects

7.5.100 The majority of mature trees at Hampton Green South will be retained. Semi-mature trees lost to the development include two semi-mature ash trees (T9 and T12) associated with H7 (to accommodate the built development), a single semi-mature ash tree (T38) along H6 (to accommodate the new access road off The Green) and a group of semi-mature ash and oak trees (T29) along Newport Pagnell Road (to accommodate the new access road and roundabout) (see **Figure 7.1**).

7.5.101 Damage/destruction of mature/semi-mature trees could occur as a result of construction works occurring within the Root Protection Areas. Replacement tree planting in such circumstances would take many years to reach an equivalent level of maturity and ecological importance.

7.5.102 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.103 Retained trees will be protected in line with standard arboricultural practice (BS5837:2012).

7.5.104 Replacement tree planting will include planting of a series of standard trees at the Site entrance, leading to an avenue of trees lining the main 'spine road' through the development. Further individual tree planting will occur within areas of open space. Tree planting at the Site will be restricted to native species of local provenance where practicable.

Operational Phase

Potential Effects

7.5.105 All retained trees at the Site will be incorporated into retained green space. Potential damage through recreational activities (e.g. children climbing trees, new footpaths leading to soil compaction around the base of trees, etc.) is considered unlikely given that the vast majority are protected within hedgerows.

7.5.106 Based on the above no significant adverse effect arising from the development on retained trees is anticipated.

Mitigation

7.5.107 None required.

Residual Effects

7.5.108 New tree planting at the Site could take many years to reach maturity and be considered of similar ecological importance to those that will be lost. It is noted that the number of the trees planted will exceed the number to be lost. As such, it is considered

that an overall loss of mature/semi-mature trees at the Site will result in a temporary adverse effect significant at the Local level.

Bats

Construction Phase

Potential Effects

7.5.109 The construction phase will result in the loss of c. 18ha of foraging habitat in the form of semi-improved grassland (11.5ha), broadleaved plantation woodland (5.9ha) and scrub (0.7ha) within Hampton Green South. However, the bat activity recorded at Hampton Green South was relatively low and dominated by common and widespread species. Transect surveys showed that bat activity over the grassland/plantation woodland/scrub was very limited. As such, no significant adverse effects arising from the loss of these habitats are anticipated.

7.5.110 The boundary features, which will be largely retained, were used comparatively more frequently. Nonetheless, activity in these areas was still very low and dominated by common and widespread species, although the highest levels of activity were recorded along H7 including a single contact by the rare barbastelle. Disturbance, associated with artificial lighting and noise from machinery may affect a low number of commuting/foraging bats along H5-H10. However, these effects will be temporary and of low magnitude given the very low levels of activity recorded. Short sections of H7 will be lost under the proposals, however this hedgerow is already fragmented. In addition, approximately 50m of hedgerow H6 will be lost to accommodate the new access road off The Green, thereby resulting in the partial loss of a navigational corridor utilised by a low number of common and widespread bat species. However, this is not anticipated to result in the isolation of roosts or foraging grounds. Therefore this partial loss of navigational corridor is not considered significant.

7.5.111 As such, no significant effects arising from the construction phase of Hampton Green South on foraging/commuting bats are anticipated.

Mitigation

7.5.112 None required.

Operational Phase

Potential Effects

7.5.113 Potential impacts associated with the operational phase of the development include artificial lighting, increased levels of human activity and associated noise arising from the residential areas and road infrastructure affecting the foraging/commuting behaviour of bats in the local area. This could permanently impact the movement of bats through the Site and into adjacent off-site habitats. These impacts are considered to primarily affect common species, although very low numbers of barbastelle could also be affected. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.114 The lighting scheme for the Site will be sensitively designed so as to avoid excessive light spill along retained boundaries, thereby maintaining these features as commuting/foraging corridors for bats. In addition, infill planting along the western end of H7 will counterbalance the small losses at the eastern end of this hedgerow.

7.5.115 Furthermore, a belt of native tree and thicket planting and seeded species-rich grassland along the eastern boundary adjacent to H9 and H10 will provide a buffer between the built development and the existing hedgerow. This buffer will enhance the foraging potential of the retained hedgerows.

Residual Effects

7.5.116 Subject to the implementation of the above mitigation measures, the commuting/foraging potential of the boundary features will be maintained and as such no significant residual effects arising from the proposed development are anticipated.

Breeding birds

Construction Phase

Potential Effects

7.5.117 Removal of small sections of hedgerow for road links could disturb/temporarily displace breeding dunnock, song thrush, yellowhammer, whitethroat and bullfinch. However, these effects are temporary and of low magnitude and as such no significant adverse effects are anticipated. However, it is anticipated that four to six pairs of breeding skylark will be permanently displaced as a result of clearance of the semi-improved grassland which equates to a loss of c. 11.5 ha of skylark breeding habitat. Given, the permanent displacement of several pairs of skylark adverse effects significant at the Local level are predicted.

Mitigation

7.5.118 Based on their legal protection, any clearance of potential nesting habitat (i.e. sections of hedgerow, scrub, plantation woodland and grassland) should be undertaken outside of the bird nesting season (March-August inclusive), or immediately following confirmation by a suitably qualified ecologist that no active nests are present.

Operational Phase

Potential Effects

7.5.119 Given the higher levels of human disturbance associated with residential development and the introduction of predators such as the domestic cat, the abundance of breeding birds present within the Site could be affected. However, the majority of nesting habitat will be retained with the exception of habitat for ground nesting birds which will be permanently lost. In addition, more elusive species including a single pair of breeding bullfinch and 2-3 pairs of breeding yellowhammer would likely be permanently lost as a result of the development.

Mitigation

7.5.120 Extensive planting of native trees and thicket will be undertaken to provide foraging and nesting habitat for birds. This will include abundant seed-, fruit- and nut-bearing species to provide a high quality foraging resource. In addition, the proposed buffer planting at the eastern boundary will screen the retained hedgerows, thereby providing adequate cover suitable for the more elusive bullfinch and yellowhammer.

Residual Effects

7.5.121 An abundant foraging and nesting resource will be available throughout the operational phase for common garden and woodland birds. However, there will be no

provision for suitable habitat for ground nesting birds such as skylark, thereby resulting in the loss of 4-6 pairs of breeding skylark.

7.5.122 Based on the above, a residual adverse effect significant at the Local level is predicted.

Wintering Birds

Construction Phase

Potential Effects

7.5.123 Construction works at the Site could temporarily displace over wintering birds including seven species of conservation concern - yellowhammer, skylark, linnet, song thrush, dunnock, bullfinch and reed bunting primarily associated with the hedgerow habitats. These affects are considered temporary and as such, no significant adverse effects, are predicted at the Site

7.5.124 Effects for wintering birds on adjacent land are assessed above in respect of the Upper Nene Valley Gravel Pits SPA.

Mitigation

7.5.125 None required.

Operational Phase

Potential Effects

7.5.126 Given the higher levels of human disturbance associated with residential development and the introduction of predators such as the domestic cat, the abundance of wintering birds present within the Site could be affected. In addition, the permanent displacement of c. yellowhammer and bullfinch is anticipated given the more elusive character of these species. Given the loss of habitat for these and other wintering species, a permanent adverse effect significant at the Local level is predicted.

Mitigation

7.5.127 Some planting of native trees and thicket will be undertaken to provide foraging habitat for wintering birds. This will provide shelter and will include seed-, fruit- and nut-bearing species to provide a foraging resource for birds throughout the winter. In addition, the proposed buffer planting at the eastern boundary will screen the retained hedgerows, thereby providing adequate cover suitable for the more elusive bullfinch and yellowhammer.

Residual Effects

7.5.128 The provision of new planting is anticipated to reduce the net loss of foraging and refuge for wintering birds. However, an overall net loss of habitats is still anticipated for Hampton Green South alone and therefore a permanent adverse (residual) effect significant at the Local level is still predicted.

Badger

Construction Phase

7.5.129 No badger setts were recorded on-site, although a large badger clan is known to be present within the local area and badgers have been recorded utilising the Site for foraging. However, given the distance of this sett from the Site (c.0.7km), no direct disturbance to the sett is anticipated. Nonetheless, the construction phase will result in the direct loss of c. 18.1 ha of foraging habitat in the form of semi-improved grassland, broadleaved plantation woodland and scrub. Given the extent of suitable foraging habitat available in the local area, this loss is considered relatively small in comparison and not significant.

7.5.130 During construction works, there is potential for badger utilising the site to become trapped in open excavations if these are left open overnight. Given the protection badgers received under the Protection of Badgers Act 1992, appropriate mitigation measures have been set out below.

Mitigation

7.5.131 The following precautionary measures will be implemented which could be secured via a Planning Condition:

- Pre-construction badger survey and monitoring for signs of new sett digging
- Covering any open excavations with wooden boards, or fitting them with appropriate escape ramps, in order to prevent badgers falling into them and injuring themselves or becoming trapped.
- Monitoring of site for any new sett excavation during prolonged remediation, construction or landscaping works.

Operational Phase

Potential Effects

7.5.132 As badgers can be habitual and retain their territories, they are expected to continue to use the Site during the operational phase for foraging and/or commuting. The layout of the Site allows badgers to do this. No significant adverse effects arising from the operational phase are predicted.

Mitigation

7.5.133 7.5.124 None required.

Residual Effects

7.5.134 Not applicable.

Japanese Knotweed

Construction Phase

Potential Effects

7.5.135 Japanese knotweed is an invasive, non-native species listed under Schedule 9 Part II of the Wildlife and Countryside Act, 1981 (as amended). It is an offence to cause to grow in the wild any plant listed under this schedule. There is potential for this species to be spread during ground works and as such there is potential for an offence to be committed.

7.5.136 The government has set out guidance on what can be considered "causing to grow in the wild" within a response to the Schedule 9 review¹⁰ which states:

"We would expect that where plants listed in Schedule 9 are grown in private gardens, amenity areas etc., reasonable measures will be taken to confine them to the cultivated area so as to prevent their spreading to the wider environment and beyond the landowner's control. It is our view that any failure to do so, which in turn results in the plant spreading to the wild, could be considered as 'causing to grow in the wild' and as such would constitute an offence.... Additionally, negligent or reckless behaviour, such as inappropriate disposal of garden waste, where this results in a Schedule 9 species becoming established in the wild would also constitute an offence."

Mitigation

7.5.137 A specialist contractor will be appointed to undertake the removal of Japanese knotweed from the site thereby minimising the risk of causing this species to spread.

Operational Phase

Potential Effects

7.5.138 Japanese knotweed will be eradicated from the Site during the construction phase. No species listed under Schedule 9 Part II of the Wildlife and Countryside Act (1981) as amended are to be included within the planting schedule for the Site. Therefore no potential effects are anticipated.

Mitigation

7.5.139 None required.

Residual Effects

7.5.140 Not applicable.

Hampton Green (Both Hampton Green North and Hampton Green South, Cumulatively)

Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI

Construction Phase

Potential Effects

7.5.141 Given the relative distance of this designation from the Site, no significant effects arising from the construction phase of the development on the Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI are anticipated.

7.5.142 However, given the proximity of land identified as supporting habitat (golden plover and lapwing feeding grounds to the east) there is potential for construction works (noise, dust, lighting) during winter months to disturb wintering birds associated with the SPA, effectively reducing foraging opportunities around the SPA. Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.143 The tree belt on the eastern boundary will be retained during construction to maintain a screen to foraging grounds east of the Site.

7.5.144 Initial clearance and construction works will be timed, as far as practicable, outside of the wintering bird season. During winter, any works will be restricted to daylight hours to reduce disturbance of wintering birds during more sensitive night-time hours.

7.5.145 The above measures would be set out within the Construction Environmental Management Plan (CEMP) for the scheme.

Operational Phase

Potential Effects

7.5.146 Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI is located c.2.0km north of the Site. The Site lies within the 3km zone of influence of the SPA and within the 'SSSI Impact Risk Zone', as detailed on MAGIC²¹. Natural England considers this designation to be 'at risk' from increased recreational pressure which causes increased levels of disturbance to wintering birds and the habitats they depend on²². Loss of 'supporting habitat' such as feeding areas for golden plover and lapwing outside of the SPA is also cited as a threat to the integrity of the SPA. However, the Site is not considered to provide 'supporting habitat' for the SPA (see 'wintering birds' above) and as such loss of supporting habitat is not considered a potential impact arising from the development. Potential impacts arising from increased recreational pressure are described below.

7.5.147 A Visitor Access Study²³ for the designation clearly shows that visit rates to the SPA tend to increase with proximity to residential development. Most visits are made by people who live within 3km of the SPA, who visit very frequently for relatively short periods of time, with dog walking being the most common main activity. Table 7.6 was used to determine how visitor rates to the SPA might change as a result of the Hampton Green development which proposed c.525 residential units. Of the 126 access points identified in the Visitor Access Study, only two within 5km of the Site have been identified as most likely to be utilised by residents from the proposed development. These include Bedford Road Holiday Inn (located c.2.2km from Hampton Green – c. 4.7km by car) and the lay-by off Bedford Road, situated between Great Houghton and Little Houghton (located c. 2.2km from Hampton Green – c. 4.1km by car). These are the closest two access points with formal parking that involve a short direct walk to the SPA. All other access points identified within 5km of the Site either have no formal parking and/or would involve long walks (at least 2.5km or 30 minutes – assuming an average walking speed of 5km/hour) before reaching the SPA. As such, the two access points identified above have been used to estimate visitor rates to the SPA arising from the proposed development (see table 7.6 below).

Table 7.6 Hampton Green: Visit rates in relation to housing at different distances from an access point (adapted from Liley et al, 2014)

	Distance of access point from site			
	0-500m	500m-1km	1-2km	2-5km
Visit Rate (people per day) from 525 houses	26.8	6.9	1.8	0.7
Ratio		3.9	15.0	40.1
Number of access points at distance band likely to be utilised by residents	0	0	0	2

²¹ Multi-Agency Geographic Information for the Countryside (MAGIC), (2013). *Interactive Map*. [online] Available at: <http://www.magic.gov.uk/MagicMap.aspx> [Accessed 08 March 2017].

²² "Upper Nene Valley Gravel Pits Special Protection Area: Supplementary Planning Document" (August 2015).

²³ Liley, D., Floyd, L., Cruickshanks, K. & Fearnley, H. (2014). Visitor Access Study of the Upper Nene Valley Gravel Pits SPA. Footprint Ecology. Unpublished report for the NIA partnership.

from the proposed development				
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7.5.148 This equates to a potential average increase of 1.34 people per day to the SPA. Total daily visitor rates to the SPA are currently estimated at 2448 person visits per day. The proposed development is therefore estimated to result in an increase of up to 0.05%.

7.5.149 In addition to the above, given the proximity of land identified as supporting habitat (golden plover and lapwing feeding grounds to the east) there is potential for recreational disturbance (including dog walking) during winter months to disturb wintering birds associated with the SPA, effectively reducing foraging opportunities around the SPA.

7.5.150 Based on the above, in the absence of mitigation, an adverse effect significant at the County level is predicted.

Mitigation

7.5.151 Hampton Green North lies within the 'SSSI Impact Risk Zone' of Upper Nene Valley Gravel Pits SSSI, as detailed on MAGIC , which states that Natural England should be consulted for any residential development with a total net gain in residential units. Additionally, the Site lies within the 3km Zone of Influence of the SPA. As such, Natural England was consulted on the potential effects on the designation and potential mitigation solutions to allow a conclusion of no likely significant effect. The proposed development will include provision of on-site recreation including circular walking/dog walking routes (c. 1.6km), an area of open space/woodland planting in the north of the Site and play areas. Furthermore, as suggested by Natural England, further off-site measures in the form of improvements to Brackmills Country Park will provided. This will include provision of pedestrian access links from the development directly to the Country Park as well as improvements to the park itself. Suggested improvements include better interpretation and route marking, path improvements, contribution to management, etc., to be agreed with NBC. Improvements to Brackmills Country Park could be secured through a section 106 agreement. The provision of the above on-site open space and off-site improvement measures will deflect visitors away from the SPA, thereby reducing visitor numbers and consequently minimising recreational disturbance to wintering birds at the SPA.

7.5.152 In order to safeguard supporting SPA habitats to the east, the landscape buffer along the eastern boundary will be retained and strengthened through new tree and shrub planting, to screen wintering birds from recreational activities during winter months. This would be secured through detailed design of the landscape scheme at the reserved matters stage, and/or through a suitably worded condition.

Residual Effects

7.5.153 Subject to the above mitigation measures, no significant residual affects arising from the proposed development on the Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI are anticipated. Therefore, the scheme is considered to be compliant with policy BN4 of the West Northants Joint Core Strategy (Part 1).

Brackmills Small Wood PWS

Construction & Operational Phases

Potential Effects

7.5.154 Given the distance of the PWS from the extent of development (c.100m), and given the lack of public access to the wood, no significant effects arising from the development are anticipated during construction or in operation.

Mitigation

7.5.155 None required

Residual Effects

7.5.156 No significant residual adverse effects arising from the proposed development on Brackmills Small Wood PWS are anticipated. On the contrary, the woodland habitats will be extended through the provision of on-site woodland planting. In addition, in combination with the proposed thicket planting and grassland seeding, the mosaic of habitats created will provide a diverse and structurally varied habitat. As such, a beneficial effect significant at the Local level is predicted.

*Brackmills Woods South PWS**Construction Phase**Potential Effects*

7.5.157 Given the relative distance of this designation from the Site, no significant adverse effects arising from the construction phase of the development on Brackmills Woods South PWS are anticipated.

Mitigation

7.5.158 None required.

*Operational Phase**Potential Effects*

7.5.159 This PWS is located c. 0.2km north-west of the Site and forms part of Brackmills Country Park which is located immediately adjacent to the Site. Proposed footpath links as part of the development will provide direct access from the Site to the Country Park. These links will provide a footpath connection from the Site to Brackmills Woods South PWS which will entail a c.300m walk. The proposed development is therefore expected to result in an increase in visitors (walkers and dog walkers) to the PWS and consequent effects include soil compaction and disturbance associated with more human movement. However, although these effects are likely to occur frequently, these are considered low in magnitude. The woodland is already exposed to such disturbances as it is well used by the local community. Based on the above no significant adverse effect arising from the development on this PWS is anticipated.

Mitigation

7.5.160 None required.

Residual Effects

7.5.161 No significant residual effects arising from the proposed development on Brackmills Woods South PWS are anticipated.

*Semi-improved grassland**Construction Phase**Potential Effects*

7.5.162 Under the proposals approximately 11.5ha of semi-improved grassland at the Site will be lost.

7.5.163 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.164 The north of the Site will comprise a mosaic of semi-natural vegetation comprising native woodland planting, native thicket planting and extensive seeding of new species-rich wildflower grassland comprising a total of c. 2.6ha. In addition, a buffer of native planting (c.0.9ha) will be provided along the full length of the eastern boundary, save for a small gap where the existing road (The Green) is located. This buffer will comprise a dense band of native tree and thicket planting flanked by seeded species-rich wildflower grassland.

7.5.165 The proposed new habitat mosaic described above will comprise a more diverse and more structurally varied habitat than currently exists at the Site. Furthermore, the newly created mosaic will be managed specifically for the benefit of biodiversity. It is proposed that the planting schedule and management for this newly created habitat be set out within a Habitat Management Plan, the design and implementation of which could be secured via a Planning Condition. It is proposed that the Habitat Management Plan be based on the following principles:

- Clear delineation within open space of formal and informal grassland areas to aid management e.g. through erection of timber post, knee rail or fencing;
- Zoned management would produce the best diversity of habitat structure i.e. with areas of grassland closest to the woodland/thicket planting left uncut in most years. Areas that are further from the woodland/thicket planting can be managed as grassland habitat (i.e. cut once or twice a year).
- Grassland that is not mown each year will become rough and "tussocky" in character thereby providing a diverse habitat structure and suitable refuge for wildlife. To control scrub and bramble development these tussocky areas may need cutting every 2-3 years between October and February.

Operational Phase

Potential Effects

7.5.166 Not applicable.

Mitigation

7.5.167 Not required.

Residual Effects

7.5.168 In combination, the areas of new grassland/woodland/tree/thicket planting will provide a mosaic of c. 3.5ha, thereby equating to an overall loss of more than 8.0ha of semi-improved grassland. Although far smaller in extent, the proposed new habitat mosaic will be more species-rich and more-structurally diverse than the existing habitat at the Site, thereby providing elevated opportunities for biodiversity. As such, subject to the production and implementation of a long term Management Plan, no significant adverse effects are predicted.

Hedgerows

Construction Phase

Potential Effects

7.5.169 Based on the proposals, the vast majority of hedgerows present at the Site will be retained. However several sections will be lost including:

- c.100m of H8 to accommodate the new road and roundabout off Newport Pagnell Road
- c. 50m of H6 and c. 50m of H4 to accommodate new access roads of The Green
- c. 50m of H7 (that dissects Hampton Green South) to accommodate the built development
- two c. 1.5m sections of H2 to accommodate pedestrian links to the adjoining development and to Brackmills Country Park, respectively
- c. 1.5m of H3 to accommodate a pedestrian link to Brackmills Country Park.

7.5.170 This equates to a total loss of c. 255m of species-rich hedgerow. Given that there is estimated to be c. 2910m of species-rich hedgerow currently present at the Site, this equates to a total loss of c. 8.8% of species-rich hedgerow.

7.5.171 In addition, damage/destruction of retained hedgerows could occur as a result of construction works occurring too close to the hedgerows or Root Protection Areas.

7.5.172 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.173 Retained Hedgerows will be protected in line with standard arboricultural practice (BS5837:2012).

7.5.174 The existing hedgerow H2 at the Site is not continuous and has very large gaps. New hedgerow planting at the site will include planting up of hedgerow H2 to infill any gaps that currently exist. This will create c. 150m of new hedgerow and will provide continuous connectivity to Brackmills Small Wood PWS. In addition, c.50m of new planting to infill the large gap at the western end of H7 will be undertaken. Nonetheless, hedgerow H7 will remain fragmented given the sections lost to the built development towards the centre and eastern sections of this hedgerow. Furthermore, c.100m of new hedgerow planting will occur along the southern boundary to replace the sections of H8 lost to the re-profiling of this boundary for the new roundabout and access road of Newport Pagnell Road. A minimum of six native species of local provenance will be used in the new hedgerow planting.

Operational Phase

Potential Effects

7.5.175 No potential significant effects arising from the operational phase of the development on retained hedgerows are anticipated.

Mitigation

Residual Effects

7.5.176 Based on the mitigation set out above, there will be a net gain of c.45m of species-rich hedgerow. Although small gaps in hedgerows will be lost to the development permanently to accommodate new roads and pedestrian links, benefits from the proposed

hedgerow planting at the Site include creation of a continuous linear feature along the western boundary of Hampton Green North (save for the small gaps lost to pedestrian links), thereby providing additional direct connectivity between on-site habitats with Brackmills Small Wood PWS.

7.5.177 Subject to the implementation of the above mitigation measures, no significant residual affects arising from the proposed development on hedgerows are anticipated.

Mature/semi-mature trees

Construction Phase

Potential Effects

7.5.178 The vast majority of trees at the Site will be retained. However, a low number of semi-mature trees will be lost to the development including two semi-mature ash trees (T9 and T12) associated with H7 (to accommodate the built development within Hampton Green South) , a single semi-mature ash tree (T38) along H6 (to accommodate the new access road off The Green) and a group of semi-mature ash and oak trees (T29) along Newport Pagnell Road (to accommodate the new access road and roundabout) (see **Figure 7.1**). This would result in an overall minor loss.

7.5.179 Damage/destruction of mature/semi-mature trees could occur as a result of construction works occurring within the Root Protection Areas. Replacement tree planting in such circumstances would take many years to reach an equivalent level of maturity and ecological importance.

7.5.180 Based on the above, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.181 Retained trees will be protected in line with standard arboricultural practice (BS5837:2012).

7.5.182 Replacement tree planting will include planting of a series of standard trees at the Site entrance, leading to an avenue of trees lining the main 'spine road' through the development. Further individual tree planting will occur within areas of open space. Tree planting at the Site will be restricted to native species of local provenance where practicable.

Operational Phase

Potential Effects

7.5.183 All retained trees at the Site will be incorporated into retained green space. Potential damage through recreational activities (e.g. children climbing trees, new footpaths leading to soil compaction around the base of trees, etc.) is considered unlikely given that the vast majority are protected within hedgerows.

7.5.184 Based on the above no significant adverse effect arising from the development on retained trees is anticipated.

Mitigation

7.5.185 None required.

Residual Effects

7.5.186 New tree planting at the Site could take 15+ years to reach maturity and be considered of similar ecological importance to those that will be lost. However, the number of the trees planted will far exceed the number to be lost. As such, subject to the implementation of the above mitigation measures, no significant residual effects arising from the proposed development on trees are anticipated. On the contrary, in the long term, once the planted trees have matured, the proposed development will result in a beneficial effect significant at the Local level.

7.5.187 Species

7.5.188

BatsConstruction Phase*Potential Effects*

7.5.189 The construction phase will result in the loss of c. 24.9ha of foraging habitat in the form of semi-improved grassland (11.5ha), broadleaved plantation woodland (5.9ha), scrub (0.7ha) and intensively managed arable land (c. 6.8ha). This habitat is of little importance for bats as concluded by the activity surveys which showed that bat activity in this area was very low and restricted to very occasional passes by a low number of common and widespread species (common pipistrelle, soprano pipistrelle and noctule). As such, no significant adverse effects arising from the loss of these habitats are anticipated.

7.5.190 The boundary features, which will be largely retained, were used much more frequently and are considered to be of greater importance to bats. By far the greatest levels of activity were recorded in Hampton Green North - along the eastern boundary and within the off-site Brackmills Small Wood PWS and along the woodland edge that abuts the northern Site boundary which will be retained. However, approximately 50m of hedgerow H4 and 50m of H6 will be lost to accommodate the new access roads off The Green, thereby resulting in the partial loss of a navigational corridor utilised by a low number of common and widespread bat species. However, this is not anticipated to result in the isolation of roosts or foraging grounds. In combination with the extensive habitat creation at the Site which would provide enhanced foraging and commuting habitat for bats, this partial loss of navigational corridor is not considered significant.

7.5.191 Potential adverse effects arising from night working (i.e. noise and light pollution) include disturbance and avoidance of this area by foraging/commuting bats. This could potentially temporarily hinder movement between foraging and roosting areas for bats in the local area i.e. between Brackmills South Woods PWS and surrounding habitats. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.192 Night time working immediately adjacent to the PWS and the eastern boundary of Hampton Green North will be avoided between March and October inclusive, where practicable. This will prevent noise disturbance and night time illumination of the woodland edge and H3 which could adversely affect foraging/commuting bats.

Operational Phase*Potential Effects*

7.5.193 Artificial lighting, increased levels of human activity and associated noise arising from the residential areas and road infrastructure are anticipated to have an adverse effect on foraging/commuting bats in the local area. This could permanently hinder movement between foraging and roosting areas for bats in the local area i.e. between Brackmills South Woods PWS and surrounding habitats. These impacts are considered to primarily effect common species, although very low numbers of barbastelle could also be affected. As such, in the absence of mitigation, an adverse effect significant at the Local level is predicted.

Mitigation

7.5.194 The lighting scheme for the Site will be sensitively designed so as to avoid light spill along the eastern boundary and PWS woodland edge. Excessive illumination of other boundary features will also be avoided, thereby maintaining the hedgerows and woodland edge as foraging/commuting corridors for bats.

7.5.195 In addition, a belt of native tree and thicket planting and seeded species-rich grassland along the eastern boundary adjacent to H3, H9 and H10 will provide a buffer between the built development and the existing hedgerow. Similarly, Brackmills Small Wood PWS will be buffered from the built-up areas of the development by semi-natural vegetation including native woodland planting and extensive seeding of new species-rich wildflower grassland. This buffer planting along the eastern boundary and in the north of the Site will enhance the foraging potential of these important bat corridors. Furthermore, infill planting along the western end of H7 will counterbalance the small losses at the eastern end of this hedgerow.

Residual Effects

7.5.196 Subject to the implementation of the above mitigation measures, the commuting/foraging potential of the boundary features will be maintained and as such no significant residual affects arising from the proposed development are anticipated.

Breeding birds

Construction Phase

Potential Effects

7.5.197 Removal of small sections of hedgerow for road links could disturb/temporarily displace breeding dunnock, song thrush, yellowhammer, whitethroat and bullfinch. However, these affects are temporary and of low magnitude and as such no significant adverse effects are anticipated. However, it is anticipated that four to six pairs of breeding skylark will be permanently displaced as a result of clearance of the semi-improved grassland (c. 11.5ha) and arable field (c 6.8ha) which equates to a loss of c. 18.3ha of skylark breeding habitat. Given the permanent displacement of several pairs of skylark, adverse effects significant at the Local level are predicted.

Mitigation

7.5.198 Based on their legal protection, any clearance of potential nesting habitat (i.e. sections of hedgerow, scrub, plantation woodland, arable land and grassland) should be undertaken outside of the bird nesting season (March-August inclusive), or immediately following confirmation by a suitably qualified ecologist that no active nests are present.

7.5.199 Extensive planting of native trees and thicket will be undertaken to provide foraging and nesting habitat for birds. This will include abundant seed-, fruit- and nut-bearing species to provide a high quality foraging resource.

Operational Phase*Potential Effects*

7.5.200 Given the higher levels of human disturbance associated with residential development and the introduction of predators such as the domestic cat, the abundance of breeding birds present within the Site could be affected. However, the majority of nesting habitat will be retained with the exception of habitat for ground nesting birds which will be permanently lost. In addition, more elusive species including a single pair of breeding bullfinch and 2-3 pairs of breeding yellowhammer would likely be permanently lost as a result of the development.

Mitigation

7.5.201 The proposed buffer planting at the eastern boundary will screen the retained hedgerows, thereby providing adequate cover suitable for the more elusive bullfinch and yellowhammer.

Residual Effects

7.5.202 There will be no provision for suitable habitat for ground nesting birds such as skylark, thereby resulting in the loss of 4-6 pairs of breeding skylark. However, the extensive woodland and thicket planting will provide an increase in breeding, nesting and foraging habitat for garden and woodland birds. As such, on balance, no significant adverse residual affect is predicted.

Wintering BirdsConstruction Phase*Potential Effects*

7.5.203 Construction works at the Site could temporarily displace over wintering birds including seven species of conservation concern - yellowhammer, skylark, linnet, song thrush, dunnock, bullfinch and reed bunting. These affects are considered temporary and low in magnitude. As such, no significant adverse effects are predicted.

7.5.204 Effects for wintering birds on adjacent land are assessed above in respect of the Upper Nene Valley Gravel Pits SPA.

Mitigation

7.5.205 None required

Operational Phase*Potential Effects*

7.5.206 Given the higher levels of human disturbance associated with residential development and the introduction of predators such as the domestic cat, the abundance of wintering birds present within the Site could be affected. In addition, the permanent displacement of yellowhammer and bullfinch is anticipated given the more elusive character of these species. Given the loss of habitat for these and other wintering species, a permanent adverse effect significant at the Local level is predicted.

Mitigation

7.5.207 Extensive planting of native trees and thicket will be undertaken to provide foraging habitat for wintering birds. This will provide shelter and will include abundant seed-, fruit- and nut-bearing species to provide a foraging resource for birds throughout the winter. In addition, the proposed buffer planting at the eastern boundary will screen the retained hedgerows, thereby providing adequate cover suitable for the more elusive bullfinch and yellowhammer.

Residual Effects

7.5.208 No significant adverse residual effects are predicted.

Badger

Construction Phase

Potential Effects

7.5.209 No badger setts were recorded on-site, although a large badger clan is known to be present within the local area and badgers have been recorded utilising the Site for foraging. However, given the distance of this sett from the Site (c.0.7km), no direct disturbance to the sett is anticipated. Nonetheless, the construction phase will result in the direct loss of c. 24.7 ha of foraging habitat in the form of semi-improved grassland, broadleaved plantation woodland, scrub and arable land. Given the extent of suitable foraging habitat available in the local area, this loss is considered relatively small in comparison and not significant.

7.5.210 During construction works, there is potential for badger utilising the site to become trapped in open excavations if these are left open overnight. Given the protection badgers received under the Protection of Badgers Act 1992, appropriate mitigation measures have been set out below.

Mitigation

7.5.211 The following precautionary measures will be implemented which could be secured via a Planning Condition:

- Pre-construction badger survey and monitoring for signs of new sett digging
- Covering any open excavations with wooden boards, or fitting them with appropriate escape ramps, in order to prevent badgers falling into them and injuring themselves or becoming trapped.
- Monitoring of site for any new sett excavation during prolonged remediation, construction or landscaping works.

Operational Phase

Potential Effects

7.5.212 As badgers can be habitual and retain their territories, they are expected to continue to use the Site during the operational phase for foraging and/or commuting. The layout of the Site allows badgers to do this. No significant adverse effects arising from the operational phase are predicted.

Mitigation

7.5.213 None required.

Residual Effects

7.5.214 Not applicable.

Japanese Knotweed

Construction Phase

Potential Effects

7.5.215 Japanese knotweed is an invasive, non-native species listed under Schedule 9 Part II of the Wildlife and Countryside Act, 1981 (as amended). It is an offence to cause to grow in the wild any plant listed under this schedule. There is potential for this species to be spread during ground works and as such there is potential for an offence to be committed.

7.5.216 The government has set out guidance on what can be considered "causing to grow in the wild" within a response to the Schedule 9 review¹⁰ which states:

"We would expect that where plants listed in Schedule 9 are grown in private gardens, amenity areas etc., reasonable measures will be taken to confine them to the cultivated area so as to prevent their spreading to the wider environment and beyond the landowner's control. It is our view that any failure to do so, which in turn results in the plant spreading to the wild, could be considered as 'causing to grow in the wild' and as such would constitute an offence.... Additionally, negligent or reckless behaviour, such as inappropriate disposal of garden waste, where this results in a Schedule 9 species becoming established in the wild would also constitute an offence."

Mitigation

7.5.217 A specialist contractor will be appointed to undertake the removal of Japanese knotweed from the site thereby minimising the risk of causing this species to spread.

Operational Phase

Potential Effects

7.5.218 Japanese knotweed will be eradicated from the Site during the construction phase. No species listed under Schedule 9 Part II of the Wildlife and Countryside Act (1981) as amended are to be included within the planting schedule for the Site. Therefore no potential effects are anticipated.

Mitigation

7.5.219 None required.

Residual Effects

7.5.220 Not applicable.

Summary of Effects

7.5.221 Table 7.7 below sets out a summary of the above effects, in relation to:

- (1) 'Hampton Green North' alone;
- (2) 'Hampton Green South' alone; &
- (3) All of Hampton Green (both Hampton Green North and South, cumulatively).

Table 7.7 Summary of Significant Effects

Important Ecological Feature	Hampton Green North			Hampton Green South			Hampton Green (Both, Cumulative)		
	Likely Significant effects (before mitigation)	Mitigation / Enhancement	Residual Effects	Likely Significant effects (before mitigation)	Mitigation / Enhancement	Residual Effects	Likely Significant effects (before mitigation)	Mitigation/ Enhancement	Residual Effects
Upper Nene Valley Gravel Pits SPA/Ramsar (& Upper Nene Valley Gravel Pits SSSI)	Adverse, local (recreational impacts at SPA)	Circular walking route; improvements to Brackmills CP	No significant adverse effects	Adverse, local (recreational impacts at SPA; disturbance of supporting habitat)	Circular walking route; improvements to Brackmills CP; Landscape buffer to supporting habitats	No significant adverse effects	Adverse, County (recreational impacts at SPA; disturbance of supporting habitat)	Circular walking routes; improvements to Brackmills CP; Landscape buffer to supporting habitats	No significant adverse effects
Brackmills Small Wood PWs	No significant adverse effects	Extension of woodland habitats	Beneficial effect at the Local level	No significant adverse effects	-	-	No significant adverse effects	Extension of woodland habitats	Beneficial effect at the Local level
Brackmills Woods South PWS	No significant adverse effects	-	-	No significant adverse effects	-	-	No significant adverse effects	-	-
Semi-improved grassland	N/A	N/A	N/A	Adverse effect, local (loss of habitat)	Provision of some grassland, shrub and tree planting	Adverse effect, local (permanent loss of habitat)	Adverse effect, local (loss of habitat)	Provision of substantial new habitats (grassland, woodland, shrub and tree planting)	No significant adverse effects

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Hedgerows	Adverse, local (loss of hedgerows)	Compliance with standard arboricultural practice, replacement of some hedges and provision of some shrub and tree planting	No significant adverse effects	Adverse, local (potential damage to retained hedgerows)	Compliance with standard arboricultural practice	No significant adverse effects	Adverse, local (loss of hedgerows)	Compliance with standard arboricultural practice, replacement of some hedges and provision of substantial woodland, tree and shrub planting	No significant adverse effects
Mature/Semi-Mature Trees	Adverse, local (potential damage to retained trees)	Compliance with standard arboricultural practice,	Beneficial, local (increase in tree cover)	Adverse, local (loss of trees)	Compliance with standard arboricultural practice, provision of some shrub and tree planting	No significant adverse effects	Adverse, local (loss of habitat)	Compliance with standard arboricultural practice, substantial new woodland planting, and some other tree and shrub planting	Beneficial, local (increase in tree cover)
Bats	Adverse, local (disturbance to foraging/commuting bats)	Restrictions on night-time working, sensitive lighting scheme, buffer planting.	Beneficial, local (increase in foraging habitat)	Adverse, local (disturbance to foraging/commuting bats)	Sensitive lighting scheme, buffer planting	No significant adverse effects	Adverse, local (disturbance to foraging/commuting bats)	Restrictions on night-time working, sensitive lighting scheme, buffer planting, substantial new woodland planting	No significant adverse effects
Breeding Birds (and 'Nesting birds')	No significant adverse effects (minimal loss of breeding habitats).; risk of legal infringement (WACA)	Substantial new woodland planting; Safeguards during construction	Beneficial, local (increase in [woodland] breeding habitat)	Adverse, local (loss breeding habitats); risk of legal infringement (WACA)	Provision of some shrub and tree planting; Safeguards during construction	Adverse, local	Adverse, local (loss breeding habitats); risk of legal infringement (WACA)	Substantial new woodland planting and other habitats; Safeguards during construction	No significant adverse effects
Wintering Birds	No significant adverse effects (minimal loss)	Substantial new woodland planting	Beneficial, local (increase in [woodland])	Adverse, local (loss of wintering)	Provision of some shrub and tree planting	Adverse, local	Adverse, local (loss wintering refuge and foraging)	Substantial new woodland planting and other habitats	No significant adverse effects

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	of wintering habitats).		wintering refuge and food sources)	refuge and food sources)					
Badger	Risk of legal infringement (badger act)	Safeguards during construction	Not applicable	Risk of legal infringement (badger act)	Safeguards during construction	Not applicable	Risk of legal infringement (badger act)	Safeguards during construction	Not applicable
Japanese knotweed	Not present therefore no effect.	Not applicable	Not applicable	Risk of legal infringement (Wildlife and Countryside Act)	Appoint specialist contractor to undertake removal	Not applicable	Risk of legal infringement (Wildlife and Countryside Act)	Appoint specialist contractor to undertake removal	Not applicable

7.5.222 Based on the above, considering both Hampton Green North and South together, the scheme is considered to be in accordance with all National and Local planning policies relating to wildlife and biodiversity including policies BN1, BN2, BN3 and BN4 of the West Northamptonshire Joint Core Strategy Local Plan (Part 1) and saved policies EV19, EV21 and EV24 of the South Northamptonshire Local Plan (adopted 1997).

7.6 ENHANCEMENT

Hampton Green North

Woodland & Associated Habitat Creation

7.6.1 New woodland planting (c.1ha) is proposed to the northern boundary adjacent to Brackmills country Park and Brackmills Small Wood PWS. The planting would include a range of native, broadleaved trees of local provenance and suited to the prevailing soil conditions. Associated habitats will be created around the woodland, including attenuation basin to include long grassland/wildflower habitats and woodland ride features. These habitats will be maintained for their ecological interest and to provide an effective extension to the Brackmills Country Park.

7.6.2 The above habitats will provide a range of benefits to local wildlife including bats, birds, amphibians, invertebrates and small mammals (including hedgehog).

Hampton Green South

Drainage Features

7.6.3 A new drainage feature will be constructed to the gateway of the Site. Whilst its primary function is hydrological, the drainage feature will be landscaped to provide benefits for biodiversity. This will comprise a permanently wet wildlife pond, surrounding wet grassland and marginal habitats, along with reedbed and wetland scrub areas.

7.6.4 The above habitat creation will provide a range of benefits to local wildlife including bats, birds, amphibians, invertebrates and small mammals (including harvest mouse).

Hampton Green (Both)

Bird and Bat Boxes

7.6.5 A number of bird and bat box features will be installed at the Site to provide additional nesting and roosting opportunities, respectively. These features would ideally be integrated into new dwellings located adjacent to open space or structural landscaping and/or erected on healthy, semi-mature trees across the Site. The total numbers will be subject to detailed design, but an average of one bat/bird box unit per 15 dwellings would be appropriate.

7.6.6 In addition to the above, erection of 10 No. bat boxes at Brackmills Small Wood CWS is proposed to enable longer term monitoring of bat populations at the Site.

Timber Fence Treatments

7.6.7 To enable small mammals, including hedgehog, to continue to use habitats the Site (i.e. private gardens) >13cm holes at the base of new timber garden fences will be incorporated into the detailed design of the plot landscaping.

7.7 CUMULATIVE EFFECTS

7.7.1 The cumulative adverse effects of the proposed development are considered in combination with the following other projects:

- Land to the East of Hardingstone (N/2013/0338) – outline permission granted [at appeal] for sustainable urban extension to include up to 1,000 dwellings, a

local centre of retail, professional and financial services, a public house, primary school, community uses and infrastructure improvements.

- Land East of Wootton Fields (S/2011/0989/MAR) – residential development of 300 dwellings with associated highway and other infrastructure works. Currently under construction.
- Land East of Wootton Fields (S/2014/0440/MAF) – residential development of 38 dwellings with associated landscaping and highways infrastructure. Currently under construction.

7.7.2 Based on the type of development and habitats present, no significant cumulative effects on the following important ecological features are anticipated:

- Brackmills Small Wood PWS
- Brackmills Woods South PWS
- Semi-improved grassland
- Mature/semi-mature trees
- Bats
- Badger

7.7.3 Cumulative effects on the remaining important ecological features, namely Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI, hedgerows, breeding birds and wintering birds are discussed below.

Hampton Green North

Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI

7.7.4 In combination, Hampton Green North, Land East of Hardingstone and both Land East of Wootton Fields Sites will provide a total of c.1453 dwellings. The potential impacts on Visitor Rates arising from these developments are detailed in Tables 7.8, 7.9 and 7.10 below, and 7.4 above.

Table 7.8 Land to the East of Hardingstone (N/2013/0338): Visit rates in relation to housing at different distances from an access point (adapted from Liley et al, 2014)

	Distance of access point from Site			
	0-500m	500m-1km	1-2km	2-5km
Visit Rate (people per day) from 1000 houses	51	13.1	3.4	1.3
Ratio		3.9	15.0	40.1
Number of access points at distance band likely to be utilised by residents from the proposed development	0	0	0	2

Table 7.9 Land to the East of Wootton Fields (S/2011/0989/MAR): Visit rates in relation to housing at different distances from an access point (adapted from Liley et al, 2014)

	Distance of access point from Site			
	0-500m	500m-1km	1-2km	2-5km
Visit Rate (people per day) from 300 houses	15.3	3.9	1.0	0.4
Ratio		3.9	15.0	40.1
Number of access points at distance band likely to be utilised by residents from the proposed development	0	0	0	2

Table 7.10 Land to the East of Wootton Fields (S/2014/0440/MAF): Visit rates in relation to housing at different distances from an access point (adapted from Liley et al, 2014)

	Distance of access point from Site			
	0-500m	500m-1km	1-2km	2-5km
Visit Rate (people per day) from 38 houses	1.9	0.5	0.1	0.05
Ratio		3.9	15.0	40.1
Number of access points at distance band likely to be utilised by residents from the proposed development	0	0	0	2

7.7.5 Based on the Tables 7.8, 7.9 and 7.10 above, the Land to the East of Hardingsstone development (N/2013/0338), Land to the East of Wootton Fields development (S/2011/0989/MAR) and Land to the East of Wootton Fields development (S/2014/0440/MAF) would result in a potential increase of up to 2.54, 0.76 and 0.10 people per day to the SPA, respectively. The Hampton Green North development would result in a potential increase of 0.29 people per day (see Table 7.4 above).

7.7.6 In the absence of mitigation, Hampton Green North, in combination with the wider sites, would result in a potential average Visit Rate to the SPA of c. 3.69 people per day.

7.7.7 Total daily visitor rates to the SPA are currently estimated at 2448 person visits per day²⁴. In the absence of mitigation, the proposed developments would therefore be estimated to result in a cumulative increase of up to 0.15%. However, the mitigation measures proposed under the Land East of Hardingsstone development and Hampton Green North development is expected to significantly reduce these visitor rates.

7.7.8 The EIA for Land to the East of Hardingsstone has established no anticipated significant effect arising from the proposals on this designation and off-sets any potential recreational impacts arising from the development through provision of on-site greenspace and promotion of the publicly accessible Brackmills Country Park to the north. Furthermore, Hampton Green North and all of the wider sites are well separated from the golden plover foraging habitat recorded to the east of the Site and therefore no disturbance affects are anticipated. As such, no significant cumulative affects arising from the Hampton Green North development, in combination with the wider sites, are anticipated.

Hedgerows

7.7.9 All hedgerows (save for the loss of small sections for access) within both of the Land to the East of Wootton Fields developments will be retained and enhanced save for the loss of the structurally-poor, gappy hedgerow that runs north-south in the south of the Site, equating to a loss of c. 130m of hedgerow. The Land to the East of Hardingsstone development will result in total losses of c. 200m based on the description set out within their ES Chapter²⁵. Retained hedgerows within all of the wider sites will be supplemented with native planting. The total cumulative loss in hedgerow length (taking into account the residual increase of c.95m of hedgerow in Hampton Green North) is therefore 235m. This loss is considered to be of relatively low magnitude given the quantity of hedgerow available in the wider landscape, the supplementary native planting proposed, and that connectivity through the sites with the wider landscape is maintained. Therefore this minor loss in hedgerow length is considered negligible. As such, no significant cumulative affects

²⁴ Liley, D., Floyd, L., Cruickshanks, K. & Fearnley, H. (2014). Visitor Access Study of the Upper Nene Valley Gravel Pits SPA. Footprint Ecology. Unpublished report for the NIA partnership.

²⁵ Parsons Brinkerhoff (2013). Land South of Brackmills SUE: Environmental Impact Assessment

arising from the Hampton Green North development in combination with the wider sites are anticipated.

Breeding Birds

7.7.10 Birds recorded within Land to the East of Hardingstone were generally restricted to common passerine species with the exception of yellowhammer and skylark, although no breeding territories of these species were recorded. The breeding bird status at the other wider sites is unknown. However, given the small size of the Sites and the habitats present, the breeding bird assemblage is considered unlikely to be significant. Given the above, in combination with no significant affects anticipated under the Hampton Green North development, no significant cumulative effects are anticipated.

Wintering birds

Wintering bird surveys were not undertaken in respect of Land to the East of Hardingstone. However, the targeted wintering bird surveys undertaken of the wider landscape as part of the current Hampton Green Site assessment identified a single lapwing within the Land to the East of Hardingstone Site. Both of the Land East of Wootton Fields sites are located immediately adjacent to existing residential development and as such are likely subjected to high levels of disturbance. Consequently, these sites are considered unlikely to support a significant assemblage of over-wintering birds. The Hampton Green North development is anticipated to result in a beneficial affect for wintering birds given the extent of woodland habitat created. Therefore, when considered in combination with the other projects, no significant cumulative effects are anticipated.

Hampton Green South

Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI

7.7.11 In combination, Hampton Green South, Land East of Hardingstone and both Land East of Wootton Fields Sites will provide a total of c.1748 dwellings. The Land to the East of Hardingstone development (N/2013/0338), Land to the East of Wootton Fields development (S/2011/0989/MAR) and Land to the East of Wootton Fields development (S/2014/0440/MAF) would result in a potential increase of up to 2.54, 0.76 and 0.10 people per day to the SPA, respectively (see Tables 7.8, 7.9 and 7.10 above). The Hampton Green South development would result in a potential increase of c. 1.04 people per day (see Table 7.5 above). In the absence of mitigation, Hampton Green South, in combination with the wider sites, would result in a potential average Visitor Rate to the SPA of c.4.44 people per day.

7.7.12 Total daily visitor rates to the SPA are currently estimated at 2448 person visits per day²⁶. In the absence of mitigation, the proposed developments would therefore be estimated to result in a cumulative increase of up to 0.18%. However, the mitigation measures proposed under the Land East of Hardingstone development and Hampton Green South development is expected to significantly reduce these visitor rates.

7.7.13 The EIA for Land to the East of Hardingstone has established no anticipated significant effect arising from the proposals on this designation and off-sets any potential recreational impacts arising from the development through provision of on-site greenspace and promotion of the publicly accessible Brackmills Country Park to the north. Furthermore, all of the wider sites are well separated from the golden plover foraging habitat recorded to the east of the Site and disturbance affects from Hampton Green South are mitigated through the retained eastern buffer. Therefore no disturbance affects are

²⁶ Liley, D., Floyd, L., Cruickshanks, K. & Fearnley, H. (2014). Visitor Access Study of the Upper Nene Valley Gravel Pits SPA. Footprint Ecology. Unpublished report for the NIA partnership.

anticipated. As such, no significant cumulative effects arising from the Hampton Green South development, in combination with the wider sites, are anticipated.

Hedgerows

7.7.14 All hedgerows (save for the loss of small sections for access) within both of the Land to the East of Wootton Fields developments will be retained and enhanced save for the loss of the structurally-poor, gappy hedgerow that runs north-south in the south of the Site, equating to a loss of c. 130m of hedgerow. The Land to the East of Hardingstone development will result in total losses of c. 200m based on the descriptions set out within their EIA²⁷. Retained hedgerows within all of the wider sites will be supplemented with native planting. The total cumulative loss in hedgerow length (taking into account the net loss of c.50m of hedgerow in Hampton Green South) is therefore 380m. This loss is considered to be of relatively low magnitude given the quantity of hedgerow available in the wider landscape, the supplementary native planting proposed, and that connectivity through the sites with the wider landscape is maintained. Therefore this minor loss in hedgerow length is considered negligible. As such, no significant cumulative effects arising from the Hampton Green South development in combination with the wider sites are anticipated.

Breeding Birds

7.7.15 Birds recorded within Land to the East of Hardingstone were generally restricted to common passerine species with the exception of yellowhammer and skylark, although no breeding territories of these species were recorded²⁸. The breeding bird status at the other wider sites is unknown. However, given the small size of the Sites and the habitats present, the breeding bird assemblage is considered unlikely to be significant. Nonetheless, given the residual effect at the Local Level arising from the Hampton Green South development (given the loss of 4-6 pairs of breeding skylark) and that none of the wider sites include provision of skylark nesting habitat under the proposals, a cumulative effect significant at the Local level is anticipated.

Wintering birds

Wintering bird surveys were not undertaken in respect of Land to the East of Hardingstone. However, the targeted wintering bird surveys undertaken of the wider landscape as part of the current Hampton Green Site assessment identified a single lapwing within the Land to the East of Hardingstone Site. Both of the Land East of Wootton Fields sites are located immediately adjacent to existing residential development and as such are likely subjected to high levels of disturbance. Consequently, these sites are considered unlikely to support a significant assemblage of over-wintering birds. The Hampton Green South development is anticipated to result in a significant permanent adverse effect given the loss of extensive foraging/sheltering habitat for over-wintering birds. Therefore, when considered in combination with the other projects, a cumulative adverse effect significant at the Local level is predicted.

Hampton Green (Both)

Upper Nene Valley Gravel Pits SPA/Ramsar/SSSI

7.7.16 In combination, Hampton Green, Land East of Hardingstone and both Land East of Wootton Fields Sites will provide a total of c.1863 dwellings. The Land to the East of Hardingstone development (N/2013/0338), Land to the East of Wootton Fields development (S/2011/0989/MAR) and Land to the East of Wootton Fields development

²⁷ Parsons Brinkerhoff (2013). Land South of Brackmills SUE: Environmental Impact Assessment

²⁸ Parsons Brinkerhoff (2013). Land South of Brackmills SUE: Environmental Impact Assessment

(S/2014/0440/MAF) would result in a potential increase of up to 2.54, 0.76 and 0.10 people per day to the SPA, respectively (see Tables 7.8, 7.9 and 7.10 above). The Hampton Green development would result in a potential increase of 1.34 people per day (see Table 7.6 above). In the absence of mitigation, Hampton Green, in combination with the wider sites, would result in a potential average Visitor Rate to the SPA of c.4.74 people per day.

7.7.17 Total daily visitor rates to the SPA are currently estimated at 2448 person visits per day . In the absence of mitigation, the proposed developments would therefore be estimated to result in a cumulative increase in the Visitor Rate of up to 0.19%. However, the mitigation measures proposed under the Land East of Hardingstone development and Hampton Green development is expected to significantly reduce these visitor rates.

7.7.18 The EIA for Land to the East of Hardingstone has established no anticipated significant effect arising from the proposals on this designation and off-sets any potential recreational impacts arising from the development through provision of on-site greenspace and promotion of the publicly accessible Brackmills Country Park to the north. Furthermore, all of the wider sites are well separated from the identified golden plover foraging habitat recorded to the east of the Site and disturbance affects from Hampton Green are mitigated through the retained eastern buffer. Therefore no disturbance affects are anticipated. As such, in considering the mitigation proposed for each of the schemes "alone", no significant cumulative affects arising from the Hampton Green development 'in-combination' with the wider sites are anticipated.

Hedgerows

7.7.19 All hedgerows (save for the loss of small sections for access) within both of the Land to the East of Wootton Fields developments will be retained and enhanced save for the loss of the structurally-poor, gappy hedgerow that runs north-south in the south of the Site, equating to a loss of c. 130m of hedgerow. The Land to the East of Hardingstone development will result in total losses of c. 200m based on the description set out within their EIA²⁹. Retained hedgerows within all of the wider sites will be supplemented with native planting. The total cumulative loss in hedgerow length (taking into account the residual increase of c.45m of hedgerow in Hampton Green) is therefore 285m. This loss is considered to be of relatively low magnitude given the quantity of hedgerow available in the wider landscape, the supplementary native planting proposed, and that connectivity through the sites with the wider landscape is maintained. Therefore this minor loss in hedgerow length is considered negligible. As such, no significant cumulative affects arising from the Hampton Green development in combination with the wider sites are anticipated.

Breeding Birds

7.7.20 Birds recorded within Land to the East of Hardingstone were generally restricted to common passerine species with the exception of yellowhammer and skylark, although no breeding territories of these species were recorded³⁰. The breeding bird status at the other wider sites is unknown. However, given the small size of the Sites and the habitats present, the breeding bird assemblage is considered unlikely to be significant. Given the above, in combination with no significant affects anticipated under the Hampton Green development, no significant cumulative effects are anticipated.

Wintering Birds

Wintering bird surveys were not undertaken in respect of Land to the East of Hardingstone. However, the targeted wintering bird surveys undertaken of the wider landscape as part

²⁹ Parsons Brinkerhoff (2013). Land South of Brackmills SUE: Environmental Impact Assessment

³⁰ Parsons Brinkerhoff (2013). Land South of Brackmills SUE: Environmental Impact Assessment

of the current Hampton Green Site assessment identified a single lapwing within the Land to the East of Hardington Site. Both of the Land East of Wootton Fields sites are located immediately adjacent to existing residential development and as such are likely subjected to high levels of disturbance. Consequently, these sites are considered unlikely to support a significant assemblage of over-wintering birds. The extensive habitat creation at Hampton Green will provide a foraging resource for birds throughout the winter and the buffer planting will screen the retained hedgerows, thereby providing cover for the more elusive species. Given this extensive habitat creation, when considered in combination with the other projects, no significant cumulative effects are anticipated.

7.8 CONCLUSION

7.8.1 When considered separately from Hampton Green South, no significant residual adverse effects arising from Hampton Green North, either alone or in combination with other projects, are predicted. Further, significant benefits are predicted at the local level to a number of important ecological features including Brackmills Small Wood PWS, tree cover, breeding birds and wintering birds.

7.8.2 When considered separately from Hampton Green North, significant residual adverse effects at the local level arising from Hampton Green South include loss of semi-improved grassland, loss of breeding bird habitat and loss of wintering bird habitat. These adverse effects remain significant at the local level when considered in combination with other projects.

7.8.3 When considered together, no significant adverse effects arising from Hampton Green as a whole, either alone or in combination with other projects, are predicted. The proposed new habitat mosaic in the north of the site and the new eastern buffer will comprise native woodland planting, native thicket planting and extensive seeding of species-rich wildflower grassland. This will provide an extension of the woodland habitat associated with Brackmills Small Wood PWS immediately adjacent to the northern Site boundary and, in addition, will provide a significant net increase in overall tree cover at the Site. Furthermore, it is anticipated that the species-diverse and structurally-diverse habitat that will be created would be readily exploited by a variety of species including wintering/breeding birds and foraging/commuting bats.