

Preliminary Ecological Appraisal

February 2024

**Land at Ratby Lane,
Markfield, Leicestershire**

Prepared by
CSA Environmental

On behalf of
Taylor Wimpey Strategic Land

Report No: CSA/2550/03

This report may contain sensitive ecological information. It is the responsibility of the Local Authority to determine if this should be made publicly available.

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EXECUTIVE SUMMARY

Residential development is proposed at Land at Ratby Lane, Markfield, for which outline planning permission will be sought.

CSA Environmental was instructed by Taylor Wimpey Strategic Land to undertake a Preliminary Ecological Appraisal (PEA) of the Site to identify ecological constraints to development, inform recommendations for design, highlight opportunities for ecological enhancement and determine any additional investigation/survey work necessary.

As part of this PEA, a desk study and UKHab survey of the Site were undertaken in April 2023. The Site comprises a single arable field bounded by a mixture of native hedges and woodland and an additional strip of grassland, extending south-eastwards through the adjacent southern field.

A number of designations are present within the wider landscape, comprising Sites of Special Scientific Interest (SSSI) and Local Wildlife Sites (LWS). The western and southern boundaries of the Site are designated as Markfield, Groby, Ratby and Green Lane Hedgerow LWS and comprise intact, native hedgerow features. These features should be retained as far as possible, and enhanced with additional strengthening and infill planting where required.

Habitats currently present within the Site are generally common and widespread, with the greatest ecological interest associated with the woodland corridor, native hedgerows and mature trees present at field boundaries. These should be retained, protected and enhanced wherever possible.

Habitats at the Site have been identified as potentially supporting foraging/dispersing bats, badger and great crested newts. Further surveys to confirm the presence or likely absence of these species has been completed. Results will be collated and an evidence-based Ecological Impact Assessment prepared.

No overriding constraints to development of the Site have been identified. Recommendations have been provided for ecological enhancement measures that could be delivered as part of the proposed development.

1.0 INTRODUCTION

- 1.1 This report has been prepared by CSA Environmental on behalf of Taylor Wimpey Strategic Land. It sets out the findings of a Preliminary Ecological Appraisal (PEA) at Land at Ratby Lane, Markfield (hereafter referred to as 'the Site'). Residential development is proposed at the Site, for which outline planning permission will be sought.
- 1.2 The scope of this appraisal has been determined with due consideration for best-practice guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017), and to the *Biodiversity: Code of practice for planning and development* (BS 42020:2013) published by the British Standards Institution (2013).
- 1.3 The Site occupies an area of c. 5.46ha and is located around central grid reference SK 49580 09505, located to the south-east of Markfield. It primarily consists of an arable field bounded by woodland to the south and east, and native hedgerows around the periphery (see Habitats Plan in Appendix A).
- 1.4 A desk study and UKHab Survey were undertaken of the Site, the findings of which are presented herein.
- 1.5 This PEA aims to:
 - Identify any ecological constraints to development of the Site
 - Inform design decisions
 - Identify further ecological surveys and investigation necessary to inform a full Ecological Impact Assessment (EclA) of the Site
 - Highlight opportunities for ecological enhancement and Biodiversity Net Gain (BNG)
- 1.6 As set out in best practice guidelines (CIEEM, 2017) a PEA is typically only suitable for planning submission where there are no ecological constraints relating to the project. Where ecological constraints are identified, such as the presence of important ecological features, the effects of development on these features should be assessed within a separate EclA report, which would supersede the PEA.

2.0 LEGISLATION, PLANNING POLICY & STANDING ADVICE

Legislation

- 2.1 Legislation relating to wildlife and biodiversity of particular relevance to this PEA includes:
- The Conservation of Habitats and Species Regulations 2017 (as amended)
 - The Wildlife and Countryside Act 1981 (as amended)
 - The Natural Environment and Rural Communities (NERC) Act 2006
 - The Protection of Badgers Act 1992
- 2.2 This above legislation has been addressed, as appropriate, in the production of this report. Further information on the above legislation is provided in Appendix B.

National Planning Policy

- 2.3 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2023) sets out the government planning policies for England and how they should be applied. Chapter 15: Conserving and Enhancing the Natural Environment, is of particular relevance to this report as it relates to ecology and biodiversity. Further details are provided in Appendix B.
- 2.4 The Government Circular 06/2005, which is referred to by the NPPF, provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their effects within the planning system.

Local Planning Policy

- 2.5 A number of local planning policies relate to ecology, biodiversity and/or nature conservation. These are summarised in Table 1 of Appendix B. These policies have been addressed, as appropriate, in the production of this report.

Standing Advice

- 2.6 Natural England and Defra's Standing Advice (Natural England & Defra, 2014) regarding habitats and 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. Standing advice has therefore been given due consideration, alongside other detailed guidance documents, in the production of this report.

3.0 METHODS

Desk Study

- 3.1 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed in September 2023 to identify nature conservation designations within the following search radii:
 - Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites within 10km of the Site (including possible/proposed sites)
 - Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) within 3km of the Site
 - Other relevant data e.g. Ancient Woodland Inventory within 1km of the Site
- 3.2 A review was undertaken of the location of any such designations, their distance from and connectivity with the Site, and the reasons for their designation. This information was used to determine whether they may be within the Site's zone of influence.
- 3.3 Leicestershire and Rutland Environment Records Centre (LRERC) was contacted for details of any non-statutory nature conservation designations and records of protected/notable habitats and species. This information was requested for an area encompassing the Site and adjacent land within c. 2km of its central grid reference. This search area was selected to include the likely zone of influence upon non-statutory designations and protected or notable habitats and species.
- 3.4 Further online resources were reviewed for information which may aid the identification of important ecological features. The Woodland Trust's online Ancient Tree Inventory was reviewed for known ancient or veteran trees within the Site and adjacent land. Interactive online mapping provided by the charity 'Buglife' was used to determine whether the Site falls within an Important Invertebrate Area.
- 3.5 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts *Triturus cristatus*, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography.
- 3.6 Where possible under the terms of the data provider, relevant desk study data are presented in Appendix C.

Field Survey

Extended Phase 1 Habitat Survey

- 3.7 An initial extended Phase 1 Habitat Survey was carried out in fine and dry weather conditions on 21 April 2021, encompassing the Site and immediately adjacent habitats that could be viewed. An update Habitat Classification ('UKHab') survey was carried out in fine and dry weather conditions on 17 April 2023, led by Alex Perry ACIEEM and assisted by Becca King.
- 3.8 UKHab is a unified and comprehensive system for mapping and classifying habitats, designed to provide a simple and robust approach to surveying and monitoring, and replaces Phase 1 Habitat survey methods. The method allows for identification of important habitat types, including habitats of Principal Importance under Section 41 (S41) of the NERC Act (2006) and Habitats Directive Annex I habitats. This method also allows for direct translation of habitats into the Statutory Biodiversity Metric (DEFRA, 2023).
- 3.9 The following parameters were adopted for the UKHab survey undertaken for this PEA:
- UKHab Professional edition (Butcher *et al.*, 2020, commercial End User Licence Agreement (EULA))
 - Minimum Mappable Unit (MMU):
 - 10m²/0.001ha (polygons)
 - 5m (linear)
 - Primary Habitats recorded to a minimum of Level 2 (see below) with UKHab codes provided
 - Mandatory secondary codes used
 - Base-mapping comprising a combination of aerial imagery and topographic information
- 3.10 Primary Habitats are recorded to a minimum of Level 2. Where the survey is conducted at an appropriate time of year (e.g. May to July for grassland) habitats may be recorded to Level 3, 4 or 5, only if conditions and the experience of the surveyor allow.
- 3.11 To assist with classification of grassland habitats quadrat samples were taken during UKHab survey on 17 July 2023 by Alex Perry and Tom Richards MCIEEM, both FISC Level 4. Representative sample locations were identified within each grassland parcel, spread evenly to avoid habitat transitions or ecotones, following a 'W' shape through the parcel and covering a minimum of five sampling locations. Both average (mean) species count per m² and peak species counts are reported for comparison.

- 3.12 Identification of habitat stands were made arbitrarily by the surveyor based upon obvious habitat structure, composition or other delineating feature (e.g. field or enclosure).
- 3.13 Quadrats of 1m x 1m were used, repeated four times in each sample location (i.e. 2m x 2m or 4m²). This technique assists, for example, with distinguishing between modified (g4) and other neutral (g3c) grasslands (using the threshold of nine species per m², reporting an average of the four samples).
- 3.14 Alongside the UKHab survey, additional field survey information was collected, comprising:
- Detailed floral species lists recorded for each identified habitat/parcel
 - Further habitat condition information based upon current Statutory Biodiversity Metric (DEFRA, 2023) condition assessment guidance
 - Evidence of, or potential for, European Protected Species (EPS) (including bats, great crested newt, dormouse and otter)
 - Evidence of, or potential for, other protected species (including birds, reptiles, water vole, badger and certain invertebrates)
 - Evidence of, or potential for, other notable species (including S41 Species of Principal Importance as well as notable, rare, protected or controlled plants and invertebrates)
 - Any other survey information relevant to ecological matters
- 3.15 Results of the UKHab survey are presented on the Habitats Plan in Appendix A. Appendix A also provides photographs of the habitats at the Site and Appendix D provides a list of floral species recorded in each habitat parcel. Nomenclature for higher plants within this report is consistent with the fourth edition of The New Flora of the British Isles (Stace, 2019).

Limitations

- 3.16 There were no specific limitations to the desktop study or extended Phase 1 Habitat survey, which was conducted at an optimal time of year and in good conditions.

Evaluation and Assessment

- 3.17 The evaluation and assessment of ecological features is beyond the scope of a PEA and has therefore not been undertaken here. Formal evaluation and assessment of any identified important ecological features should be undertaken as part of either a full EclA, or receptor-specific survey and assessment in accordance with the published CIEEM method (CIEEM, 2018).

4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

- 4.1 There are no statutory designations covering any part of the Site.
- 4.2 No international statutory designations were identified within 10km of the Site.
- 4.3 The Site falls within the fluvial catchment of the Soar River, which discharges to the Humber Basin. It shares no hydrological connectivity with any statutory river, wetland, estuary or coastal designation which has been identified in advice from Natural England as being vulnerable to increases in nutrient loading from new development.
- 4.4 Five national statutory designations were identified within 3km of the Site. These statutory designations are described in Table 1 below.
- 4.5 Footpath connections are present between the Site and a number of the SSSI's, such as Ulverscroft Valley SSSI. However, given the distance from the Site and the lack of a car park, no appreciable increase in visitor numbers is considered likely to this designation.
- 4.6 The remaining designations have local car parks meaning visitors may drive from further afield for recreational visits. Bradgate Park and Cropston Reservoir SSSI contains multiple car parks and cafes and is likely to be managed in such a way to support high visitor numbers. As such, any minor increase in visitors to this designation is considered unlikely to result in a negative effect.
- 4.7 Although there is no direct connectivity through the local footpath network, Sheet Hedges Wood SSSI and Groby Pool and Woods SSSI both have an associated car park. As such, local residents may travel by car to visit these designations on occasion. Information available on the National Forest website states that access to the SSSI portion of Sheet Hedges Wood is via a nature trail only, which is likely to be managed to accommodate higher visitor numbers and avoid impacts to sensitive features. As such, the minor increase in visitors to this designation is unlikely to result in a negative effect.
- 4.8 Groby Pool and Woods SSSI is serviced by a free car park and as such is likely to receive higher visitor numbers. Natural England's SSSI Impact Risk Zones tool has also been considered, which allows a rapid initial assessment to be made of the potential risks posed by development types to SSSI designations. The Site falls partially within the SSSI impact risk zone of Groby Pool and Woods SSSI, citing any developments with a net increase in 100 residential units outside of existing settlements may potentially result in negative impacts. Whilst the Site comprises semi-

natural habitat at present, it is located adjacent to Markfield and therefore is not considered to comprise 'rural residential' development. It is acknowledged that there may be occasional additional visitors to this designation, but due to the distance from the Site, and the availability of alternative woodland walking routes in the locality, it is likely new residents will largely use other more local opportunities.

- 4.9 No local statutory designations were identified within 3km of the Site.

Non-Statutory

- 4.10 A total of 17 non-statutory designations were identified within 1km of the Site. These non-statutory designations are described in Table 1 below. A number of LWS were returned, including several labelled as candidate, notified and potential. Candidate LWS are those with clear evidence that the LWS designation criteria would be met but they have not yet been formally accepted. Notified and Candidate sites have the same status with regards to planning policy and Potential sites are those which are likely to meet the designation criteria but further surveys are needed to confirm this. As such, all of the designations with the above prefix have been considered within this report.
- 4.11 A number of designations comprise mature trees or stretches of hedgerow. As off-site designations are less likely to be impacted by proposals, those relating to hedgerows and mature trees over 0.5km from the Site have been omitted from the table below.
- 4.12 The closest of these non-statutory designations were Markfield, Groby, Ratby and Green Lane Hedgerows (Potential) LWS which form the western and southern boundaries of the Site. As Markfield, Groby, Ratby and Green Lane Hedgerows (Potential) LWS forms part of the Site boundary, there is potential for negative effects to arise as a result of the proposed development. As this designation comprises on-site habitats, their importance and any associated impacts are discussed under the relevant habitat heading below.
- 4.13 Bradgate House, Groby (Potential) LWS is located c. 0.5km east of the Site and comprises the previously inhabited Bradgate House (now ruins) and associated estate land and gardens. Although the designation appears to be open to the public and is frequently used for walking, Bradgate House is located on the opposing side of the A50 dual carriageway. As such, the number of visitors from the proposed development is anticipated to be minor.
- 4.14 A large swathe of ancient semi-natural woodland on the opposing side of the A50 is designated as Groby, Hedgerow (Candidate) LWS, located c. 0.2km east. Although this designation is situated near to the Site, visitors would need to cross the busy A50 dual carriageway to access the designation. There may be a minor increase in visitors as a result of the proposed development, but due to the size of the LWS and number of

available walking routes in the locality, the effects of the increase are anticipated to be minimal.

- 4.15 The remaining designations largely comprise small areas of habitat on private land, such as a stretch of hedgerow or parcel of grassland. No hydrological connection appears to be present between the Site and remaining designations, and an increase in recreational pressure is not anticipated due to the small and publicly inaccessible nature of the designations. As such, no negative effects are anticipated for any of the remaining LWS.

Table 1. Statutory and Non-Statutory Designations within search radii

Site Name & Designation	Distance & Direction from Survey Area	Special Interests or Qualifying Features
International Designations within 10km		
-	-	-
National Designations within 3km		
Ulverscroft Valley SSSI	c. 1.1km north	Unimproved grassland with areas of acidic character. Fragments of heath, woodland and wetlands support nationally scarce fragrant orchid and flea sedge. Adjacent acidic marshy grassland is dominated by purple moor-grass, tufted hair-grass, bilberry and rushes. The site supports protected bird species including, woodcocks, yellow wagtails and redstarts.
Grobby Pool and Woods SSSI	c. 1.9km south-east	Variety of habitats including, alder and oak woodland, grassland, marsh and open water. The site supports niche plant communities of acidic soils with the largest natural body of water in Leicestershire. Supports wintering waterfowl, breeding bird communities and a variety of invertebrate species.
Cliffe Hill Quarry SSSI	c. 2km north-west	Designated for geological interests.
Bradgate Park and Cropston Reservoir SSSI	c. 2.2km east	The site is a good drainage area for the midlands, with one of the last remaining wet heathlands in the county and nationally important geological features. The ancient oak parkland supports marginal plant and diverse bird communities. Saxicolous lichens on dry acidic grasslands provide refuge for the regionally scarce bilberry. Small pools contain bog moss and support locally scarce invertebrates including, broad-bodied chaser dragonfly and water beetles.
Sheet Hedges Wood SSSI	c. 2.8km south-east	Ancient woodland comprising of ash and alder, on clay soils. The site has a range of native wildflower species

		including, toothwort and giant bellflower.
Local Designations within 3km		
-	-	-
Non-statutory Designations within 1km		
Markfield, Groby, Ratby and Green Lane Hedgerows pLWS	Western and southern Site boundary	Potential LWS due to its dense hedgerows.
Groby, Hedgerow LWS	c. 0.2km east	Candidate LWS for historic ancient semi-natural woodland.
Newton Linford, Land off Markfield Lane LWS	c. 0.4km north-east	Candidate LWS due to its mixed grassland
Lower Grange Farm Hedge, Markfield LWS	c. 0.4km west	Candidate LWS designated for species rich hedgerow adjacent to stream.
Cover Cloud Field Neutral Grassland LWS	c. 0.5km north	Designated for mixed grassland and hedgerow habitats which support a diverse range of flora species including wood horsetail <i>Equisetum sylvaticum</i> .
Bradgate House, Groby LWS	c. 0.5km south-west	Potential LWS designated for mesotrophic grassland, parkland, meadow, woodland and pond habitats with mature trees.
Cover Cloud Wood LWS	c. 0.5km north	Ancient semi-natural broadleaved woodland supporting a range of ground-flora species including bluebell <i>Hyacinthoides Non-scripta</i> .
Heyday Hays Wood LWS	c. 0.5km north-east	Semi-natural woodland dominated by silver birch <i>Betula pendula</i> , with frequent mature oak <i>Quercus Robur</i> and rowan <i>Sorbus aucuparia</i> . Supporting diverse ground-flora including bluebell.
Home Farm LWS	c. 0.8km north-west	Mesotrophic grassland with areas of transitional mesotrophic and acid grassland, supporting IUCN Red Listed protected species.
Field North of Leicester Road LWS	c. 0.9km north-west	Transitional mesotrophic and wet grassland.

Ancient Woodland

- 4.16 No ancient woodland has been identified covering any part of the Site or in the immediately adjacent land. Ancient semi-natural woodland has been identified within 1km of the Site, but present on the opposing side of the A50 dual carriageway. As such, ancient woodland is not anticipated to pose a constraint to development.

Habitats and Flora

- 4.17 Habitats recorded on-site were classified in line with current Phase 1 Habitat survey guidance (JNCC, 1990), as illustrated in Appendix A. Detailed species lists for each habitat are provided in Appendix D.

Notable Flora Records

- 4.18 The LRERC provided a number of notable plant species within the search area. A total of 424 records of 63 notable plant species were identified within the search area, dating from 1999 to 2022. Those of potential relevance to the Site, and associated with the habitats present, include bird's-foot *Ornithopus perpusillus*, chicory *Cichorium intybus*, field woundwort *Stachys arvensis*, fragrant agrimony *Agrimonia procera*, slender trefoil *Trifolium micranthum*, smooth brome *Bromus racemosus*, trailing tormentil *Potentilla anglica* and velvet bent *Agrostis canina*. No notable flora were recorded within on-site habitats.
- 4.19 Also of note, are records of hybrid bluebell *Hyacinthoides x massartiana*, canadian waterweed *Elodea Canadensis*, cherry laurel *Prunus laurocerasus*, Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica*, montbretia *C. x crocosmiiflora* and rhododendron *Rhododendron ponticum*, which are included within the Wildlife and Countryside Act's 1981 (as amended) Schedule 9 list of invasive non-native species. A total of 75 records of Schedule 9 species were provided within the search radius, however none were located on or adjacent to the Site.

Cereal Crops (c1c)

- 4.20 The Site is dominated by an arable field under active cultivation. At the time of the surveys the field was found to be sown with a cereal crop.
- 4.21 Uncultivated grassland margins are present around all boundaries of the field, measuring c. 1m-1.5m in width. Species recorded include cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, dandelion *Taraxacum officinale* agg., rosebay willowherb *Chamerion angustifolium*, lesser celandine *Ficaria verna*, common field-speedwell *Veronica persica*, spear thistle *Cirsium vulgare*, common ragwort *Jacobaea vulgaris* and cleavers *Galium aparine*.
- 4.22 Arable land is common and widespread in the local landscape and offers limited ecological value. This habitat is considered to be important at less than Local level and are scoped out of further assessment.

Modified Grassland (g4) cattle grazed (59)

- 4.23 Field F2 comprises modified grassland, which at the time of the field survey was grazed by cattle. Limited botanical diversity was noted within the sward, with species recorded including perennial ryegrass *Lolium perenne*, dandelion, with occasional common mouse-ear *Cerastium fontanum* and dock *Rumex* sp. Only a small linear strip of grassland within Field F2 is present within the Site boundary.
- 4.24 The grassland on-site is homogenous and heavily cattle grazed, resulting in a short sward. This habitat is considered to be important at the less than Local level and is scoped out of further assessment.

Other Woodland; Broadleaved (w1g) and Hedgerows (h2)

- 4.25 A woodland corridor is present along the south-western edge of Field F1, spanning the length of the Site and providing connectivity to a larger area to the south-east. The woodland is relatively recently planted, with online mapping showing it to have been planted between 2000 and 2006 and as such the trees within the woodland are young-mature.
- 4.26 Species present within the woodland include hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, oak *Quercus robur*, field maple *Acer campestre*, sycamore *Acer pseudoplatanus*, holly *Ilex aquifolium*, bramble and ivy *Hedera helix*. A public footpath runs from Ratby Lane easterly through the woodland.
- 4.27 The boundaries of the Site are marked by hedgerows to the north-west, a mixture of treeline and hedgerow to the south-east, a woodland corridor to the south-west and a mixture of hedgerow and fencing to the north-east, adjacent to residential gardens. The southern and western boundaries (B1 and B2) also comprise Markfield, Groby, Ratby and Green Lane Hedgerows (Potential) LWS. As such, these features should be afforded higher protection. These are described individually in Table 2 below and labelled on the Habitats Plan in Appendix A.
- 4.28 Hedgerows typically measure c. 1–2.5m in height x c. 0.5-1m wide and are dominated by hawthorn and blackthorn *Prunus spinosa*. Other woody species present include elder, ash *Fraxinus excelsior*, oak, beech *Fagus sylvatica* and dogwood *Cornus sp.* Additional species present within the hedgerows include bramble *Rubus fruticosus agg.*, ivy and holly.

Table 2. Summary of boundary features

Boundary Ref.	Description	Woody species
B1	c. 3m tall x c. 2m wide, managed hedgerow adjacent to road.	Hawthorn, blackthorn, holly, ash and privet, elder
B2	c. 1m tall x c. 0.5m wide, recently cut, adjacent to fence.	Blackthorn and elder
B3	c. 4m tall x c. 2m wide, treeline.	Hawthorn, elder, oak, hazel and holly
B4	c. 2m tall x c. 1m wide, defunct mixed hedgerow adjacent to residential gardens.	Hawthorn, oak, beech, privet, dogwood, holly and ash
B5	c. 3m tall x c. 2m wide, managed hedgerow adjacent to residential gardens.	Hawthorn , holly, and privet

- 4.29 All hedgerows are adopted as a Habitat of Principal Importance under the NERC Act 2006. The individual hedgerows on-site vary in their

structural integrity and exhibit generally low species diversities, however, taken together, the hedgerows form valuable green corridors for wildlife on-site and in the local area and have intrinsic ecological value for a range of species. Collectively, including the Candidate LWS features, hedgerows and trees on-site are considered to be of importance at up to Local level.

- 4.30 Woodland offers a valuable habitat resource for a range of species, with the woodland on-site providing connectivity to the wider area. On balance this habitat is considered to be important at up to the Local level.

Fauna

Bats

- 4.31 A total of 668 bat records were identified within the search area, dating from 1998 to 2022. These include the following species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula*, Natterer's *Myotis nattereri*, Nathusius' pipistrelle *P. nathusii*, *Myotis* sp., Leisler's *Nyctalus leisleri* and brown long-eared *Plecotus auritus* bats.
- 4.32 Roosts of common and soprano pipistrelle, brown long-eared and *Myotis* were returned within search area, with the closest and most recent record in 2014 (c. 0.3km north of the Site), comprising 62 common pipistrelle bats and another nearby record of 101 common pipistrelles c. 0.4km north. Other records are related to bats in flight, with the closest record comprised of an individual, foraging common pipistrelle located c. 0.2km east of the Site in 2018.
- 4.33 Arable habitat on-site offers limited habitat suitability for bats, with boundary vegetation comprising hedgerows and grassland margins, as well as the woodland to the south and east providing more suitable foraging and dispersing opportunities for a number of bat species. Hedgerows on-site are well managed or located adjacent to residential dwellings, but still provide connectivity to the wider landscape, particularly those extending to the east.
- 4.34 Generally, trees within the woodland corridor and along hedgerows are young to semi-mature, however mature oaks are present along the boundaries of the Site, which may in turn offer roosting potential for bats.
- 4.35 Further survey work for roosting and dispersing bats has been completed, with the results appended to this report (Appendix E).

Ground-Based Tree Assessments

- 4.36 A ground-based tree assessment was undertaken in April 2023 to identify trees with potential roosting features for bats. Only trees within the site

boundary were assessed, resulting in one tree, Tree T12 (in line with Tree Survey Report reference: BHA/4237/TS), identified as having 'Low' potential to support bats. The tree comprises a mature oak and although no features were identified, it is of a size that may support features higher in the canopy in trunk or the branches that may not have been visible from ground level. All other trees were found to have 'Negligible' bat roosting potential. Full methods and results are provided in Appendix E.

Bat Activity Surveys

- 4.37 Three seasonal dusk transect surveys have been undertaken at the Site in spring (May), summer (July) and autumn (September) 2023. During these surveys two bat species were recorded comprising common pipistrelle and soprano pipistrelle, with the former accounting for c. 91% of all bat activity. Bat activity during the surveys was mostly along the southern and western boundaries of Field F1, with lower levels throughout the rest of the Site. No distinct foraging and dispersing habitats for bats were noted on-site.
- 4.38 Automatic static monitoring was also conducted in May, July and September 2023, using two static detectors on each occasion, the first located along the western boundary, and the second along woodland to the south. At least seven species were recorded during the static monitoring including common pipistrelle, soprano pipistrelle, noctule, *Myotis* species, serotine, brown long-eared and *Nathusius'* pip. In line with the transect surveys, common pipistrelle was the most frequently recorded species, comprising c. 83% of all bat contacts. Soprano pipistrelle comprised c. 8% of all bat contacts. The remaining bat species were recorded at very low levels in comparison (<50 bat contacts per species).
- 4.39 These activity survey results are broadly consistent with those of the surveys carried out in 2021. Full methods and results are provided in Appendix G.

Badger

- 4.40 The LRERC provided 45 records of badger *Meles meles* from within the search area, dating from 1999 to 2022. The closest record is of a road casualty dating from 2021, located c. 0.2km south-west from the Site. Two records of main setts were also returned in the data search, dating from 2009 and 2011 and located c. 1.3km north-west and c. 1.7km north respectively, both on the opposite side of the A50.
- 4.41 Mature hedgerows and woodland offer suitable sett building habitat for badger, whilst arable fields and grassland may provide foraging habitat.
- 4.42 A single suspected sett entrance and badger guard hair was identified along the eastern boundary of the Site in April 2021. An update badger survey was undertaken in April 2023 (see Appendix H), with the entrance

still present but appearing less active on account of vegetation over the hole. Results can be seen in Appendix F.

Dormouse

- 4.43 No records of dormouse *Muscardinus avellanarius* were identified within the search area.

Hedgerows and woodland may offer limited suitability for dormouse if this species persisted in the local area. However, dormice are extremely rare in Leicestershire and are known to only persist in well-monitored areas of high-quality habitat such as ancient woodland.

Riparian Mammals

- 4.44 A total of three records of water vole *Arvicola amphibius* were identified within the search area, all dating from 1999. The closest record is c. 1.7km south-west of the Site.

- 4.45 Two records of otter *Lutra lutra* was identified within the search area, located c.1.6km south-east of the Site, dating from 2020 and c. 1.8km north of the Site, dating from 2015.

There is no suitable aquatic habitat on or immediately adjacent to the Site. The closest suitable habitat is located at a tributary of Rotherly Brook c. 1.2km west from Site.

Other Mammals

Brown Hare

- 4.46 The data search returned one record of brown hare *Lepus europaeus* from within the search area, c. 1.4km north. Arable land has potential to support this species however the woodland and adjacent boundaries provide a sheltered environment, whereas hare typical prefer swathes of open arable land. No brown hare have been recorded during the field work.

- 4.47 This species has potential to utilise on-site habitats, however any population present is unlikely to be notable.

Harvest Mouse

- 4.48 One record of harvest mouse *Micromys minutus* was identified within the search area dating from 2020, located c. 1.3km north of the Site.

- 4.49 Suitable areas of habitat for harvest mice, such as tall reed or grassland, are generally absent from the Site. As such, this species is considered unlikely to utilise on-site habitats.

Hedgehog

- 4.50 Forty-six records of hedgehog *Erinaceus europaeus* were identified within the search area, dating from 2000 to 2022. The closest records were located along Jacqueline Road, c. 50m north of the Site. The majority of records were recorded within local residential areas.
- 4.51 Hedgerows, woodland and grassland habitats present on-site offer foraging, sheltering and dispersal habitat for hedgehogs. Whilst it's acknowledged that this species may use on-site habitats, a notable assemblage is not anticipated.

Birds

- 4.52 A total of 377 records of 40 bird species were identified within the search area, dating from 1998 to 2022. A total of 27 of the recorded species are listed as 'red' or 'amber' on the Birds of Conservation Concern (BoCC) list. Species of potential relevance to the Site include red kite *Milvus milvus*, lesser spotted woodpecker *Dryobates minor*, brambling *Fringilla montifringila*, fieldfare *Turdus pilaris* and barn owl *Tyto alba*.
- 4.53 The arable land offers potential habitat for farmland specialists, whilst the trees and hedgerows provide nesting habitat for a range of generalist species.

Reptiles

- 4.54 A total of seven records of common lizard *Zootoca vivipara* were identified within the search area. Records are dated between 2005 and 2011. The closest of these records was located c. 1.3km north-west of the Site.
- 4.55 Dominant habitats present at the Site are of poor suitability for reptile species due to narrow, homogenous on-site field-margins and management of grassland within Field F2 to a short sward with limited structure. The woodland corridor to the south of the Site is shaded, and therefore unlikely to offer suitable habitat for reptiles.

Amphibians

- 4.56 A total of 122 records of five amphibian species were identified within the search area, including great crested newt *Triturus cristatus*, common frog *Rana temporaria*, common toad *Bufo bufo*, palmate newt *Lissotriton helveticus* and smooth newt *Lissotriton vulgaris*, dating from 1998 to 2018. In total, 20 records are located within 0.5km of the Site, dating from 2005 to 2018. Eleven of these comprise records for great crested newt, dating from 2014.
- 4.57 A more detailed appraisal of the Site in respect of great crested newt is provided below.

Great Crested Newt

- 4.58 The LRERC provided 27 records of great crested newt, two of which are located within ponds on adjacent land to the south-west of the Site (Ponds P1 and P2 in Appendix I), dating from 2014 and comprising a peak count of two and eight individuals respectively.
- 4.59 While the majority of the Site is dominated by arable land with some short grazed grassland, and as such is considered to be poorly suited to amphibians other than for dispersal, the woodland, hedgerows and field margins provide suitable sheltering and foraging opportunities for this species. In accordance with Natural England Guidelines (English Nature, 2001), a search of ponds within 500m of the Site was undertaken using aerial photography and OS maps to consider the potential for great crested newts to be in the area. This search identified six potential ponds, as shown in the Pond Plan in Appendix I (CSA/2550/125).
- 4.60 Further survey work for great crested newts has been undertaken. Results are summarised below and should be read in conjunction with the great crested newt survey report in Appendix G.

Habitat Suitability Index Assessment

- 4.61 A pond scoping exercise and Habitat Suitability Index (HSI) assessment was undertaken for suitable ponds within the 500m radius of the Site to confirm the presence and location of each pond and their suitability to support a breeding population of great crested newts. Further to records of great crested newt within off-site Ponds P1 and P2, located c. 25m and 0.1km south-east of the narrow redline which extends in a along the proposed SUDS linear outfall route, Pond P3 comprises a large, open duck pond set within amenity grassland c. 0.2km south also off site. Two ponds, Ponds P4 and P5, are present in woodland to the south-east of the Site at c. 0.3km and c. 0.4km east respectively. Pond P6 is present c. 0.4km north-east of the Site, on the opposite side of the A50, which is likely to form a barrier to dispersal and scoped out of further investigation.
- 4.62 Following HSI assessments, Ponds P1, P2 and P4 scored 'Average' for suitability for great crested newts. Ponds P3 and P5 scored 'Poor' on account of the major waterfowl and suspected fish presence in these ponds respectively.

Presence/Likely Absence Surveys

- 4.63 Conventional bottle trapping/torchlight surveys for great crested newts were undertaken at Ponds P1, P2, P4 and P5 in 2021. No great crested newts were recorded in Ponds P4 or P5 and as such these ponds were subject to update surveying by eDNA sampling in 2023.

- 4.64 Ponds P1 and P2 were subject to update convention bottle trapping and torchlight surveys between 17 April and 25 May 2023. The 2021 surveys found great crested newts to be likely absent from Pond P1, with a small population with a peak count of two individuals present in Pond P2. In 2023, no great crested newts were recorded within the first four surveys at Pond P1, however as this feature is known to have supported great crested newts historically, a further two surveys were undertaken. The further two surveys at Ponds P1 recorded a peak count of one male great crested newt during the sixth survey, and eight great crested newts (six females and two males) in Pond P2. As such, both of these ponds are considered to support a 'small' population class size estimate in line with published guidance. No evidence of breeding, such as eggs, efts or juveniles were recorded in either pond in 2021 or 2023.
- 4.65 Water samples for both Ponds P4 and P5 returned negative eDNA results, confirming the continued likely absence of great crested newts, following no great crested newts recorded during 2021 presence / likely absence conventional bottle trapping surveys.
- 4.66 Great crested newts have been found to currently use ponds to the south of the Site but have been confirmed as not using ponds to the south-east. The ponds to the south support an estimated small population. While the Site is predominantly arable land or grazed grassland of low suitability for great crested newts, there is potential for the species to use on-site hedgerows and woodland margins for dispersal and foraging.
- 4.67 Great crested newts are a European Protected Species. Individual great crested newts and their habitats (aquatic and terrestrial) are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended). They are also Section 41 Species of Principal Importance. Although no evidence of breeding was recorded, the presence of females and males within Pond P2 indicate that this pond could be used by breeding great crested newts.

Invertebrates

- 4.68 A total of 74 records of 31 invertebrate species were identified within the search area, including 30 species which are listed under the UK Biodiversity Action Plan (BAP) for Leicestershire. These include three butterfly species and 27 moth species. Those of potential relevance to the Site include, mottled rustic *Caradrina morpheus*, latticed heath *Chiasmia clathrate*, small phoenix *Ecliptopera silaceata*, rustic moth *Hoplodrina blanda*, rosy rustic *Hydraecia micacea*, dot moth *Melanchra persicariae*, shaded broad-bar *Scotopteryx chenopodiata*, cinnabar *Tyria jacobaeae* and wall butterfly *Lasiommata megera*. The Site is not located within an Important Invertebrate Area (IIA).

- 4.69 A total of 21 records of two crustacean species, including white-clawed crayfish *Austropotamobius pallipes* and signal crayfish *Pacifastacus leniusculus*, were identified within the search area, dating from 1999 to 2021. The closest record is of a white-clawed crayfish, c. 1.3km north-west from the Site, at Hill Hole Quarry LNR. Given the absence of suitable aquatic habitat on-site for crayfish, these species are considered to be likely absent.
- 4.70 A typical range of opportunities for invertebrates are available within the habitats on-site, with the hedgerows and scrub in particular likely to support a range of common and widespread species. There is no indication from the habitat types present that a notable assemblage is likely to be present.

5.0 DISCUSSION AND RECOMMENDATIONS

Nature Conservation Designations

Statutory

Grobby Pool and Woods SSSI

- 5.1 A portion of the Site (c. 1.13ha) falls within the SSSI Impact Risk Zone for Groby Pool and Woods SSSI, citing a potential risk for residential developments of 100 units or more. This SSSI appears to have a local carpark and as such is easily accessible by new residents. Given the proximity of this designation from the Site, there is potential for a small increase in visitor numbers as a result of the proposed development. The potential effects of the increase in visitor numbers to this designation should be considered, with measures to minimise impacts explored, such as delivery of new strategically placed green space to provide alternative walking routes for new residents.

Non-Statutory

Markfield, Groby, Ratby and Green Lane Hedgerow Potential LWS

- 5.2 The western and southern boundaries of the Site are designated as Markfield, Groby, Ratby and Green Lane Hedgerow Potential LWS and comprise intact, native hedgerow features. These features should be retained as far as possible and enhanced with additional strengthening or infill planting where required. Should any unavoidable impacts arise to this hedgerow as a result of the proposed access, it is recommended that suitable replacement planting be secured and provided to mitigate for any section that is lost.

Habitats and Flora

Hedgerows, Woodland and Mature Trees

- 5.3 All native hedgerows are classified as habitats of principal importance for nature conservation (under Section 41 of the Natural Environment and Rural Communities Act, 2006) and should be a priority for retention and enhancement, wherever possible. The value of the hedgerows is enhanced by the presence of a diverse range of woody species and mature trees. Those to the north-east and south-east of the Site (Hedgerows B4 and B5) are species-rich in composition, and if practicable should be buffered from development edge effects.
- 5.4 Hedgerows and their associated trees and ditches should be protected from damage during construction in line with BS5837:2012 - Trees in relation to design, demolition and construction. Recommendations.
- 5.5 Mature trees and woodland comprise habitats of intrinsic ecological value, with the potential to support a range of species, and contribute to the existing network of green, linear habitats. These features should

be retained and protected with appropriate buffers alongside development proposals wherever possible, in accordance with Policy M4 of the emerging Markfield Parish Neighbourhood Plan.

Biodiversity Net Gain

- 5.6 Existing legislation and policy seeks to leave biodiversity in a better state than prior to development, i.e. development should deliver a Biodiversity Net Gain (BNG), with the Environment Act 2021 mandating a 10% net gain from February 2024.
- 5.7 The Site is dominated by arable habitat which is considered to be of lower ecological value. As such, development of the Site presents opportunities to deliver measurable ecological enhancement through habitat restoration or creation alongside proposals, i.e. as part of the Site's green infrastructure provision. Other areas of greater biodiversity value have been identified, including on-site hedgerows and woodland.
- 5.8 It is anticipated that the Site can deliver a 10% net gain in habitat and hedgerow units alongside proposals. A Biodiversity Net Gain calculation will be submitted alongside any planning applications to demonstrate net gains.

Fauna

Bats

- 5.9 A suite of activity surveys has been completed in line with prevailing guidance at the time of writing (Collins, 2016) to identify species present, their relative abundance and any key foraging/dispersal areas. Surveys undertaken to date have found that on-site habitats support a range of bat species.
- 5.10 Development proposals seek to retain and buffer boundary habitats from the built development and ensure any artificial light spill onto retained and newly created vegetated habitats is avoided. Measures on how to achieve this should be detailed within a lighting strategy, to be delivered at the detailed design stage.

Birds

- 5.11 All breeding birds, their nests, eggs and young are legally protected. Vegetation clearance works could result in an offence if undertaken during the nesting bird season (March-August inclusive). Works should be timed to avoid this period or a pre-commencement survey should be undertaken by a qualified ecologist to confirm no active nests are present.

Great crested newt

- 5.12 Terrestrial habitats within the Site, notably the arable field margins, woodland and hedgerow bases are suitable to support dispersal, refuge and foraging by great crested newts. In addition, local records indicate the presence of this species in the local landscape.
- 5.13 Further survey work has found a low population of great crested newts to be present within ponds c. 25m from the Site boundary.
- 5.14 Leicestershire County Council have now joined Natural England's District Level Licensing (DLL) scheme and can hold a single licence covering all accepted developments partaking in the scheme. This takes financial payments from developers to contribute to offsite strategic conservation measures for great crested newt. Further discussions on buying into the DLL scheme are underway. If DLL is taken up, final payments to Natural England for offsite management works will be made upon receipt of a planning consent.

Summary of Recommendations

- 5.15 Based on the ecological constraints identified above, Table 3 summarises recommendations for necessary further work, some of which is completed and other surveys underway, to determine the need for, and scope of, any avoidance, mitigation and/or compensation measures to address potential adverse effects of development. The outcome of this further work will inform an EclA of the final scheme.

Table 3. Recommendations for further investigation/survey

Ecological Feature	Further Work	Applicable Timescales
Condition Assessments	Undertake condition assessment of on-site habitats to inform biodiversity net gain calculations	May - July
Bats	Preliminary ground-based roost assessment of on-site trees	Any time
	Seasonal walked transects and periods of automated static monitoring	Spring, summer and autumn
Great Crested Newt	HSI assessment of ponds within a potential dispersal range of the Site.	Any time of year, but optimal from May - September
	Conventional great crested newt surveys at suitable ponds	Mid-March – mid-June

Opportunities for Ecological Enhancement

- 5.16 To promote adherence to the NPPF and Policy DM6 of the Site Allocations and Development Management Policies DPD the following opportunities for ecological enhancement have been identified:

- Provision of new aquatic habitat creation to provide new habitat opportunities, including for amphibians such as great crested newts, which are known to be present in the locality
- Opportunity to create dedicated wildlife enhancement areas in the south-east and south-west of the Site adjacent to woodland areas, to include graded habitat edges, grassland under less intensive management regimes and habitat features such as log piles and aquatic features.
- Enhancement of existing hedgerows through infill planting and provision of buffer zones to maintain and strengthen connectivity and wildlife dispersal opportunities across the Site and with green infrastructure assets in the wider landscape.
- Incorporation of native plants and those of wildlife importance in to landscaping scheme to provide foraging opportunities for birds, invertebrates and bats
- Provision of new bat roosting opportunities within new buildings and retained mature trees
- Provision of bird nesting opportunities within new buildings and retained mature trees
- Provision of hedgehog gaps in new fencing to promote habitat connectivity across and within the Site

6.0 CONCLUSIONS

- 6.1 Based on the work undertaken to date, confirmed ecological constraints to development at the Site have been identified as the presence of:
- Statutory sites
 - Non-statutory sites
 - Hedgerows and woodland
 - Great crested newts
- 6.2 The following additional investigation/survey work is recommended (and is underway) to inform an evidence-based EclA of the proposed development, such that suitable ecological impact avoidance, mitigation and/or compensation measures may be adopted:
- Bat activity and static monitoring surveys
 - Badger surveys
- 6.3 Avoidance and mitigation measures should be adopted into development proposals. Precautionary measures are recommended for habitat clearance works to avoid potential harm to nesting birds. These measures will be detailed within a CEMP to be prepared at the detailed planning stage.
- 6.4 No overriding ecological constraints to development have been identified subject to the implementation of appropriate mitigation measures in respect of confirmed ecological constraints, and further recommended survey work.
- 6.5 As the majority of the Site is dominated by arable land, which is considered to be of low ecological value, it's anticipated that a 10% net gain in biodiversity can be achieved through the implementation of a sensitive landscaping scheme and retention of key habitats.
- 6.6 Recommendations for ecological enhancement measures that could be delivered as part of development at the Site have been provided here-in, which will aid accordance with national and local planning policy.

7.0 REFERENCES

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Appendix A

Habitats Plan & Photographs



- Site boundary
- Cereal crops (c1c)
- Modified grassland (g4)
- Bramble scrub (h3d)
- Other woodland; broadleaved (w1g)
- Developed land, sealed surface (u1b)
- Native hedgerows (h2a)
- Native hedgerows with trees
- Field reference
- Hedgerow reference
- Woodland reference

0 50 100 m

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Project	Land at Ratby Lane, Markfield, Leicestershire	Date	November 2023	Drawing No.	CSA/2550/124
Drawing Title	Baseline Habitats Plan	Scale	Refer to scale	Rev	B
Client	Taylor Wimpey Strategic Land	Drawn	CM	Checked	AP



Photograph 1. Arable Field F1 and Boundary B3.



Photograph 2. Grassland margin along Boundary B3.



Photograph 3. Treeline and grassland margin along Boundary B4.



Photograph 4. Arable Field F1 and Boundary B5 and B6.



Photograph 5. Woodland corridor W1 and public footpath.



Photograph 6. Grassland Field F2 and offsite pond (Pond P1).

Appendix B

Legislation and Planning Policy

- 1.1. The **Conservation of Habitats and Species Regulations 2017** (as amended) make prescriptions for the designation and protection of Sites of Community Importance ('European sites', i.e. Special Areas of Conservation and Special Protection Areas) and European Protected Species (EPS). The latter include all native bats, great crested newts, dormice, otters and certain reptiles, listed under Annex II of the Regulations. Following the UK's departure from the European Union, the provisions of the Regulations have been retained through enactment of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which came into force on 31 December 2020.
- 1.2. The **Wildlife and Countryside Act 1981** (as amended, principally by the Countryside and Rights of Way Act 2000) forms the basis for protection of statutory designated sites of national importance (e.g. Sites of Special Scientific Interest; SSSIs) and native species that are rare and vulnerable in a national context. Additionally, badgers are protected under the **Protection of Badgers Act 1992**.
- 1.3. The **Environment Act 2021** received Royal Assent in November 2021. Through an amendment to the Town and Country Planning Act 1990 the Environment Act will introduce a mandatory requirement for all planning permissions to be conditional upon the submission of a Biodiversity Gain Plan for approval by the Local Planning Authority. The Plan demonstrates a net gain of at least 10% in the biodiversity value of the development site. These provisions are coming into force from February 2024.
- 1.4. Section 40(1) of the **Natural Environment and Rural Communities (NERC) Act 2006** states that each public authority, "must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity." This legislation makes it clear that planning authorities should consider impacts to biodiversity when determining planning applications, with particular regard to the Section 41 (S41) lists of 56 habitats and 943 species of principal importance. The UK Biodiversity Action Plan (BAP) has been superseded by the Biodiversity 2020 Strategy, however Local BAPs continue to influence biodiversity management and conservation effort, including through the spatial planning system, at the local scale.
- 1.5. The **National Planning Policy Framework (2023)** (NPPF) sets out the government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 15: Conserving and Enhancing the Natural Environment, paragraph 180, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.
- 1.6. Paragraph 186 sets out the principles that local planning authorities should apply when determining planning applications:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.
 - Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.
 - Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.
 - Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.
- 1.7. Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). The Natural Environment PPG addresses principles across a broad spectrum of topics targeting biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services, and the use of local ecological networks to support the national Nature Recovery Network. In particular, the PPG promotes the delivery of measurable Biodiversity Net Gain through the creation and enhancement of habitats alongside development.
- 1.8. The **Government Circular 06/2005**, which is referred to within the NPPF, defines statutory nature conservation sites and protected species as a material consideration in the planning process.
- 1.9. Local planning policies of relevance to ecology, biodiversity and/or nature conservation have been set out in Table 1 below.

Table 1. Summary of regional and local planning policy relating to ecology

Policy	Summary
Hinckley & Bosworth Borough Council Local Development Framework Core Strategy (Adopted in December 2009)	
Spatial Objective 10: Natural Environment and Cultural Assets	To deliver a linked network of green infrastructure, enhancing and protecting the borough's distinctive landscapes, woodlands, geology, archaeological heritage and biodiversity and encourage its understanding, appreciation, maintenance and development.
Policy 20: Green Infrastructure	The implementation of the Green Infrastructure Network as outlined on the Key Diagram is a key priority of the council. To assist delivery of this plan, the following strategic interventions will be supported: • Public Access - Provide multi-user and traffic free access between Markfield and Groby. Options include routing around Groby Pool or to the south of the A50 via Little John and Martinshaw Wood. • Promote the settlements within the National Forest (Markfield, Thornton, Stanton Under Bardon and Bagworth) and on the fringe (Groby, Ratby, Newbold Verdon, Desford, Barlestone and Nailstone) as 'gateway' villages to the National Forest. • Transport Corridor Disturbance Mitigation - Plant trees alongside the A50 and A46 to the north and east of Groby and to the north and west of Markfield to reduce the visual and physical effects of the roads.
Markfield Parish Neighbourhood Plan 2020-2039 (Submission Draft)	
Policy M4: Ecology and Biodiversity	New development will be expected to maintain and where possible enhance the following and other ecological corridors and landscape features (such as watercourses, hedgerows and treelines) ... Local Nature Reserves ... Local Wildlife Sites ... Regionally Important Geological Sites ... The priorities for biodiversity enhancement are: 1. Management of woodlands, open grasslands and water features; 2. Restoration of drystone walls; 3. Planting of gaps in hedgerows to strengthen historic field patterns and management of over-mature hedges; 4. Tree planting to replace mature/veteran trees as they come to the end of their lives. 5. Maintenance of or creation of new stock fencing to prevent damage to the above.
Policy M5: Trees	Planning applications affecting trees should be accompanied by a tree survey that establishes the health, longevity and amenity value of any affected trees as well as their role in the local ecosystem. Development that damages or results in the loss of ancient trees or trees of good arboricultural and amenity value, will not be supported. Instead, proposals should be designed to retain ancient trees or trees of arboricultural and amenity value as they help to define the character of the area. Where trees or hedgerows of lower arboricultural and amenity value are to be lost, then native species replacements should be planted in locations where they would have the opportunity to grow to maturity, increase canopy cover and contribute to the local ecosystem and the appearance of the area.
Site Allocations and Development Management Policies DPD (Adopted 2016)	
DM6 Enhancement of	Development proposals must demonstrate how they conserve and enhance features of nature conservation and geological

Policy	Summary
Biodiversity and Geological Interest	value including proposals for their long-term future management. Major developments in particular must include measures to deliver biodiversity gains through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Proposals where the primary objective is to conserve or enhance biodiversity or geological interest will be permitted where they comply with other relevant policies in the plan. On site features should be retained, buffered and managed favourably to maintain their ecological value, connectivity and functionality in the long-term. The removal or damage of such features shall only be acceptable where it can be demonstrated the proposal will result in no net loss of biodiversity and where the integrity of local ecological networks can be secured. If the harm cannot be prevented, adequately mitigated against or appropriate compensation measures provided, planning permission will be refused. In addition to the above, where specific identified sites are to be affected the following will be taken into account: Internationally and Nationally Designated Sites International and Nationally Designated Sites will be safeguarded. Development which is likely to have any adverse impact on the notified features of a nationally designated site will not normally be permitted. In exceptional circumstances, a proposal may be found acceptable where it can be demonstrated that: a) A suitable alternative site with a lesser impact than that proposed is not available; and b) The on-site benefits of the proposal clearly outweigh the impacts on the notified features of the site and where applicable, the overall SSSI or habitat network; and c) All appropriate mitigation measures have been addressed through the development management process; and d) Development likely to result in a significant effect on internationally designated sites will be subject to assessment under the Habitats Regulations and will not be permitted unless adverse effects can be fully avoided, mitigated and/or compensated. Irreplaceable Habitats Proposals which are likely to result in the loss or deterioration of an irreplaceable habitat would only be acceptable where: e) The need and benefits of the development in that location clearly outweigh the loss; and, f) It has been adequately demonstrated that the irreplaceable habitat cannot be retained with the proposed scheme; and g) Appropriate compensation measures are provided on site wherever possible and off site where this not is feasible. Locally Important Sites Development proposals affecting locally important sites should always seek to contribute to their favourable management in the long term. Where a proposal is likely to result in harm to locally important sites (including habitats or species of principal importance for biodiversity), developers will be required to accord with the following sequential approach: h) Firstly, seek an alternative site with a lesser impact than that proposed; i) Secondly, and if the first is not possible, demonstrate mitigation measures can be taken on site;

Policy	Summary
	j) Thirdly, and as a last resort, seek appropriate compensation measures, on site wherever possible and off site where this is not feasible.
DM9 Safeguarding Natural and Semi-Natural Open Spaces	All developments within or affecting Natural and Semi-Natural Open Spaces should seek to retain and enhance the accessibility of the space and its recreational value whilst ensuring the biodiversity and conservation value is also enhanced. Development within areas of Natural and Semi-Natural Open Space, as defined on the policies map, will only be considered appropriate where: a) The proposal relates to the enhancement of the area for recreational purposes and only where this does not lead to the loss or damage of the area's biodiversity value; or b) It relates to the enhancement of the area's biodiversity or conservation value; or c) It would promote the establishment and enhancement of pedestrian footpaths and cycle ways; or d) If within the National Forest, it contributes to the delivery of the National Forest Strategy in line with Core Strategy Policy 21; and e) If within a Green Wedge, it protects its role and function in line with Core Strategy policies 6 and 9.

Appendix C

Desk Study Information



Legend

-  Ramsar Sites (England)
-  Proposed Ramsar Sites (England)
-  Special Areas of Conservation (England)
-  Possible Special Areas of Conservation (England)
-  Special Protection Areas (England)
-  Potential Special Protection Areas (England)

Projection = OSGB36

xmin = 425200

ymin = 298100

xmax = 474900

ymax = 321200

Map produced by MAGIC on 19 April, 2021.

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19/04/2021

Site Check Report Report generated on Mon Apr 19 2021
You selected the location: Centroid Grid Ref: SK49750944
The following features have been found in your search area:

Ramsar Sites (England)
No Features found

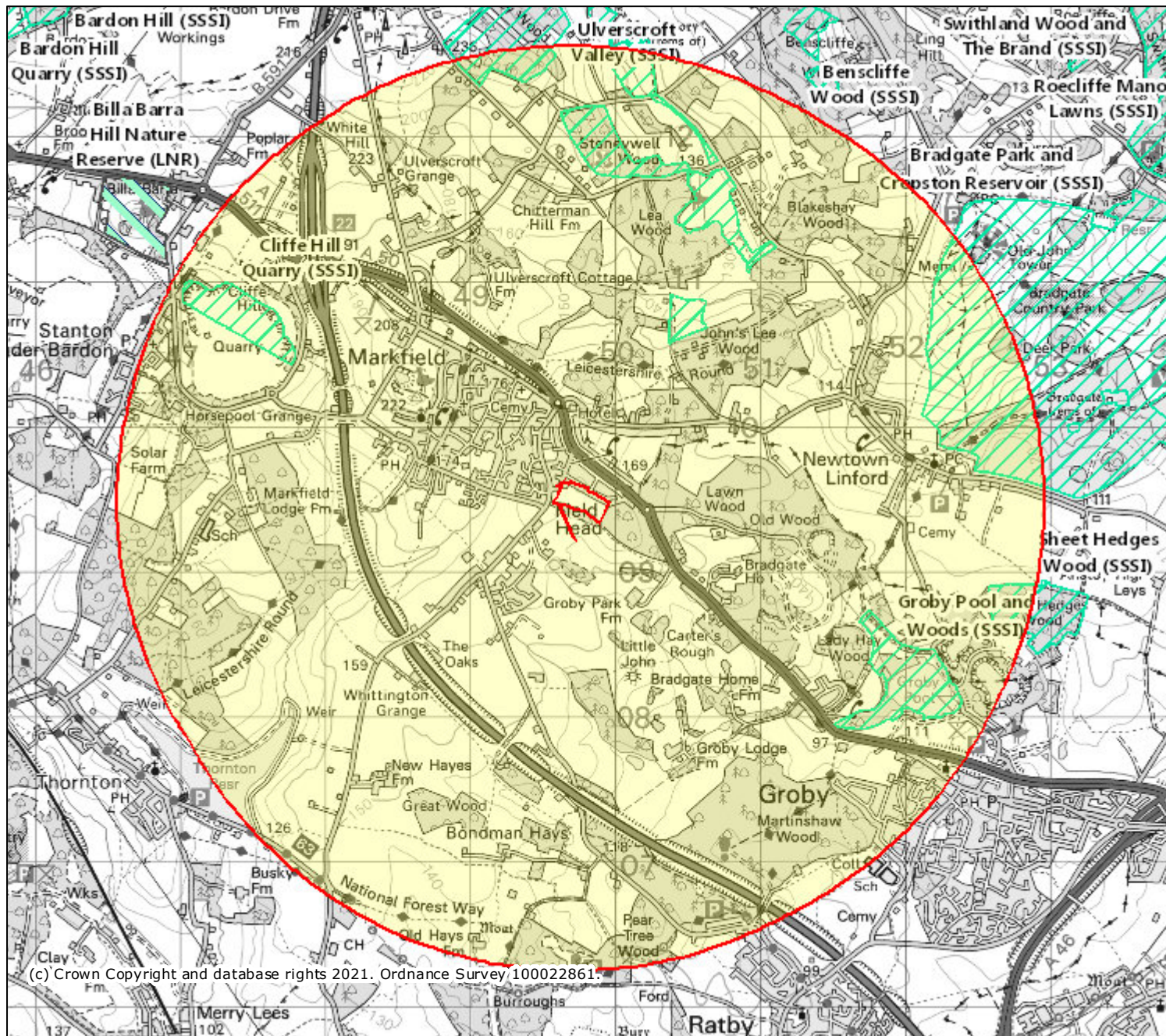
Proposed Ramsar Sites (England)
No Features found

Special Areas of Conservation (England)
No Features found

Possible Special Areas of Conservation (England)
No Features found

Special Protection Areas (England)
No Features found

Potential Special Protection Areas (England)
No Features found



Legend

-  Local Nature Reserves (England)
-  National Nature Reserves (England)
-  Sites of Special Scientific Interest (England)

Projection = OSGB36

xmin = 443100

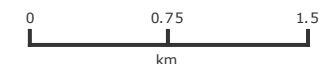
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Map produced by MAGIC on 19 April, 2021.

Copyright resides with the data suppliers and the map must not be reproduced without their permission. Some information in MAGIC is a snapshot of the information that is being maintained or continually updated by the originating organisation. Please refer to the metadata for details as information may be illustrative or representative rather than definitive at this stage.



19/04/2021

Site Check Report Report generated on Mon Apr 19 2021
You selected the location: Centroid Grid Ref: SK49750944
The following features have been found in your search area:

Sites of Special Scientific Interest (England)

Name	Cliffe Hill Quarry SSSI
Reference	1003016
Natural England Contact	NEIL RUDGE
Natural England Phone Number	0845 600 3078
Hectares	19.21
Citation	1003647
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1003647

Name	Grobby Pool and Woods SSSI
Reference	1003036
Natural England Contact	SADIE HOBSON
Natural England Phone Number	0845 600 3078
Hectares	29.02
Citation	1000094
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1000094

Name	Sheet Hedges Wood SSSI
Reference	1003061
Natural England Contact	East Midlands Area Delivery
Natural England Phone Number	0845 600 3078
Hectares	21.7
Citation	1001884
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001884

Name	Ulverscroft Valley SSSI
Reference	1003069
Natural England Contact	East Midlands Area Delivery
Natural England Phone Number	0845 600 3078
Hectares	110.75
Citation	1002060
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1002060

Name	Bradgate Park and Cropston Reservoir SSSI
Reference	1003007
Natural England Contact	East Midlands Area Delivery
Natural England Phone Number	0845 600 3078
Hectares	399.67
Citation	1003431
Hyperlink	http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1003431

Local Nature Reserves (England)

No Features found

National Nature Reserves (England)

No Features found

Appendix D

Habitats and Flora Species List

Habitats and Flora Species List										
Site name	2250 Land at Ratby Lane, Markfield									
Survey date and surveyor	12/04/2021 & 17/04/2023 Alex Perry ACIEEM									
Scientific name	Common name	Habitat Type								
		F1	F2	B1	B2	B3	B4	B5	B6	W1
Herb species										
<i>Anthriscus sylvestris</i>	Cow parsley	X								
<i>Cerastium</i> sp.	Mouse-ear		X							
<i>Chamerion angustifolium</i>	Rosebay willowherb	X								
<i>Cirsium vulgare</i>	Spear thistle	X								
<i>Ficaria verna</i>	Lesser celandine	X								
<i>Galium aparine</i>	Cleavers	X								
<i>Heracleum sphondylium</i>	Hogweed	X								
<i>Jacobaea vulgaris</i>	Common ragwort	X								
<i>Narcissus</i> sp.	Daffodil	X								
<i>Pleioblasus</i> sp.	Bamboo							X		
<i>Ranunculus repens</i>	Creeping buttercup	X								
<i>Rumex</i> sp.	Dock	X	X							
<i>Taraxacum officinale</i> agg.	Dandelion	X	X							
<i>Urtica dioica</i>	Common nettle	X								
<i>Veronica persica</i>	Common field-speedwell	X								
Grasses										
<i>Dactylis glomerata</i>	Cock's-foot	X								
<i>Holcus lanatus</i>	Yorkshire fog	X								
<i>Lolium perenne</i>	Perennial rye grass		X							
Woody species										
Coniferous										
<i>Cupressus</i> × <i>leylandii</i>	Leylandii							X		
Broadleaved										
<i>Acer campestre</i>	Field maple									X
<i>Acer pseudoplatanus</i>	Sycamore									X
<i>Clematis</i> sp.	Clematis	X								
<i>Cornus</i> sp.	Dogwood							X		X
<i>Corylus avellana</i>	Hazel						X			
<i>Crataegus monogyna</i>	Hawthorn			X	X		X	X	X	X
<i>Fagus sylvatica</i>	Beech							X		
<i>Fraxinus excelsior</i>	Ash								X	X
<i>Forsythia</i> sp.	Forsythia						X			
<i>Hedera helix</i>	Ivy				X		X		X	
<i>Ilex aquifolium</i>	Holly				X		X	X	X	X
<i>Ligustrum</i> sp.	Privet							X	X	
<i>Prunus</i> sp.	Prunus									X
<i>Prunus</i> sp.	Laurel							X		
<i>Prunus spinosa</i>	Blackthorn					X			X	
<i>Quercus</i> sp.	Oak			X			X	X		X
<i>Rubus fruticosus</i> agg.	Bramble				X	X	X	X	X	X
<i>Sambucus nigra</i>	Elder			X	X	X	X			

Appendix E

Bat Survey Report

1.0 Introduction

- 1.1 This appendix has been produced by CSA Environmental on behalf of Taylor Wimpey Strategic Land. It sets out the methods and results of bat activity surveys undertaken at Land at Ratby Lane, Markfield (hereafter referred to as 'the Site'), where residential development is proposed.
- 1.2 Bat activity surveys, consisting of walked transects and static monitoring surveys were undertaken to:
- Establish the diversity of bat activity at the Site (i.e. which bat species/genera make use of the Site).
 - Establish the distribution of on-site activity, including any hotspots or key flight lines.
 - Complete a qualitative assessment of bat behaviour/use of the Site (e.g. foraging, or 'commuting' to off-site habitat resources).
 - Complete a quantitative assessment of the relative level of bat activity at the Site (including spatial and/or temporal variation).
 - Facilitate the design of development proposals which are sensitive to the bats found to use the Site.
 - Support an evidence-based assessment of the likely effects of development on bat population.
- 1.3 A Preliminary Roost Assessments (PRA) of trees within the Site was carried out to determine the presence/absence of Potential Roost Features (PRF) and to categorise each tree in terms of its suitability for roosting bats to allow potential impacts to be predicted and appropriate mitigation proposed.

2.0 Legislation

- 2.1 All British bat species are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended). These Regulations make it an offence to:
- Deliberately capture, injure, or kill a bat
 - Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young, or which significantly affects the local distribution or abundance of the species
 - Damage or destroy a breeding site or resting place used by bats
- 2.2 All bats and their roosts in the UK were previously fully protected under the Wildlife & Countryside Act 1981 (as amended). Amendments to the Act have removed most provisions as they relate to bats, however it remains an offence to:
- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection
 - Intentionally or recklessly obstruct access to any structure or place used for shelter or protection

- 2.3 It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Regulations, the offence of damaging or destroying a breeding site or resting place is subject to 'strict liability', i.e. an offence is committed irrespective of whether the causal act was deliberate or otherwise.
- 2.4 Where development is proposed that would result in an offence under the Regulations, a European Protected Species (EPS) statutory derogation licence (often termed 'EPS Mitigation Licence') will need to be secured from Natural England to permit an act that would otherwise be unlawful. Such a licence can only be granted following receipt of planning permission with all relevant conditions discharged, and where it has been demonstrated that specific statutory derogation tests have been met.

3.0 Methods

- 3.1 The following survey methods, design, data analysis and interpretation have been undertaken with due consideration of the Bat Conservation Trust (BCT) guidelines 3rd edition (Collins, 2016), the prevailing guidelines at the time of the survey work.

Preliminary Roost Assessment (PRA)

Trees

- 3.2 All trees on-site were inspected from ground level, using binoculars and high-powered torches as appropriate. Particular attention was given to woodpecker holes, limb splits, lifting bark and mature ivy stems. The survey was completed on 03 June 2021 and updated on 17 April 2023 by Alex Perry ACIEEM (Bat Class Survey Licence WML-CL18, Registration Number 2017-32919-CLS-CLS).
- 3.3 A description of each tree was made, including the species, height, diameter at breast height and condition.
- 3.4 The aim of this inspection was to record direct (i.e. actual roosting bats) or indirect evidence of roosting bats (e.g. droppings), as well as the nature and number of features with 'potential' to support roosting bats. This includes consideration of trees to support bats whilst in hibernation.

Assessing 'Potential' of Trees to Support Roosting Bats

- 3.5 All trees were assigned to one of four categories in respect of their 'potential' to support roosting bats, or the confirmation of any bat roosts identified. 'Potential' in this context is taken to be the broad suitability of features to support roosting bats, based upon the nature, condition or structure of such features, in the absence of confirmed evidence of roosting.
- 3.6 Assigning the following categories is intended to determine the effort of any further targeted survey or inspections which are necessary to prove

presence or likely absence of roosting bats, rather than to assign importance to such features.

3.7 The following categories are assigned to structures and/or trees herein, Either:

- **Confirmed Roost** – where one or more bat roosts are identified during PRA inspections, either through direct sightings of bats, and/or indirect evidence such as bat droppings.

Or:

- **High** – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
- **Moderate** – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, assessments at this stage are made irrespective of species conservation status).
- **Low** – A structure or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
- **Negligible** – Negligible habitat features on site likely to be used by roosting bats.

3.8 The potential of a tree or structure to support roosting bats is often influenced by its age and construction, thermal stability, lighting and levels of human activity. Furthermore, the proximity to foraging habitat - particularly woodland, parkland and wetland- as well as the presence of navigational routes (e.g. hedgerows, treelines and watercourses) influence both the potential for bats to roost, as well as the species which may roost. Professional judgement is therefore applied, based upon known factors which effect the potential of features to support roosting bats, insofar as determining the need or scope of further surveys or inspections.

Limitations

3.9 Although the Preliminary Roost Assessment was originally undertaken in June 2021, when leaves may be obscuring features, an update was undertaken in April 2023 before trees were in leaf and as such a robust assessment was able to be made.

Activity Surveys

Transect Surveys

- 3.10 Seasonal transect surveys were originally undertaken in 2021 and then updated in May, July and September 2023. On each occasion a single transect route aimed to cover all accessible areas, features and habitats at the Site. Each transect route was repeated at least once during each survey to minimise temporal bias.
- 3.11 Each transect was walked at a moderate and consistent speed with qualitative observations of bat behaviour made by the surveyor. Each survey commenced at sunset (British Summer Time), continuing for the following two hours. The surveys were led by Alex Perry, in suitable weather conditions (see Table 3).
- 3.12 Bat calls were recorded using Elekon Batlogger M detectors. This detector automatically records ultrasonic signals with a one second delay between recordings. Recordings of bat contacts were subsequently analysed using BatExplorer software, with sonograms reviewed to confirm bat identification to genera, or where possible, species level.
- 3.13 Each of the recorded files, which contain a variable number of call 'pulses', was designated a 'bat contact'. At the point of contact, each sound file is assigned a GPS location.
- 3.14 Transect surveys are intended to gather data on the spatial distribution of bat activity across the Site, identifying areas of relative importance for bats, including key flight lines. In addition, direct observation of bats allows for qualitative assessments of how bats use the Site to be made complementing quantitative data collected through remote monitoring.

Remote Monitoring

- 3.15 Two Wildlife Acoustics Songmeter (SM4) detectors were deployed seasonally in 2021, and these surveys were then updated in May, July and September 2023 to provide six update data-sets. The locations of these Monitoring Locations (ML) are shown on Figure 1 below.



Figure 1. The locations of each Monitoring Location (ML) surveyed during remote monitoring surveys in 2021 and updated in May, July and September 2023

- 3.16 The detectors were setup to automatically record ultrasonic signals for the period from half an hour before sunset to half an hour after sunrise each night, with each monitoring period spanning at least five consecutive nights.
- 3.17 Weather conditions were obtained for each night surveyed using historic weather data from the World Weather Online website, with weather observations taken from the nearest weather station in Leicester Forest East. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed, see Table 3) were taken forward for analysis.
- 3.18 Recordings are triggered when a bat echolocation call is detected and will contain a variable number of call 'pulses'. Each file containing call pulses by a bat/s is designated as a 'bat contact' for each species present. The maximum recording duration is 15 seconds after which time a new recording file, and thus a new bat contact, is generated if

echolocation calls are still being detected. This means that periods of prolonged bat activity near a detector is represented as multiple bat contacts, rather than a single one.

- 3.19 Recorded bat calls were analysed using the specialist software AnalookW to identify the species present. Quantitative analysis of bat activity was then undertaken by calculating the average bat contacts per hour on each night monitored, for each species.
- 3.20 Bat activity can show considerable inter-night variability and is dependent on a number of variables, including temperature, wind, and seasonality, amongst others. To account for this variability the median values for the average hourly bat contacts per night are reported, rather than a mean value which would misrepresent the average activity.

Limitations

- 3.21 It should be noted that the findings described herein for remote monitoring surveys are based on the bat activity recorded at the location immediate to each detector, and therefore only describe localised activity at the Site.
- 3.22 In addition, comparisons drawn on the number of detector activations by different species/genera can only give an indication of relative species abundance at the Site, as detectability varies between species.
- 3.23 It is acknowledged that the quantum of bat contacts recorded during a survey may not give a true reflection of the abundance of bats using the Site. For example, a single bat foraging close to a detector may trigger several hundred activations in the course of one night. However, this activity level does provide a proxy for the level of use by bats, and therefore its relative importance.
- 3.24 The SD card during the July 2023 survey resulted in only three nights of data being recorded. Although this is below the five nights required, the total data recorded is considered sufficient to provide an overall picture of bat activity at the Site.

4.0 Results

Preliminary Roost Assessment (PRA)

Trees

- 4.1 All trees and tree groups on-site were included in the assessment. Tree numbers are consistent with those used within the Tree Survey Report (report reference: BHA_4237_TS).
- 4.2 Generally, trees on-site are small and restricted to within hedgerow features. Only trees within the site boundary were assessed, resulting in one tree, Tree T12, identified as having Low potential to support bats. The tree comprises a mature oak and although no features were identified,

it is of a size that may support features higher in the canopy in trunk or the branches, that may not have been visible from ground level. All other trees were found to have negligible bat roosting potential.

Activity Surveys

Transect Surveys

- 4.3 The weather conditions experienced during the transect surveys are provided in Table 1 below.

Table 1. Bat transect survey timings and weather conditions

Survey Date	Sunset Time	Start Time	End Time	Temp. (°C)		Cloud Cover (oktas)		Wind (Beaufort Scale)		Precip
				Start	End	Start	End	Start	End	
24/05/2023	21:08	21:08	23:08	13	13	1	0	3	1	None
12/07/2023	21:24	21:24	23:24	17	15	1	3	1	2	None
18/09/2023	19:14	19:14	21:14	12	11	2	3	3	3	None

- 4.4 A total of two species were recorded during the transect survey, comprising common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*. The majority of contacts were recorded along the western boundary where single bats were often recorded foraging under an adjacent streetlight along Ratby Lane, and along the southern boundary where foraging was observed along the woodland edge.
- 4.5 The number of bat contacts recorded for each species are summarised in Table 2 below. The locations of each bat contact and the overall distribution of activity across the Site are illustrated in Figures 2 and 3.

Table 2. Summary of bat contacts recorded during transect surveys

Month	Common pipistrelle	Soprano pipistrelle
May	77	9
July	73	3
September	147	15
Total	297	27
Percentage of Total (%)	91.67	8.33



Figure 2. Locations of bat contacts recorded across all transect surveys

- 4.6 Figure 3 below provides an indicative illustration of 'hotspots' in bat activity recorded across all transect surveys undertaken at the Site. No key commuting lines were observed, but foraging by a common and soprano pipistrelle bats along the western and southern boundaries were seen during the transect survey, as is reflected within the results. Both areas of the Site are also more sheltered due to topography.



Figure 3. Indicative 'Utilisation Distribution' (UD) of all bat species/genera at the Site estimated from all transect data combined. The UD illustrates the relative probability of a bat in flight being present at a given point at the Site, with higher/central contours having a greater probability, and lower/peripheral contours having less probability.

Remote Monitoring

- 4.7 The weather conditions experienced during the five nights where data was analysed are provided in Table 3 below.
- 4.8 Weather conditions during the end of May 2023 were unseasonably cold as can be seen within Table 3. The period of static monitoring tried to capture periods of dryer, warmer weather to ensure the majority of the average temperature during the five nights were above 10°C and dry.
- 4.9 The total number of bat contacts recorded across all monitoring locations and monitoring periods for each bat species/genera are provided in Figure 4 below.

Table 3. Overnight weather conditions during remote monitoring

Survey Month	Dates Sampled	Temp. (°C)		Cloud Cover (%)		Wind (km/h)		Precipitation
		Min	Max	Min	Max	Min	Max	
May	24/05/2023	9	12	7	96	1	4	Dry
May	25/05/2023	9	13	79	100	5	9	Dry
May	26/05/2023	6	9	6	15	4	9	Very light rain at 21:00
May	27/05/2023	10	14	9	67	5	13	Dry
May	28/05/2023	3	8	13	21	9	16	Dry
July	06/07/2023	11	14	4	8	13	17	Dry
July	07/07/2023	17	19	3	82	12	20	Light rain at 03:00. Dry before and after.
July	08/07/2023	13	17	11	87	5	13	Light rain at 21:00. Dry after.
July	09/07/2023	11	15	6	77	9	12	Very light rain at 21:00. Dry after.
July	10/07/2023	14	16	60	100	10	23	Heavy rain at 21:00. Very light rain at 00:00. Light rain at 03:00. Dry after.
Sept	04/09/2023	14	18	0	2	7	11	Dry
Sept	05/09/2023	14	16	0	100	5	11	Dry
Sept	06/09/2023	18	21	3	13	6	8	Dry
Sept	07/09/2023	16	21	5	44	4	6	Dry
Sept	08/09/2023	18	21	7	24	3	5	Dry

Figure 4. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations

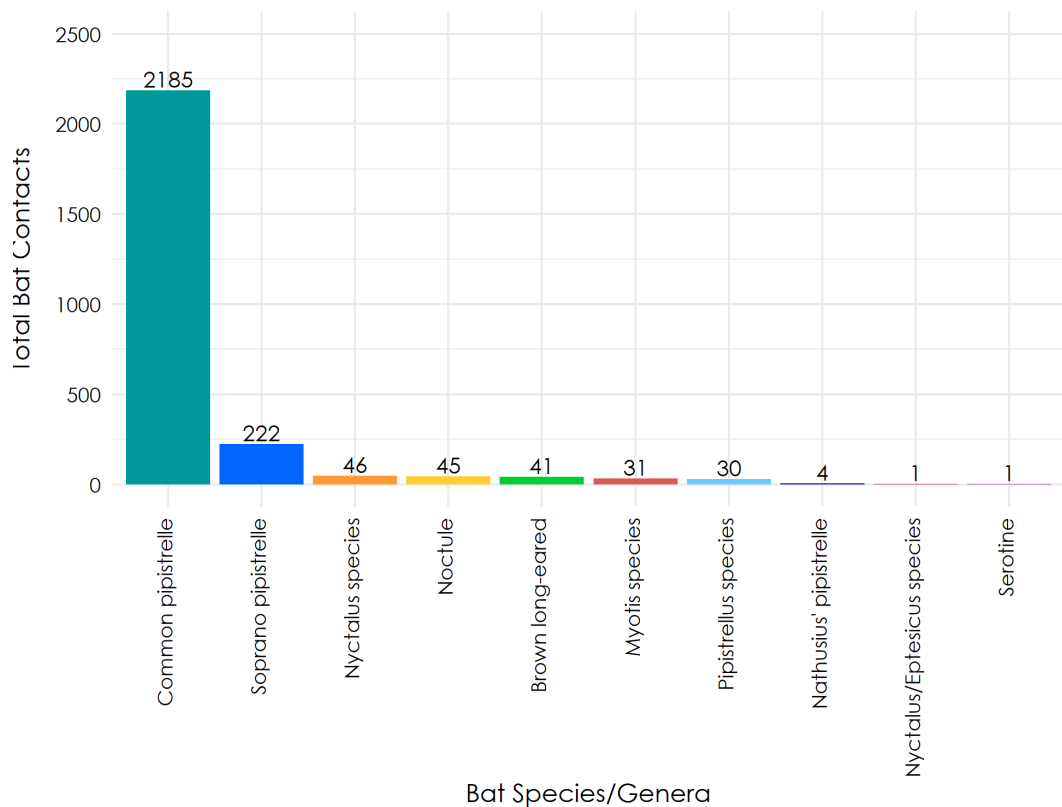


Table 4. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations

Month	BLE	Com pip	Myotis sp	Nath pip	Noct	Nyct sp	Nyct/ Epte sp	Pip sp	Sero	Sop pip
May	4	537	3	1	14	11	1	20	1	24
July	0	689	0	2	3	6	0	5	0	63
Sept	37	959	28	1	28	29	0	5	0	135
Total	41	2185	31	4	45	46	1	30	1	222

*BLE = brown long-eared, pip = pipistrelle, com = common, sop = soprano, Nath = Nathusius', Nyct = Nyctalus, Epte = Eptesicus, Noct = noctule, Sero = serotine, sp = species

4.10 Markedly higher pass numbers of common pipistrelle bat were recorded, with low levels of all other species. Bat activity appears to be marginally higher at ML1 than ML2, but this may be on account known foraging area for common pipistrelle under the streetlight.

4.11 Figure 5 below shows the variance in nightly activity levels for each of these bat species recorded on-site. More detailed data describing Figure 5 are provided in Table 4. The activity data in Figure 5 is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 5 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question. Further information on the data shown in Figure 5 is shown in Table 5.

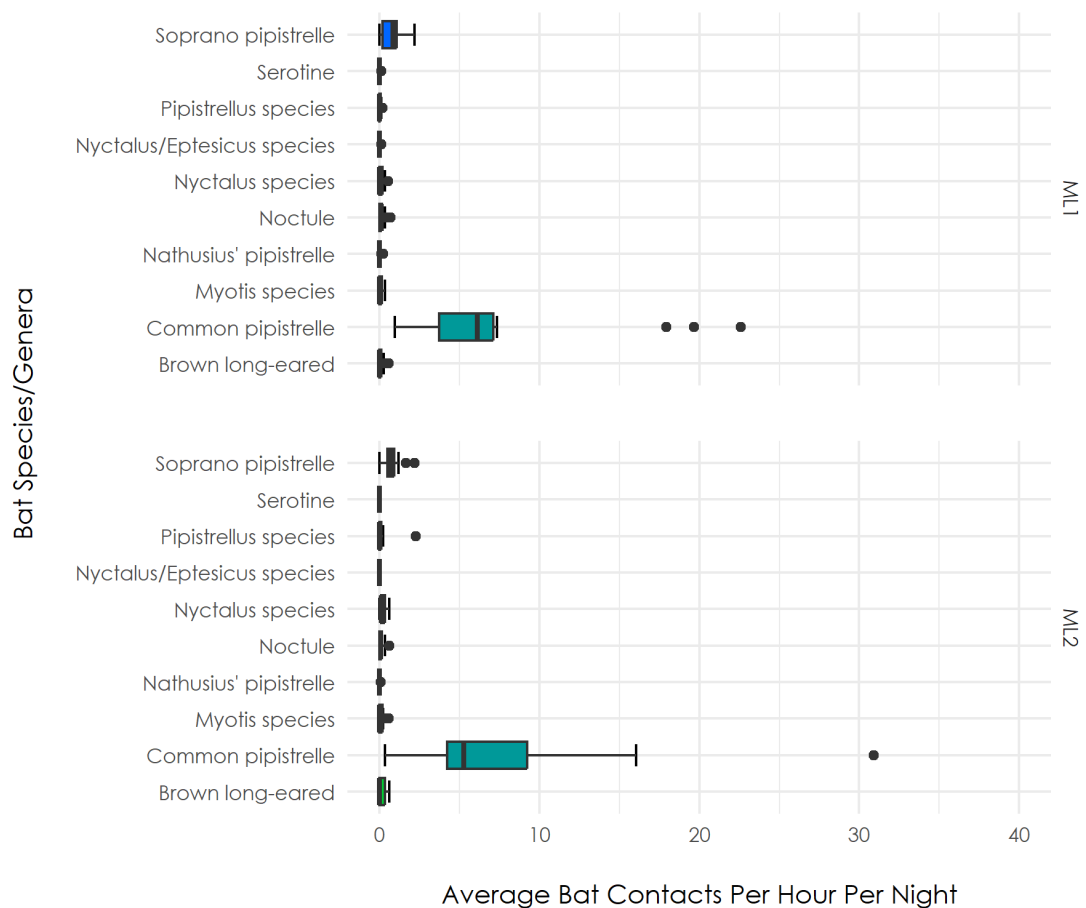


Figure 5. Average bat contacts per hour per night for each bat species/genera recorded across all remote monitoring

4.12 The data shows a marginally higher average number of common pipistrelle passes at ML1 than ML2, whilst ML2 had the highest number of common pipistrelle passes within an hour of over 30. The diversity of species is prominently equal between the two statics location with exception of a single serotine pass at ML1.

Table 5. Average bat contacts per hour per night recorded during remote monitoring surveys

ML	Species	Average bat contacts per hour per night				Total bat contacts	Number of nights monitored
		Min	Max	Med	IQ range		
ML1	Brown long-eared	0.000	0.591	0.000	0.128	17	15
ML1	Common pipistrelle	0.947	22.577	6.108	3.380	1135	15
ML1	Myotis species	0.000	0.338	0.000	0.146	13	15
ML1	Nathusius' pipistrelle	0.000	0.228	0.000	0.000	3	15
ML1	Noctule	0.000	0.675	0.115	0.146	23	15
ML1	Nyctalus species	0.000	0.519	0.000	0.200	18	15
ML1	Nyctalus/Eptesicus species	0.000	0.119	0.000	0.000	1	15
ML1	Pipistrellus species	0.000	0.171	0.000	0.057	6	15
ML1	Serotine	0.000	0.119	0.000	0.000	1	15
ML1	Soprano pipistrelle	0.000	2.194	0.838	0.909	120	15

ML2	Brown long-eared	0.000	0.597	0.000	0.338	24	13
ML2	Common pipistrelle	0.348	30.898	5.269	4.998	1050	13
ML2	Myotis species	0.000	0.591	0.000	0.170	18	13
ML2	Nathusius' pipistrelle	0.000	0.085	0.000	0.000	1	13
ML2	Noctule	0.000	0.597	0.086	0.169	22	13
ML2	Nyctalus species	0.000	0.605	0.116	0.225	28	13
ML2	Nyctalus/Eptesicus species	0.000	0.000	0.000	0.000	0	13
ML2	Pipistrellus species	0.000	2.275	0.000	0.115	24	13
ML2	Serotine	0.000	0.000	0.000	0.000	0	13
ML2	Soprano pipistrelle	0.000	2.189	0.694	0.416	102	13

Summary

- 4.13 A total of two species were recorded during the transect survey, comprising common pipistrelle *Pipistrellus pipistrellus* and Soprano pipistrelle *Pipistrellus pygmaeus*. The majority of contacts were recorded along the southern and western boundaries.
- 4.14 The static monitoring surveys resulted in a greater diversity of bats, but the vast majority of recording were that of common pipistrelle. At least seven bat species were recorded during the static monitoring surveys, including low numbers of serotine and Nathusius' pipistrelle.
- 4.15 As the mature oak, which was found to have low potential to support roosting bats, is due to be retained and protected within an area of open space and therefore no additional survey work has been deemed necessary
- 4.16 Scheme design should seek to retain vegetation at the Site as flightlines for bats, including the woodland corridor to the south. New and retained vegetation should be maintained as dark corridors through delivery of a sensitive lighting strategy, where new native species planting can be used to buffer potential light spill from the new development and create new foraging opportunities for bats.

Appendix F

Badger Survey Report

1.0 Introduction

- 1.1 This appendix has been produced by CSA Environmental on behalf of Taylor Wimpey Strategic Land. It sets out the methods and results of badger surveys undertaken at Land at Ratby Lane, Markfield (hereafter referred to as 'the Site'), where residential development is proposed.

2.0 Legislation

- 2.1 Badgers and their setts are protected under the Protection of Badgers Act 1992 which, in part, makes it an offence to:

- Kill, injure or take a badger
- Destroy or damage a badger sett or any part of it
- Obstruct access to, or any entrance of, a badger sett
- Disturb a badger whilst it is occupying a sett

- 2.2 Impacts to badgers and their setts should be avoided in the first instance by retaining setts and implementing an appropriate buffer distance to limit disturbance. Where this is not possible, a Natural England licensing system exists to permit certain works that would otherwise be illegal. This can include direct or indirect impacts which may result in any of the above offences. Where a licence has been granted, permitted impacts to a badger sett can only be carried out between the months of July and November (inclusive) and following an agreed method statement.

3.0 Methods

- 3.1 An initial badger survey was conducted on 10 August 2021 by Alex Perry ACIEEM and Lorna Gwilliam. An update badger survey was conducted on 24 May 2023 by Tom Richards ACIEEM and Ryan Clarke, using standard survey methods, searching the Site and immediately adjacent areas for field signs of badger and mapping any present such as:

- Feeding signs such as snuffle entrances made during foraging
- Hairs caught on vegetation or fences
- Latrines, usually positioned on territorial boundaries
- Foraging tracks through vegetation or under fences
- Badger setts

- 3.2 When badger setts are found the number of entrances are recorded as well as the level of usage. Recording this information gives an indication of the type of sett by categorising it according to the criteria listed in Table 1 below (Harris *et al.* 1989, Cresswell *et al.* 1990, Wilson *et al.* 1997).

Table 1. Description of sett types and badger activity

Sett Type
Main Setts - These usually have a large number of entrances with large spoil heaps, and the sett generally looks well used. There will be well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continuous use, it is possible to find a main sett that has become disused due to

excessive digging or some other reason; it should be recorded as a disused main sett. In the first survey, the average size of an active main sett was twelve entrances (including all categories of use).
Annexe setts - They are often close to a main sett, usually less than 150 metres away, and are usually connected to the main sett by one or more obvious well-worn paths. They usually have several entrances, but may not be in use all the time even if the main sett is very active. In the first survey the average size was five entrances (including all categories of use).
Subsidiary setts - These often only have a few; four (including all categories of use) was the average number in the first survey. They are usually at least 50 metres from a main sett, and do not have an obvious path connecting with another sett. They are not continuously active.
Outlying setts - These usually have only one or two entrances, often have little spoil outside the entrance, have no obvious path connecting with another sett, and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel (not the actual entrance entrance), which is usually at least 250mm in diameter, and is rounded or a flattened oval shape. Fox and rabbit tunnels are smaller and often taller than broad.
Entrance Type
Well used entrances - These are clear of any debris or vegetation, are obviously in regular use, and may or may not have been excavated recently.
Partially used entrances - These are not in regular use and have debris such as leaves and twigs in the entrance, or have moss and/or other plants growing in or around the entrance. Partially used entrances could be in regular use after a minimal amount of clearance.
Disused entrances - These have not been in use for some time, are partially or completely blocked, and could not be used without a considerable amount of clearance. If the entrance has been disused for some time, all that may be visible is a depression in the ground where the entrance used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Limitations

- 4.0 There were no specific limitations to the badger survey, which was conducted at an optimum time of year and in good conditions.

5.0 Results

- 5.1 During the initial badger survey in 2021, a single sett opening was discovered along the eastern boundary of the Site. No other evidence of badger was recorded. The same single entrance was confirmed to still be present during the update badger survey in 2023. There were no recent signs of activity, and the hole is deemed to be disused. No other evidence was recorded during the update badger survey.
- 5.2 Badger activity identified at the Site is shown on the Habitats Plan as target note 2 (CSA/2550/117A).

6.0 Summary

- 6.1 Badger activity on-site is limited to a single disused hole along the eastern boundary of the Site. No other evidence of badger was recorded during the detailed badger surveys.

- 6.2 As badger activity can change rapidly over time, the results within this report are considered to be valid for 12 months. After this period survey work will need to be updated.

Appendix G

Great Crested Newt Survey Report

1.0 Introduction

- 1.1 This appendix has been produced by CSA Environmental on behalf of Taylor Wimpey Strategic Land. It sets out the methods and results of great crested newt *Triturus cristatus* surveys undertaken at Land at Ratby Lane, Markfield (hereafter referred to as 'the Site'), where residential development is proposed.

2.0 Legislation

- 2.1 Great crested newts *Triturus cristatus* are legally protected as European Protected Species (EPS) under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended). These Regulations make it an offence to:

- Deliberately capture, injure, kill or capture a great crested newt
- Deliberately disturb great crested newts, impairing their ability to survive, breed, reproduce or rear/nurture their young
- Damage or destroy a breeding site or resting place used by a great crested newt

- 2.2 Great crested newts are also fully protected under the Wildlife & Countryside Act 1981 (as amended), making it an offence to:

- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place of shelter or protection
- Intentionally or recklessly obstruct access to any structure or place of shelter or protection

- 2.3 Disturbance of great crested newts is covered by both the 2017 Regulations and the 1981 Act. Disturbance that impairs survival or successful reproduction would be covered by the Regulations, while less significant acts of disturbance may only be covered by the Act.

- 2.4 It is important to note that great crested newts and their habitats (such as breeding ponds) are protected throughout the year, regardless of whether or not newts are present at the time.

- 2.5 Great crested newts are also listed as a species of principal importance for the conservation of biodiversity in England, under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. The S41 species list is used to guide decision-makers, including planning authorities, in implementing their duty under Section 40 of the NERC Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Licensing

- 2.6 Where development is proposed that would result in an offence under the Habitats and Species Regulations, a statutory derogation licence may be granted by Natural England to permit an act that would

otherwise be unlawful. To obtain an EPS licence for development, it must be demonstrated that the purpose of the act to be licensed is for:

- “preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 55(2)(e))

2.7 In addition, Natural England will not grant an EPS licence unless they are satisfied that:

- “There is no satisfactory alternative” (Regulation 55(9)(a))
- “The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range” (Regulation 55(9)(b))

3.0 Methods

Desk Study

3.1 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken in August 2021 and updated in March 2023 to identify ponds within 500m of the Site which may have potential to support breeding great crested newts, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography. Typically, 500m is the generally accepted maximum dispersal range of this species, with great crested newt most likely to use terrestrial habitat within 250m of breeding ponds.

Habitat Suitability Index (HSI) Assessment

3.2 Where ponds were situated within an 500m radius and connected to the Site by traversable terrestrial habitats, access permission was requested to undertake a Habitat Suitability Index (HSI) assessment, using the standard approach set out by Oldham *et al.* (2000). These assessments were undertaken on 29 April 2021 by Alex Perry ACIEEM (Natural England Class Licence WML-CL08 – Registration Number 2015-18118-CLS-CLS) and updated on 17 April 2023.

Presence/Likely Absence Surveys

3.3 Following the HSI assessment, Ponds P1, P2 and P4 were subject to specific presence / likely absence surveys in suitable weather conditions between April and June 2021, using the following survey methods: torch surveying, bottle-trapping, egg searching and netting; in accordance with the Great Crested Newt Mitigation Guidelines (2001). Terrestrial habitats were also searched for great crested newts, e.g. under logs, rocks and debris. The surveys were led by Alex Perry.

3.4 Update surveys on Ponds P1 and P2 were undertaken between April and May 2023 in suitable weather conditions, using the same survey methods

as 2021, in accordance with the Great Crested Newt Mitigation Guidelines (2001).

- 3.5 On each of the survey visits bottle traps were set out during the evening, just before dusk. These traps were then checked early the following morning for the presence of great crested newts and the traps were subsequently removed. Bottle traps were set out at regular intervals along accessible stretches of bank. During each survey, nighttime air temperatures were recorded, in line with current guidelines.
- 3.6 Torchlight searches were carried out after dark on each survey visit with one million candlepower Clulite™ torches. Any amphibians seen were recorded. On each survey visit the vegetation was searched for the presence of great crested newt eggs.
- 3.7 Suitable weather conditions are those nights when the night-time air temperature is 5°C or warmer, with little or no wind. All surveys were conducted during such conditions, as shown in Table 1 below.

Table 1: Survey conditions during 2023 surveys

Date	Air temp (°C)	Pond 1		Pond 2	
		Veg cover (0-5)	Turbidity (0-5)	Veg cover (0-5)	Turbidity (0-5)
18/04/2023	8	1	1	3	2
26/04/2023	10	2	1	2	2
02/05/2023	9	3	2	4	1
11/05/2023	11	2	2	3	2
17/05/2023	13	1	2	2	2
25/05/2023	12	1	3	1	3

Environmental DNA (eDNA) Sampling

- 3.8 Following negative results in 2023, environmental DNA (eDNA) sampling was used to determine the updated presence / likely absence of great crested newts from Ponds P4 and P5 in 2023. This method has been shown to be a highly effective in detecting the presence of great crested newts (Biggs *et al.*, 2014).
- 3.9 Water samples were collected from Ponds P4 and P5 on 18 April 2023 by Alex Perry ACIEEM (Natural England Class Licence WML-CL08 – Registration Number 2015-18118-CLS-CLS), following the recommended procedure. Appropriate biosecurity measures were taken to avoid cross contamination of great crested newt eDNA. Subsequently the samples were sent to ADAS for DNA analysis.

Limitations

- 3.10 There were no limitations to the surveys regarding weather, which were conducted at an optimum time of year and in good conditions. The fields around Pond P2 were frequently used by cattle, which were moved before each survey to ensure surveyor safety. The cows were found to be in the field before the sixth torchlit survey and it was decided not to proceed with the survey over health and safety concerns. This pond was still subject to bottle trapping and an egg search.

4.0 Results

- 4.1 Results should be read in conjunction with the Pond Plan shown at the end of this report.

Desk Study

- 4.2 The desktop search for ponds and subsequent site visits identified six waterbodies within 500m of the Site. These ponds are identified on the Pond Plan (CSA/2550/123). Pond P6 is located c. 420m east of the Site, though the intervening A50 trunk road separates the two and is likely to form a barrier to dispersal. Pond P6 was therefore ruled out of further investigation.
- 4.3 The data search provided 27 records of great crested newt, two of which are located within ponds almost adjacent to the south-west of the Site (Ponds P1 and P2 in Appendix C), dating from 2014, comprising a peak count of one and eight individuals respectively.

Habitat Suitability Index (HSI) Assessment

- 4.4 The results of the HSI assessments are provided in Table 2 below. Pond 3 comprises a large, ornamental lake with major waterfowl impact, whilst Pond 5 comprises a large, suspected fishing lake. As such, these two ponds were found to support 'Poor' suitability for great crested newts and as such were ruled out of further survey work. Detailed results of the HSI assessment can be found at the end of this report.
- 4.5 As the Site boundary spans south-easterly for creation of the outfall, the distances for Ponds P1 to P3 reflect the distance from the southernmost part of the outfall.

Table 2. HSI Results

Pond Number	Distance from Site	HSI Index Value	Category
1	c. 5m south-west	0.681	Average
2	c. 100m south-east	0.654	Average
3	c. 200m south-west	0.459	Poor
4	c. 335m east	0.657	Average
5	c. 390m east	0.419	Poor

Environmental DNA (eDNA) Sampling

- 4.6 Water samples for both Ponds P4 and P5 returned negative eDNA results, confirming the continued likely absence of great crested newts, following 2021 presence / likely absence conventional bottle trapping surveys. The condition of the water samples upon receipt were classed as either 'good' or 'low sediment.' Full results can be found at the end of this report. Given the negative eDNA results, Pond P4 and P5 were not subject to further presence or absence surveys.

Presence/Likely Absence Surveys

2021 surveys

- 4.7 As Pond P1 is known to have previously supported great crested newts, this pond was subject to six surveys comprising four presence / likely absence surveys in the first instance, followed by two population class estimate surveys. During the surveys, no great crested newts were recorded in Pond P1.
- 4.8 During surveys at Pond P2, two female great crested newts were recorded in bottle traps during the second survey, with two females recorded by torching during the fourth survey. On this basis, a further two population class estimate surveys were completed. During the fifth survey a single great crested newt was found in the bottle traps. On this basis the pond is considered to support a peak count of two great crested newts.
- 4.9 Four surveys of Pond P4 recorded no great crested newts or smooth newts within this pond.

2023 surveys

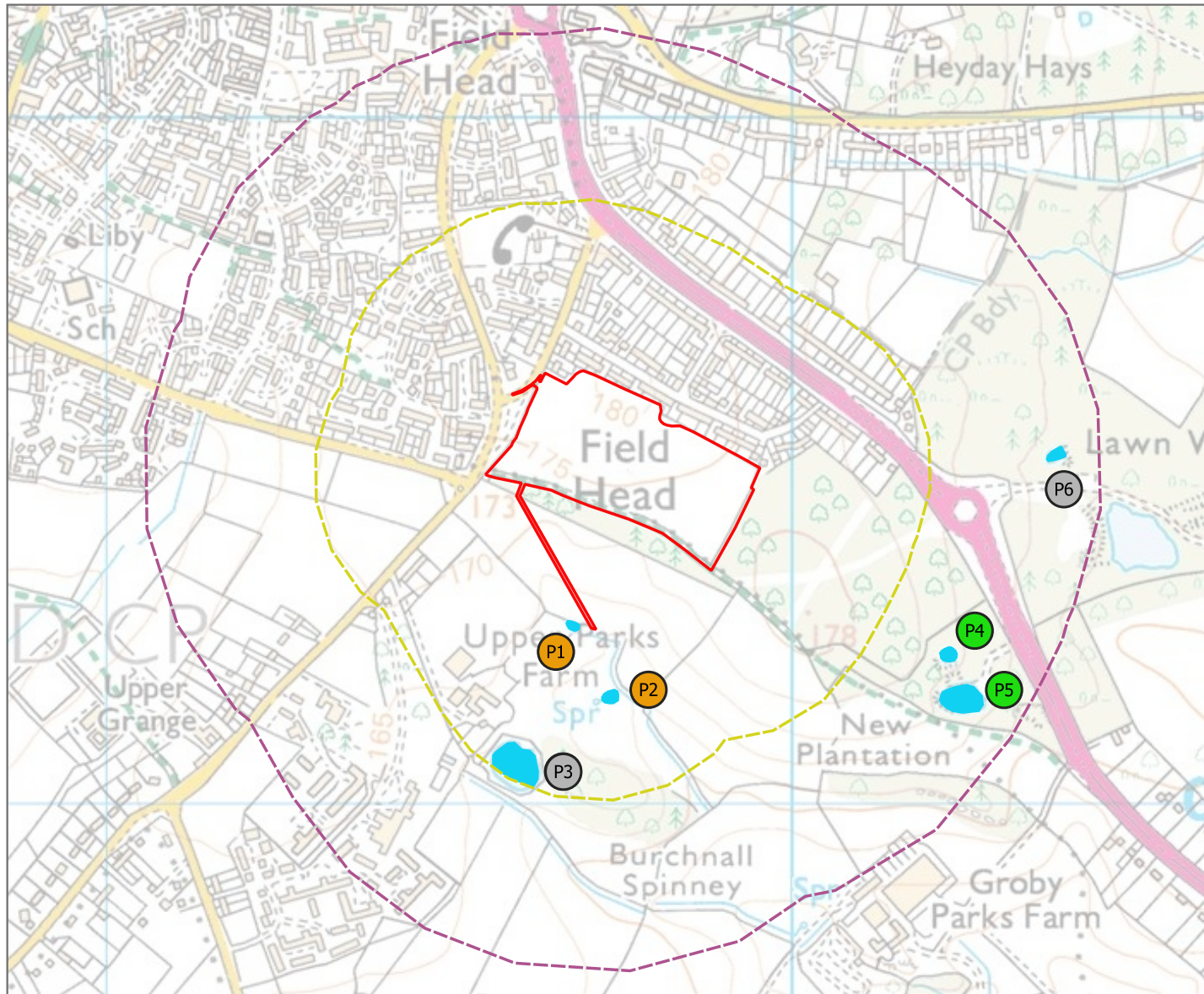
- 4.10 Following the negative eDNA surveys of Ponds P4 and P5 in 2023 no further survey work was undertaken at these two ponds.
- 4.11 As above, due to previous recorded presence of great crested newt in 2014, Pond P1 was subject to six surveys, despite none being recorded during the initial four visits. A single male great crested newt was recorded in the bottle traps during the sixth and final survey. No great crested newt eggs, efts or larvae were recorded in any of the ponds during the six surveys of Pond P1. As such, the peak count at Pond P1 is considered to be one, comprising a small Population size class assessment.
- 4.12 A peak count of eight smooth newts *Lissotriton vulgaris* were recorded in Pond P1 during the survey work.
- 4.13 A peak count of two female great crested newts were recorded during the first four surveys at Pond P2 and as such, this pond was subject to two further surveys to establish population count. During the sixth and final survey, a peak count of six females and two male great crested newts

were recorded within bottle traps. As such this pond is considered to have a peak count of eight great crested newts, comprising a small population class size estimate.

- 4.14 Full survey results can be seen within the table at the end of this report.

5.0 Summary

- 5.1 Negative eDNA results from Ponds P4 and P5 confirmed the continued likely absence of great crested newts from within these waterbodies.
- 5.2 Great crested newts are confirmed to be present within both Ponds P1 and P2. Presence / likely absence surveys and population estimate surveys resulted in peak counts of a single great crested newt in Pond P1 and eight great crested newts in Pond P2. As such, it is considered that both ponds support small populations of great crested newt.
- 5.3 Great crested newts comprise a European Protected Species and as such individuals and their habitat are protected by law. As this species is known to persist near to the Site, a derogation licence from Natural England will be required for works to proceed.
- 5.4 The Site is located within the Hinckley and Bosworth district of Leicestershire, which is included within Natural England District Level Licensing scheme. Developers have the potential to join this scheme which in turn will provide the licence required for works to proceed.



- Site boundary
- 250m radius from boundary
- 500m radius from boundary
- Pond
- Pond reference
- Confirmed presence of great crested newt
- Great crested newts likely absent
- Ponds ruled out following pond scoping / HSI exercise



Project	Land at Ratby Lane, Markfield, Leicestershire	Date	October 2023	Drawing No.	CSA/2550/123
Drawing Title	Pond Plan	Scale	Refer to scale	Rev	-
Client	Taylor Wimpey Strategic Land	Drawn	CM	Checked	AP

Habitat Suitability Factors:		Pond Number				
		1	2	3	4	5
Map location	Category	Zone A	Zone A	Zone A	Zone A	Zone A
	SI Value	1	1	1	1	1
Pond area in m ²	Category	125m2	200m2	>2000m2	350m2	>2000m2
	SI Value	0.25	0.4		0.7	
Permanence / Desiccation	Category	Rarely Dries	Rarely Dries	Never Dries	Never Dries	Never Dries
	SI Value	1	1	0.9	0.9	0.9
Water quality	Category	Moderate	Moderate	Moderate	Moderate	Poor
	SI Value	0.67	0.67	0.67	0.67	0.33
Percentage perimeter shade to at least 1m from shore	Category	66-70%	96-100%	0-60%	91-95%	0-60%
	SI Value	0.8	0.2	1	0.3	1
Waterfowl impact (excluding moorhen)	Category	Minor	Absent	Major	Minor	Minor
	SI Value	0.67	1	0.01	0.67	0.67
Fish presence	Category	Absent	Absent	Possible	Possible	Major
	SI Value	1	1	0.67	0.67	0.01
Number of ponds within 1km not separated by barriers	Category	8	8	10	5	5
	SI Value	0.89	0.89	0.95	0.75	0.75
Terrestrial habitat	Category	Moderate	Moderate	Moderate	Good	Moderate
	SI Value	0.67	0.67	0.67	1	0.67
Percentage of pond surface occupied by aquatic vegetation (March – May)	Category	6-10%	11-15%	1-5%	1-5%	6-10%
	SI Value	0.4	0.45	0.35	0.35	0.4
HSI Score		0.681	0.654	0.459	0.657	0.419
HSI Suitability		Average	Average	Poor	Average	Poor

Disclaimer: The HSI Calculator is a tool to provide a general assessment of great crested newt *Triturus cristatus* habitat suitability in accordance with Oldham et al., 2000 and Brady, 2010. It is the responsibility of the user to check the accuracy of the outputs. The copyright holder accepts no responsibility for repercussions (financial and/or legal) resulting from inaccurate or incorrect outputs.

Client: Lucy Moorhouse,
CSA Environmental



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Sample ID: ADAS-5602 Condition on Receipt: Good Volume: Passed
Client Identifier: P4, 2550 Description: pond water samples in preservative
Date of Receipt: 20/04/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/04/2023
Degradation Control [§]	Within Limits	Real Time PCR	24/04/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/04/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:

Signed:

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 25/04/2023 Date of issue: 25/04/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

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CSA Environmental



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Tel: 01159 229249
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Sample ID: ADAS-5603 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: P5, 2550 Description: pond water samples in preservative
Date of Receipt: 20/04/2023 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	24/04/2023
Degradation Control [§]	Within Limits	Real Time PCR	24/04/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	24/04/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
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[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Pond reference		Pond P1		Torch									Bottle-trap								Egg search	Larvae	
Surveyors		KC / TR / BK		Torch power:				>= 1,000,000 cp					No. of traps used in pond;				30				GCN eggs found?	GCN larvae found? (any method)	
				GCN				Smooth newt	Palmate newt	Smooth/ Palmate		GCN			Smooth newt			Palmate newt					
Sex/life stage:				M	F	Imm ³	NS ⁴	M	M	F	Imm	NS	M	F	Imm	M	F	Imm	NS	M	F	Imm	NS
Date:	Air temp (°C)	Veg cover ¹	Turbidity ²																				
17/04/2023	12	2	0	0	1	0	0	8	0	7	0	0	1	0	0	6	1	0	0	0	0	0	0
03/05/2023	12	1	0	0	0	0	0	3	0	3	0	0	0	0	0	6	0	0	0	0	0	0	0
09/05/2023	15	1	2	0	1	0	0	3	0	1	0	0	0	0	0	3	1	0	0	0	0	0	0
30/05/2023	13	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/06/2023	13	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
13/06/2023	24	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak adult GCN count for this pond						
Torching				Bottle-trap		
GCN		Smooth	Palmate	Smooth/ Palmate	GCN	Smooth newt
1		8	0	7	1	6

Pond reference		Pond 2		Torch								Bottle-trap								Egg search	Larvae
Surveyors		KC / TR / BK		Torch power:				>= 1,000,000 cp				No. of traps used in pond:				10				GCN eggs found?	GCN larvae found? (any method)
				GCN				Smooth newt	Palmate newt	Smooth/ Palmate	GCN		Smooth newt		Palmate newt						
Sex/life stage:				M	F	Imm ³	NS ⁴	M	M	F	Imm ^m	NS	M	F	Imm	M	F	Imm	NS		
Date:	Air temp (°C)	Veg cover ¹	Turbidity ²	M	F	Imm ³	NS ⁴	M	M	F	Imm ^m	NS	M	F	Imm	M	F	Imm	NS		
17/04/2023	11	2	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	No	No
03/05/2023	11	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No
09/05/2023	15	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No
30/05/2023	13	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No
08/06/2023	13	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No

Peak adult GCN count for this pond						
Torching				Bottle-trap		
GCN		Smooth	Palmate	Smooth/ Palmate	GCN	Smooth newt
0		0	0	0	0	0

Pond reference		Pond 3		Torch								Bottle-trap								Egg search	Larvae	
Surveyors		KC / TR / BK		Torch power:		>= 1,000,000 cp				No. of traps used in pond:				None				GCN eggs found?	GCN larvae found? (any method)			
				GCN		Smooth newt	Palmate newt	Smooth/ Palmate	GCN		Smooth newt		Palmate newt									
Sex/life stage:				M	F	Imm ³	NS ⁴	M	M	F	Imm ^m	NS	M	F	Imm	NS	M	F		Imm	NS	
Date:	Air temp (°C)	Veg cover ¹	Turbidity ²	M	F	Imm ³	NS ⁴	M	M	F	Imm ^m	NS	M	F	Imm	NS	M	F		Imm	NS	
17/04/2023	10	0	4	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	No	No
03/05/2023	11	0	4	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	No	No
09/05/2023	13	1	4	0	0	0	0	1	0	0	0	0	-	-	-	-	-	-	-	-	No	No
30/05/2023	13	0	4	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	No	No

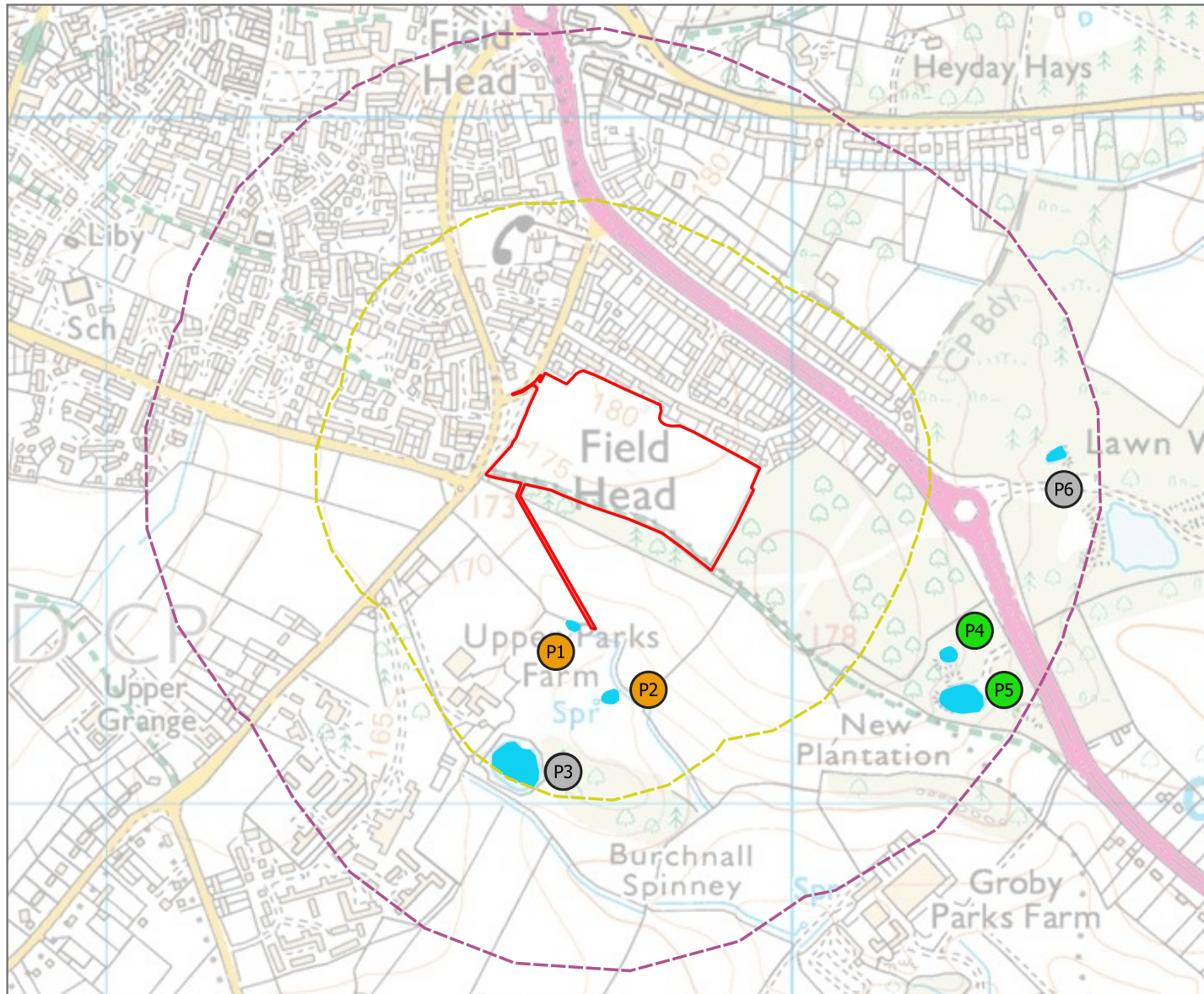
Peak adult GCN count for this pond						
Torching				Bottle-trap		
GCN		Smooth	Palmate	Smooth/ Palmate	GCN	Smooth newt
0		1	0	0	0	0

* Imm - Immature / Juvenile

** NS - Not Specified

*** Vegetation cover score (0 – 5); 0 = no vegetation obscuring survey; 5 = water completely obscured by vegetation

**** Turbidity score (0 – 5); 0 = completely clear; 5 = very turbid



- Site boundary
- 250m radius from boundary
- 500m radius from boundary
- Pond
- Pond reference
- Confirmed presence of great crested newt
- Great crested newts likely absent
- Ponds ruled out following pond scoping / HSI exercise



Project	Land at Ratby Lane, Markfield, Leicestershire	Date	October 2023	Drawing No.	CSA/2550/123
Drawing Title	Pond Plan	Scale	Refer to scale	Rev	-
Client	Taylor Wimpey Strategic Land	Drawn	CM	Checked	AP



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