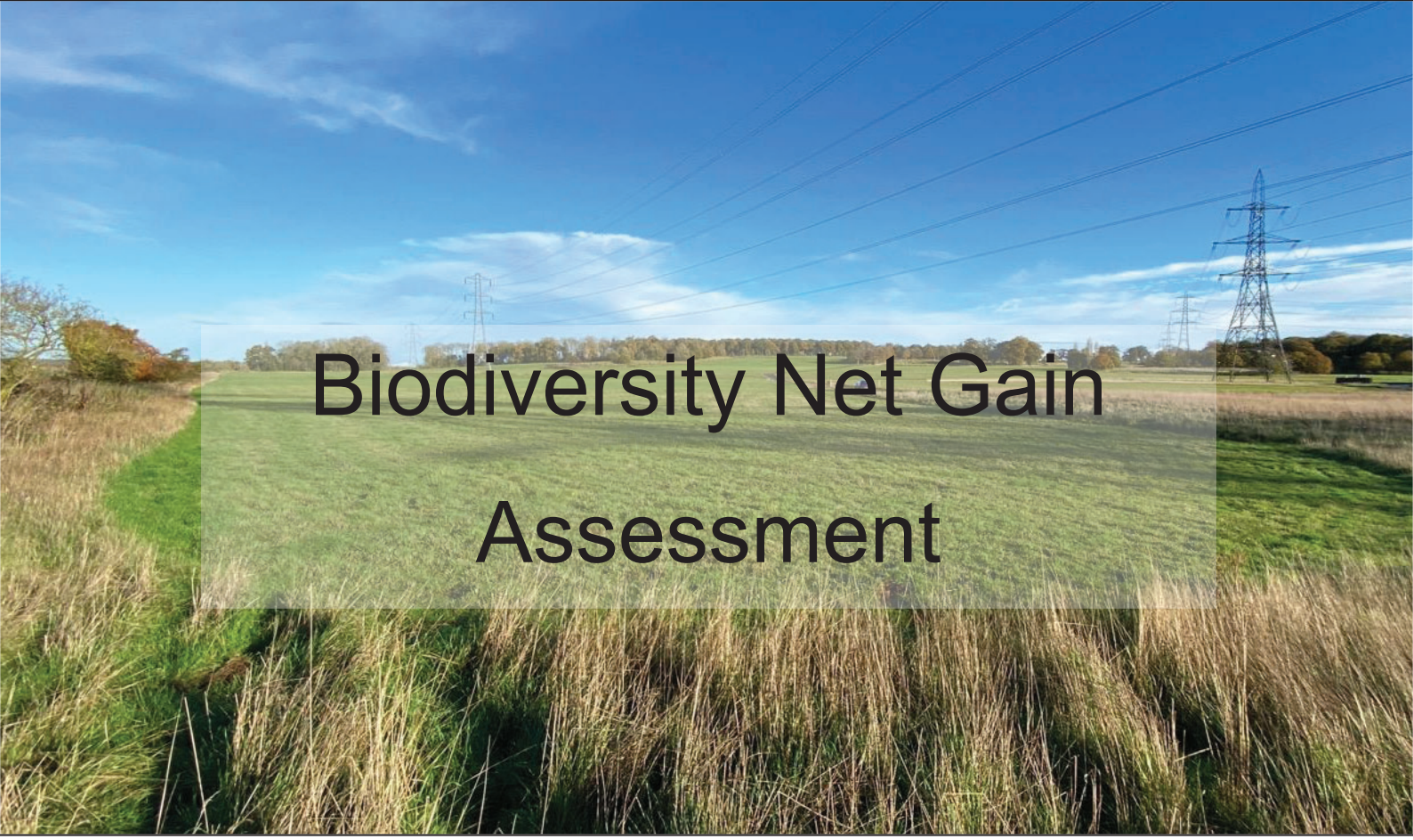
Annex D – Ecology and BNG Supplementary Environmental Information



Biodiversity Net Gain Assessment

Culham Battery Storage

On behalf of Statera Energy

December 2024

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Project Code	Title	Date of Issue
EBD02513	Culham Battery Storage Biodiversity Net Gain Assessment (v5)	17 December 2024

	Name	Date
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Checked by	Karen Lunan BSc (Hons), MSc, MCIEEM	26 January 2024
v4 Updated by	Anna Spence BSc (Hons) MSc, MCIEEM	12 April 2024
v5 Update by	Laura Grant BSc (Hons), MCIEEM	17 December 2024

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Contents

1 Executive Summary

Report purpose	This report identifies the results of a quantitative Biodiversity Net Gain Assessment undertaken of proposals for a 420 megawatt battery storage facility, with 248 sound insulated lithium ion battery units housed within standard shipping containers and 31 larger noise insulated inverter houses to accommodate the inverters and transformers. The facility is proposed within c. 26ha of land north of the Culham Science Centre (approximate central grid reference: SU 52879 96551). A Biodiversity Net Gain Assessment (BNG) is mandatory under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by Schedule 14 of the Environment Act 2021) and required in accordance with Policy ENV3 from the South Oxfordshire District Council Local Plan (adopted December 2020). This report functions to satisfy the requirements of the following part of that policy: *"All proposals should be supported by evidence to demonstrate a biodiversity net gain using a recognised biodiversity accounting metric".*
Date and methods of survey and assessment	Three baseline habitat condition assessments of the site was undertaken on 12 July 2022, 16 November 2022 and 11 January 2024 and the results used to populate the Statutory Biodiversity Metric based on planting plans provided by Stratera Energy (drawing reference Dwg No. SL254_L_X_GA_1). Ecological advice for maximising biodiversity gain potential within the layout was provided during the detailed design stage and incorporated within the plans. The mitigation hierarchy and all other best practice principles for biodiversity net gain were followed during the design process.
Key findings	The Application scheme and Appeal scheme have marginal differences in red line boundaries, being 26.91ha and 25.37ha respectively. The Application scheme has a baseline value of 65.29 habitat units and the proposals will achieve 109.11 habitat units, delivering a gain of 43.82 habitat units i.e. 67.11% increase and 5.10 hedgerow units. The Appeal scheme has a baseline value of 66.11 habitat units and the proposals will achieve 107.16 habitat units, delivering a gain of 41.05 habitat units i.e. 62.10% increase and 5.21 hedgerow units. Both schemes are securing significant biodiversity net gains and the trading rules are satisfied as a result of the proposals. Features such as bird boxes, bat boxes and insect boxes are not considered within the biodiversity metric calculation but will be incorporated within the site which will further enhance the site for wildlife, as detailed within the Ecological Impact Assessment (Ecology by Design, 2024). This assessment has robustly demonstrated that the proposals will result in a biodiversity net gain, satisfying the mandatory 10% net gain requirement under the Environment Act 2021 and Policy ENV3 from the South Oxfordshire District Council Local Plan and ensuring a biodiversity gain will be achieved as part of the proposals. Post-consent, this report should be used to inform a detailed Biodiversity Net Gain Habitat Management and Monitoring Plan (HMMP). A HMMP will be required to ensure the long-term delivery of the habitats contributing to the quantitative net gain calculated by this report.

2 Introduction

2.1 Background

2.1.1 Ecology by Design were commissioned by Stratera Energy to undertake a Biodiversity Impact Assessment (BIA) of proposals for a battery storage facility north of Culham Science Centre, Thames Lane, Culham, OX14 3ES at approximate central grid reference SU 52879 96551.

2.1.2 Ecology by Design have undertaken various surveys at the site between July 2022 and November 2024 including:

- An extended UKHab Habitat Survey;
- Daytime tree assessments for bats; and
- Monitoring of potential badger setts.

2.1.3 The results of the above are set out within the Ecological Impact Assessment report (Ecology by Design, 2024).

2.2 Site Description

2.2.1 The site is approximately 26ha in extent and comprises four large fields along with a portion of a fifth field used for non-cereal crops (permanent modified grasslands harvested for hay and silage) and two areas of other neutral grassland. The fields had been mown when the survey was conducted in January 2023, with small strips on the field margins remaining unmown. There are occasional scattered trees and scrub within the site.

2.2.2 In the wider landscape, there is mixed woodland immediately north of the site, the River Thames runs from east to west 130m north of the site, there are additional non-cereal fields to the north and south-west and Culham Science Centre to the south-east.

2.2.3 Soilscapes (https://www.landis.org.uk/soilscapes/) indicates the soils of the site comprise slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.

2.3 Proposals

2.3.1 The proposals are for the development of a battery energy storage system (BESS) connected directly to the National Grid, with BESS compound area, National Grid cable sealing end compound, substation upgrade works and associated infrastructure works including access, drainage and landscaping.

2.4 Relevant Policy and Legislation

2.4.1 Policy ENV3 from South Oxfordshire District Council Local Plan (adopted 2020) states: *"Development that will conserve, restore and enhance biodiversity in the district will be supported. All development should provide a net gain in biodiversity where possible. As a minimum, there should be no net loss of biodiversity. All proposals should be supported by evidence to demonstrate a biodiversity net gain using a recognised biodiversity accounting metric..."*

2.4.2 The Environment Act 2021 stipulates a 10% Biodiversity Net Gain above baseline conditions is required for all developments in England and is mandatory from 12th February 2024.

2.4.3 The National Planning Policy Framework (NPPF) (MHCLG, 2024) states that development proposals should seek opportunities for securing measurable net gains for biodiversity. It also outlines that development proposals should follow a 'mitigation hierarchy' by which loss of biodiversity should preferably be avoided as a first course of action, mitigated as a second, or compensated for as a last resort.

2.5 Aims of Report

2.5.1 This report is a Biodiversity Net Gain Assessment (BNG) of the proposals at the site. It has been produced following a site visit to evaluate the baseline habitats present and a review of the proposed habitats in accordance with the guidance provided alongside the Statutory Biodiversity metric (DEFRA, 2023b) and industry standard guidance (CIEEM *et al*., 2019; BSI, 2021).

2.5.2 This report is intended to satisfy the requirements of ensuring a net gain in biodiversity within Policy ENV3 and the Environment Act 2021 read in conjunction with the detailed landscape proposals (Stratera Energy drawing reference: Dwg No. SL254_L_X_GA_1).

2.5.3 This report will be submitted to South Oxfordshire District Council alongside a completed copy of the Biodiversity Metric Statutory Calculation Tool (DEFRA, 2023a) to inform the Application scheme and Appeal scheme. GIS shapefiles will be available on request.

2.5.4 This report addresses a quantitative biodiversity net gain assessment only, it should be read in conjunction with the Ecological Impact Assessment (Ecology by Design, 2024) which addresses all other ecological considerations such as designated sites and protected species.

2.6 Personnel

2.6.1 The site visit, mapping and completion of the Statutory Metric (DEFRA, 2023a) was undertaken by Ecology by Design Senior Ecologist Anna Spence BSc (Hons), MSc, MCIEEM who has seven

years' experience carrying out habitat surveys. The report, metric and associated figures were reviewed by Principal Ecologist Karen Lunan BSc (Hons), MSc, MCIEEM who has 18 years' experience as an ecologist.

2.6.2 Anna and Karen have both received specific training in the use of the DEFRA Statutory metric and are suitably qualified and accomplished in habitat evaluation and use of GIS to complete a biodiversity impact assessment metric on a site of this nature.

3 Methods

3.1 Desk Study

3.1.1 The Ecological Impact Assessment (Ecology by Design, 2024) includes a detailed desk study to inform the application which is not discussed further within this report.

3.2 Biodiversity Impact Assessment

Compliance with Best Practice

3.2.1 A biodiversity impact assessment was undertaken using the statutory biodiversity metric (DEFRA, 2023a) in accordance with all relevant best practice guidelines (CIEEM *et al*., 2019; BSI, 2021). The 10 'Principles of Biodiversity Net Gain (CIEEM, *et al*., 2019) were followed:

- Principle 1 – Apply the mitigation hierarchy
- Principle 2 – Avoid losing biodiversity that cannot be offset by gains elsewhere
- Principle 3 – Be inclusive and equitable
- Principle 4 – Address risks
- Principle 5 – Make a measurable net gain
- Principle 6 – Achieve the best outcomes for biodiversity
- Principle 7 – Be additional
- Principle 8 – Create a net gain legacy
- Principle 9 – Optimise sustainability
- Principle 10 – Be transparent

Methodology

3.2.2 To calculate the net impact on biodiversity as a result of the proposals, the Statutory Biodiversity Metric (DEFRA, 2023a) was completed in accordance with the accompanying user guide and technical supplements (DEFRA, 2023b). The Metric calculation was completed with baseline data from a site visit and proposals data from the proposed landscape scheme.

3.2.3 A site visit was undertaken to collect baseline data on the existing habitats and their condition within the site. In accordance with the Statutory Biodiversity Metric user guide (DEFRA, 2023b) no specific minimum mappable unit was used; baseline data was collected on site on 12 July 2022, 16 November 2022 and 11 January 2024 and digitised using Ordnance Survey mapping and google satellite imagery during January 2024 at a scale of 1:250 using professional judgement, site notes and experience in cases where feature boundaries were not readily apparent.

3.2.4 Proposed habitats were manually digitised using an image file of Dwg No. SL254_L_X_GA_1 (Appendix 1) georeferenced using QGIS version 3.28.5 'Georeferencer' plugin; the georeferenced raster file is available on request in various formats. Full details of the habitat classifications are outlined within the biodiversity metrics submitted alongside this report and accompanying GIS shapefiles available on request in various formats.

3.2.5 In order to avoid rounding errors, area and length values were entered into the statutory metric to the level of accuracy calculated by the QGIS 3.28.5 function $area/$length as a decimal ('real') number attribute.

3.2.6 Existing and proposed habitats were categorised based on the UK Habitats Classification Scheme (UKHab Ltd, 2023) and conditions were assessed in accordance with the accompanying guidelines for the DEFRA statutory metric (Annex 1 to Natural England, 2023b).

3.2.7 The personnel were suitably qualified to conduct the assessment, as detailed in Section 2.6.

3.3 Limitations and Constraints

3.3.1 Industry standard principles were employed for the biodiversity impact assessment where appropriate to the current project. Any deviation from best practice was circumstantial and minor and did not have a significant impact on the conclusions made which are considered valid and robust. A full break down of the industry standard principles involved and any justifiable deviation is available on request if required.

3.3.2 The habitat assessment was conducted in July and November 2022 and January 2024. Whilst November and January are outside the optimal period given many species are not in flower, species composition was readily identified given the common and widespread habitats present within the site, therefore, this is not considered to have constrained the identification of habitat types, habitat condition or assessment of potential impacts.

4 Results and Interpretation

4.1.1 Baseline and proposed habitat condition assessments are recorded within the DEFRA Statutory Metric submitted alongside this report and accompanying GIS shapefiles (available on request in various formats).

4.1 Habitats Baseline

4.1.1 The baseline habitats and their retention category (lost/retained/enhanced) are illustrated on Figures EBD_2513_DR001 - EBD_2513_DR002 at Appendix 2 and detailed within Table 4.1 below. Detailed condition assessment results are presented alongside justification in Appendix 4.

Table 4.1: *Habitat types identified during the baseline condition assessment*

Habitat type	Description
Modified grassland	The vast majority of the site comprises modified grassland which is either mown for hay or used for sheep grazing. The modified grassland exhibits poor species-diversity and a uniform sward height. Species present include perennial ryegrass (*Lolium perenne*), cock's-foot (*Dactylis glomerata*), sterile brome (*Bromus sterilis*), Yorkshire fog (*Holcus mollis*), timothy (*Phleum pratense*), false oatgrass (*Arrhenatherum elatius*), soft brome (*Bromus hordeaceus*), red fescue (*Festuca rubra*), wall barley (*Hordeum murinum*) annual meadowgrass (*Poa annua*). Forbs were rarely offering within the field and included field pansy (*Viola arvensis*), common poppy (*Papaver rhoeas*) and scentless mayweed (*Tripleurospermum inodorum*).
Other neutral grassland	The margins of the modified grassland fields were typically 1-2m wide with a uniform grass-dominated sward height of 1m height, with frequent false oatgrass, Yorkshire fog, cock's-foot, perennial ryegrass and yarrow (*Achillea millefolium*), occasional agrimony (*Agrimonia eupatoria*) and wild parsnip (*Pastinaca sativa*), rarely occurring nettle (*Urtica dioica*), hogweed (*Heracleum sphondylium*), curled dock (*Rumex crispus*), wild carrot (*Daucus carota*), field bindweed (*Convolvulus arvensis*), creeping cinquefoil (*Potentilla reptans*) and bramble (*Rubus fruticosus* agg.). Along the central access road white stonecrop (*Sedum album*) was also present.
Mixed scrub	In the east of the site is 0.33ha of mixed scrub which appears to have been planted in c. 2010 and is typically 3m height with some already existing pedunculate oak (*Quercus robur*) or faster growing trees cherry (*Prunus* sp.) and douglas fir (*Pseudotsuga menziesii*) being up to 7m height. The scrub is species-rich, containing frequent hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and dogwood (*Cornus sanguinea*), occasional hazel (*Corylus avellana*), ash (*Fraxinus excelsior*), wayfaring tree (*Viburnum lantana*), and European larch (*Larix decidua*) and rarely occurring walnut (*Juglans regia*), cherry, sycamore (*Acer pseudoplatanus*) and Scots pine (*Pinus sylvestris*). The understorey is typical of the field margins.
Bramble scrub	In the south-east of the site is 0.52ha of scrub dominated by bramble c. 1m height including rarely occurring scattered elder (*Sambucus nigra*), hawthorn and rose (*Rosa* sp.).

Scattered trees	There are infrequent scattered trees within the site including turkey oak (*Quercus cerris*), ash, plum (*Prunus* sp.), large-leaved lime (*Tilia platyphyllos*), apple (*Malus* sp.) and pedunculate oak (*Quercus robur*).
Developed land, sealed surface	Hardstanding roads bisect the site, and a small substation building is present towards the south.

4.1.2 The Application scheme has a baseline value of 65.29 habitat units and the Appeal scheme has a baseline value of 66.11 habitat units.

4.1.3 No hedgerow or river habitats are within or adjacent to the site so the metric does not include an assessment of these units.

4.2 Retained/Enhanced/Lost Habitats

4.2.1 The retention category of baseline habitats (retained/enhanced/lost) is illustrated on Drawing EBD_2513_DR002 at Appendix 2. The proposals include the retention of existing scattered trees, small areas of other neutral grassland and the access tracks (developed land). The remainder of the habitats will be lost. The habitats at the south-east adjacent to Thame Lane will be re-instated post development and have therefore been categorised as 'lost' and 'created' under the metric.

4.3 Proposed Habitats

4.3.1 Site layout proposals used to inform the proposals are provided at Appendix 1; our interpretation of these habitats for input into the metric is illustrated on drawing EBD_2513_DR003 at Appendix 2. Detailed condition assessments for the proposed habitats are provided at Appendix 5 alongside justification.

4.3.2 To achieve the condition assessments and habitat classifications detailed below, implications to the necessary management regime have been agreed with Stratera Energy. These implications are included, where relevant, within the recommendations in Section 5; these recommendations will need to inform the detailed Biodiversity Net Gain Habitat Management and Monitoring Plan (HMMP) for the site.

4.3.3 The habitats proposed within the site for the Application / Appeal scheme are detailed below.

Developed Land

4.3.4 A portion of the site will comprise developed land, sealed surface covering approximately 9.7932ha / 8.0675ha of the Application scheme and Appeal scheme respectively for which no condition assessment is required.

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4.3.5 An attenuation basin covering approximately 0.2351ha will be created towards the west of both schemes. The basin will be sown with a grassland seed mix tolerant of seasonal inundation with as Emorsgate Seeds EM8 meadow mixture for wetlands or similar and will achieve good condition. This will deliver multifunctional benefits, satisfying paragraph 182 of the NPPF (MHCLG, 2024).

Wildlife pond

4.3.6 A wildlife pond measuring 0.066ha will be created in the north of the site for both schemes. The pond will have good water quality, have semi-natural habitat for at least 10m from the pond edge, will not be connected to other waterbodies and will have water levels which fluctuate naturally. The pond is therefore likely to achieve moderate condition.

Other neutral grassland

4.3.7 A total of 10.7127ha / 11.5368ha (of the Application scheme and Appeal scheme respectively) of other neutral grassland will be created and/or retained and managed to achieve moderate condition by passing the following criteria; (i) the vegetation closely matching characteristics of other neutral grassland with indicator species throughout the sward, (ii) no bracken and cover of scrub less than 5%, and (iii) absence of invasive species. It may fail the following criteria (i) cover of bare ground being 1-5% and (ii) sward height being varied and (iii) there being greater than 9 species per meter square.

4.3.8 Roughly 50% of the existing grassland will be power harrowed in strips, seeded with a species-rich seed mix and then managed as a traditional hay meadow with an annual cut in the summer, removing risings. The remaining 50% of the grassland would be bare ground following harrowing to allow natural seeding to occur.

4.3.9 A suitable seed mix would comprise the Emorsgate basic general purpose meadow mixture or similar. The grassland will be mown annually within late-July or August and all arisings will be removed. This will serve to remove nutrients and minimise scrub encroachment.

4.3.10 Any invasive species will be identified and removed.

Other broadleaved woodland

4.3.11 2.1781ha / 2.5043ha of other broadleaved woodland will be created in the Application scheme and Appeal scheme respectively, targeting moderate condition. The woodland will be comprised of at least five native species and managed to prevent the establishment of invasive species and allow a varied structure with a mixture of different aged trees to develop.

Mixed scrub

4.3.12 Areas of mixed scrub totalling approximately 1.6165ha / 1.4467ha will be created within the open space at the north and west of the Application scheme and Appeal scheme respectively. The scrub will include at least three woody native species with no single species comprising more than 75% of the habitat and will be managed to ensure invasive non-native plants do not become established. The scrub will also be allowed to develop edge habitat with scattered scrub and tall forbs/grassland between it and the adjacent other neutral grassland. As such, it is anticipated the mixed scrub will reach moderate condition under the metric.

Hedge Planting

4.3.13 The proposals include the planting of approximately 0.2km of native hedgerow, 0.73km of native hedgerow with trees and 0.08km of native tree line. Subject to the implementation of an appropriate management scheme, the hedgerows are anticipated to meet the criteria for good condition whilst the native tree line will be of moderate condition.

Further Enhancements

4.3.14 Enhancement features such as bird boxes, bat boxes and insect boxes are not considered within the biodiversity metric calculation but will be incorporated within the site which will further enhance the site for wildlife, as detailed within Section 5 of the Ecological Impact Assessment (Ecology by Design, 2024).

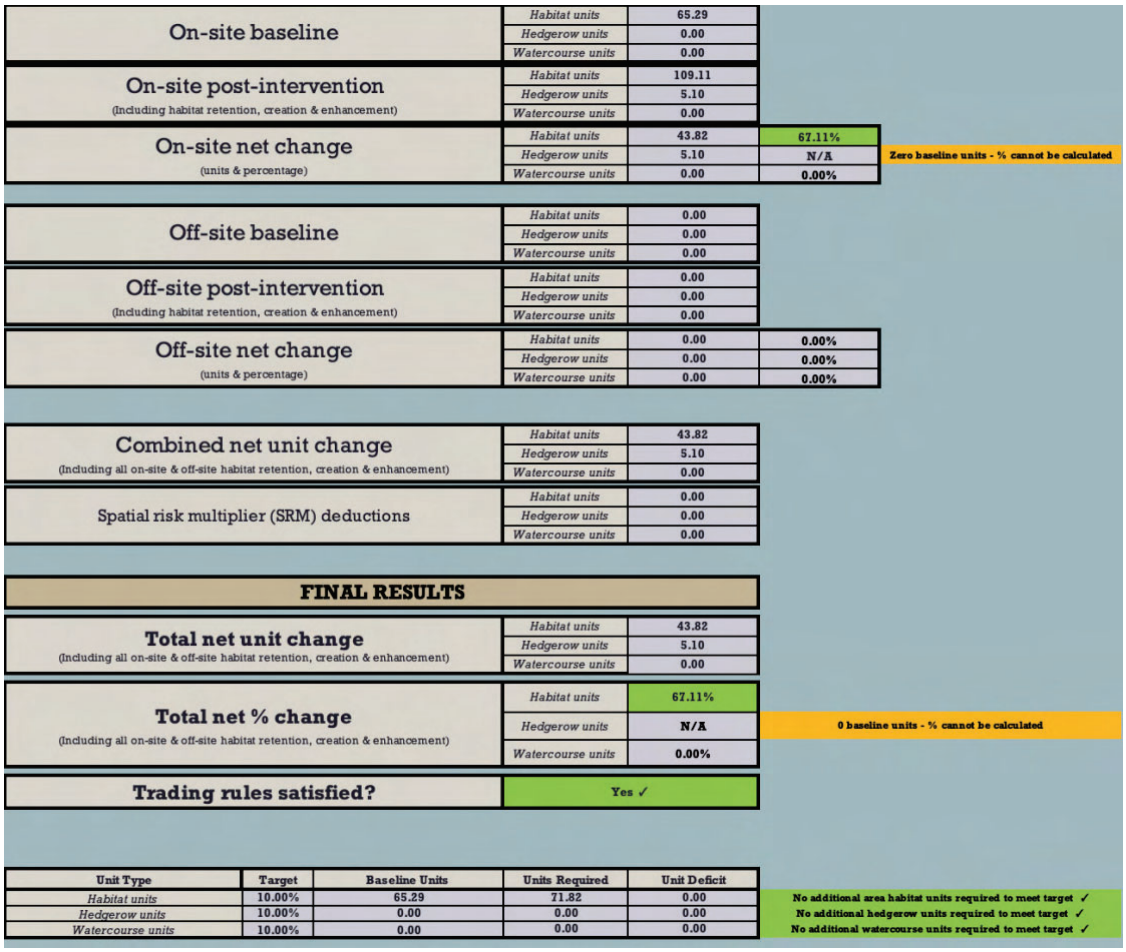
4.4 Metric Calculation Result

4.4.1 The Application scheme has a baseline value of 65.29 habitat units and the proposals will achieve 109.11 habitat units, delivering a gain of 43.82 habitat units i.e. 67.11% increase and 5.10 hedgerow units.

4.4.2 The Appeal scheme has a baseline value of 66.11 habitat units and the proposals will achieve 107.16 habitat units, delivering a gain of 41.05 habitat units i.e. 62.10% increase and 5.21 hedgerow units.

4.4.3 Both schemes are securing significant biodiversity net gains and the trading rules are satisfied as a result of the proposals.

Figure 1: *Application Scheme Biodiversity Metric Headline Calculator Summary*



On-site baseline	Habitat units	65.29		
	Hedgerow units	0.00		
	Watercourse units	0.00		
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	109.11		
	Hedgerow units	5.10		
	Watercourse units	0.00		
On-site net change (units & percentage)	Habitat units	43.82	67.11%	
	Hedgerow units	5.10	N/A	Zero baseline units - % cannot be calculated
	Watercourse units	0.00	0.00%	
Off-site baseline	Habitat units	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site net change (units & percentage)	Habitat units	0.00	0.00%	
	Hedgerow units	0.00	0.00%	
	Watercourse units	0.00	0.00%	
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	43.82		
	Hedgerow units	5.10		
	Watercourse units	0.00		
Spatial risk multiplier (SRM) deductions	Habitat units	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		

FINAL RESULTS

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	43.82	
	Hedgerow units	5.10	
	Watercourse units	0.00	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	67.11%	
	Hedgerow units	N/A	0 baseline units - % cannot be calculated
	Watercourse units	0.00%	
Trading rules satisfied?	Yes ✓		

Unit Type	Target	Baseline Units	Units Required	Unit Deficit	
Habitat units	10.00%	65.29	71.82	0.00	No additional area habitat units required to meet target ✓
Hedgerow units	10.00%	0.00	0.00	0.00	No additional hedgerow units required to meet target ✓
Watercourse units	10.00%	0.00	0.00	0.00	No additional watercourse units required to meet target ✓

Figure 2: *Appeal Scheme Biodiversity Metric Headline Calculator Summary*

On-site baseline	*Habitat units*	66.11		
	Hedgerow units	0.00		
	Watercourse units	0.00		
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	107.16		
	Hedgerow units	5.21		
	Watercourse units	0.00		
On-site net change (units & percentage)	*Habitat units*	41.06	62.10%	
	Hedgerow units	5.21	N/A	Zero baseline units - % cannot be calculated
	Watercourse units	0.00	0.00%	
Off-site baseline	*Habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site net change (units & percentage)	*Habitat units*	0.00	0.00%	
	Hedgerow units	0.00	0.00%	
	Watercourse units	0.00	0.00%	
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	41.06		
	Hedgerow units	5.21		
	Watercourse units	0.00		
Spatial risk multiplier (SRM) deductions	*Habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		

FINAL RESULTS

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	41.06	
	Hedgerow units	5.21	
	Watercourse units	0.00	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	62.10%	
	Hedgerow units	N/A	0 baseline units - % cannot be calculated
	Watercourse units	0.00%	
Trading rules satisfied?	Yes ✓		

Unit Type	Target	Baseline Units	Units Required	Unit Deficit	
Habitat units	10.00%	66.11	72.72	0.00	No additional area habitat units required to meet target ✓
Hedgerow units	10.00%	0.00	0.00	0.00	No additional hedgerow units required to meet target ✓
Watercourse units	10.00%	0.00	0.00	0.00	No additional watercourse units required to meet target ✓

5 Recommendations

5.1 Biodiversity Net Gain Habitat Management and Monitoring Plan (HMMP)

5.1.1 In order for the anticipated net gain in biodiversity to be realised, the statutory Habitat Management and Monitoring Plan (HMMP) template tool will be used to produce a structured management and monitoring plan to demonstrate how habitat creation, enhancement, management and monitoring will be undertaken. This HMMP could be secured as a suitably worded pre-commencement condition and would need to be referenced by a legal agreement (S106, conservation covenant or similar) to secure the habitat creation/enhancement needed to achieve the net gain in biodiversity.

5.1.2 The HMMP must include the details outlined below:

Habitat Creation and Management

5.1.3 The HMMP must include details of individually referenceable parcels/habitats that are to be created and managed to contribute towards the net gain in biodiversity. The HMMP may make reference to a Landscape and Ecology Management Plan (LEMP) or similar or include detailed habitat creation and management prescriptions within its contents.

Timeframe

5.1.4 The HMMP must cover a period of at least 30 years.

5.1.5 The 'times to target condition' must accord with the details outlined in Appendix 5.

Scope

5.1.6 The HMMP will cover creation and management of any habitats contributing towards the biodiversity net gain result described above with the exception of the following habitat types which are better addressed within a separate LEMP or similar:

- Buildings and hardstanding.

5.1.7 Where habitat parcels are described within both a LEMP and a HMMP, the creation/management prescriptions must align precisely.

Responsible Bodies

5.1.8 The HMMP must outline necessary qualifications/experience for ecologists undertaking monitoring surveys, and must also name responsible bodies for:

- Creation and management of the habitats; and
- Review of monitoring reports.

Monitoring

5.1.9 The HMMP must include provision for independent ecological monitoring and progress reporting over the lifetime of the management period, with provision for rectification works if required. Ecological monitoring must take place yearly as a minimum for five years, with monitoring reports produced to document:

- Commissioned client, site name and purpose of report;
- Background and timeline for project;
- Project description, as built;
- Aims/objectives/scope of monitoring survey;
- Reference to original aims described within this report;
- Survey methods;
- Evidence of technical competence and experience;
- Limitations;
- Clear statements on whether biodiversity unit targets are being met; and
- Details of any rectification works and implications necessary.

5.1.10 The frequency of monitoring will likely be decreased (e.g. to years 5, 10, 15, 25, 30) after five years at the monitoring ecologists' discretion if targets are being consistently met and risk of deviation is considered low.

Condition

5.1.11 The HMMP must make clear which condition criteria (e.g. DEFRA statutory metric) are targeted for each individual habitat so that ecological monitoring reports have a benchmark against which to measure. It may be appropriate to update condition criteria assessment as new versions of the metric are made available; any deviation from the version used within this report should be highlighted and justified.

5.2 Broad Management Prescriptions

5.2.1 The HMMP should be based on the below broad management prescriptions which have been agreed with Stratera Energy during the design stage. Parcel references within the below refer to those on drawing EBD_2513_DR003 (proposed habitats) at Appendix 2.

Newly created other neutral grassland (moderate condition)

5.2.2 The other neutral grassland within the application site must be managed around a traditional 'hay-cut' regime with the exception of informal footpaths which are to be mown regularly to a short height:

- mowing as required to <10mm height between March and mid-April inclusive;
- leaving grassland unmanaged during mid-April to late-July;
- taking a single summer hay cut in early August and remove arisings; and
- mowing monthly to <10mm August-October, removing arisings each mow.

Newly created mixed scrub

5.2.3 The newly planted mixed scrub within the application site will require no specific management beyond periodic brush-cutting and replacement of dead/damaged areas to maintain their current extent.

Newly planted scattered trees and tree line

5.2.4 The proposed trees must be watered as required during the first year, and then will require minimal ongoing management with the exception of inspections, restorative pruning, and replacement of damaged/failed individuals.

Newly created other broadleaved woodland

5.2.5 The newly planted woodland should initially be subject to weed control through the application of mulch or mulch mats around tree bases in early summer or the strimming of vegetation 1m around the base of each tree. Bio-degradable tree guards should be used to protect new trees from potential damage through grazing. New planting growth will be monitored every six months during the first year following planting an annually thereafter for five years, with watering, weed control, tree guard replacement and the replanting of failed specimens undertaken annually.

5.2.6 Once established, tree guards and stakes (if used) will be removed. A site visit will be carried out every five years (commencing year 5 post-construction) of the woodland to monitor the growth/condition and inform if/when any of the following are required:

- Thinning of close-set trees and non-native trees within the canopy;
- Replanting of varied native canopy and understorey species;
- Rotational coppicing of understoreys;
- Continued control of deer populations and piling of brash screening around newly planted/coppiced areas to manage over-grazing; and
- Creation of standing and fallen deadwood features.

5.2.7 Substantial works (other than minor trimming) will take place outside 1st March to 31st August inclusive to avoid impacting nesting birds.

Newly created SuDS and wildlife pond.

5.2.8 The newly created SuDS and wildlife pond will be subject to ongoing management carried out in response to the conditions at the time. This will generally include the removal of litter and larger items of debris, containment and investigation of any pollutions, selective pruning of surrounding vegetation and marginal vegetation, monitoring water conditions (i.e. algal blooms) and monitoring levels of human disturbance and taking remedial action if required.

6 References

BSI (2021). *BS 8683:2021 Process for designing and implementing Biodiversity Net Gain – Specification*. The British Standards Institution Ltd., London.

CIEEM, CIRIA, IEMA (2019). *Biodiversity net gain. Good practice principles for development. A practical guide.* CIRIA C776a. London, 2019.

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DEFRA (2023a). Statutory Biodiversity Metric calculation tool (spreadsheet). DEFRA

DEFRA (2023b). Statutory Biodiversity Metric User Guide (draft). Natural England Joint Publication JP039. DEFRA.

MHCLG (2024). *National Planning Policy Framework*. Ministry of Housing, Communities & Local Government

UKHab Ltd (2023). *UK Habitat Classification Version 2.0* (at https://www.ukhab.org)

Appendix 1 - Site Proposals

Drawing ref. Stratera energy dwg No. 241011_SL254_L_X_GA_1 (overleaf)

Legend

Site boundary	Existing tree	4m high infrared CCTV pole	Nuneham and Courtenay Conservation Area	Inverter building (total 31)	4m high wooden acoustic fence
Land ownership boundary	Existing tree	Emergency services information point	Historic parkland boundary	Transformer	1.5m high stock proof fence
Existing hedgerows and trees	Stone access track	Existing contours	Thames water main	Battery container (total 248)	2.5m high steel weld mesh fence
New woodland planting	Existing macadam track	Proposed contours	Railway easement	Control room (total 5)	1.8m high deer fence
New hedgerow	Attenuation pond	Tower maintenance clearance zone	Underground electric cable connection	WT Fire water tank	Impermeable drainage channel with penstocks to allow drainage from the compound to be controlled in the case of an emergency
New scrubland	Loose permeable gravel	Public Right of Way (PRoW)	Overhead electricity line	Welfare and storage containers	
Wildflower grass	New macadam track	Viewpoint	Permissive path for the duration of the planning consent		

STATERA
BALANCING THE GRID

Revision	Date	Comment
A	11.11.24	Proposed connection tower relocated out of the Registered Park and Garden into the proposed BESS compound. Batteries reduced from 296 to 248 and inverters from 37 down to 31. Earth mounding to landscape areas removed. BESS equipment arrangement adjusted to accommodate the connection tower compound. Fire water tanks reduced to two tanks, but of larger diameter, to maintain required capacity.

ON BEHALF
STATERA

PROJECT
CULHAM BATTERY ENERGY STORAGE SYSTEM

DATE 22 July 2022
SCALE 1 : 2,000 @ A1
DWG No SL254_L_X_GA_1_Rev A
APPROVED CMcD

TITLE
BLOCK PLAN

Appendix 2 - Figures

Figure 1: Application scheme baseline habitats

Figure 2: Application scheme impacts

Figure 3: Application scheme proposed habitats

Figure 4: Appeal scheme baseline habitats

Figure 5: Appeal scheme impacts

Figure 6: Appeal scheme proposed habitats

(overleaf)

LEGEND

Site Boundary

Site Boundary (26.91 ha)

~~Blackthorn scrub (0.1357 ha)~~

Bramble scrub (1.0255 ha)

Developed land; sealed surface (3.521 ha)

Buildings (0.0045 ha)

Mixed scrub (0.281 ha)

Modified grassland (19.601 ha)

Other neutral grassland **(2.4793 ha)**

Rural tree, medium **(19 trees)**

Rural tree, small **(24 trees)**

12 medium sized trees present within this zone and accounted for within updated v1.1 metric

0 75 150 225 300 375 m

N

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Baseline

Drawing No.: EBD_2513_DR001

Scale (@A3): 1:3,300

Central Eastings, Northings: 453133, 196452

Date Drawn: 05/04/2024

Drawn by: ASp

Approved by: BG

Hampden House, Monument Park, Chalgrove, Oxon, OX44 7RW

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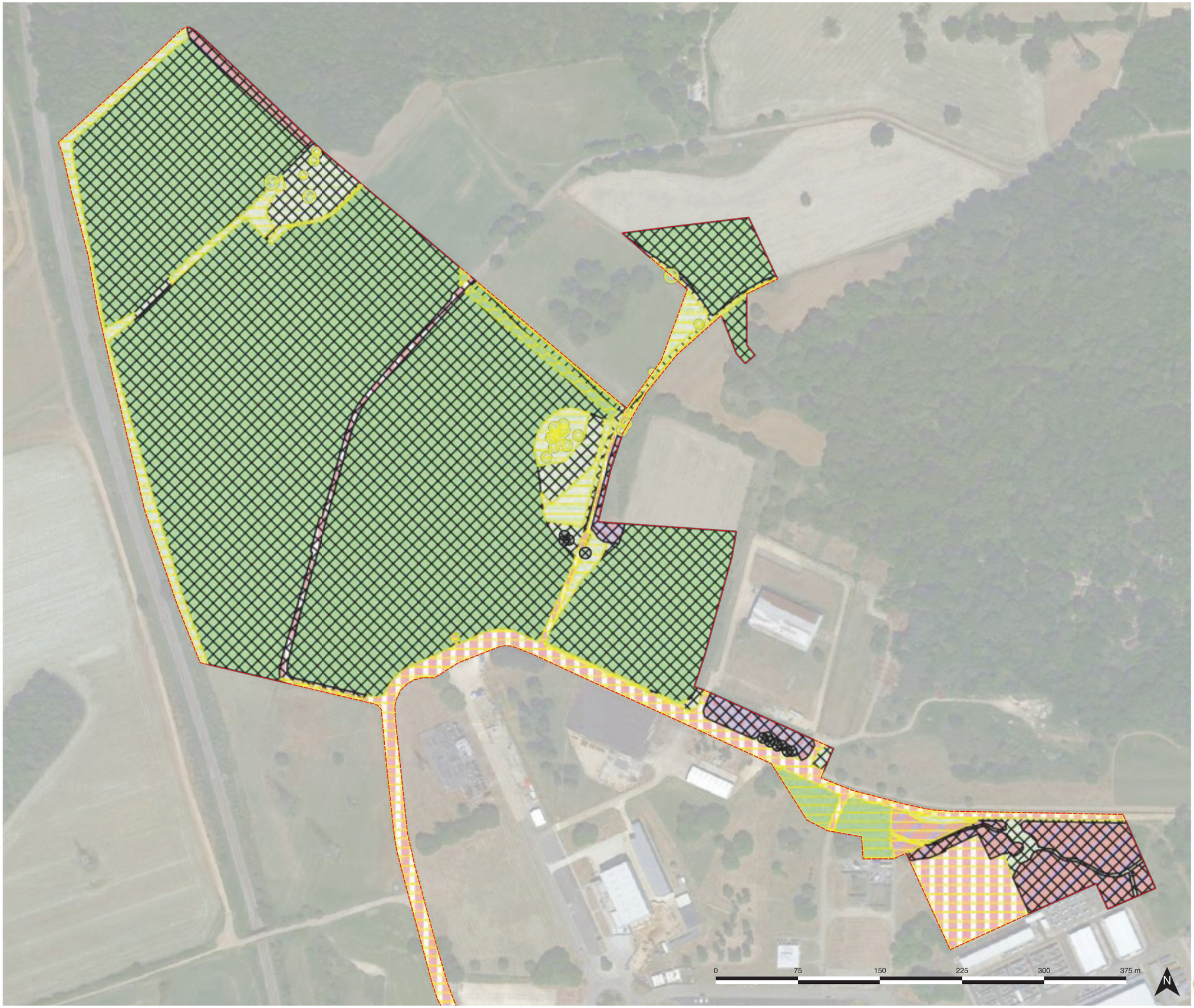

LEGEND

Site Boundary

- Site Boundary (26.91 ha)

Retained Habitats

- Bramble scrub (0.1486 ha)
- Buildings (0.0045 ha)
- Developed land; sealed surface (3.2679 ha)
- Modified grassland (0.5199 ha)
- Other neutral grassland (1.2742 ha)

Lost Habitats

- Blackthorn scrub (0.1357 ha)
- Bramble scrub (0.8769 ha)
- Developed land; sealed surface (0.2531 ha)
- Mixed scrub (0.281 ha)
- Modified grassland (19.0811 ha)
- Other neutral grassland (1.0694 ha)

Retained Trees

- Rural Tree, small (14 trees)
- Rural Tree, medium (6 trees)

Lost Trees

- Rural Tree, small (10 trees)
- Rural Tree, medium (1 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Impacts

Drawing No.: EBD_2513_DR002

Scale (@A3): 1:3,300

Central Eastings, Northings: 453133, 196452

Date Drawn: 05/04/2024

Drawn by: ASp

Approved by: BG

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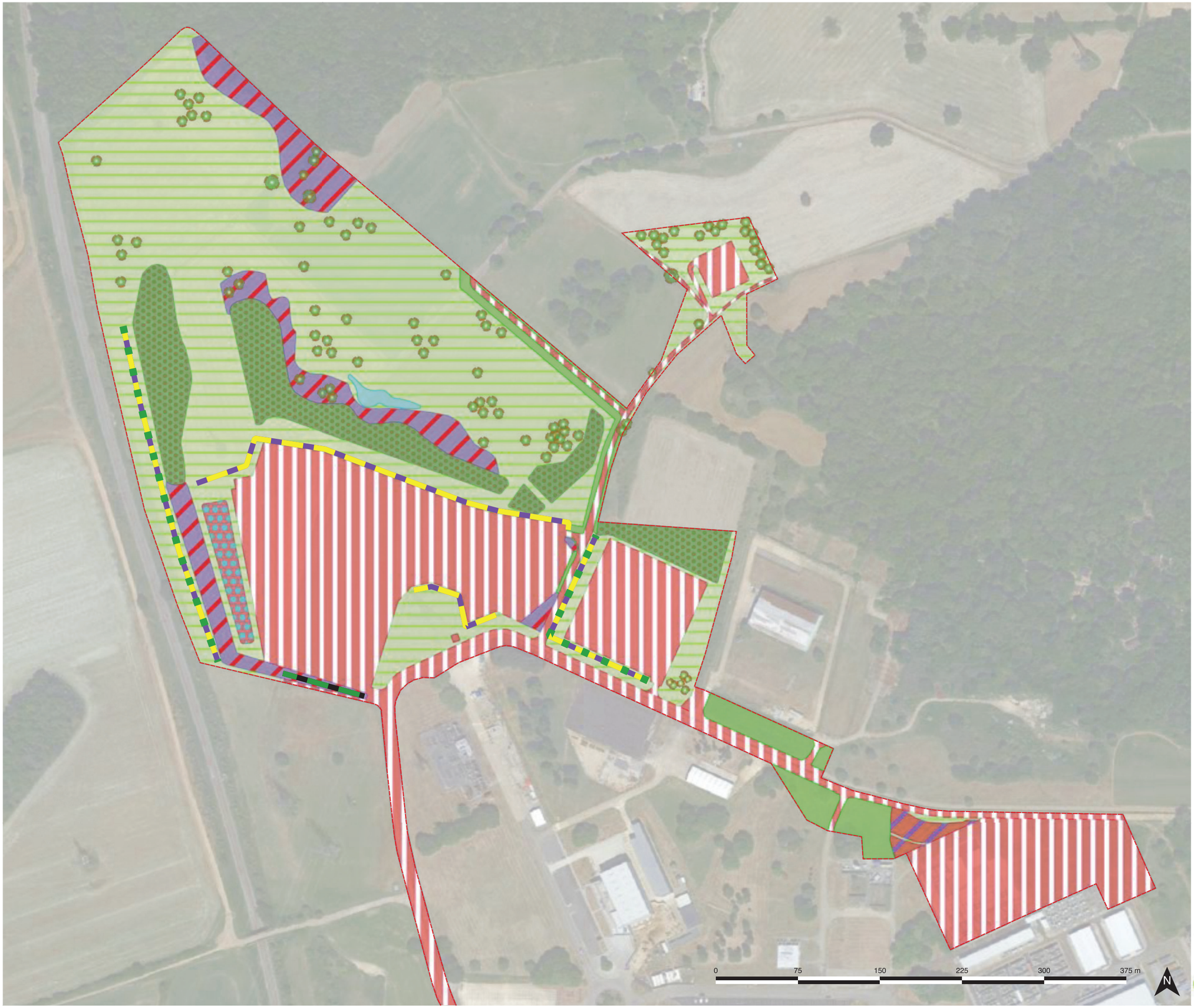

LEGEND

Site Boundary

- Site Boundary (26.91 ha)
- Bramble scrub (0.1486 ha)
- Developed land; sealed surface (9.7932 ha)
- Buildings (0.0045 ha)
- Mixed scrub (1.6165 ha)
- Modified grassland (0.8826 ha)
- Other neutral grassland (11.9869 ha)
- Other woodland; broadleaved (2.1781 ha)
- Ponds (Priority Habitat) (0.0668 ha)
- Sustainable urban drainage feature (0.2351 ha)
- Rural Tree, Small (85 trees)
- Rural Tree, Medium (6 trees)
- Native hedgerow (0.48 km)
- Native hedgerow with trees (0.52 km)
- Line of trees (0.08 km)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Proposals

Drawing No.:	*Scale (@A3):*
EBD_2513_DR003	1:3,300
Central Eastings, Northings:	*Date Drawn:*
453133, 196452	05/04/2024
Drawn by:	*Approved by:*
ASp	BG

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F1
F2
F3
F4
F5
F6
F7
0 50 100 150 200 250 m
N

LEGEND

Site boundary (25.37 ha)

Habitats

Bramble scrub (0.9931 ha)
Developed land; sealed surface (2.2073 ha)
Buildings (0.0045 ha)
Mixed scrub (0.2677 ha)
Modified grassland (19.559 ha)
Other neutral grassland (2.3414 ha)

Trees

M Rural tree, medium (19 trees)
S Rural tree, small (24 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Appeal Scheme Baseline

Drawing No.: EBD_2513_DR001

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 06/12/2024

Drawn by: JE

Approved by: BG

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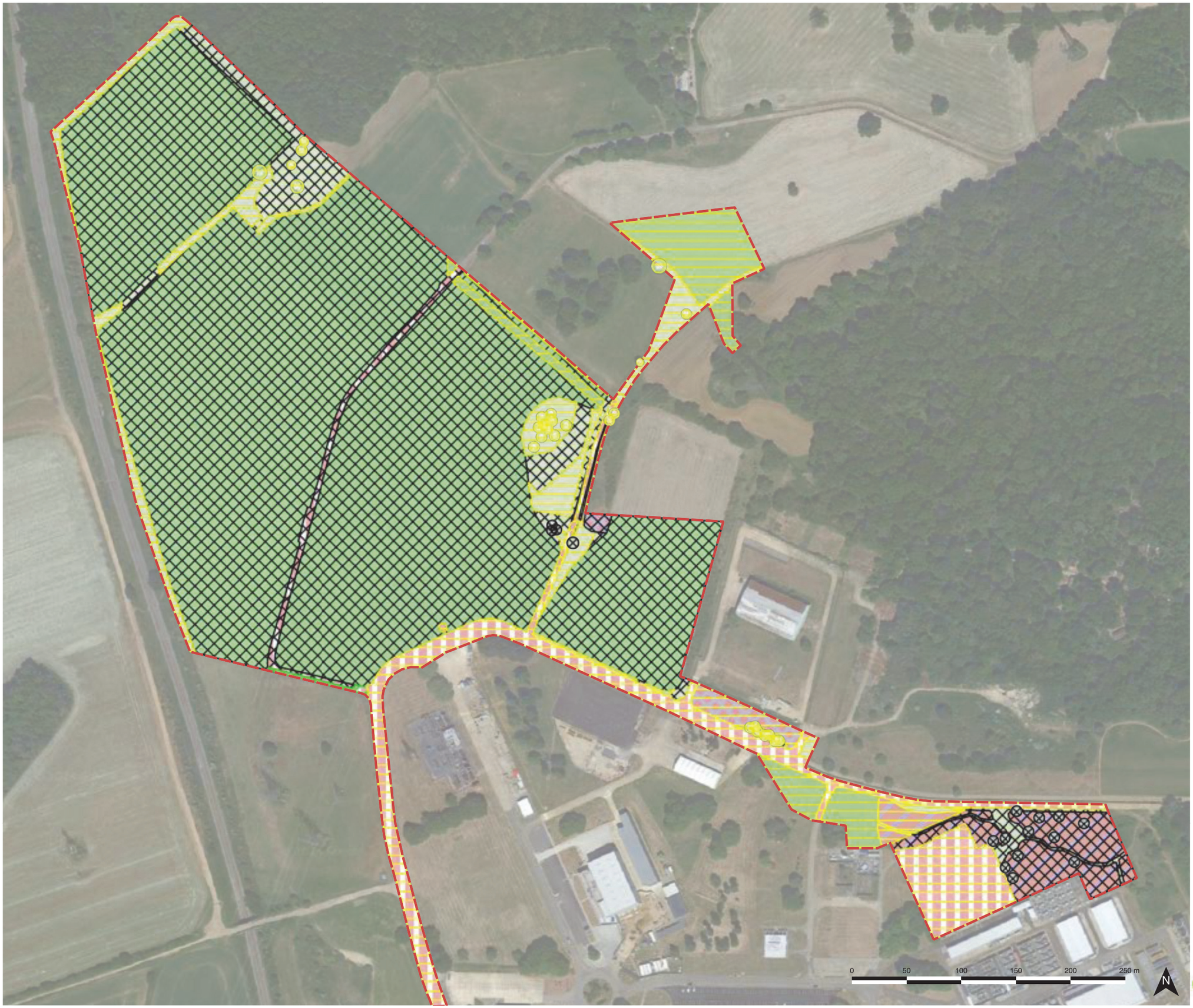

LEGEND

Site boundary (25.37 ha)

Habitats

Retained and enhanced

Developed land; sealed surface (0.0279 ha)

Retained

Bramble scrub (0.1476 ha)

Buildings (0.0045 ha)

Developed land; sealed surface (1.9264 ha)

Mixed scrub (0.2185 ha)

Modified grassland (1.243 ha)

Other neutral grassland (1.2526 ha)

Lost

Bramble scrub (0.8455 ha)

Developed land; sealed surface (0.253 ha)

Mixed scrub (0.0492 ha)

Modified grassland (18.316 ha)

Other neutral grassland (1.0888 ha)

Trees

Retained

Rural Tree, small (21 trees)

Rural Tree, medium (6 trees)

Lost

Rural Tree, small (3 trees)

Rural Tree, medium (13 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Impacts

Drawing No.: EBD_2513_DR002

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 06/12/2024

Drawn by: JE

Approved by: BG

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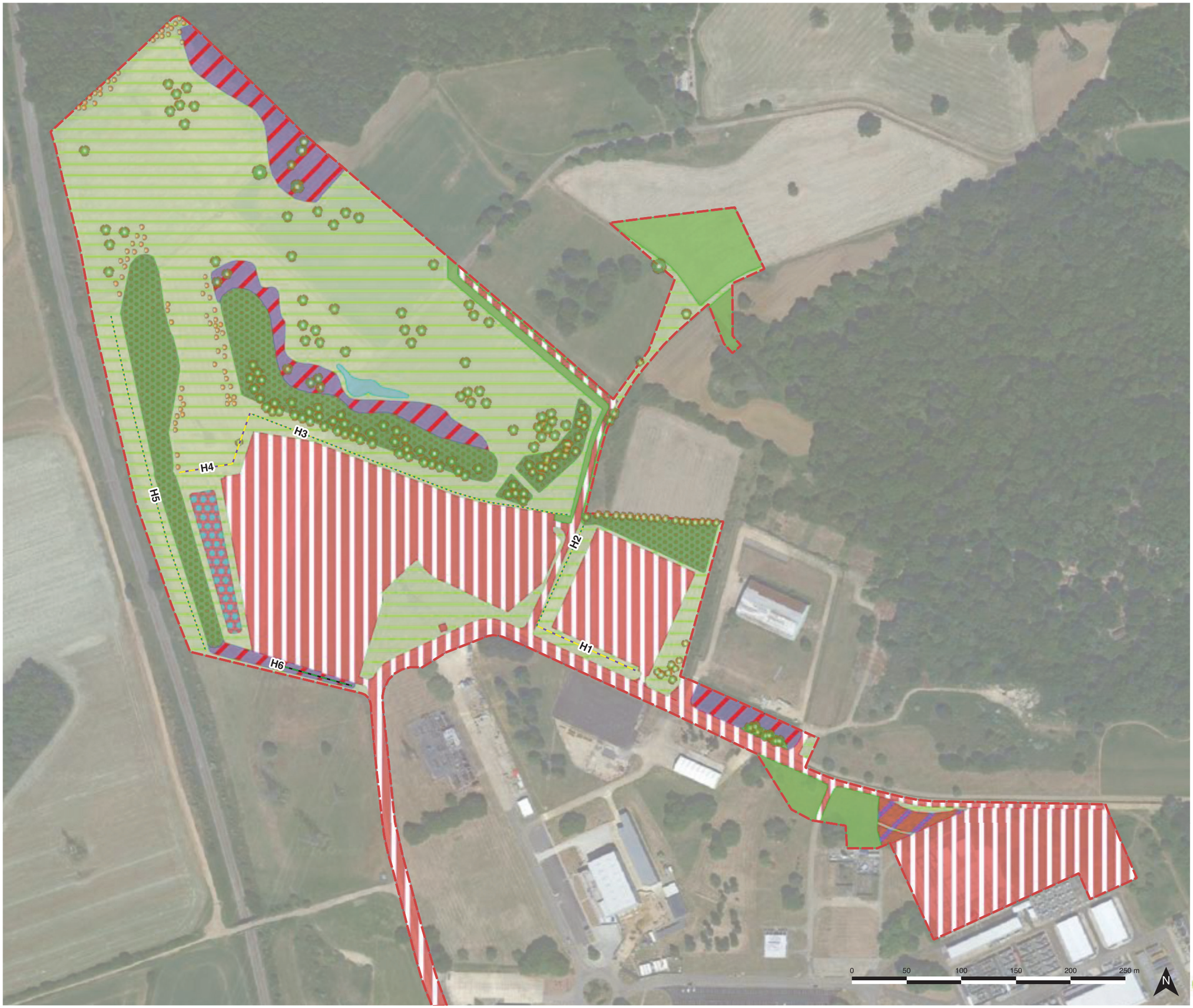

LEGEND

Site boundary (25.37 ha)

Habitats

- Bramble scrub (0.1476 ha)
- Developed land; sealed surface (8.0675 ha)
- Buildings (0.0045 ha)
- Mixed scrub (1.4467 ha)
- Modified grassland (1.3645 ha)
- Other neutral grassland (11.5368 ha)
- Other woodland; broadleaved (2.5043 ha)
- Ponds (Priority Habitat) (0.066 ha)
- Sustainable urban drainage feature (0.2351 ha)

Hedgerows

- Native hedgerow (0.2 km)
- Native hedgerow with trees (0.73 km)
- Line of trees (0.08 km)

Trees

- S Rural tree, small (241 trees)
- M Rural tree, medium (6 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Proposals

Drawing No.: EBD_2513_DR003

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 06/12/2024

Drawn by: JE

Approved by: BG

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Appendix 3 - Photographs

The following photographs were taken during the baseline survey in July 2022.

Photograph 1: Modified grassland

Photograph 2: Other neutral grassland

Photograph 3: Mixed scrub

Photograph 4: Developed Land, sealed surface

Photograph 5: Scattered trees within other neutral grassland at the east of the site

Photograph 6: Bramble scrub in the south-east

Appendix 4 - Baseline Condition Assessment Tables

See accompanying excel spreadsheet

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)			
UK Habitat Classification (UKHab) Habitat Type			
Grassland - Modified grassland			
On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Habitat Description

Baseline modified grassland

ukhab – UK Habitat Classification			

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m [2] present, including at least 2 forbs (these may include those listed in Footnote 1). **Note - this criterion is essential for achieving Moderate or Good condition.** Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m [2] (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	N	
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	N	
C	Any scrub present accounts for less than 20% of the total grassland area. (Some scattered scrub such as bramble *Rubus fruticosus* agg. may be present). Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Y	
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens) [2].	N	
F	Cover of bracken *Pteridium aquilinum* is less than 20%.	Y	
G	There is an absence of invasive non-native plant species [3] (as listed on Schedule 9 of WCA [4]).	Y	
		Essential criterion achieved (Yes or No)	No
		Number of criteria passed	4

Condition Assessment Result (out of 7 criteria)	Condition Assessment Score	Score Achieved ×/✓
Passes 6 or 7 criteria including passing essential criterion A	Good (3)	
Passes 4 or 5 criteria including passing essential criterion A	Moderate (2)	
Passes 3 or fewer criteria; OR Passes 4 - 6 criteria (excluding criterion A)	Poor (1)	Y

Suggested enhancement interventions to improve condition score

Footnotes

Footnote 1 – Creeping thistle *Cirsium arvense* , spear thistle *Cirsium vulgare*, curled dock *Rumex crispus* , broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, greater plantain *Plantago major*, white clover *Trifolium repens* and cow parsley *Anthriscus sylvestris* .

Footnote 2 – For example, this could include small, scattered areas of bare ground allowing establishment of new species, or localised patches where not exceeding 10% cover.

Footnote 3 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.

Footnote 4 – Wildlife and Countryside Act 1981 (as amended).

Condition Sheet: GRASSLAND Habitat Type (medium, high and very high distinctiveness)

UK Habitat Classification (UKHab) Habitat Types

Grassland - Lowland calcareous grassland
Grassland - Lowland dry acid grassland
Grassland - Lowland meadows
Grassland - Other lowland acid grassland
Grassland - Other neutral grassland
Grassland - Tall herb communities (H6430) [Not to be confused with the Tall forbs secondary code – see UKHab guidance for details.]
Grassland - Upland acid grassland
Grassland - Upland calcareous grassland
Grassland - Upland hay meadows
Sparsely vegetated land - Calaminarian grassland

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Habitat Description

Baseline Other neutral grassland - moderate

ukhab – UK Habitat Classification			

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description). [1] **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**	Y	
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	N	
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens [2].	N	
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	Y	
E	Combined cover of species indicative of suboptimal condition [3] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species [4] (as listed on Schedule 9 of WCA [5]) are present, this criterion is automatically failed.	Y	

Additional Criterion - must be assessed for all non-acid grassland types

F	There are 10 or more vascular plant species per m ^{2} present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). **Note - this criterion is essential for achieving Good condition for non-acid grassland types only.**	N	
	Essential criterion for Good condition achieved (for non-acid grassland) (Yes or No)	Yes	
	Number of criteria passed	3	

Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓
Acid grassland types (Result out of 5 criteria)		
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	
Non-acid grassland types (Result out of 6 criteria)		
Passes 5 or 6 criteria, including essential criterion A and additional criterion F.	Good (3)	
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)	Y
Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F.	Poor (1)	

Suggested enhancement interventions to improve condition score

Notes

Footnote 1 - Professional judgement should be used alongside the UKHab description.

Footnote 2 – For example, this could include small, scattered areas of bare ground allowing for plant colonisation, or localised patches not exceeding 5% cover.

Footnote 3 - Species indicative of suboptimal condition for this habitat type include: creeping thistle *Cirsium arvense* , spear thistle *Cirsium vulgare* , curled dock *Rumex crispus* , broad-leaved dock *Rumex obtusifolius* , common nettle *Urtica dioica* , creeping buttercup *Ranunculus repens* , greater plantain *Plantago major* , white clover *Trifolium repens* and cow parsley *Anthriscus sylvestris* . There may be additional relevant species local to the region and or site.

Footnote 4 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, by applying professional judgement.

Footnote 5 – Wildlife and Countryside Act 1981 (as amended).

Condition Sheet: GRASSLAND Habitat Type (medium, high and very high distinctiveness)

UK Habitat Classification (UKHab) Habitat Types

Grassland - Lowland calcareous grassland
Grassland - Lowland dry acid grassland
Grassland - Lowland meadows
Grassland - Other lowland acid grassland
Grassland - Other neutral grassland
Grassland - Tall herb communities (H6430) [Not to be confused with the Tall forbs secondary code – see UKHab guidance for details.]
Grassland - Upland acid grassland
Grassland - Upland calcareous grassland
Grassland - Upland hay meadows
Sparsely vegetated land - Calaminarian grassland

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Habitat Description

Baseline Other neutral grassland - poor

ukhab – UK Habitat Classification			

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description). [1] **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**	N	
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	N	
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens [2].	N	
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	Y	
E	Combined cover of species indicative of suboptimal condition [3] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species [4] (as listed on Schedule 9 of WCA [5]) are present, this criterion is automatically failed.	Y	

Additional Criterion - must be assessed for all non-acid grassland types

F	There are 10 or more vascular plant species per m^2 present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). **Note - this criterion is essential for achieving Good condition for non-acid grassland types only.**	N	
	Essential criterion for Good condition achieved (for non-acid grassland) (Yes or No)	Y	
	Number of criteria passed	2	

Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓
Acid grassland types (Result out of 5 criteria)		
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	
Non-acid grassland types (Result out of 6 criteria)		
Passes 5 or 6 criteria, including essential criterion A and additional criterion F.	Good (3)	
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)	
Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F.	Poor (1)	Y

Suggested enhancement interventions to improve condition score

Notes

Footnote 1 - Professional judgement should be used alongside the UKHab description.

Footnote 2 – For example, this could include small, scattered areas of bare ground allowing for plant colonisation, or localised patches not exceeding 5% cover.

Footnote 3 - Species indicative of suboptimal condition for this habitat type include: creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, greater plantain *Plantago major*, white clover *Trifolium repens* and cow parsley *Anthriscus sylvestris*. There may be additional relevant species local to the region and or site.

Footnote 4 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, by applying professional judgement.

Footnote 5 – Wildlife and Countryside Act 1981 (as amended).

Condition Sheet: SCRUB Habitat Type			
Habitat Types			
Heathland and shrub - Blackthorn scrub **Heathland and shrub - Gorse scrub** **Heathland and shrub - Hawthorn scrub** **Heathland and shrub - Hazel scrub** **Heathland and shrub - Mixed scrub** **Heathland and shrub - Dunes with sea buckthorn (H2160)** **Heathland and shrub - Willow scrub**			
Habitat Description			
Baseline - mixed scrub			
For Dunes with sea buckthorn see:	Dunes with sea-buckthorn (Dunes with Hippophae rhamnoides) - Special Areas of Conservation (jncc.gov.uk)		
For other scrub types see:	ukhab – UK Habitat Classification		
On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range). [1] - At least 80% of scrub is native, - There are at least three native woody species [2], - No single species comprises more than 75% of the cover (except hazel *Corylus avellana*, common juniper *Juniperus communis*, sea buckthorn *Hippophae rhamnoides* (only in its restricted native range), or box *Buxus sempervirens*, which can be up to 100% cover).	Y	
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran [3]) shrubs are all present.	N	
C	There is an absence of invasive non-native plant species [4] (as listed on Schedule 9 of WCA[5]) and species indicative of suboptimal condition [6] make up less than 5% of ground cover.	Y	
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.	N	
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.	N	
	Number of criteria passed	2	

Condition Assessment Result (out of 5 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	Y
Suggested enhancement interventions to improve condition score		

Condition Sheet: INDIVIDUAL TREES Habitat Type

Habitat Types

Individual trees – Urban trees

Individual trees – Rural trees

Complete a condition sheet for each tree or block of trees.

Please see the separate Line of trees condition sheet for a line of rural trees. You should only use the Line of trees condition assessment and record that habitat type in rural locations.

Habitat Description

Baseline individual trees - rural (non-native)

Individual trees (description applied to the urban or rural environment):

Young trees over 7.5 cm in diameter at breast height whose canopies are not touching.

Urban Perimeter / Linear Blocks and Groups (description applied to the urban environment only):

Groups or stands of trees (size requirement as defined above) within and around the perimeter of urban land. This includes those along urban streets, highways, railways and canals, and also former field boundary trees incorporated into developments. Canopies should predominantly overlap continuously. Groups of urban trees that don't match the descriptions for woodland may be assessed within this category.

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The tree is a native species (or at least 70% within the block are native species).	N	
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	N	
C	The tree is mature (or more than 50% within the block are mature) [1].	N	
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Y	
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	N	
F	More than 20% of the tree canopy area is oversailing vegetation beneath.	Y	
	Number of criteria passed	2	

Condition Assessment Result (out of 6 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 or 6 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	Y

Note that 'Fairly Good and Fairly Poor' condition categories are not available for this broad habitat type.

Suggested enhancement interventions to improve condition score [2]

Condition Sheet: INDIVIDUAL TREES Habitat Type

Habitat Types

Individual trees – Urban trees

Individual trees – Rural trees

Complete a condition sheet for each tree or block of trees.

Please see the separate Line of trees condition sheet for a line of rural trees. You should only use the Line of trees condition assessment and record that habitat type in rural locations.

Habitat Description

Baseline individual trees - rural (native)

Individual trees (description applied to the urban or rural environment):

Young trees over 7.5 cm in diameter at breast height whose canopies are not touching.

Urban Perimeter / Linear Blocks and Groups (description applied to the urban environment only):

Groups or stands of trees (size requirement as defined above) within and around the perimeter of urban land. This includes those along urban streets, highways, railways and canals, and also former field boundary trees incorporated into developments. Canopies should predominantly overlap continuously. Groups of urban trees that don't match the descriptions for woodland may be assessed within this category.

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The tree is a native species (or at least 70% within the block are native species).	Y	
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	N	
C	The tree is mature (or more than 50% within the block are mature) [1].	N	
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Y	
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	N	
F	More than 20% of the tree canopy area is oversailing vegetation beneath.	Y	
	Number of criteria passed	3	

Condition Assessment Result (out of 6 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 or 6 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	Y
Passes 2 or fewer criteria	Poor (1)	
Note that 'Fairly Good and Fairly Poor' condition categories are not available for this broad habitat type.		

Suggested enhancement interventions to improve condition score [2]

Appendix 5 - Proposed Condition Assessment Tables

See accompanying excel spreadsheet

Condition Sheet: GRASSLAND Habitat Type (medium, high and very high distinctiveness)

UK Habitat Classification (UKHab) Habitat Types

Grassland - Lowland calcareous grassland
Grassland - Lowland dry acid grassland
Grassland - Lowland meadows
Grassland - Other lowland acid grassland
Grassland - Other neutral grassland
Grassland - Tall herb communities (H6430) [Not to be confused with the Tall forbs secondary code – see UKHab guidance for details.]
Grassland - Upland acid grassland
Grassland - Upland calcareous grassland
Grassland - Upland hay meadows
Sparsely vegetated land - Calaminarian grassland

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Habitat Description

Proposed other neutral grassland

ukhab – UK Habitat Classification			

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description). [1] **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**	Y	
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	N	
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens [2].	N	
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	Y	
E	Combined cover of species indicative of suboptimal condition [3] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species [4] (as listed on Schedule 9 of WCA [5]) are present, this criterion is automatically failed.	Y	

Additional Criterion - must be assessed for all non-acid grassland types

F	There are 10 or more vascular plant species per m^2 present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). **Note - this criterion is essential for achieving Good condition for non-acid grassland types only.**	N	
Essential criterion for Good condition achieved (for non-acid grassland) (Yes or No)		Y	
Number of criteria passed		3	

Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓
Acid grassland types (Result out of 5 criteria)		
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	
Non-acid grassland types (Result out of 6 criteria)		
Passes 5 or 6 criteria, including essential criterion A and additional criterion F.	Good (3)	
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)	Y
Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F.	Poor (1)	

Suggested enhancement interventions to improve condition score

Notes

Footnote 1 - Professional judgement should be used alongside the UKHab description.

Footnote 2 – For example, this could include small, scattered areas of bare ground allowing for plant colonisation, or localised patches not exceeding 5% cover.

Footnote 3 - Species indicative of suboptimal condition for this habitat type include: creeping thistle *Cirsium arvense* , spear thistle *Cirsium vulgare* , curled dock *Rumex crispus* , broad-leaved dock *Rumex obtusifolius* , common nettle *Urtica dioica* , creeping buttercup *Ranunculus repens* , greater plantain *Plantago major* , white clover *Trifolium repens* and cow parsley *Anthriscus sylvestris* . There may be additional relevant species local to the region and or site.

Footnote 4 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, by applying professional judgement.

Footnote 5 – Wildlife and Countryside Act 1981 (as amended).

Condition sheet: HEDGEROW Habitat Types

Habitat Type

Native hedgerow
Native hedgerow - associated with bank or ditch
Native hedgerow with trees
Native hedgerow with trees - associated with bank or ditch
Species-rich native hedgerow
Species-rich native hedgerow - associated with bank or ditch
Species-rich native hedgerow with trees
Species-rich native hedgerow with trees - associated with bank or ditch

Habitat Description

Proposed Native hedgerow (H1 + H4)

ukhab – UK Habitat Classification

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Condition Assessment Details

A series of ten attributes, representing key physical characteristics are used for this assessment. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.

This assessment is based on the Hedgerow Survey Handbook [1] and Favourable Conservation Status document [2]. For further clarification please refer to the Hedgerow Survey Handbook.

Best practice would be to record the species, age, spacing and other key information about all trees present along a hedgerow within the 'Habitat Description' box, as well as other key features of the hedgerow.

Hedgerow favourable condition attributes

Attributes and functional groupings (A, B, C, D and E)		Criteria - the minimum requirements for 'favourable condition'	Criteria description	Criterion passed (Yes or No)	Notes (such as justification)
Core groups - applicable to all hedgerow types					
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is >1.5 m height).	Y	
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (such as blackthorn *Prunus spinosa* suckers) are only included in the width estimate when they are >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).	Y	
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical 'gappiness' of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	N	
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	This is the horizontal 'gappiness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gappiness' but are not subject to the >5 m criterion (as this is the typical size of a gate).	Y	
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	Y	

C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles *Urtica* spp., cleavers *Galium aparine* and docks *Rumex* spp. Their presence, either singly or together, does not exceed the 20% cover threshold.	Y	
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA [3]) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website [4], as well as the BSBI website[5] where the 'Online Atlas of the British and Irish Flora' [6] contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website [7].	Y	
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (for example, excessive hedgerow cutting).	Y	
Additional group - applicable to hedgerows with trees only					
E1.	Tree class	There is more than one age-class (or morphology) of tree present (for example: young, mature, veteran and or ancient [8]), and there is on average at least one mature, ancient or veteran tree present per 20 - 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.		
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.		

The hedgerow condition assessment generates a weighting (score) ranging from 1 - 3, which is used within the Statutory Biodiversity Metric. The scores for each are set out in the tables below.

Condition categories for hedgerows without trees		
Category	**Category Requirements**	**Metric Score**
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 4 failures in total; **AND** Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and C2 = Moderate condition).	2
Poor	Fails a total of more than 4 attributes; **OR** Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	Good

Condition categories for hedgerows with trees		
Category	**Category Requirements**	**Metric score**
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 5 failures in total; **AND** Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1, C2 and E1 = Moderate condition).	2
Poor	Fails a total of more than 5 attributes; **OR** Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	

Suggested enhancement interventions to improve condition score

Condition sheet: HEDGEROW Habitat Types

Habitat Type

Native hedgerow
Native hedgerow - associated with bank or ditch
Native hedgerow with trees
Native hedgerow with trees - associated with bank or ditch
Species-rich native hedgerow
Species-rich native hedgerow - associated with bank or ditch
Species-rich native hedgerow with trees
Species-rich native hedgerow with trees - associated with bank or ditch

Habitat Description

Proposed Native hedgerow with trees (H2, H3 + H4)

ukhab – UK Habitat Classification

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Condition Assessment Details

A series of ten attributes, representing key physical characteristics are used for this assessment. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.

This assessment is based on the Hedgerow Survey Handbook [1] and Favourable Conservation Status document [2]. For further clarification please refer to the Hedgerow Survey Handbook.

Best practice would be to record the species, age, spacing and other key information about all trees present along a hedgerow within the 'Habitat Description' box, as well as other key features of the hedgerow.

Hedgerow favourable condition attributes

Attributes and functional groupings (A, B, C, D and E)		Criteria - the minimum requirements for 'favourable condition'	Criteria description	Criterion passed (Yes or No)	Notes (such as justification)
Core groups - applicable to all hedgerow types					
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is >1.5 m height).	Y	
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (such as blackthorn *Prunus spinosa* suckers) are only included in the width estimate when they are >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).	Y	
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical 'gappiness' of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	N	
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	This is the horizontal 'gappiness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gappiness' but are not subject to the >5 m criterion (as this is the typical size of a gate).	Y	
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	Y	

C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles *Urtica* spp., cleavers *Galium aparine* and docks *Rumex* spp. Their presence, either singly or together, does not exceed the 20% cover threshold.	Y	
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA [3]) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website [4], as well as the BSBI website[5] where the 'Online Atlas of the British and Irish Flora' [6] contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website [7].	Y	
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (for example, excessive hedgerow cutting).	Y	
Additional group - applicable to hedgerows with trees only					
E1.	Tree class	There is more than one age-class (or morphology) of tree present (for example: young, mature, veteran and or ancient [8]), and there is on average at least one mature, ancient or veteran tree present per 20 - 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.	N	
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	Y	

The hedgerow condition assessment generates a weighting (score) ranging from 1 - 3, which is used within the Statutory Biodiversity Metric. The scores for each are set out in the tables below.

Condition categories for hedgerows without trees		
Category	**Category Requirements**	**Metric Score**
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 4 failures in total; **AND** Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and C2 = Moderate condition).	2
Poor	Fails a total of more than 4 attributes; **OR** Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	Good

Condition categories for hedgerows with trees		
Category	**Category Requirements**	**Metric score**
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 5 failures in total; **AND** Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1, C2 and E1 = Moderate condition).	2
Poor	Fails a total of more than 5 attributes; **OR** Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	

Suggested enhancement interventions to improve condition score

Condition Sheet: LINE OF TREES Habitat Type

Habitat Types

Line of trees
Line of trees – associated with bank or ditch
Ecologically valuable line of trees
Ecologically valuable line of trees – associated with bank or ditch

Please see the separate Individual trees condition sheet for linear blocks and groups of trees in an urban setting. You should only use this Line of trees condition assessment and record this habitat type in rural locations.

Habitat Description

Proposed Line of trees (H6)

See the Statutory Biodiversity Metric User Guide.
This assessment is based on the Hedgerow Survey Handbook [1]. For further clarifications please refer to the Handbook.
Where ancient and veteran trees are present within the line of trees, see Footnote 2 for standing advice.

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	At least 70% of trees are native species.	Y	
B	Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.	Y	
C	One or more trees has veteran features and or natural ecological niches for vertebrates and invertebrates, such as presence of standing and attached deadwood, cavities, ivy or loose bark.	N	
D	There is an undisturbed naturally-vegetated strip of at least 6 m on both sides to protect the line of trees from farming and other human activities (excluding grazing). Where veteran trees are present, root protection areas should follow standing advice [2].	N	
E	At least 95% of the trees are in a healthy condition (deadwood or veteran features valuable for wildlife are excluded from this). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	Y	
		Number of criteria passed	3

Condition Assessment Result (out of 5 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	Y
Passes 2 or fewer criteria	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnotes

Condition Sheet: POND Habitat Type			
Habitat Type			
Lakes - Ponds (priority habitat) **Lakes - Ponds (non-priority habitat)** **Lakes - Temporary lakes ponds and pools (H3170)** [Use this condition sheet for Temporary ponds and pools, use Lake condition sheet for Temporary lakes] **Lakes - Ornamental lake or pond** [Use this condition sheet for Ornamental ponds, use Lake condition sheet for Ornamental lakes]			
Habitat Description			
Proposed pond (priority habitat)			
ukhab – UK Habitat Classification			
On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - applicable to all ponds (woodland [1] and non-woodland):			
A	The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.	Y	
B	There is semi-natural habitat (moderate distinctiveness or above) completely surrounding the pond, for at least 10 m from the pond edge for its entire perimeter.	Y	
C	Less than 10% of the water surface is covered with duckweed *Lemna* spp. or filamentous algae.	N	
D	The pond is not artificially connected to other waterbodies, such as agricultural ditches or artificial pipework.	Y	
E	Pond water levels can fluctuate naturally throughout the year. No obvious artificial dams[2], pumps or pipework.	Y	
F	There is an absence of listed non-native plant and animal species [3].	Y	
G	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.	Y	
Additional Criteria - must be assessed for all non-woodland ponds:			
H	Emergent, submerged or floating plants (excluding duckweed) [4] cover at least 50% of the pond area which is less than 3 m deep.	N	

I	The pond surface is no more than 50% shaded by adjacent trees and scrub.	N	
	Number of criteria passed	6	

Condition Assessment Result	**Condition Assessment Score**	**Score Achieved ×/✓**
Results for woodland ponds which require assessment of 7 core criteria		
Passes 7 criteria	Good (3)	
Passes 5 or 6 criteria	Moderate (2)	
Passes 4 or fewer criteria	Poor (1)	
Results for non-woodland ponds which require assessment of 9 criteria		
Passes 9 criteria	Good (3)	
Passes 6 to 8 criteria	Moderate (2)	Y
Passes 5 or fewer criteria	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnote 1 - A woodland pond will be surrounded on all sides by woodland habitat.

Footnote 2 – This excludes natural dams such as those created by Eurasian beaver *Castor fiber*.

Footnote 3 - Any species included on the Water Framework Directive (WFD) UKTAG GB High Impact Species List should be absent: WFD UKTAG (2021) *Classification of aquatic alien species according to their level of impact*[online]. Available from:

Condition Sheet: SCRUB Habitat Type			
Habitat Types			
Heathland and shrub - Blackthorn scrub **Heathland and shrub - Gorse scrub** **Heathland and shrub - Hawthorn scrub** **Heathland and shrub - Hazel scrub** **Heathland and shrub - Mixed scrub** **Heathland and shrub - Dunes with sea buckthorn (H2160)** **Heathland and shrub - Willow scrub**			
Habitat Description			
Proposed - mixed scrub			
For Dunes with sea buckthorn see:	Dunes with sea-buckthorn (Dunes with Hippophae rhamnoides) - Special Areas of Conservation (jncc.gov.uk)		
For other scrub types see:	ukhab – UK Habitat Classification		
On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range). [1] - At least 80% of scrub is native, - There are at least three native woody species [2], - No single species comprises more than 75% of the cover (except hazel *Corylus avellana*, common juniper *Juniperus communis*, sea buckthorn *Hippophae rhamnoides* (only in its restricted native range), or box *Buxus sempervirens*, which can be up to 100% cover).	Y	
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran [3]) shrubs are all present.	Y	
C	There is an absence of invasive non-native plant species [4] (as listed on Schedule 9 of WCA[5]) and species indicative of suboptimal condition [6] make up less than 5% of ground cover.	Y	
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.	Y	
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.	N	
	Number of criteria passed	4	

Condition Assessment Result (out of 5 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	Y
Passes 2 or fewer criteria	Poor (1)	

Suggested enhancement interventions to improve condition score

Condition Sheet: INDIVIDUAL TREES Habitat Type

Habitat Types

Individual trees – Urban trees

Individual trees – Rural trees

Complete a condition sheet for each tree or block of trees.

Please see the separate Line of trees condition sheet for a line of rural trees. You should only use the Line of trees condition assessment and record that habitat type in rural locations.

Habitat Description

Proposed individual trees - rural

Individual trees (description applied to the urban or rural environment):

Young trees over 7.5 cm in diameter at breast height whose canopies are not touching.

Urban Perimeter / Linear Blocks and Groups (description applied to the urban environment only):

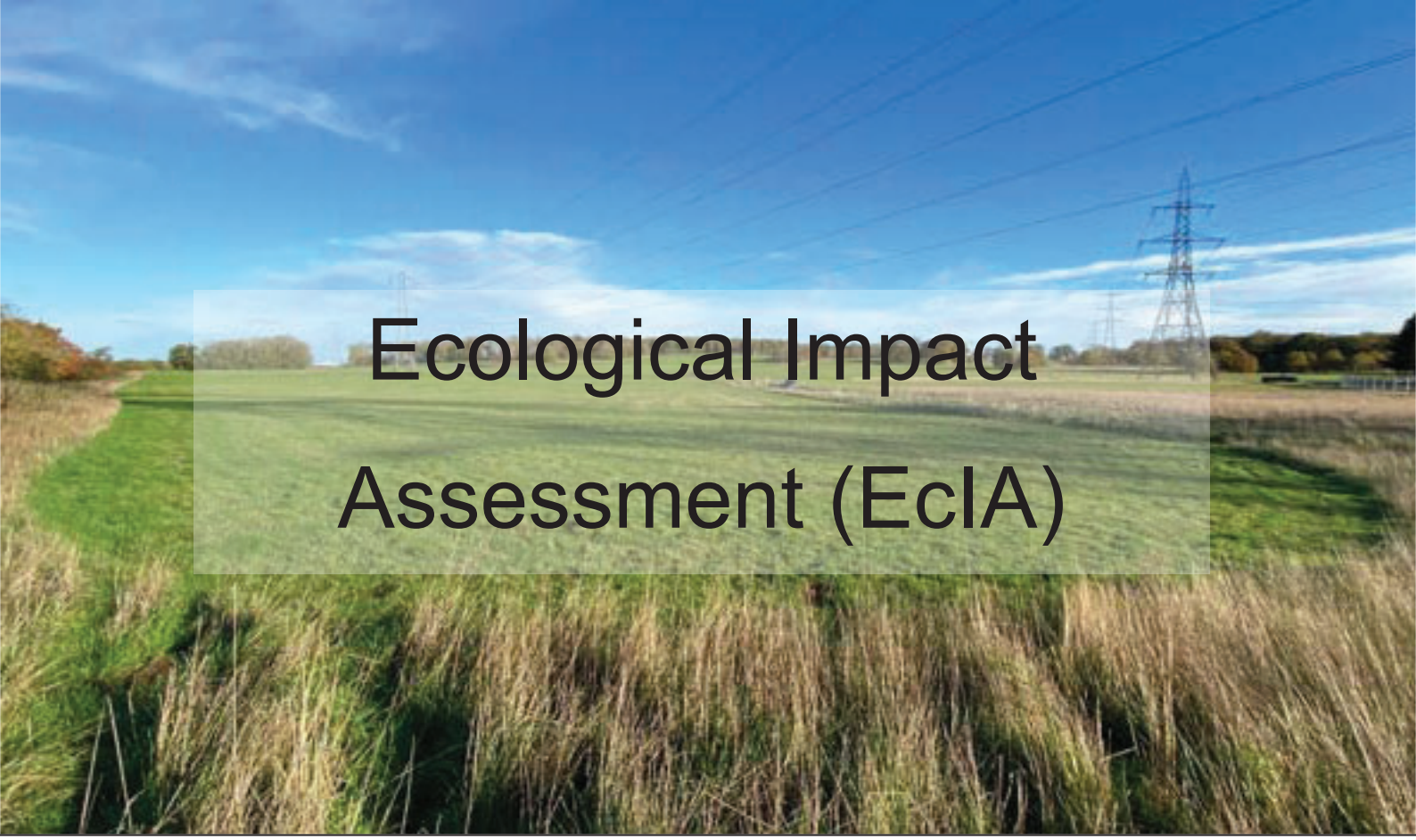
Groups or stands of trees (size requirement as defined above) within and around the perimeter of urban land. This includes those along urban streets, highways, railways and canals, and also former field boundary trees incorporated into developments. Canopies should predominantly overlap continuously. Groups of urban trees that don't match the descriptions for woodland may be assessed within this category.

On-site or off-site, site name and location	Culham Battery Storage	**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The tree is a native species (or at least 70% within the block are native species).	Y	
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	N	
C	The tree is mature (or more than 50% within the block are mature) [1].	N	
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Y	
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	N	
F	More than 20% of the tree canopy area is oversailing vegetation beneath.	Y	
	Number of criteria passed	3	

Condition Assessment Result (out of 6 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 or 6 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	Y
Passes 2 or fewer criteria	Poor (1)	
Note that 'Fairly Good and Fairly Poor' condition categories are not available for this broad habitat type.		

Suggested enhancement interventions to improve condition score [2]



Ecological Impact Assessment (EcIA)

Culham Battery Storage

On behalf of Statera Energy

December 2024 (Version 7)

Ecology by Design Ltd,

Hampden House, Monument Park, Chalgrove, Oxon OX44 7RW.

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Registered in England and Wales No. 9318075.

Project Code	Title	Date of Issue
EBD02513	Culham Battery Storage Ecological Impact Assessment (EcIA)	17 December 2024

	Name	Date
Prepared by	Laura Grant BSc (Hons), MCIEEM	21 November 2022
Checked by	Ben Gardner BSc (Hons), MCIEEM, CEnv	22 November 2022
v5 Updated by	Anna Spence BSc (Hons), MSc, MCIEEM	20 February 2024
v6 Updated by	Anna Spence BSc (Hons), MSc, MCIEEM	11 April 2024
v7 Updated by	Laura Grant BSc (Hons), MCIEEM	17 December 2024

Contents

1 Executive Summary

Report purpose	This report identifies the potential ecological impacts, mitigation, compensation and enhancement measures for development of a battery energy storage system (BESS) connected directly to the National Grid, with the BESS compound area, National Grid cable sealing end compound, substation upgrading works and associated infrastructure works including access, drainage and landscaping.
Date and methods of survey	Surveys of the site were conducted throughout July-November 2022, January 2024 and November 2024 including (i) an extended habitat survey, (ii) daytime tree assessments for bats and (iii) monitoring of potential badger setts.
Key findings	The Application scheme and Appeal scheme have marginal differences in red line boundaries, being 26.91ha and 25.37ha respectively. The site, situated north of Culham Science Centre includes portions of five fields containing modified grassland, two areas and margins of other neutral grassland, hardstanding, scattered trees and scattered scrub. There are no ponds within the site or 500m of the site (aside from north of the River Thames which is 130m north of the site). Protected and priority species present or potentially present include: • Badger setts within the site and local landscape; • Brown hare within the grassland habitats; • Potential for common species of reptiles on the site boundaries and within the other neutral grassland habitat; • Potential for foraging and commuting bats on the site boundaries (there are no opportunities for roosting within the site); • Opportunities for nesting birds within the scattered trees and scrub; and • Negligible opportunities for other protected or priority species.
Potential impacts	Habitats within the site are of negligible intrinsic ecological interest due to being common and widespread, however, they are of biodiversity value, having a baseline value of 65.29 habitat units within the Application scheme and 66.11 habitat units within the Appeal scheme. In the absence of mitigation, habitat loss to accommodate the proposals would result in a loss of biodiversity habitat units and potentially reduce suitability of the site for badger, brown hare and reptiles. One single hole outlier sett will be lost as a result of the proposals.
Measures to avoid and/or reduce impacts and deliver biodiversity enhancements	• A badger licence will be required to progress with closure of the badger sett (S13) in the centre of the site; • The Statutory Metric has been used to identify the baseline habitat value and inform the design schemes to deliver a gain of 43.82 habitat units i.e. 67.11% increase and 5.10 hedgerow units for the Application scheme and 41.05 habitat units i.e. 62.10% increase and 5.21 hedgerow units for the Appeal scheme; • Tree and scrub clearance will be conducted sensitively to protect nesting birds; • Habitats of value to wildlife potentially present within the local landscape will be created including woodland, scrub, species-rich grassland and ponds. These habitats will represent enhancements for badger, nesting birds, reptiles and brown hare; and • Two log piles will be installed in the north of the site for reptiles and invertebrates and features for nesting birds and roosting bats will be installed on mature scattered trees.

2 Introduction

2.1 Background and Site Description

2.1.1 Ecology by Design Ltd was commissioned by Statera Energy to undertake a Preliminary Ecological Appraisal (PEA) of a potential battery storage facility north of Culham Science Centre Thames Lane, Culham, OX14 3ES at approximate central grid reference SU 52879 96551.

2.1.2 The site is c.26ha in extent and comprises portions of five fields used for non-cereal crops (permanent modified grasslands harvested for hay and silage) and two areas of other neutral grassland, mixed scrub and hard standing. The fields had been mown when the survey was conducted in July 2022, with small strips on the field margins remaining unmown. There are occasional scattered trees and scrub within the site.

2.1.3 In the wider landscape, there is mixed woodland immediately north of the site, the River Thames runs from east to west 130m north of the site, there are additional non-cereal fields to the north and south-west and Culham Science Centre to the south-east.

2.2 Proposed Works

2.2.1 The proposals are for the development of a battery energy storage system (BESS) connected directly to the National Grid, with BESS compound area, National Grid cable sealing end compound, substation upgrade works and associated infrastructure works including access, drainage and landscaping.

2.3 Aims of Report

2.3.1 This report is an Ecological Impact Assessment which presents the approach and findings of the assessment of the potential ecological impacts of the proposed development works in accordance with industry standard guidance (CIEEM, 2019; BSI Standards Limited, 2013). It has been produced following a Preliminary Ecological Appraisal, Daytime Bat Walkover and further surveys for badger in order to be confident in the potential impacts of the proposals and how these could be mitigated. The development does not require an Environmental Impact Assessment (EIA), therefore 'EcIA' has been included on the title page.

2.3.2 This report will be submitted to South Oxfordshire District Council to inform the planning Application and/or Appeal.

2.4 Personnel

2.4.1 The site survey was conducted, and report was prepared by Associate Director Laura Grant BSc (Hons) MCIEEM. Laura has been an ecological consultant for 16 years and routinely conducts assessments for sites of this scale.

2.4.2 Review of the report was conducted by Senior Ecologist Anna Spence BSc (Hons), MSc, MCIEEM who has seven years' experience and Director Ben Gardner who has 18 year's experience in ecological consultancy.

3 Methods

3.1 Desk Study

3.1.1 A desk study was carried out to identify:

- internationally protected sites within the potential zone of influence of the site (7km)
- nationally protected sites within 5km of the site
- non-statutory designated sites and records of protected or priority species within 2km of the site

3.1.2 A 2km search radius for species and non-statutory designated sites is justified as an industry standard due to the small-scale category of development proposed at the site. It is thought highly unlikely that species or non-statutory sites outside of the search zone would be negatively impacted by the scale and type of development proposed at the site. A larger search radius is applied for internationally and nationally designated sites as these sites are protected to a higher level and can often be more sensitive to impacts. These search distances are also based on industry standard guidance and exceed the minimum distances recommended for international designated sites.

3.1.3 Sources consulted include:

- Thames Valley Environmental Records Centre (TVERC) (Received: 11 July 2022);
- MAGIC (www.magic.gov.uk) (last accessed 18 November 2024);
- publicly accessible data from Natural England; and
- local planning policy documents.

3.2 Preliminary Ecological Appraisal

3.2.1 A Preliminary Ecological Appraisal (PEA) was conducted on 12 July 2022 by Ecology by Design Associate Ecologist Laura Grant BSc MCIEEM using standard techniques and methodologies (CIEEM, 2017) and the nomenclature of Stace (2019). Weather conditions during the survey were warm (23°C), breezy (wind 2 on the Beaufort scale[1]) and overcast (cloud 8/8[2]).

3.2.2 There was a small extension to the red line boundary proposed in the south of the site, encompassing an area of other neutral grassland, therefore this area was subject to survey by

[1] The Beaufort scale is an empirical measure from 0-12 which relates wind speed to observed conditions. 0- Calm, 1- Light air, 2- Light breeze, 3- Gentle breeze, 4- Moderate breeze, 5- Fresh breeze etc.
[2] Cloud cover is measured using the system called oktas. The visible sky is divided into eight and cloud presence is determined within each section. A value of one to eight is then assigned (1 okta being cloudless to 8 oktas being total cloud cover).

Laura on 16 November 2022. Weather conditions during the further survey were cool (10°C), calm (wind 1 on the Beaufort scale[3]) and bright (cloud 3/8[4]). An update site walkover and survey of an additional parcel of land to the north of the site was conducted by Anna on 11 January 2024. Weather conditions during this survey were cold (3°C), breezy (wind 3 on the Beaufort scale) and partially cloudy (cloud 5/8). An update site walkover was conducted on 27 November 2024 by Assistant Ecologist Nick Boyd.

3.2.3 The PEA includes a survey of the habitats utilising the UK Habitat Classification System (UKHab Ltd., 2023). The DAFOR scale was used to provide a quick estimate of the relative abundance of plant species in a given area, where Dominant equates to >75% cover, Abundant is 51-75%, Frequent is 26-50%, Occasional is 11-25% and Rare is 1-10%. Species counts within a specific area were made where required to assess habitat condition. Photographs of the site are given in Appendix 1 and a UKHab habitat map is included in Appendix 2.

3.2.4 Opportunities for or evidence of protected and priority species were also identified. Where potential impacts on features of ecological interest are identified, the PEA is extended to include an assessment of impact. Any further surveys required are outlined and recommendations are made for appropriate avoidance, mitigation, compensation and enhancement measures.

3.3 Ecological Impact Assessment (EcIA)

3.3.1 Wherever potential impacts as a result of the proposals were identified, an Ecological Impact Assessment (EcIA) was undertaken. The function of the EcIA was to identify, quantify and evaluate the potential effects of the proposed development on designated sites, notable/protected habitats and species. The EcIA was informed by the desk study, PEA, Daytime Bat Walkover, ground level tree assessment, badger survey and Biodiversity Net Gain Assessment detailed in Sections 3.4-3.7 undertaken with reference to best practice guidelines (CIEEM, 2019) whereby:

- the scope of the EcIA was informed by a desk study and initial site survey;
- importance of ecological features within the site was established and ecological importance identified with reference to known criteria and geographic context where appropriate and available;

[3] The Beaufort scale is an empirical measure from 0-12 which relates wind speed to observed conditions. 0- Calm, 1- Light air, 2- Light breeze, 3- Gentle breeze, 4- Moderate breeze, 5- Fresh breeze etc.
[4] Cloud cover is measured using the system called oktas. The visible sky is divided into eight and cloud presence is determined within each section. A value of one to eight is then assigned (1 okta being cloudless to 8 oktas being total cloud cover).

- assessment of potential impacts of the proposed development was made with reference to their significance and geographic context; and
- avoidance, mitigation, compensation and enhancement measures were identified and recommended as appropriate.

3.4 Daytime Bat Walkover

3.4.1 A Daytime Bat Walkover (DBW) survey was conducted by Senior Ecologist Anna Spence (Natural England Level 1 Class Licence 2020-50071-CLS-CLS) during the update walkover survey in January 2024.

3.4.2 During the DBW any habitats suitable for roosting, foraging or commuting bats within or adjacent to the site were noted. This includes recoding structures, habitat features and trees which could be suitable for bats.

Table 3.1: *Categorisation of Potential Suitability of Sites for Bats (Collins, 2023)*

Suitability	Description of Potential Flightpaths and Foraging Habitats
None	No suitable features for flightpaths and foraging.
Negligible	No obvious flightpath or foraging features but cannot be discounted.
Low	Habitats with limited connectivity suitable for use by low numbers of bats.
Moderate	High habitat connectivity including flightpath or foraging habitats features.
High	Well-connected habitats high quality habitats for foraging which is likely to be in regular use.

3.5 Ground Level Tree Assessment

3.5.1 A ground level tree assessment was conducted by Laura Grant (Natural England Licence 2015-10871-CLS-CLS) whilst conducting the habitat surveys. Laura has held a Level 2 bat licence since 2012 and an Earned Recognition licence since 2022.

3.5.2 The surveyor used a high-power torch (LEDLenser Lamp) and 10x42mm binoculars to identify features of interest. Where possible, each aspect of the tree was inspected to identify features with potential to support roosting bats such as woodpecker holes, rot holes, splits, cracks, flaking bark and/or ivy cover. Where any evidence of use by bats such as droppings, staining or scratches around such features were present this was noted.

3.5.3 Each tree or cluster of trees was identified as having high, medium, low or negligible suitability for roosting bats. Collins (2016) categorizes the suitability of trees for roosting bats as follows:

- Negligible = Negligible habitat features likely to be used by roosting bats.
- Low = A tree of sufficient size and age to contain potential roosting features but with none seen from the ground or features seen with only very limited roosting suitability.
- Medium = A 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.
- 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.

3.6 Badger Survey

3.6.1 A badger (*Meles meles*) survey was conducted by Laura Grant and Anna Spence whilst conducting the PEAs. An update badger survey was conducted on 27 November 2024 by Nick Boyd. The badger survey involved walking across the site and accessible habitat within 30m searching for evidence of badgers and badger activity in accordance with standard guidance (Gov.uk, 2015). Any badger setts found were defined as main / annexe / subsidiary / outlier sett as adapted from Neal and Cheeseman (1996) and Harris *et al*. (1989). In addition to badger setts other evidence of badgers was also recorded. This included:

- Live or dead badgers;
- Foraging scrapes (distinctive excavations made by badgers when searching for food);
- Badger dung;
- Dung pits (a badger will often deposit its dung within a small excavated pit);
- Latrines (a collection of dung pits) (Roper, 2010);
- Badger guard hairs;
- Mammal paths; and
- Badger tracks.

3.6.2 Current UK Government guidance (Gov.uk, 2015) suggests that sett entrances should be monitored over an extended period of time, e.g. up to four weeks, to identify whether they are active. Camera traps were used at S1, S2 and S5 and sand was installed at the entrance of setts S1 and S2 (to record footprints), as well as sticks (to see if animals are entering or exiting) to create hair traps. The three wildlife cameras were deployed within the site positioned at entrances to burrows at:

- ///flush.magnetic.masterful (S1);
- ///yards.penned.crinkled (S2); and

- ///crossword.deeds.mimes (S5).

3.6.3 The cameras were deployed from 20 July 2022 until 19 August 2022 at S1 and S2, and 24 August to 18 October 2022 at S5 recording continuously throughout these periods. The cameras were set to trigger photographs and videos. The footage was reviewed to identify the activity of badgers within the site.

3.7 Biodiversity Net Gain Assessment

3.7.1 Data from the PEA and the proposed site plan were used to complete the Statutory Biodiversity Metric: Calculation tool (DEFRA, 2023b) using the published guidance (DEFRA, 2023). The proposed landscape scheme (Statera Energy Dwg No. SL254_L_X_GA_1) was used to calculate the change in biodiversity on site as a result of the proposed development. The full results of the Biodiversity Net Gain Assessment are reported on separately (Ecology by Design, 2024). Figures 1-3 in Appendix 2 indicate the baseline habitats, impacts and proposed habitats respectively.

3.8 Limitations/Constraints

3.8.1 The ecological work and surveys undertaken within the site accorded with published good practice methods and guidelines.

3.8.2 The grasslands within the fields were harvested ahead of the habitat survey in July 2022. The surveyor was able to readily identify the species within the sward therefore this is not considered to have constrained the identification of habitats or their condition.

3.8.3 Whilst July is a sub-optimal time of year to conduct ground level tree assessments due to leaves potentially concealing features of interest, this is not considered to be a significant constraint at the site as the majority of trees are immature and/or have open canopies with features readily identified.

4 Results and Interpretation

4.1 Designated Sites

4.1.1 The desk study identified two internationally designated sites of nature conservation importance within 7km of the site, one nationally designated sites of nature conservation importance within 5km and three non-statutory sites within 2km of the site. These sites are detailed in Table 4.1.

Table 4.1: *Records of Statutory and non-statutory designated sites (7km for International, 5km for National designations and 2km for local designations)*

Site Name and Designation *	Distance (km) and direction	Description
International designations		
Little Wittenham SAC SSSI	4.7km SW	69ha designated for it's Great Crested Newt *(Triturus cristatus*) (GCN). Two main ponds within broadleaved and conifer woodland containing a very large GCN population.
Cothill fen SAC	7km NW	43ha of the largest surviving alkaline fen in central England with rare M13 *Schoenus nigricans* vegetation type.
National designations		
Culham Brake SSSI	1.8km W	1.5ha of wet willow woodland by the River Thames containing one of the largest British populations of the summer snowflake (*Leucojum aestivum*) a Red Data Book plant species.
Local non-statutory sites		
Furze Brake LWS	760M NE	17.8ha of woodland, it houses the most important heronry in the upper Thames basin, with nearly 50 active nests.
Radley Gravel Pits LWS	851m NW	171ha of restored gravel works and landfill into large waterbodies with sedge and reedbeds valuable for birds, plants, invertebrates and bats.
Abbey Fishponds LNR	1.65km NW	5.6ha of fen with dry rough grassland banks, tall herb and woodland. Past records for scarce oxford species including devil's-bit scabious (*Succisa pratensis*), purple moor-grass (*Molinia caerulea*), common spotted orchid (*Dactylorhiza fuchsii*) and southern marsh- orchid (*Dactylorhiza praetermissa*). The site contains Water vole, bats and notable birds.

* Where:

SAC= Special Area of Conservation (International Designation, Statutory)

SSSI = Site of Special Scientific Interest (national designation, statutory)

LNR=Local Nature Reserve (local designation, non-statutory)

4.2 Habitats

4.2.1 The following habitats were recorded on site (see habitat map at Appendix 2 and species list at Appendix 4):

Table 4.2: *Habitat types identified during the habitat survey*

Habitat type	Description [including UKHab codes in square brackets where relevant]
Modified grassland (Code g4) / Cropland – Non-cereal crops (Code c1c)	There are portions of five fields within the site which support modified grassland managed by mowing [106] for hay [109] and sheep grazing [102]. The grasslands were each very dry [500] during the 2022 survey and exhibited poor species-diversity and uniform sward height due to management. Field F1 in the north-west has been sown with perennial ryegrass (*Lolium perenne*), and includes occasional cock's-foot (*Dactylis glomerata*), sterile brome (*Bromus sterilis*), and Yorkshire fog (*Holcus mollis*), and rarely occurring timothy (*Phleum pratense*), soft brome (*Bromus hordeaceus*) and annual meadowgrass (*Poa annua*). Forbs were rarely offering within the field and included field pansy (*Viola arvensis*), common poppy (*Papaver rhoeas*) and scentless mayweed (*Tripleurospermum inodorum*). See photograph 1. Fields F2-4 (Photographs 2-4) were grass-dominated and 5-10cm height, typically containing frequent Yorkshire fog, cock's-foot, perennial ryegrass and false oatgrass (*Arrhenatherum elatius*), occasional red fescue (*Festuca rubra*), timothy and wall barley (*Hordeum murinum*) and rarely occurring sterile brome. Field F7 is a newly sown perennial ryegrass field with no additional species noted. All modified grassland within the site is in poor condition.
Other neutral grassland (Code g3c)	The margins of the fields were typically 1-2m wide with a uniform grass-dominated sward of 1m height, with frequent false oatgrass, Yorkshire fog, cock's-foot, perennial ryegrass and yarrow (*Achillea millefolium*), occasional agrimony (*Agrimonia eupatoria*) and wild parsnip (*Pastinaca sativa*), rarely occurring nettle (*Urtica dioica*), hogweed (*Heracleum sphondylium*), curled dock (*Rumex crispus*), wild carrot (*Daucus carota*), field bindweed (*Convolvulus arvensis*), creeping cinquefoil (*Potentilla reptans*) and bramble (*Rubus fruticosus* agg.). Along the central access road white stonecrop (*Sedum album*) was also present. In the east of F3 and north of the access road (F6) are two areas of other neutral grassland which are infrequently managed, resulting in tussocky grassland habitat. The sward heights include some variation due to grazing by rabbits, typically being 5-50cm height with small areas of bare ground where rabbits have foraged. The sward includes frequent false oatgrass, cock's-foot, red fescue (*Festuca rubra*) and ribwort plantain, occasional Yorkshire fog, a vetch (*Vicia* sp.), nettle, yarrow and dove's-foot crane's-bill (*Geranium pusillum*) and rarely occurring teasel (*Dipsacus fullonum*), creeping cinquefoil, dandelion (*Taraxacum officinalis* agg.), bramble, cleavers (*Galium aparine*), white clover (*Trifolium repens*), common stork's-bill (*Erodium cicutarium*), white campion (*Silene latifolia*), wavy hair grass (*Deschampsia caespitosa*) curled dock (*Rumex crispa*), common sorrel, field bindweed and perforate St John's-wort (*Hypericum perforatum*). Field F5 at the north of the site has been left unmanaged and developed a longer sward of approximately 15cm other neutral grassland of similar species composition to above with the addition of stands of maize (*Zea mays*) left from the previous crop grown in this area. All other neutral grassland within the site is in moderate condition.
Mixed scrub (Code h3h)	In the east of the site is 0.33ha of mixed scrub which appears to have been planted in c. 2010 and is typically 3m height with some already existing pedunculate oak (*Quercus robur*) or faster growing trees cherry (*Prunus* sp.) and douglas fir (*Pseudotsuga menziesii*) being up to 7m height. The scrub is species-

	rich, containing frequent hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and dogwood (*Cornus sanguinea*), occasional hazel (*Corylus avellana*), ash (*Fraxinus excelsior*), wayfaring tree (*Viburnum lantana*), and European larch (*Larix decidua*) and rarely occurring walnut (*Juglans regia*), cherry, sycamore (*Acer pseudoplatanus*) and Scots pine (*Pinus sylvestris*). The understorey is typical of the field margins. See Photograph 8.
Bramble scrub (Code h3d)	In the south-east of the site is 0.52ha of scrub dominated by bramble c. 1m height including rarely occurring scattered elder (*Sambucus nigra*), hawthorn and rose (*Rosa* sp.). See photograph 9.
Road (Code 800)	Hardstanding roads bisect the site. See Photograph 6.
Scattered tree (Code 32)	There are infrequent scattered trees within the site including turkey oak (*Quercus cerris*), ash, plum (*Prunus* sp.), large-leaved lime (*Tilia platyphyllos*), apple (*Malus* sp.) and pedunculate oak (*Quercus robur*).
Scattered scrub (Code 10)	There is scattered scrub within the site including occasional elder (*Sambucus nigra*) beneath the pylons within the centre of the fields and on the boundaries, English elm (*Ulmus minor*) and hawthorn (*Crataegus monogyna*).

Conclusion

4.2.2 Habitats within the site are of negligible value in accordance with the geographic criteria in Appendix 2, however, the habitats are of biodiversity value, as detailed within Section 4.4.

4.3 Protected Species

4.3.1 In Table 4.3 the findings of the desk study and Preliminary Ecological Appraisal are presented together. Relevant legislation and policy is referred to as appropriate and further details are provided in Section 6. The presence or potential for each species/group to occur within the site is considered.

Table 4.3: *Presence of or potential for protected / notable / invasive species within the site and local area*

Species	Protection or Status *	Presence/potential at the site
Badger (*Meles meles*)	Protection of Badgers Act 1992.	The desk study returned 30 badger records within 2km. 13 records were of badger setts including one recorded on site (S2 on Figure 1) and another c. 40m and 100m south in 2020 (S5 on Figure 1). Low numbers of badger are frequently active within the site. Six badger setts and four latrines have been identified within / adjacent to site. See further details within the *Badger monitoring* section below.
Bats	EPS. Some species are also SPIs. W&CA 1981 Sch5	The desk study returned 754 records of 11 bat species. 711 of them where within 1km of the site and two roost records were within 2km. MAGIC returned three records of European Protected Species Mitigation licenses for bats within 2km of the site. Two were for common pipistrelle (*Pipistrellus pipistrellus*) and one was

		for brown long-eared and Natterer's bat (*Myotis nattereri*). All licences were granted in 2020. The habitats within the site offer no obvious flightpaths for commuting bats or foraging habitats and the site is therefore of negligible potential for foraging and commuting bats. The woodland edge on the northern boundary is likely to be suitable for foraging and commuting bats and there are some trees on the boundary also supporting features with suitability for roosting bats. The scattered trees on site all have negligible potential to support roosting bats.
Birds	W&CA 1981 Sch1 / Sch5	The desk study returned 25,200 records of 107 species of protected or notable bird species. Of these records 313 of 18 species were recorded within the site boundary and 158 are protected species records. The resolution of these records is 1km square. Species with potential to make use of habitats within the site include 75 records of barn owl (*Tyto alba*), 175 records of fieldfare (*Turdus pilaris*), 581 records of red kite (*Milvus milvus*), 426 records of redwing (*Turdus iliacus*) and 614 records of skylark (*Alauda arvensis*). No skylark were audible within this site during the PEA or subsequent surveys throughout July-October 2022. The grassland fields contain limited floristic diversity and comprise single-height swards with no bare ground, limiting the suitability for breeding skylark. The scattered trees and to a lesser extent, scattered scrub, provide suitable habitat for a range of birds associated with farmland habitats.
Dormouse (*Muscardinus avellanarius*)	EPS. SPI. W&CA 1981 Sch5	No records of the species were returned by the desk study. The habitats within the site are unsuitable for the species due to their structure, isolation and/or age.
Otter *(Lutra lutra)*	EPS. SPI. W&CA 1981 Sch5	102 records of otter were returned within 2km of the site. The nearest record was 136m north in the River Thames from 2011. 52 of the records were within 1km of site.
Water vole (*Arvicola amphibius)*	W&CA 1981 Sch5	There were 56 water vole records returned, eight of which were within 1km of the site. The closest record was 300m from the site in 2009. All records are from 2015 or earlier. The
Other wild mammals	Various	No records of brown hare (*Lepus europaeus*) were recorded, however, droppings of the species were recorded within Fields F1 and F2. The desk study returned three records of harvest mouse (*Micromys minutus*) nests all earlier than 2011 and over 1km from site. The narrow arable field margins and areas of unmown grassland are of limited suitability for the species. One record of European hedgehog (*Erinaceus* europaeus) was also recorded in 2020 over 1km away. The grassland habitats provide potential foraging habitat for the species.
Reptiles	ESP W&CA 1981 Sch5	The desk study returned a record of a breeding adder (***Vipera berus***) pair 1.4km from site in 1995. Other reptile records included 46 grass snake (*Natrix natrix*) records, the closest was 124m from site in 2010, and a slow-worm (*Anguis fragilis*) record 1.km from site in 2015.

		The structure of the other neutral grasslands are suitable for common species of reptile.
Great crested newt (*Triturus cristatus*) and other amphibians	EPS. SPI. W&CA 1981 Sch5	382 records were returned within 2km of the site, 361 were within 1km but none were recorded on site. The closest record was 290m north in 2015. MAGIC returned two records of European Protected Species Mitigation licenses for great crested newt within 2km of the site, both with a start date of 2015 and north of the River Thames. The River Thames is c. 50m wide and strongly flowing adjacent to the site therefore this is likely to act as a barrier to dispersal for great crested newts. There are no ponds within 500m of the site south of the River Thames. The species are therefore considered unlikely to be present or impacted by the proposals.
White-clawed crayfish (*Austropotamobius pallipes*)	EPS. SPI. W&CA 1981 Sch5	No records of the species were returned by the desk study. Three records of signal crayfish (*Pacifastacus leniusculus*) were returned from the River Thames therefore it is considered likely that the species is not present either due to competition or introduction of the crayfish plague.
Invertebrates	W&CA 1981 Sch5 & Sch9	The desk study returned 23 records of five Protected butterfly species including white admiral (*Limenitis Camilla*), purple emperor (*Apatura iris*), dingy skipper (*Erynnis tages*) small heath (*Coenonympha pamphilus*), and Grizzled skipper (*Pyrgus malvae*). 19 were recorded within 1km of site however none were recorded on site. 134 protected or notable moth species were also returned with the closest record being a Shaded Broad-bar (*Scotopteryx chenopodiata*) 132m away. There were ten records of three protected bee and wasp species all within 1.3km of the site. The closest was 405 m away in 2011. One record of the protected rugged oil beetle (*Meloe rugosus*) was also returned by the desk study as 906m from site in 2006. The site offers limited opportunities for an assemblage of species typical of arable habitats.
Protected plants	W&CA 1981 Sch8	181 records of 44 species of notable or protected flowering plants were returned by the desk study. Four of the notables were indicated to be present within the site including Common cudweed (*Filago vulgaris),* Field Pepperwort (*Lepidium campestre*), Knotted Clover (*Trifolium striatum*), and Prickly Poppy (*Papaver argemone)*. These species are Red listed or scarce in Oxford. The records range between 1997-2020. No protected or notable plant species were recorded during the PEA and are considered unlikely to be present given the sward composition.
Invasive species	W&CA 1981 Sch9	139 records of invasives were returned by the desk study. Nine species of invasive plants were recorded including Japanese knotweed (*Reynoutria japonica*), Himalayan Balsam (*Impatiens glandulifera*), and Rhododendron (*rhododendron ponticum)*. None of these records are on site but the closest

		was 213m away. 49 records where within 1km. No invasive species were recorded within the site. Records of five aquatic invasive species were returned (predominantly from the River Thames) including signal crayfish, zebra mussel (*Dreissena polymorpha*), American mink (*Neovison vison*), Ruddy Duck (*Oxyura jamaicensis*) and red eared terrapin (*Trachemys scripta elegans*). The site does not provide increased potential for invasive animal species and none were recorded.

* Where:

EPS = European Protected Species under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended)

SPI = Species of Principal Importance under Section 41 of the NERC Act 2006

W&CA 1981 = Wildlife and Countryside Act 1981 (as amended)

Sch1 = Schedule 1 Birds which are Protected by Special Penalties (W&CA 1981)

Sch5 = Schedule 5 Animals which are Protected (W&CA 1981)

Sch8 = Schedule 8 Plants which are Protected (W&CA 1981)

Sch9 = Schedule 9 Animals and Plants to which Section 14 Applies (W&CA 1981)

Ground level tree assessment

4.3.2 There are two off-site ash trees on the woodland edge in the north-west of the site which were identified as supporting potential roost features; a low suitability torn limb with a downward facing feature and a south-facing rot hole of moderate suitability.

4.3.3 The remainder of trees within or adjacent to the site were identified as having negligible potential to support roosting bats.

Badger monitoring

4.3.4 During the badger monitoring in 2022, infrequent activity of badger was recorded in proximity to setts S1 and S2, with no badger recorded entering or leaving the sett entrances and no badger hairs being captured on the sticky traps. There are likely to be additional sett entrances on the embankment west of S2. Badger were recorded squeezing beneath the fence at this location and were actively using a latrine west of the fence.

4.3.5 Camera monitoring of S5 for nearly two months in 2022 recorded six passes by badger, none of which entered or emerged from the entrances monitored (each entrance was not monitored, and it is recognised there may be additional sett entrances within the bramble scrub). The low level of activity in the vicinity of the sett indicates that it is likely used infrequently by low numbers of badger as an outlier sett. Scrub clearance was conducted in the vicinity of the sett which has revealed five entrances of a suitable size for badger, however, they are now occupied by rabbits.

4.3.6 In 2024, the survey area was extended to the north-east and a main badger sett (S7) was recorded in the off-site woodland. Additional single hole outliers were recorded within the local landscape, as detailed below and shown on Figure 7. The status of the setts in 2024 is as follows:

- S1 (on site; SU 52793 96495) = Inactive single hole outlier
- S2 (on site; SU 52669 96671) = Inactive single hole outlier
- S3 (off site; SU 52825 96234) = Inactive single hole outlier
- S4 (off site; SU 52796 96220) = Inactive potential single hole outlier
- S5 (off site; SU 53498 96131) = A former five-hole annexe or main sett now inactive
- S6 (off-site; SU 52825 96140) = Annexe sett with four active holes
- S7 (off site; ///digests.carbonate.producers) = Active main sett comprising at least 15 holes
- S8 (off site; ///outboard.megawatt.parks) = Inactive single hole outlier
- S9 (off site; ///configure.cosmetic.escape) = Inactive single hole outlier
- S10 (off site; ///legs.mavericks.bonnet) = Active single hole outlier
- S11 (on site; ///removed.renovated.soldiers) = Inactive single hole outlier
- S12 (on site; ///caramel.conveys.lightbulb) = Inactive single hole outlier
- S13 (on site; ///obtain.boss.sleepless) = Active single hole outlier

Evaluation

4.3.7 The site is of Local value to brown hare and badger and negligible value to the remainder of other species in accordance with the geographic context set out in Appendix 4.

5 Potential Impacts and Recommendations

5.1 Introduction

5.1.1 This section presents the potential impacts and subsequent recommendations for the proposed development at the site.

Adoption of the Mitigation Hierarchy

5.1.2 In accordance with the National Planning Policy Framework (NPPF) (see Section 6) and British Standard 42020:2013 'Code of Practice for Planning and Development' (BSI Standards Limited, 2013), the 'Mitigation Hierarchy' has been adopted at the site with regards to the potential ecological impacts of the proposals. The mitigation hierarchy outlines a stepwise process as follows:

- **Avoidance** – as a first option, adverse impacts should be avoided through good design, such as retaining and safeguarding important ecological features wherever practicable;
- **Mitigation** – where unavoidable, adverse impacts should be reduced as much as possible, such as reducing land-take of important habitats;
- **Compensation** – where residual effects remain, compensation should be secured to offset adverse impacts, such as through compensatory habitats creation; and
- **Enhancement** – opportunities for net gains in biodiversity should be explored and included wherever appropriate.

5.2 Designated Sites

Potential Impacts

5.2.1 The site is sufficiently distant from the designated sites within the local landscape to avoid direct or indirect impacts as a result of the proposals such as noise, dust, changes to water supply or changes in air quality.

5.3 Habitats

Potential Impacts

5.3.1 The River Thames is 130m north of the site. Assuming standard pollution control measures are specified within a Construction Environmental Management Plan (CEMP) and adopted (see Recommendation R1), the proposals have no potential to directly or indirectly impact upon the river habitat or species supported by it.

5.3.2 Whilst habitats within the site are of negligible intrinsic ecological interest, they contribute to the biodiversity value of the site. Unmitigated habitat loss to accommodate the proposals

would therefore result in a loss of biodiversity habitat units. The Statutory Metric has been used to identify the baseline habitat value and inform the design scheme to ensure a net gain for habitat biodiversity. Habitats of value to wildlife potentially present within the local landscape will be created including woodland, species-rich grassland a wildlife pond and attenuation pond. The habitats to be created are indicated within Figure 3, Appendix 2. The methods for creation of these habitats are outlined within the Biodiversity Net Gain Assessment (Ecology by Design, 2024). A Habitat Management and Monitoring Plan (HMMP) will be required to specify the long-term management of the habitats to meet their target conditions and deliver long-term benefits for wildlife for 30 years.

Recommendation R1: Construction Environmental Management Plan

5.3.3 A Construction Environment Management Plan (CEMP) will be produced to identify measures to be adopted to ensure protection of valued features during construction. It includes:

1) Details of the licence required to lawfully close badger sett S13 ahead of site clearance.

2) Any update surveys needed prior to site clearance (e.g. a pre-commencement nesting bird and/or badger check).

3) Risk assessment of potentially damaging construction activities.

4) Identification of biodiversity protection zones.

5) Practical measures (both physical measures and sensitive working practices) to avoid, reduce or mitigate the impacts on important habitats and protected species during construction.

6) The location and timing of sensitive works to avoid harm to biodiversity features.

7) The times during construction when specialist ecologists need to be present on site to oversee works.

8) Responsible persons and lines of communication.

9) Use of protective fences, exclusion barriers and warning signs.

Recommendation R2: Habitat Management and Monitoring Plan

5.3.4 The statutory Habitat Management and Monitoring Plan (HMMP) template tool will be used to produce a structured management and monitoring plan to demonstrate how habitat creation, enhancement, management and monitoring will be undertaken. This HMMP will be produced by an ecologist alongside consultation with the developer and landscape architects to ensure the appropriate design and long-term management of mitigation measures to protect and enhance the landscape character and biodiversity. It includes:

1) Review of site potential and constraints.

2) Purpose and conservation objectives for the proposed works.

3) Detail design(s) and/or working method(s) to achieve the stated objectives.

4) Extent and location/area of proposed works on appropriate scale maps and plans (e.g. woodland planting / creation of log piles).

5) Type and source of materials to be used where appropriate (e.g. native species of local provenance, specification etc).

6) Timetable for implementation.

7) Details of initial aftercare and long-term maintenance of ecological habitats (e.g. woodland, hedgerows and grassland areas).

8) Details for monitoring and remedial measures.

9) Persons responsible for implementing the works.

10) Preparation of a work schedule to cover 20 years.

11) Details of the body or organisation responsible for implementation of the plan.

5.4 Protected and Notable Species

Potential Impacts

5.4.1 The proposals will result in the destruction of an active single hole outlier sett (S13).

5.4.2 Brown hare currently make use of the site for foraging. In the absence of mitigation, the proposals would reduce the available foraging resource available to the species. However, the retained modified grasslands will be retained and enhanced to increase their species and structural diversity. There are similarly suitable fields to the north-east and south-west and connectivity to these features will be maintained along the northern and southern site boundaries.

5.4.3 The modified grassland habitats within the site are currently unsuitable for reptiles, however, they will be subject to enhancements to increase their species and structural diversity which will increase their suitability for reptiles. The scattered trees felled in the east of the site will be used to create log piles in the north-west of the site.

5.4.4 Clearance of trees and scrub has the potential to result in the destruction of an active bird nest, if present.

5.4.5 Limited lighting will be required within the site for security purposes. Lighting could impact foraging and commuting (there are no opportunities for roosting bats in proximity to the compounds). Lighting will therefore be sensitively designed to ensure no impacts arise.

Woodland planting will increase the foraging opportunities for bats and three bat boxes will be installed on scattered trees to create roosting opportunities.

5.4.6 A fence will surround each of the battery compounds for security purposes. The fencing will comprise propriety weld mesh fences 2.5m height with a cranked top 0.5m height supporting three strands of barbed wire. The compounds themselves will be of negligible value for wildlife due to comprising hardstanding, gravel and the batteries themselves. These fences will not prevent access to habitats of value or sever the landscape, therefore no mitigation measures are considered necessary.

5.4.7 Opportunities for nesting birds will be provided by the proposed woodland habitats and three nest boxes will be installed on scattered trees.

Recommendation R3: Badger

5.4.8 Monitoring of sett S13 will be conducted once planning permission is secured to inform a badger licence to enable its lawful destruction should it be confirmed as being active. The licence can be implemented between 1st July and 30th November. Implementation will include installation of a one-way gate to enable badger to leave but not re-enter, followed by 21 days of monitoring, closure of the sett and a destructive search of the burrow.

Recommendation R4: Reptile Mitigation and Enhancement

5.4.9 The creation of other neutral grassland in moderate condition (10.7127ha within the Application scheme or 11.5368ha within the Appeal scheme) will represent a significant enhancement for reptiles.

5.4.10 In addition, two log piles 2m length and width and 1.5m height will be installed in the north of the site, alongside the existing other neutral grassland habitat (on the edges of the modified grassland habitat which will be subject to enhancements; see locations on Figure 3, Appendix 2).

Recommendation R5: Safeguarding nesting birds

5.4.11 Any birds' nests are protected whilst in use. Ideally, works to suitable nesting habitat/features should be scheduled to avoid the bird nesting season (March to August inclusive). Should such works take place during March-August inclusive, they must be immediately preceded by a check for any active nests by a suitably qualified ecologist. Any active nests identified during works (regardless of time of year) would need to be protected and left with a suitable buffer (to be defined by the ecologist) until the nest is no longer active.

Recommendation R6: Bat boxes

5.4.12 Three woodcrete / woodstone bat boxes (e.g. 2F Schwegler Bat Box) suitable for crevice-dwelling species will be installed on the scattered trees in the north-east of the site.

Recommendation R7: Bird boxes

5.4.13 Three woodcrete / woodstone bird boxes suitable for starlings, woodpeckers and nuthatches (e.g. 3S Schwegler Starling Nest Box) or similar will be installed on the scattered trees in the north-east of the site.

5.5 Demonstrating Biodiversity Net Gain

5.5.1 The Statutory Metric has been used to identify the biodiversity change as a result of the proposals.

5.5.2 The Application scheme has a baseline value of 65.29 habitat units and the proposals will achieve 109.11 habitat units, delivering a gain of 43.82 habitat units i.e. 67.11% increase and 5.10 hedgerow units.

5.5.3 The Appeal scheme has a baseline value of 66.11 habitat units and the proposals will achieve 107.16 habitat units, delivering a gain of 41.05 habitat units i.e. 62.10% increase and 5.21 hedgerow units.

5.5.4 Both schemes are securing significant biodiversity net gains and the trading rules are satisfied as a result of the proposals.

6 Relevant Legislation and Policy

6.1 Exit from European Union

6.1.1 The Conservation of Habitats and Species Regulations 2017 (as amended), referred to as the '2017 Regulations,' are one of the pieces of domestic law that transposed the land and marine aspects of the Habitats Directive (Council Directive 92/43/EEC) and certain elements of the Wild Birds Directive (Directive 2009/147/EC) (known as the Nature Directives). Changes to the 2017 Regulations have been made by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (referred to as the '2019 Regulations') to transfer functions from the European Commission to the appropriate authorities in England and Wales.

6.1.2 The amendments prescribed by the 2019 Regulations allow existing protections afforded by current wildlife legislation and transposed EC Council Directives to be operable from 01 January 2021.

6.1.3 The 2019 Regulations protect rare and vulnerable birds and the habitats that they depend upon. This is achieved in part through the classification of Special Protection Areas (SPAs). The Habitats Directive aims to protect plants, habitats and animals other than birds. This is achieved in part through the creation of Special Areas of Conservation (SACs). SPAs and SACs are collectively referred to as the 'National Site Network'.

6.1.4 Designated Wetlands of International Importance (known as Ramsar sites) do not form part of the National Site Network, however, all Ramsar sites remain protected in the same was as SACs and SPAs.

6.2 Local Planning Policy

6.2.1 The South Oxfordshire District Council Local Plan 2035 was adopted on 10 December 2020.

Policy ENV1: Landscape and Countryside

6.2.2 South Oxfordshire's landscape, countryside and rural areas will be protected against harmful development. Development will only be permitted where it protects and, where possible enhances, features that contribute to the nature and quality of South Oxfordshire's landscape, in particular:

- trees (including individual trees, groups of trees and woodlands), hedgerows and field boundaries;
- irreplaceable habitats such as ancient woodland and aged or veteran trees found outside ancient woodland;

- the landscapes, waterscapes, cultural heritage and user enjoyment of the River Thames, its tributaries and flood plains;
- other water course and water bodies;
- the landscape setting of settlements or the special character and landscape setting of Oxford;
- topographical features;
- areas or features of cultural and historic value;
- important views and visually sensitive skylines; and
- aesthetic and perceptual factors such as tranquilly, wilderness, intactness, rarity and enclosure.

6.2.3 The Council will seek the retention of important hedgerows. Where retention is not possible and a proposal seeks the removal of a hedgerow, the Council will require compensatory planting with a mixture of native hedgerow species.

Policy ENV2: Biodiversity – Designated Sites, Priority Habitats and Species

1. The highest level of protection will be given to sites of international nature conservation importance (Special Areas of Conservation). Development that is likely to result in a significant effect, either alone or in combination, on such sites will need to satisfy the requirements of the Conservation of Habitat and Species 2017 (as amended).

2. Sites of Special Scientific Interest (SSSI) are of national importance. Development that is likely to have an adverse effect on a SSSI (either on its own or in combination with other developments) will only be permitted in exceptional circumstances, where it can be demonstrated that the benefits of the development in the location proposed clearly outweigh an harm to the special interest features and the SSSI's contribution to the local ecological network. In such circumstances, measures should be provided (and secured through planning conditions or legal agreements) that would mitigate or, as a last resort, compensate for the adverse effects resulting from development.

3. Development likely to result, either directly or indirectly to the loss, deterioration or harm to:

- Local Wildlife Sites
- Local Nature reserves
- Priority Habitats and Species
- Legally Protected Species
- Local Geological Sites

- Ecological Networks (Conservation target Areas)
- Important or ancient hedges or hedgerows
- Ancient woodland and veteran trees

will only be permitted if:

I. the need for, and benefits of the development in the proposed location outweighs the adverse effect on the interests;

II. it can be demonstrated that it could not reasonably be located on an alternative site that would result in less or no harm to the interests and

III. measures will be provided (and secured through planning conditions or legal agreements) that would avoid, mitigate or as a last resort, compensate for the adverse effects resulting from development.

4. Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) will be refused planning permission, unless there are wholly exceptional reasons justifying the granting of planning permission.

5. Where development has the potential to affect a proposed wildlife site the developer must undertake surveys and assessments to determine whether the site meets the criteria for Local Wildlife Site status.

Policy ENV3: Biodiversity

6.2.4 Development that will conserve, restore and enhance biodiversity in the district will be supported. All development should provide a net gain in biodiversity where possible. As a minimum, there should be no net loss of biodiversity. All proposals should be supported by evidence to demonstrate a biodiversity net gain using a recognised biodiversity accounting metric, in this case DEFRA's Biodiversity Metric 3.0 or the Small Sites Metric.

6.2.5 Development proposals which would result in a net loss of biodiversity will only be considered if it can demonstrated that alternatives which avoid impacts on biodiversity have been fully explored in accordance with the mitigation hierarchy*. In the absence of alternative sites or layouts, development proposals must include adequate mitigation measures to achieve a net gain of biodiversity. Where harm cannot be prevented or adequately mitigated, appropriate compensation measures will be sought, as a last resort, through planning conditions or planning obligations (depending on the circumstances of each application) to offset the loss by contributing to appropriate biodiversity projects to achieve an overall net gain for biodiversity.

6.2.6 Planning permission will only be granted if impacts on biodiversity can be avoided, mitigated or, as a last resort, compensated fully.

6.3 National Planning Policy Framework

6.3.1 The National Planning Policy Framework (NPPF) was updated in December 2024 (MHCLG, 2024) thereby replacing the older version of December 2023.

6.3.2 In relation to planning and flood risk, para 182 states 'Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:

a) take account of advice from the Lead Local Flood Authority;

b) have appropriate proposed minimum operational standards; and

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.'

6.3.3 The new framework sets out in section 15 that planning policies and decisions should contribute to and enhance the natural and local environment by … (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs (Para 187).

6.3.4 To protect and enhance biodiversity and geodiversity (Para 192), plans should:

- identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

6.3.5 When determining planning applications, local planning authorities should apply the following principles (Para 193):

- 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; and
- 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.

Standing Advice (GOV.UK)

6.3.6 The GOV.UK website provides information regarding protected species and sites in relation to development proposals: 'Local planning authorities should take advice from Natural England or the Environment Agency about planning applications for developments that may affect protected species.' GOV.UK advises that 'some species have standing advice which you can use to help with planning decisions. For others you should contact Natural England or the Environment Agency for an individual response.'

6.3.7 The standing advice (originally from Natural England and now held and updated on GOV.UK) provides advice to planners on deciding if there is a 'reasonable likelihood' of protected species being present. It also provides advice on survey and mitigation requirements.

6.3.8 When determining an application for development that is covered by standing advice, in accordance with guidance in Government Circular 06/2005, Local planning authorities are required to take the standing advice into account. In paragraph 82 of the aforementioned Circular, it is stated that: 'The standing advice will be a material consideration in the determination of the planning application in the same way as any advice received from a statutory consultee…it is up to the planning authority to decide the weight to be attached to the standing advice, in the same way as it would decide the weight to be attached to a response from a statutory consultee.'

6.4 Badger

6.4.1 Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "a structure or place, which displays signs indicating current use by a badger".

6.4.2 ODPM Circular 06/2005 provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that "The likelihood of disturbing a badger sett, or adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions."

6.4.3 Natural England provides Standing Advice , which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

6.5 Bats

6.5.1 All species of bats are protected under The Conservation of Habitats and Species Regulations 2017 (as amended) with additional protection provided under the Wildlife and Countryside Act 1981 (as amended). This makes it illegal to injure or kill a bat, to disturb, damage, destroy or obstruct a bat roost.

6.6 Birds

6.6.1 All nesting wild birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

6.7 Reptiles

6.7.1 All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are included as 'species of principal importance' for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016. Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only.

6.8 Wild mammals in general

6.8.1 The Wild Mammals (Protection) Act 1996 (as amended) makes provision for the protection of wild mammals from certain cruel acts, making it an offence for any person to intentionally cause suffering to any wild mammal. In the context of development sites, for example, this may apply to rabbits in their burrows.

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Appendix 1 – Photographs

The following photographs were taken during the baseline survey in July 2022.

Photograph 1: Field 1, view east along northern boundary

Photograph 2: Field 2, view west along southern boundary

Photograph 3: Field 3, view north along eastern boundary

Photograph 4: Field 4, view east along southern boundary

Photograph 5: Scattered trees within other neutral grassland in east of site

Photograph 6: Hardstanding roads, view from north to south within centre of site

Photograph 7: Field F7

Photograph 8: Mixed scrub in south-east

Photograph 9: Bramble scrub in the south-east

Appendix 2 – Figures

Figure 1: Application scheme baseline habitats

Figure 2: Application scheme impacts

Figure 3: Application scheme proposed habitats

Figure 4: Appeal scheme baseline habitats

Figure 5: Appeal scheme impacts

Figure 6: Appeal scheme proposed habitats

Figure 7: Badger survey results

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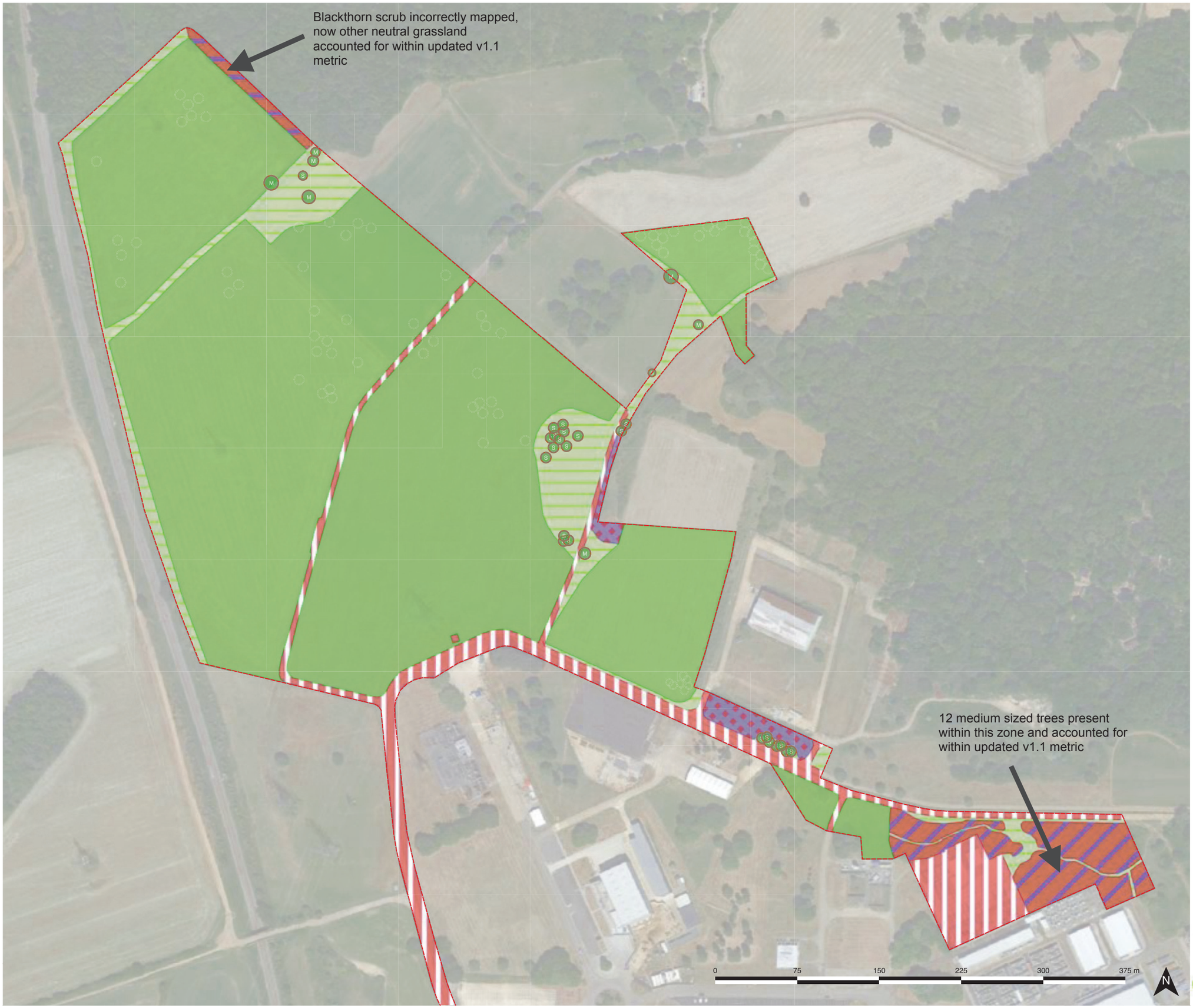

LEGEND

Site Boundary

- Site Boundary (26.91 ha)
- ~~Blackthorn scrub (0.1357 ha)~~
- Bramble scrub (1.0255 ha)
- Developed land; sealed surface (3.521 ha)
- Buildings (0.0045 ha)
- Mixed scrub (0.281 ha)
- Modified grassland (19.601 ha)
- Other neutral grassland **(2.4793 ha)**
- Rural tree, medium **(19 trees)**
- Rural tree, small **(24 trees)**

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Baseline

Drawing No.:	*Scale (@A3):*
EBD_2513_DR001	1:3,300
Central Eastings, Northings:	*Date Drawn:*
453133, 196452	05/04/2024
Drawn by:	*Approved by:*
ASp	BG

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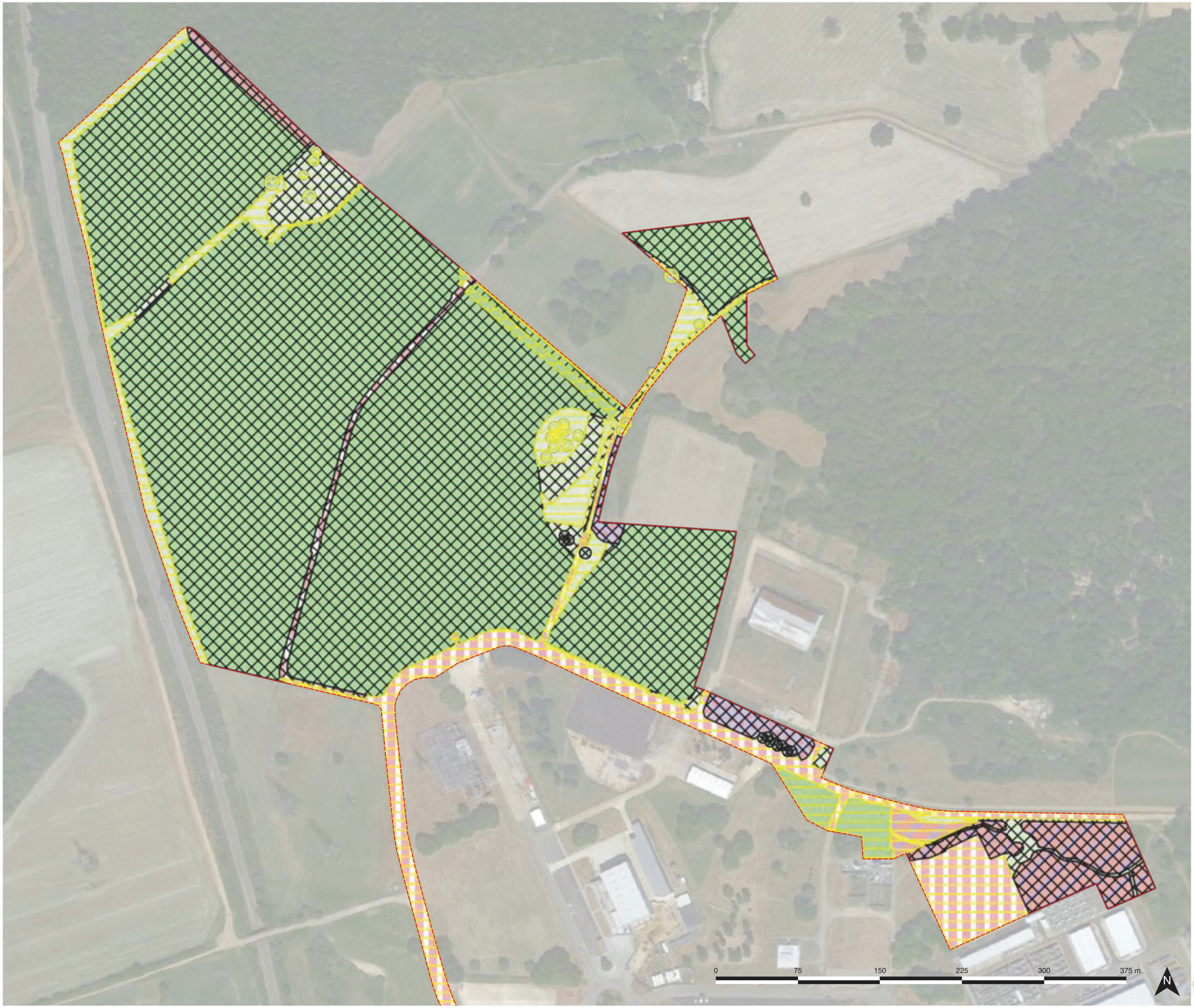

LEGEND

Site Boundary

- Site Boundary (26.91 ha)

Retained Habitats

- Bramble scrub (0.1486 ha)
- Buildings (0.0045 ha)
- Developed land; sealed surface (3.2679 ha)
- Modified grassland (0.5199 ha)
- Other neutral grassland (1.2742 ha)

Lost Habitats

- Blackthorn scrub (0.1357 ha)
- Bramble scrub (0.8769 ha)
- Developed land; sealed surface (0.2531 ha)
- Mixed scrub (0.281 ha)
- Modified grassland (19.0811 ha)
- Other neutral grassland (1.0694 ha)

Retained Trees

- Rural Tree, small (14 trees)
- Rural Tree, medium (6 trees)

Lost Trees

- Rural Tree, small (10 trees)
- Rural Tree, medium (1 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Impacts

Drawing No.: EBD_2513_DR002

Scale (@A3): 1:3,300

Central Eastings, Northings: 453133, 196452

Date Drawn: 05/04/2024

Drawn by: ASp

Approved by: BG

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LEGEND

Site Boundary

- Site Boundary (26.91 ha)
- Bramble scrub (0.1486 ha)
- Developed land; sealed surface (9.7932 ha)
- Buildings (0.0045 ha)
- Mixed scrub (1.6165 ha)
- Modified grassland (0.8826 ha)
- Other neutral grassland (11.9869 ha)
- Other woodland; broadleaved (2.1781 ha)
- Ponds (Priority Habitat) (0.0668 ha)
- Sustainable urban drainage feature (0.2351 ha)
- Rural Tree, Small (85 trees)
- Rural Tree, Medium (6 trees)
- Native hedgerow (0.48 km)
- Native hedgerow with trees (0.52 km)
- Line of trees (0.08 km)

0 75 150 225 300 375 m

N

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Application Scheme Proposals

Drawing No.:	*Scale (@A3):*
EBD_2513_DR003	1:3,300
Central Eastings, Northings:	*Date Drawn:*
453133, 196452	05/04/2024
Drawn by:	*Approved by:*
ASp	BG

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F1
F2
F3
F4
F5
F6
F7

0 50 100 150 200 250 m

N

LEGEND

Site boundary (25.37 ha)

Habitats

Bramble scrub (0.9931 ha)

Developed land; sealed surface (2.2073 ha)

Buildings (0.0045 ha)

Mixed scrub (0.2677 ha)

Modified grassland (19.559 ha)

Other neutral grassland (2.3414 ha)

Trees

M Rural tree, medium (19 trees)

S Rural tree, small (24 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Appeal Scheme Baseline

Drawing No.: EBD_2513_DR001

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 06/12/2024

Drawn by: JE

Approved by: BG

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LEGEND

Site boundary (25.37 ha)

Habitats

Retained and enhanced

Developed land; sealed surface (0.0279 ha)

Retained

Bramble scrub (0.1476 ha)

Buildings (0.0045 ha)

Developed land; sealed surface (1.9264 ha)

Mixed scrub (0.2185 ha)

Modified grassland (1.243 ha)

Other neutral grassland (1.2526 ha)

Lost

Bramble scrub (0.8455 ha)

Developed land; sealed surface (0.253 ha)

Mixed scrub (0.0492 ha)

Modified grassland (18.316 ha)

Other neutral grassland (1.0888 ha)

Trees

Retained

S Rural Tree, small (21 trees)

M Rural Tree, medium (6 trees)

Lost

S Rural Tree, small (3 trees)

M Rural Tree, medium (13 trees)

0 50 100 150 200 250 m

N

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Appeal Scheme Impacts

Drawing No.: EBD_2513_DR002

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 06/12/2024

Drawn by: JE

Approved by: BG

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H1
H2
H3
H4
H5
H6

0 50 100 150 200 250 m

N

LEGEND

Site boundary (25.37 ha)

Habitats

- Bramble scrub (0.1476 ha)
- Developed land; sealed surface (8.0675 ha)
- Buildings (0.0045 ha)
- Mixed scrub (1.4467 ha)
- Modified grassland (1.3645 ha)
- Other neutral grassland (11.5368 ha)
- Other woodland; broadleaved (2.5043 ha)
- Ponds (Priority Habitat) (0.066 ha)
- Sustainable urban drainage feature (0.2351 ha)

Hedgerows

- Native hedgerow (0.2 km)
- Native hedgerow with trees (0.73 km)
- Line of trees (0.08 km)

Trees

- S Rural tree, small (241 trees)
- M Rural tree, medium (6 trees)

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Appeal Scheme Proposals

Drawing No.: EBD_2513_DR003

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 06/12/2024

Drawn by: JE

Approved by: BG

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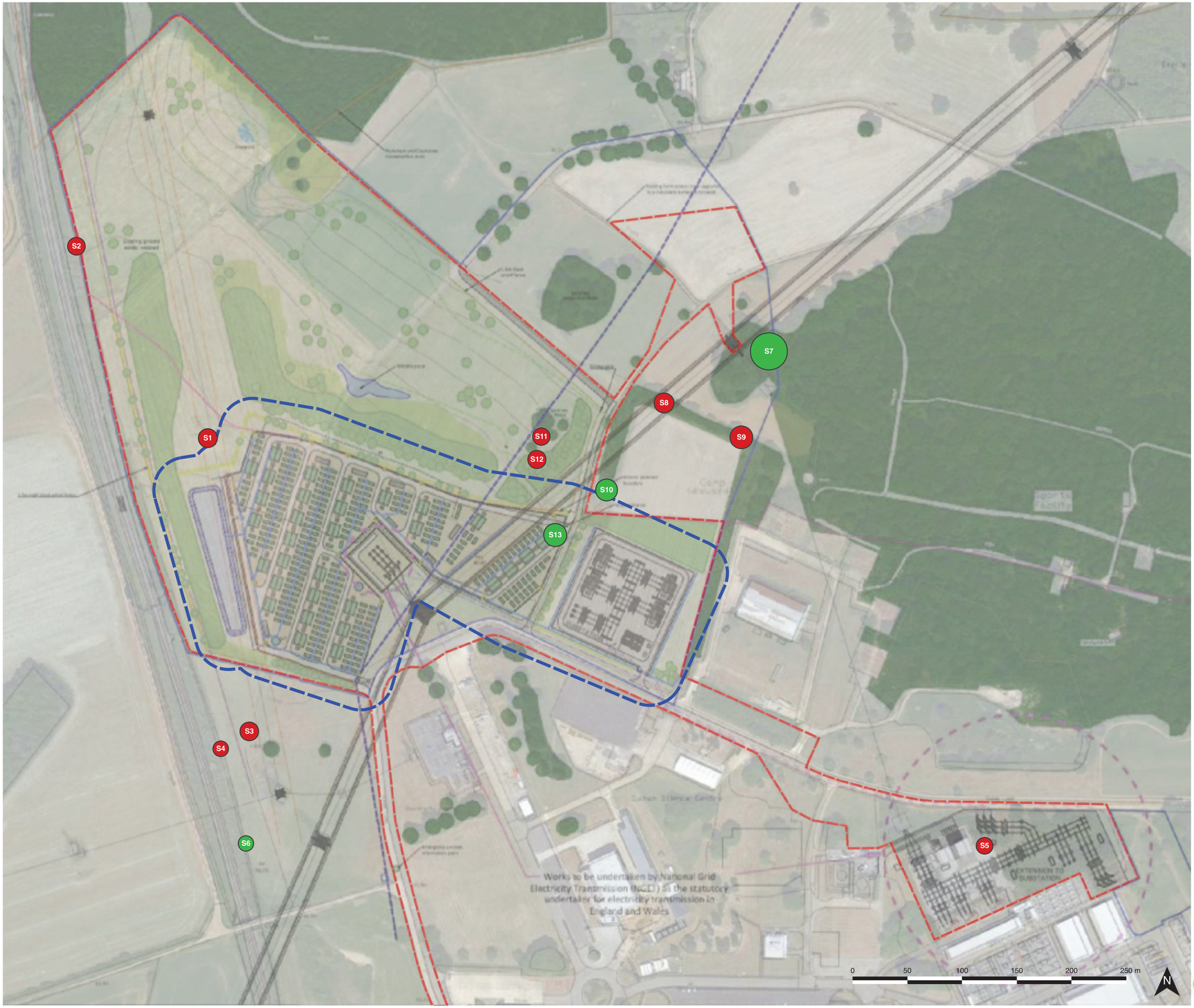

LEGEND

Site boundary (25.37 ha)

Infrastructure 30m buffer

Badger sett

Active

Inactive

Location (1:75,000):

Project:

Culham Battery Storage

Client:

Stratera Energy

Drawing Title:

Badger Setts

Drawing No.: EBD_2513_DR004

Scale (@A3): 1:3,300

Central Eastings, Northings: 453144, 196442

Date Drawn: 04/12/2024

Drawn by: JE

Approved by: BG

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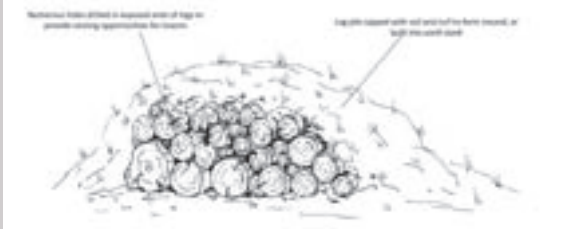
Appendix 3 – Definitions of the Geographic Context of Habitat Importance

Geographic Context of Importance	Examples
International value	Ramsar Sites, Special Protection Areas, Biosphere Reserves, Special Areas of Conservation. Sites supporting populations of internationally important species.
National value	SSSIs or non-designated Sites meeting SSSI selection criteria, NNRs, Marine Nature Reserves, NCR Grade 1 Sites. Sites containing viable areas of key habitats identified in the UK Biodiversity Action Plan.
Regional value	Sites containing viable areas of threatened habitats listed in a Regional BAP (or some Natural Areas), comfortably exceeding SINC criteria, but not exceeding SSSI criteria.
County / Metropolitan	Sites meeting the criteria for county or metropolitan designation (SINC, CWS, etc.). Ancient semi-natural woodland, LNRs or viable areas of key habitat types listed in county BAPs/Natural Areas.
District / Borough	Undesignated Sites or features considered to appreciably enrich the habitat resource in the District or Borough.
Local i.e. Parish / Neighbourhood	Undesignated Sites or features which appreciably enrich the habitat resource within the Parish or Neighbourhood.
Negligible value	Low grade and widespread habitats.

Appendix 4 – Definitions of the geographic Context of Species Importance

Geographic Context of Importance	Examples
International	Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of any internationally important species.
National	Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A regularly occurring, regionally or county significant population/number of any nationally important species.
Regional	Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; A regularly occurring, locally significant number of a regionally important species.
County/ Metropolitan	Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan “red data book” or BAP on account of its regional rarity or localisation; A regularly occurring, locally significant number of a County/Metropolitan important species.
District / Borough	A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation; A regularly occurring, locally significant number of a District / Borough important species during a critical phase of its life cycle.
Local i.e. Parish / Neighbourhood	Species that are not threatened but are valued at a local level on intrinsic appeal.
Negligible	Common or widespread species.

Appendix 5 – Recommended Enhancements

Products	Description
	**3S Schwegler Starling Nest Box (or similar)** A versatile box that attracts other species such as woodpeckers, nuthatches and pied flycatchers. http://www.nhbs.com/title/177925/3s-schwegler-starling-nest-box
	**2F Schwegler Bat Box (or similar)** A standard bat box for smaller bats to be placed on a mature tree. http://www.nhbs.com/2f-schwegler-bat-box-general-purpose
	**Buried Log Piles** Partially buried log piles provide valuable shelter and foraging resources for reptiles and a range of invertebrates and other wildlife. Buried log piles are particularly beneficial when constructed from pre-existing dead wood taken from the site. Wood from any broadleaved tree can be used but oak, beech and fruit trees support the richest invertebrate assemblages.