

Gate Burton Energy Park

EN010131

Biodiversity Net Gain Assessment
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Prepared for:

Gate Burton Energy Park

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1. Introduction

- 1.1.1 This Biodiversity Net Gain (BNG) assessment has been prepared on behalf of Gate Burton Energy Park Limited (hereafter referred to as the 'Applicant'), for the Gate Burton Energy Park (hereafter referred to as 'the Scheme').
- 1.1.2 The Scheme will comprise the construction, operation, maintenance, and decommissioning of a solar photovoltaic (PV) electricity generating facility with a total capacity exceeding 50MW, an energy storage facility and an export connection to the National Grid, at the existing Cottam Power Station. The Scheme will be located within the 'Order limits' (as described below) and is the subject of a DCO application. The Scheme is described in **ES Volume 1, Chapter 2: The Scheme [EN010131/APP/3.1]**.
- 1.1.3 The BNG assessment has been undertaken to quantify the potential overall effect of the Scheme upon the site's biodiversity value. This is achieved by comparing the sites baseline habitat value with that of the Scheme. Calculations consider the level of proposed habitat loss, retention, enhancement and/or creation delivered by the Scheme and are measured using DEFRA's Biodiversity Metric 3.1 (Ref 1) in accordance with the accompanying guidance (Ref 2) and best practice principles (Ref 3). The report sets out the results of the BNG assessment including the methodology in Section 2, the results in Section 3, and the conclusions in Section 4.

1.2 Site Description

- 1.2.1 The Order limits, as shown on the 'Baseline Plan' (Appendix A) is located approximately 4 km south of Gainsborough. The Order limits is approximately 824 ha in size and is dominated by arable fields with game crop strips (approximately 652 ha). The remaining area (approximately 170 ha) comprises mainly of arable fields but also incorporates hedgerows and watercourses including the River Trent.
- 1.2.2 A Local Wildlife Site (LWS) is located within the Order limits. Cow Pasture Lane Drains LWS is approximately 0.45 ha in size.

1.3 The Scheme

- 1.3.1 Details for the Scheme are set out in the post Development Plan (Appendix B). The larger portion of the Order limits (652 ha of arable fields) will form the Solar and Energy Storage Park, which will include a number of structures, substations, compounds (both permanent and temporary) and associated fencing and security. The further 170 ha will form the Grid Connection Corridor including access tracks and temporary roads and compounds.
- 1.3.2 The Scheme will consist of the following principle infrastructure:
- Solar PV modules;
 - PV module mounting structures;

- Inverters;
- Transformers;
- On-site substation;
- On-site cabling;
- Energy storage system;
- On-site electrical compounds (including substations and control buildings);
- Approximately 7.5km electrical connection route;
- Off-site electrical compound (including substation and control building);
- Storage building or enclosure;
- Fencing and security;
- Access tracks; and
- Associated landscaping and biodiversity enhancement.

1.4 Policy context

National Legislation

- 1.4.1 It is government policy that planning decisions should minimise impacts on and provide net gain for biodiversity (National Planning Policy Framework 2021) (Ref 4). In addition, the Environment Act 2021 includes provisions to make biodiversity net gain (BNG) a mandatory requirement within the town and country planning system in England.
- 1.4.2 As a Nationally Significant Infrastructure Project (NSIP), the Scheme will instead require consent via a Development Consent Order (DCO) which is not currently subject to any mandatory biodiversity net gain requirements. It is however anticipated that secondary legislation mandating the need for NSIP's to provide a minimum of 10% net gain in biodiversity through development will become mandatory in the mid-2020s.

Local Planning Policy

- 1.4.3 For planning context the following local planning policies are relevant to the Scheme and the requirements to deliver biodiversity net gain.
- The Bassetlaw Local Plan (Ref 5) includes Policy ST40: Biodiversity and Geodiversity;

“All new development should make provision for at least 10% net biodiversity gain on site, or where it can be demonstrated that for design reasons this is not practicable, off site through an equivalent financial contribution. A

commuted sum equivalent to 30 years maintenance will be sought to manage the biodiversity assets in the long term.”

- The Central Lincolnshire Local Plan (Ref 6) includes **Policy LP21** relating to the ancient woodland located adjacent to the Site. Ancient woodland is excluded from the Metric as it is an irreplaceable habitat;

“Planning permission will be refused for development resulting in the loss, deterioration or fragmentation of irreplaceable habitats, including ancient woodland and aged or veteran trees”

- The West Lindsey Local Plan (Ref 7) includes **Policy NBE 12: Development Affecting Locally Designated Nature Conservation Sites and Ancient Woodlands** in relation to habitat and Site retention;

“Development will not be permitted which would adversely affect any of the following, unless there is a demonstratable overriding regional or local need for the development which cannot be accommodated elsewhere and the reason for the development clearly outweighs the need to safeguard the substantive nature conservation value of the site:

- I. *Sites of Nature Conservation Importance;*
- II. *A Local Nature Reserve;*
- III. *A Lincolnshire Trust Nature Reserve;*
- IV. *A Regionally Important Geological or Geomorphological Site;*
- V. *Ancient Woodlands;*
- VI. *Any species of animal or plant, or its habitat, protected under British or European Law.”*

Minimum BNG Requirement

- 1.4.4 Therefore, at a minimum, the Scheme will be seeking to achieve no net loss in biodiversity to align with the NPPFs aim to minimise impacts on and provide net gains for biodiversity.

2. Methodology

2.1 Biodiversity Metric 3.1

- 2.1.1 The BNG assessment involves making a comparison between the biodiversity value of habitats present within the Site prior to development (i.e., the ‘baseline’) and the predicted biodiversity value of habitats following the completion of the development (i.e., ‘post-development’). The comparison is made in terms of ‘biodiversity units’, with a ‘biodiversity metric’ providing the mechanism to allow biodiversity values to be calculated and compared.
- 2.1.2 Biodiversity Metric 3.1 (Ref 1) calculates the overall loss or gain of biodiversity of development projects by assessing the distinctiveness (i.e., type of habitat and its value), condition, extent, and strategic significance of habitats on site pre- and post-development, including both permanent and temporary land-

take areas. To achieve biodiversity net gain, the biodiversity unit score must have a post-development score higher than the baseline score.

- 2.1.3 When calculating the post-development biodiversity units, the metric includes a series of standard ‘risk multipliers’ to account for the inherent risk of creating and restoring habitats, the time taken to establish habitats and the location of the mitigation in relation to the habitats lost on site. The risk multipliers have the effect of reducing the value of the proposed habitats, which means larger areas, habitats of higher distinctiveness, and/or condition are required to mitigate for losses and achieve net gain.
- 2.1.4 The metric assesses and generates separate outputs for area-based habitats¹ (measured in habitat units) and linear based habitats, including hedgerows (measured in hedgerow units) and rivers (measured in river units). To claim a net gain in biodiversity, there must be an increase across all habitats, hedgerow and river units, the units cannot be summed to give an overall biodiversity unit value i.e., an increase in habitat and hedgerow units cannot be used to offset a loss in river units.
- 2.1.5 The information required to undertake the calculation is described below.

Baseline Data

- 2.1.6 Phase 1 habitat data collected by AECOM in August 2021 (Ref 8) with update walkovers in April 2022 (Ref 9) (hereafter referred to as ‘the baseline’) have been utilised to determine the baseline area-based habitats within the Site. The baseline habitats were converted from standard Phase 1 Habitat types (Ref 9) to UKHab Classification categories (Ref 10) (Appendix C) before being digitised in Geographic Information System (GIS) to provide area and length measurements of each habitat type.
- 2.1.7 All baseline habitats defined within the Order limits were assigned a condition using the condition assessment criteria outlined in the Biodiversity Metric 3.1 – User Guide and Technical Supplement (Ref 2) by a suitably qualified ecologist. The data was aggregated and entered into the metric to calculate the baseline biodiversity units.

River habitats

- 2.1.8 For rivers, habitat categories, associated distinctiveness, and condition scores have been defined as per current guidance (Ref 2). A desk study was undertaken to identify all watercourse habitats present within the Order limits using the ‘Discovering Priority Habitat in England’ river data map (Ref 11). Following this, water body habitats were assigned a habitat category (according to the criteria: Priority Habitat, Other Rivers and Streams, Ditches,

¹ This includes all area-based terrestrial and intertidal habitats. All habitats from the low water mark to the high-water mark can and should be assessed using Metric 3.1 where they are impacted by development. Any marine habitats beyond the low water mark cannot be assessed using Metric 3.1.

Canals, Culvert) and distinctiveness using Section 41 of the NERC Act's Priority Habitat descriptions (Ref 12).

- 2.1.9 Following the desk study, a scoping exercise was carried out to identify water bodies that are to be impacted by the Scheme, i.e., through culverting for access road crossings and open-cut crossings along the Grid Connection Corridor. Only water bodies that have been assessed as being impacted by the Scheme have been included in this assessment.
- 2.1.10 Water body crossings were given a “sensitivity classification” based on assessment of aquatic ecology receptors and the severity of potential impact from the Scheme. Further information is detailed in **ES Volume 3: Appendix 8-E [EN010131/APP/3.3]**. Only higher sensitivity water bodies with potential impacts from crossing points were surveyed. Water bodies with lower sensitivity were given a precautionary condition by way of a desk-based assessment of readily available information from previous surveys, as well as aerial imagery.
- 2.1.11 To assess condition of rivers and streams, Modular River Physical (“MoRPh”) surveys were undertaken by accredited surveyors on the 7th/8th of September and 29th of November in line with Natural England Guidance. The survey utilises the MoRPh5 survey methodology (Ref 13)(Ref 14), to record the physical and vegetation structural features across the river bed, bank face and riparian zone (extending to 10m from the bank top). While undertaking the field survey, the average width of the watercourse was determined and used to calculate the individual survey module lengths. Five contiguous modules were then surveyed to provide data for one sub-reach. If the length of one sub-reach was not equal to or greater than 20% of the total length of the watercourse within the Scheme boundary, further sub-reaches were surveyed until this condition was met.
- 2.1.12 Post-survey, an additional desk-study was conducted to determine the river type of the water bodies. The reach length, planform, confinement, and sinuosity of watercourses were determined using information from Google Earth (Ref 15) to ascertain the geomorphic river type. This river type was combined with the indicative condition score (as determined by the MoRPh field surveys) to provide the final watercourse baseline condition.
- 2.1.13 Habitat classification, length measurement values, strategic significance, condition data and watercourse and riparian encroachment information were then inputted to the metric to determine the baseline biodiversity units for river habitats within the Order limits.

Post-Development Data

- 2.1.14 The Outline Landscape Masterplan (see **ES Volume 2: Figure 10-23 [EN010131/APP/3.2]**) has been used to determine the extent and type of habitats to be lost, retained and/or created post-development. Habitats in the Outline Landscape Masterplan (see **ES Volume 2: Figure 10-23 [EN010131/APP/3.2]**) were converted to UKHab Classification categories (Appendix C) before being digitised into GIS to produce the ‘Post-Development’ Plan (Appendix B). Target condition scores for the proposed habitats were selected in accordance with Biodiversity Metric 3.1 User Guide

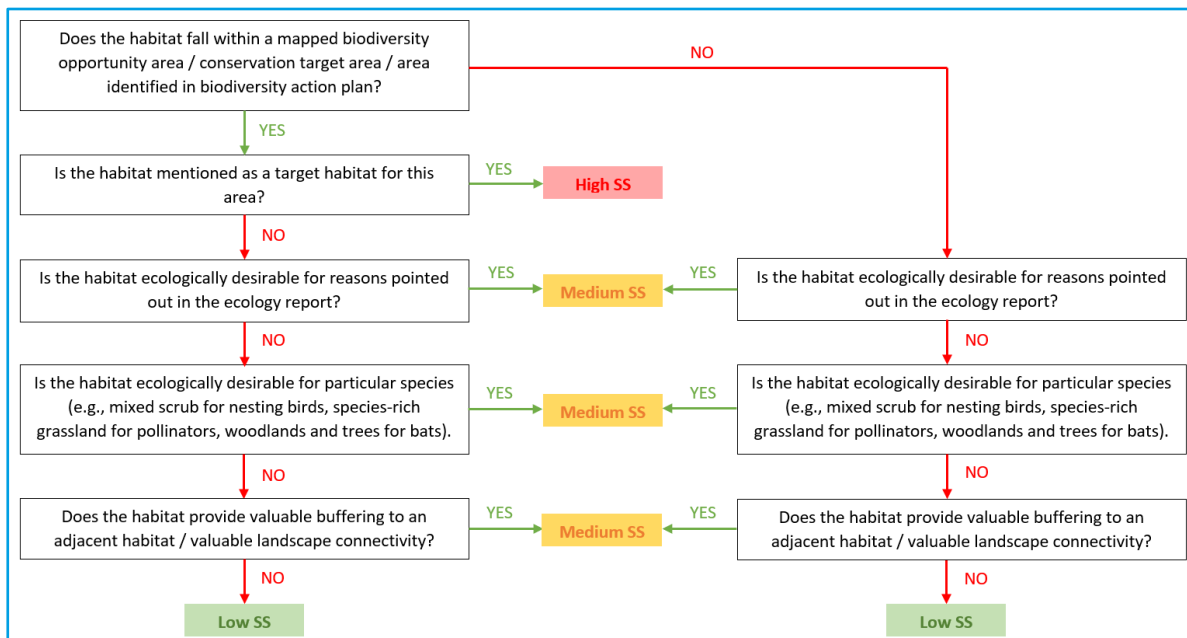
and Technical Supplement (Ref 2) using professional judgement to ensure the condition scores selected were realistic. The data was utilised to predict the post development biodiversity units.

2.1.15 The majority of works within the Grid Connection Corridor are temporary or involve avoiding impacts to habitats via horizontal directional drilling (HDD). It is intended that the majority of habitats will be either retained or reinstated post-construction. The Metric 3.1 User Guide (Ref 1) states *“Where a habitat is disturbed for a short period of time, it may be considered temporary loss if specific criteria are met. If these criteria are met, then the habitat may be recorded as ‘retained’ within the metric tool. The temporary loss option is **only** available for disturbed habitats that can be restored (in full) to their baseline condition (or better) within 2 years from the date of impact”*. As the predicted construction period for the Site is anticipated to be 24 – 36 months, temporary works within the Grid Connection Corridor will not qualify for the ‘retained’ status within the metric. In this instance temporarily lost habitats were inputted as ‘lost’ and subsequently ‘created’ within the metric to accurately capture the timing of reinstatement.

Strategic Significance

2.1.16 Metric 3.1 requires that the strategic significance (hereafter referred to as ‘SS’) of all baseline and post-development habitats be defined. SS refers to strategic locations for local biodiversity and nature improvements, identified within local planning policies. The process of how the SS of a habitat is assessed is shown in Figure 1.

Figure 1. Strategic Significance Guidance



2.1.17 As part of this assessment, the following relevant documents were reviewed to determine the SS of the habitats on the Site:

- Central Lincolnshire Local Plan (Ref 6);
- Bassetlaw Local Plan 2020-2037 (Ref 5);

- West Lindsey Local Plan 2017 (Ref 7)
- Central Lincolnshire Green Infrastructure Steering Group: Biodiversity Opportunity Mapping Study for Central Lincolnshire (Ref 16);
- Lincolnshire Biodiversity Action Plan (Ref 17);
- Nottinghamshire Biodiversity Action Plan (Ref 18);
- Gate Burton Energy Park PEA – Preliminary Ecological Appraisal (Ref 8); and
- Magic (Ref 19).

2.1.18 River habitats follow a different methodology for SS and can only be Low SS or High SS if they fall within one of the following: Within Local Plans, Within River Basin Management Plan, Within Catchment Plans, Within Catchment Planning System or Within Priority Habitats for Restoration.

Assumptions

2.1.19 In undertaking the calculation, the following assumptions have been made:

Area based habitats and hedgerows

- Habitats created as part of the Scheme will be subject to appropriate ongoing management as set out in the **Outline Landscape and Ecological Management Plan (OLEMP) [EN010131/APP/7.10]** and monitored to ensure correct establishment and growth. Remedial action will be taken if this does not proceed as expected to achieve the target conditions in the specified timeframes according to the metric;
- Guidance published by BRE recognises that on average 95% of a site used for solar farm development is *“still accessible for plant growth and potentially for wildlife enhancements and complementary agricultural activities such as conservation grazing”* (Ref 20). As such 95% of the solar array footprint within the proposed fence lines have been categorised as the UKHab habitat ‘Grassland – Modified grassland’ with the remaining 5% allocated within the metric as ‘sealed surface’ to take into account array infrastructure. This approach is understood to be supported by the RSPB (Ref 21);
- Areas of modified grassland under panels have been assigned a post development target condition of ‘moderate’ to acknowledge both the prolonged levels of shading these areas will receive over the lifetime of the Scheme and the seed mixes and management prescriptions as specified in the OLEMP.
- Any loss of biodiversity units arising from temporary impacts within the Grid Connection Corridor will be ‘offset’ within the Solar and Energy Storage Park;

- No time delay in habitat creation has been applied as works are expected to be completed within 24-36 months;
- Works along the GCC will be done in phases to ensure there is no habitat loss exceeding 24 months and habitats will be restored to their baseline condition within this time period;
- All baseline habitats of the same type and condition have been aggregated within the metric, due to the findings from the ecology survey concluding relative uniformity within habitat types across the Order limits;
- Where temporary access points or visibility splays are proposed hedgerows have been assumed to be lost and reinstated;
- Where permanent access points or visibility splays are proposed permanent hedgerow loss has been assumed;
- Cow Pasture Lane LWS and the River Trent will not be directly impacted for the duration of the works as works will follow HDD methodologies with drilling occurring at a depth equal to or greater than 3m;
- To prevent direct or indirect impacts to an area of adjacent ancient woodland a 15m buffer of naturally regenerating scrub will be created and works avoided in this area.

Rivers, Streams and Ditches

2.1.20 The river metric assessment was completed based on a worst-case scenario of impacts, which consisted of the following assumptions:

- Culverts will be extended by a maximum of 2m where there is an existing crossing. This has been assessed in the metric as a worst-case scenario for each existing crossing;
- New culverts will be installed at any new crossings and are assumed to consist of 6m water body length;
- Culverts within the Grid Connection Corridor have been assessed as being permanent due to being in place for 24-36 months. If culverts are removed post-construction it is recommended that a further BNG assessment of watercourses is undertaken to ensure the baseline condition is representative of that at the time;
- HDD will be used for cable laying under the higher sensitivity water bodies (as shown by the avoidance areas (as shown on **ES Volume 3: Appendix 2-B (Figure 1) [EN010131/APP/3.3]**);
- One haul road crossing will be required for each water body (with the exception of the River Trent and Watercourse 1). Each of these crossings is assumed to be 6m wide and it is assumed that each water body being crossed will require installation of a culvert to facilitate the haul road.

- To prevent impacts to the LWS, a bailey bridge will be used for access across Cow Pasture Lane Drain. In addition, to align with requirements identified in the Ecology Chapter for water voles utilising Tributary 2 of Padmoor Drain (denoted as Watercourse 7 in the Ecology Chapter) within the Solar and Energy Storage Park, a bailey bridge or existing crossing points will be used for access. The bailey bridges will be approximately 6m wide and will be in place for a maximum of 24 months;
- It is assumed that haul roads within the Grid Connection Corridor will be removed after 5 years. However, within the biodiversity metric 3.1, *“where the habitat cannot be restored to its baseline value within 2 years of the date of impact this should be recorded as a loss of baseline habitat and creation of the replacement habitat”*(Ref 2);
- For the open cut crossings, a single trench will be installed. This has been assessed as a temporary impact, as the disturbed habitat will be restored to its baseline condition (or better) within 2 years of the date of impact (Ref 2);
- A 10m exclusion zone for all rivers and ditches is assumed for all solar panels and access roads (where they do not cross the water body);
- The Scheme will only result in those impacts to water bodies as described in this report within the post development section below;
- Where habitat condition has been assigned from desk-based assessment alone, i.e., for water bodies of low sensitivity, a reasonable precautionary approach has been adopted to prevent underestimating the value of the baseline habitat;
- There are some water bodies within the Order limits that are not included within this BNG assessment as it is understood under the current design there will be no impacts to these ditches, watercourses, or their riparian zones (10m from the bank-top either side). However, these are assessed in the Water Framework Directive (WFD) assessment presented in Appendix 9-A of the Environmental Statement (Ref 17);
- The MoRPh and ditch condition assessment surveys assess water body condition based on physical and morphological features, not biological elements of watercourse condition; these are assessed in Appendix 8-E of the Environmental Statement (Ref 17);
- Some ditches were scoped out of the river metric based on the assessment that they likely do not hold water for more than four months of the year (Ref 2), and therefore they are assessed as part of the adjacent area-based habitats or associated features; and
- If proposed lengths of enhancements are not adhered to, there is potential for a loss of watercourse habitat units.

Constraints or Limitations

2.1.21 The following limitations also apply:

- The total areas of the Solar and Energy Storage Park and the Grid Connection Corridor may vary slightly within the metric. This difference is caused by the rounding of areas of individual habitats within the dataset to three decimal places. This has a negligible impact on the assessment as a whole due to the minor variation in area and lengths;
- All habitat areas and lengths have been measured using ArcGIS based on the Phase 1 Habitat Plan and the Outline Landscape Masterplan (see **ES Volume 2: Figure 10-23 [EN010131/APP/3.2]**), as such habitat areas are approximations only; and
- The metric calculation includes the loss of small areas of woodland and hardstanding. These losses are an artifact of the GIS mapping process and have arisen when combining proprietary and third-party data with the published Order limits. For completeness these losses are annotated in the accompanying metric, however, no real-world impacts upon these habitats will result.

3. Results

3.1 Biodiversity Metric 3.1 Calculation Tool Output

Baseline Habitats

- 3.1.1 The Order limits covers a total area of 824ha. The habitats identified on Order limits vary in ecological value, ranging from 'very low' to 'medium' distinctiveness. The Baseline Plan is provided in Appendix A. The most dominant habitat in the Solar and Energy Storage Park area is 'Cropland – Cereal crops' with a total of approximately 564ha. The most dominant habitat along the Grid Connection Route was also 'Cropland – Cereal Crops' covering a total of approximately 93ha. Several hedgerows, including lines of trees were present throughout the Order limits and have been captured within the 'Hedgerows' tab of the Metric 3.1 Calculation Tool.
- 3.1.2 A number of 'Avoidance Areas' have been identified along the Grid Connection Corridor. These areas comprise highly valuable habitats, including the Cow Lane Local Wildlife Site, that require retention. In order to retain these habitats and avoid direct and indirect impacts works in these areas will take place via HDD.
- 3.1.3 As mentioned previously in Section 2.1.5, 'dry ditches' (when dry for >4 months of the year) are primarily excluded from the metric and their length is incorporated into the adjacent terrestrial habitat. However, in the case when a 'dry ditch' runs alongside a hedgerow or a line of trees, the ditch is identified as being part of the habitat with 'associated with ditch or bank' being included

within the UKHab hedgerow terminology. This enables both ecological functions of the 'dry ditch' and hedgerow/line of trees to be captured.

3.1.4 As outlined in Section 2.1.3, SS has been assigned to all baseline habitats present within the Site. High SS has been assigned to all habitats within a Biodiversity Opportunity Area (BOA), LWS or that are identified as being priority habitat on MAGIC (Ref 19).

3.1.5 Medium SS has been assigned to the following habitats as they have been identified as providing suitable habitat for protected and/or priority species:

- Cropland – Arable field margins game bird mix;
- Cropland – Cereal crops;
- Grassland – Modified grassland (acid grassland);
- Grassland – Modified grassland;
- Grassland – Other neutral grassland (marshy grassland);
- Grassland – Other neutral grassland;
- Heathland and shrub – Mixed scrub;
- Woodland and forest – Lowland mixed deciduous woodland;
- Woodland and forest – Other woodland; broadleaved;
- Woodland and forest – Other woodland; mixed;
- Native hedgerow;
- Native hedgerow associated with bank or ditch;
- Native hedgerow with trees;
- Native hedgerow with trees associated with bank or ditch;
- Native species rich hedgerows;
- Native species rich hedgerows associated with bank or ditch;
- Native species rich hedgerow with trees; and
- Native species rich hedgerow with trees associated with bank or ditch.

3.1.6 All other habitats that do not meet the criteria detailed above have been assigned Low SS.'

3.1.7 Detailed descriptions of each baseline habitat is present in Appendix D with justification for their condition scores provided in Appendix E.

Rivers and wet ditches

3.1.8 A total of 33 water body crossing points were identified within the Solar and Energy Storage Park and Grid Connection Corridor, impacting a total of five rivers and 25 ditches. A total of 20 ditches were assessed during scoping surveys as dry (i.e., do not hold water for more than four months of the year)

and were therefore scoped out of the river metric – these dry ditches have been assessed as part of the adjacent area-based habitats or in association with a hedgerow or line of trees where relevant. The River Trent will be crossed by HDD with no haul road crossing and is therefore not considered to be directly impacted. A number of culverts were identified during the MoRPH survey, these have not been detailed on the Baseline or Post-development plans, however they have been measured at varying between 2-8 m and have been included within the metric to reflect this. River habitats were identified as being both Low and High SS with watercourses being identified within Local Plans and Catchment Plans.

Rivers

- 3.1.9 A total of 3.724km of river and stream habitats are present within the baseline habitats. This consists of 3.679km of “*Other Rivers and Streams*” habitat and 0.045km of existing culvert habitat. Further detailed information on the rivers within the Site is provided in Appendix D.
- 3.1.10 The impacted river and stream habitats within the Solar and Energy Storage Park are comprised of:
- 0.57 km of a tributary of Padmoor Drain (SK 84969 85595, hereafter referred to as “tributary 1 of Padmoor Drain”); and
 - 1.935 km of another tributary of Padmoor Drain (SK 84960 83947, hereafter referred to as “tributary 2 of Padmoor Drain”).
- 3.1.11 Within the Grid Connection Corridor, the impacted habitats are comprised of:
- 0.292 km of Seymour Drain (SK 82077 80720); and
 - 0.145 km of Marton Drain (SK 83674 81172).

Wet ditches

- 3.1.12 Some water body habitats to be impacted by the Scheme were considered to be “ditches”. Ditches are assessed separately to rivers and streams in the River Metric and are defined for Biodiversity Metric 3.1 as “*artificially created linear water-conveyancing features that are less than 5 m wide and are likely to hold water for more than four months of the year. Their hydraulic function is primarily for land drainage and although partially or fully connected to a river system, they would not have been present without human intervention*” (Ref 2).
- 3.1.13 Any water bodies that have been scoped into the assessment as ditches under this definition are therefore subjected to a ditch condition assessment within the Metric 3.1 Technical Supplement, which involves conducting a survey in the field that uses eight criteria to assess condition. These criteria include water quality and levels, macrophyte abundance and morphotype diversity, presence of marginal vegetation, physical damage, shading, and presence of invasive non-native species (INNS). The greater the number of criteria the ditch achieves, the better the condition score attributed to it.
- 3.1.14 A total of 2.582km of ditch habitats are present within the baseline habitats, assessed as being impacted by the Scheme. This consists of 2.577km of ditch

habitat and 0.005km of existing culvert habitat. Further information on the wet ditches within the Order limits is provided in Appendix D.

3.1.15 The impacted wet ditch habitats within the Solar and Energy Storage Park are comprised of:

- 0.333km of an unnamed ditch (SK 85152 85428, hereafter referred to as “Ditch 1”).

3.1.16 Within the Grid Connection Corridor, the impacted habitats are comprised of:

- 0.141km of an unnamed ditch (SK 84923 81947, hereafter referred to as “Ditch 2”);
- 0.151km of Carr Drain (SK 82630 80923);
- 0.161km of an unnamed ditch (SK 81421 80610, hereafter referred to as “Ditch 3”);
- 0.616km of Cow Pasture Lane Drain (SK 80697 80258); and
- 0.1.175km of an unnamed ditch (SK 80970 78826), hereafter referred to as “Ditch 4”).

Baseline Habitat Units

3.1.17 The respective baseline biodiversity value for area-based habitats is provided in Table 1. In total, the baseline biodiversity value of the habitats present was calculated as 1,838.38 habitat units.

Table 1 Baseline Area-Based Habitats

Habitat type (UKHab)	Area (ha)	Distinctiveness	Condition	Strategic Significance	Habitat Units
Area-Based Habitats—Solar and Energy Storage Park					
Cropland – Arable field margins game bird mix	13.370	Medium	Condition Assessment N/A	Medium	58.83
Cropland – Arable field margins game bird mix	0.816	Medium	Condition Assessment N/A	High	3.75
Cropland – Cereal crops	550.757	Low	Condition Assessment N/A	Medium	1211.67
Cropland – Cereal crops	13.721	Low	Condition Assessment N/A	High	31.56
Grassland – Bracken	0.321	Low	Condition Assessment N/A	Low	0.64
Grassland – Modified grassland	54.968	Low	Poor	Medium	120.93

Habitat type (UKHab)	Area (ha)	Distinctiveness	Condition	Strategic Significance	Habitat Units
Grassland – Modified grassland	1.682	Low	Poor	High	3.86
Grassland – Modified grassland	0.011	Low	Poor	Medium	0.02
Grassland – Other neutral grassland	0.031	Medium	Moderate	High	0.29
Grassland – Other neutral grassland	0.258	Medium	Moderate	Medium	2.27
Heathland and shrub – Mixed scrub	5.284	Medium	Poor	Medium	23.23
Heathland and shrub – Mixed scrub	0.018	Medium	Poor	High	0.09
Sparsely vegetated land – Ruderal/Ephemeral	0.318	Low	Moderate	Low	1.28
Urban – Developed land; sealed surface	0.249	V.Low	N/A – Other	High	0.00
Urban – Developed land; sealed surface	8.693	V.Low	N/A – Other	Low	0.00
Urban – Vacant/derelict land/ bareground	0.048	Low	Poor	High	0.12
Urban – Vacant/derelict land/ bareground	0.584	Low	Poor	Low	1.15
Lakes – Ponds (Non-Priority Habitat)	0.287	Moderate	Moderate	Medium	2.53
Lakes – Ponds (Non-Priority Habitat)	0.308	Medium	Moderate	Medium	2.71
Woodland and forest – Lowland mixed deciduous woodland	0.003	High	Moderate	Medium	0.04
Woodland and forest – Lowland mixed deciduous woodland*	0.000	High	Moderate	High	0.00
Woodland and forest – Other woodland; broadleaved	0.110	Medium	Poor	Medium	0.48
Woodland and forest – Other woodland; broadleaved	0.490	Medium	Poor	High	2.25
Urban – Urban Tree	0.037*	Medium	Moderate	High	0.34
Urban – Urban Tree	2.271*	Medium	Moderate	Medium	19.98
Total	654.35	-	-	-	1,485.52

Area-Based Habitats - Grid Connection Corridor

Habitat type (UKHab)	Area (ha)	Distinctiveness	Condition	Strategic Significance	Habitat Units
Cropland – Cereal crops	90.132	Low	Condition Assessment N/A	Medium	198.29
Cropland – Cereal crops	3.883	Low	Condition Assessment N/A	High	8.93
Grassland – Modified grassland	41.056	Low	Poor	Medium	90.32
Grassland – Modified grassland	13.116	Low	Poor	High	30.17
Grassland – Modified grassland	1.116	Low	Poor	Medium	2.46
Grassland – Other neutral grassland	0.001	Medium	Moderate	Medium	0.01
Heathland and shrub – Mixed scrub	0.263	Medium	Poor	Medium	1.16
Heathland and shrub – Mixed scrub	0.057	Medium	Poor	High	0.26
Lakes – Ponds (Non-Priority Habitat)	0.004	Medium	Moderate	Medium	0.04
Sparsely vegetated land – Ruderal/Ephemeral	0.569	Low	Moderate	Low	2.28
Urban – Developed land; sealed surface	0.056	V.Low	N/A-Other	High	0.00
Urban – Developed land; sealed surface	15.465	V.Low	N/A-Other	Low	0.00
Urban – Vacant/ derelict land/ bareground	0.182	Low	Poor	High	0.42
Urban – Vacant/ derelict land/ bareground	0.419	Low	Poor	Low	0.84
Woodland and forest – Other woodland; broadleaved	3.263	Medium	Poor	Medium	14.36
Woodland and forest – Other woodland; broadleaved	0.726	Medium	Poor	High	3.34
Total	170.31				352.86
Combined Total	824.66				1,838.38

* The area of trees does not contribute to the total calculated area to avoid double counting, the unit value of trees does however contribute to the overall biodiversity unit value of the Site.

3.1.18 The respective baseline biodiversity value for linear hedgerow habitats is provided in Table 2. In total, the baseline biodiversity value of the hedgerow habitats present was calculated as 367.53 hedgerow units.

Table 2. Baseline Hedgerow Habitats

Habitat type (UKHab)	Length (km)	Distinctiveness	Condition	Strategic Significance	Hedgerow Units
Hedgerows – Solar and Energy Storage Park					
Native Hedgerow	11.844	Low	Moderate	Medium	52.11
Native Hedgerow	1.089	Low	Moderate	High	5.01
Native Hedgerow – Associated with bank or ditch	1.387	Medium	Moderate	Medium	10.06
Native Hedgerow – Associated with bank or ditch	0.487	Medium	Poor	Medium	2.14
Native Hedgerow with trees	3.151	Medium	Moderate	Medium	27.73
Native Species Rich Hedgerow	2.965	Medium	Moderate	Medium	1.53
Native Species Rich Hedgerow	0.166	Medium	Moderate	High	1.53
Native Species Rich Hedgerow – Associated with bank or ditch	2.117	High	Moderate	Medium	27.94
Native Species Rich Hedgerow – Associated with bank or ditch	0.225	High	Moderate	High	3.11
Native Species Rich Hedgerow with trees	2.672	High	Moderate	Medium	35.27
Native Species Rich Hedgerow with trees	0.240	High	Moderate	High	3.31
Native Species Rich Hedgerow with trees – Associated with bank or ditch	0.794	V.High	Moderate	Medium	13.97
Total	26.65	-	-	-	206.14
Hedgerows – Grid Connection Corridor					
Native Hedgerow	3.141	Low	Moderate	Medium	13.82
Native Hedgerow	0.201	Low	Poor	Medium	0.44
Native Hedgerow – Associated with bank or ditch	0.331	Medium	Moderate	Medium	2.91
Native Hedgerow – Associated with bank or ditch	0.458	Medium	Poor	Medium	2.02
Native Hedgerow with trees	2.265	Medium	Moderate	Medium	19.93

Habitat type (UKHab)	Length (km)	Distinctiveness	Condition	Strategic Significance	Hedgerow Units
Native Species Rich Hedgerow	3.930	Medium	Moderate	Medium	34.58
Native Species Rich Hedgerow	1.854	Medium	Moderate	High	17.06
Native Species Rich Hedgerow with trees	0.116	High	Moderate	Medium	1.53
Native Species Rich Hedgerow with trees	0.065	High	Moderate	High	0.90
Native Hedgerow	1.386	Low	Moderate	Medium	6.10
Native Hedgerow	1.983	Low	Moderate	High	9.12
Native Hedgerow – Associated with bank or ditch	0.370	Medium	Moderate	Medium	3.26
Native Hedgerow with trees	0.156	Medium	Moderate	Medium	1.37
Native Species Rich Hedgerow	0.297	Medium	Moderate	Medium	2.61
Native Species Rich Hedgerow	1.128	Medium	Moderate	High	10.38
Native Species Rich Hedgerow with trees	2.679	High	Moderate	Medium	35.36
Total	20.36				161.39
Combined Total	47.01				367.53

3.1.19 The respective baseline biodiversity value for river and ditch habitats are provided in Table 3. In total, the baseline biodiversity value of the river and ditch habitats present was calculated as 38.22 river and ditch units.

Table 3 - Baseline river and ditch habitats

Habitat type	Reference	Length (km)	Distinctiveness	Condition	Strategic Significance	River Units
Rivers and Ditches – Solar and Energy Storage Park						
Other Rivers and Streams	Tributary 1 of Padmoor Drain	0.57	High	Fairly Poor	High	4.42
Culvert	Tributary 1 of Padmoor Drain – existing culverts	0.015	Low	Poor	Low	0.03
Other Rivers and Streams	Trib 2 of Padmoor Drain	1.935	High	Fairly Poor	High	15.02

Habitat type	Reference	Length (km)	Distinctiveness	Condition	Strategic Significance	River Units
Culvert	Trib 2 of Padmoor Drain – existing culverts	0.030	Low	Poor	Low	0.06
Other Rivers and Streams	Watercourse 1	0.587	High	Moderate	High	8.10
Ditches	Ditch 1	0.333	Medium	Poor	High	1.53
Total		3.47				29.17
Rivers and Ditches – Grid Connection Corridor						
Other Rivers and Streams	Marton Drain	0.145	High	Moderate	High	2.00
Other Rivers and Streams	Seymour Drain	0.292	High	Fairly Poor	High	2.27
Other Rivers and Streams	River Trent	0.150	High	Moderate	High	2.07
Ditches	Ditch 2	0.141	Medium	Poor	High	0.65
Ditches	Carr Drain	0.151	Medium	Poor	Low	0.60
Culvert	Carr Drain – existing culvert	0.005	Low	Poor	Low	0.01
Ditches	Ditch 3	0.161	Medium	Poor	Low	0.64
Ditches	Cow Pasture Lane Drain	0.616	Medium	Poor	High	2.83
Ditches	Ditch 4	1.175	Medium	Moderate	Low	9.40
Total	-	2.845	-	-	-	20.48
Combined Total		6.31				49.65

Post-Development Habitats

3.1.20 The Outline Landscape Masterplan (see **ES Volume 2: Figure 10-23 [EN010131/APP/3.2]**) includes provision of several habitats with the dominant created habitat being 'Modified grassland', which is co-located with the solar panel arrays. Sections of hedgerow will be permanently lost to allow for access roads throughout the Site. However, as existing access routes have been used wherever possible most hedgerows will be retained within the Scheme. To avoid any direct or indirect impacts upon adjacent ancient woodland a 15m buffer of naturally regenerating 'Heathland and shrub – Mixed scrub' has been incorporated into the design.

- 3.1.21 The Grid Connection Corridor will require the temporary loss of habitats to create the connections between the Solar and Energy Storage Park and the National Grid at Cottam Substation. In line with the DEFRA Metric 3.1 User Guide, as the construction phase is estimated to last for 3 years habitats identified as being temporarily lost have been recorded in the metric as re-created targeting their baseline condition. All habitats within mapped 'Avoidance Areas', and subject to HDD, have been retained.
- 3.1.22 The majority of hedgerow loss along the Grid Connection Corridor is to facilitate temporary access points and associated visual splays (this includes some hedgerows within Avoidance Areas, as access will still be required to facilitate the underground HDD works). All of these hedgerows, excluding a length on the western boundary allowing highway access, will be reinstated following the completion of the development. The proposed habitats to be created, retained and enhanced are shown on the Post-development Plan in Appendix B.
- 3.1.23 As outlined in Section 2.1.3, SS has been assigned to all post-development habitats proposed within the Outline Landscape Masterplan (see **ES Volume 2: Figure 10-23 [EN010131/APP/3.2]**) SS has been assigned using the same methodology as the baseline with habitats within a BOA, LWS or mapped on Magic being of High SS and those that have importance for protected species being has been assigned. Medium SS. All other habitats have been assigned Low SS.
- 3.1.24 Management prescriptions required for the created habitats to reach their target condition in the specified timeframe is provided in the accompanying LEMP.
- 3.1.25 Details of river enhancement provisions are provided in Appendix F whilst habitat enhancement and creation provisions will be provided within the Outline Landscape and Ecological Management plan (OLEMP) **[EN010131/APP/7.10]**.

Rivers and wet ditches

Rivers

Solar and Energy Storage Park

Tributary 1 of Padmoor Drain

- 3.1.26 A total of 0.015 km of this tributary is to be retained in its current condition, consisting of three existing culverts in "Poor" condition. A total of 0.57 km is proposed to be enhanced from the baseline condition of "Fairly Poor" to "Fairly Good" condition. This will be achieved through the implementation of a 10 m buffer zone on the left bank top for the entirety of its length within the site boundary, where the riparian zone will be re-naturalised by planting a diverse structure of riparian vegetation, including trees and scrub of local provenance to be identified in the landscaping plans. If possible, a smaller buffer zone should also be implemented on the right bank between the river channel and Kexby Lane. Other enhancements include bank face planting of a diverse vegetation structure, including trees and scrub, the marginal planting of aquatic vegetation, bank reprofiling in selected locations to create a diversity

of natural bank profiles, and increasing the extent of bare sediment on the bank face. Filamentous algae growth will likely reduce due to the change in land use from agricultural fields, although existing filamentous algae should be removed where possible. All vegetation being planted should comprise native plant species from within the same catchment to avoid the spread of invasive species. An existing culverted crossing on this tributary will be extended by 2m to facilitate an upgraded access road, resulting in a 2m loss of “Fairly Poor” condition river habitat, and the creation of 2m of culvert habitat at “Poor” condition. There is no change in watercourse or riparian encroachment from the baseline.

Tributary 2 of Padmoor Drain

- 3.1.27 A total of 0.03km of this tributary is to be retained at its current condition, consisting of an existing railway culvert and access track crossing culvert at “Poor” condition. A total of 1.933km is proposed to be enhanced from the baseline condition of “Fairly Poor” to “Fairly Good” condition. This will be achieved through the implementation of a 10m buffer zone, where possible, on both bank tops for the entirety of its length within the site boundary, where the riparian zone can be re-naturalised by planting a diverse structure of riparian vegetation, including trees of local provenance to be detailed in the landscaping plans. Other enhancements include bank face planting of a diverse vegetation structure, including trees and scrub, the marginal planting of aquatic vegetation, bank reprofiling in selected locations to create a diversity of natural bank profiles, and increasing the extent of bare sediment on the bank face. All vegetation being planted should comprise native plant species from within the same catchment to avoid the spread of invasive species. A total of 2m of river habitat at “Fairly Poor” condition will be lost and replaced by the creation of 2m of “Poor” culvert habitat. This is due to a 2m extension of the existing culverted crossing for an access road. There is no change in watercourse or riparian encroachment from the baseline.

Watercourse 1

- 3.1.28 A total of 0.587km of Watercourse 1 will be enhanced from the baseline condition of “Moderate” to “Fairly Good” condition. This will be achieved through the implementation of a 10m buffer zone, where possible, on both bank tops for the entirety of its length within the Site boundary, where the riparian zone can be re-naturalised by planting a diverse structure of riparian vegetation, including trees of local provenance to be detailed in the landscaping plans. Other enhancements include bank face planting of a diverse vegetation structure, including trees and scrub, the marginal planting of aquatic vegetation, bank reprofiling in selected locations to create a diversity of natural bank profiles, and increasing the extent of bare sediment on the bank face. All vegetation being planted should comprise native plant species from within the same catchment to avoid the spread of invasive species.

Grid Connection Corridor

Marton Drain

- 3.1.29 A new 6m culvert will be installed for an access road crossing, which will cause a change from the baseline of “No Encroachment” to “Major encroachment” in

the riparian zone, with the new access road encroaching to within 4m of the channel. Within the metric, this is represented as a loss of the entire 0.145km length of Marton Drain, replaced by the creation of 0.139km of river habitat with major riparian encroachment. Marton Drain will remain at Moderate condition as it is not considered that major encroachment would be sufficient to reduce the condition in the post-development scenario. The new access road crossing will result in the creation of 6m of “Poor” culvert habitat.

Seymour Drain

- 3.1.30 A total of 0.286km of Seymour Drain will be retained at its current condition of “Fairly Poor”. 6m of river habitat will be lost and replaced by the creation of “Poor” culvert habitat, due to a new 6m culvert for an access road crossing. There is no change in watercourse or riparian encroachment from the baseline.

Wet ditches

Solar and Energy Storage Park

Ditch 1

- 3.1.31 A total of 0.327km of this ditch is to be retained at its current condition of “Poor”. 6m of ditch habitat will be lost and replaced by the creation of “Poor” culvert habitat, due to a new 6m culvert for an access road crossing.

Grid Connection Corridor

Ditch 2

- 3.1.32 A total of 0.135km of this ditch will be retained at its current condition of “Poor”. 6m of ditch habitat will be lost and replaced by the creation of “Poor” culvert habitat, due to a new 6 m culvert for an access road crossing.

Carr Drain

- 3.1.33 A total of 0.145km of ditch habitat and 0.005km of culvert habitat will be retained at their current condition of “Poor”. 6m of ditch habitat will be lost and replaced by the creation of “Poor” culvert habitat, due to a new 6m culvert for an access road crossing.

Ditch 3

- 3.1.34 A total of 0.155km of Ditch 3 will be retained at its current condition of “Poor”. 6m of ditch habitat will be lost and replaced by the creation of “Poor” culvert habitat, due to a new 6m culvert for an access road crossing.

Ditch 4

- 3.1.35 A total of 1.169km of ditch habitat will be retained at its current condition of “Moderate”. 6m of ditch habitat will be lost and replaced by the creation of “Poor” culvert habitat, due to a new 6m culvert for an access road crossing.

Post-Development Habitat Units

- 3.1.36 The Post-Development biodiversity value of the habitats (retained and created) was calculated as 441.26 biodiversity units for retained habitat units, Table 4 and 2,701.26 biodiversity units for created habitat units, Table 5.

Table 4 Retained Area-Based Habitats

Habitat type (UKHab)	Area (ha)	Distinctiveness	Condition	Strategic Significance	Habitat Units
Area-Based Habitats-- Solar and Energy Storage Park					
Cropland – Arable field margins game bird mix	0.804	Medium	Condition Assessment N/A	Medium	3.54
Cropland – Arable field margins game bird mix	0.816	Medium	Condition Assessment N/A	High	3.75
Cropland – Cereal crops	12.797	Low	Condition Assessment N/A	High	29.43
Cropland – Cereal crops	17.459	Low	Condition Assessment N/A	Medium	38.41
Grassland – Modified grassland	0.614	Low	Poor	Medium	1.35
Grassland – Modified grassland	0.691	Low	Poor	High	1.59
Grassland – Modified grassland	0.011	Low	Poor	Low	0.02
Grassland – Other neutral grassland	0.031	Medium	Moderate	Medium	0.29
Heathland and shrub – Mixed scrub	4.125	Medium	Poor	Medium	18.15
Heathland and shrub – Mixed scrub	0.018	Medium	Poor	High	0.08
Lakes – Ponds (non-priority habitat)	0.308	Medium	Moderate	Medium	2.71
Urban – Developed land sealed surface	0.195	V. Low	N/A Other	High	0.00
Urban – Developed land sealed surface	2.923	V. Low	N/A Other	High	0.00
Woodland and forest – Lowland mixed deciduous woodland	0.003	High	Moderate	Medium	0.04
Urban – Urban Tree	0.037*	Medium	Moderate	High	0.34
Urban – Urban Tree	2.271*	Medium	Moderate	Medium	19.98
Total	43.10				119.69
Area-Based Habitats—Grid Connection Corridor					
Cropland – Cereal crops	80.543	Low	Condition Assessment N/A	Medium	177.19

Habitat type (UKHab)	Area (ha)	Distinctiveness	Condition	Strategic Significance	Habitat Units
Cropland – Cereal crops	3.606	Low	Condition Assessment N/A	High	8.29
Grassland – Modified grassland	39.259	Low	Poor	Medium	86.37
Grassland – Modified grassland	11.048	Low	Poor	High	25.41
Grassland – Modified grassland	1.116	Low	Poor	Medium	2.46
Grassland – Other neutral grassland	0.001	Medium	Moderate	Medium	0.01
Heathland and scrub – Mixed scrub	0.263	Medium	Poor	Medium	0.33
Heathland and scrub – Mixed scrub	0.057	Medium	Poor	High	0.26
Lakes – Ponds (Non-Priority Habitat)	0.004	Medium	Moderate	Medium	0.04
Sparsely vegetated land – Ruderal/Ephemeral	0.569	Low	Moderate	Low	2.28
Urban – Developed land; sealed surface	0.056	V. Low	N/A Other	High	0.00
Urban – Developed land; sealed surface	15.398	V. Low	N/A Other	Low	0.00
Urban – Vacant/derelict land/bare ground	0.182	Low	Poor	High	0.42
Urban – Vacant/derelict land/bare ground	0.409	Low	Poor	Low	0.82
Woodland and forest - Other woodland broadleaved	3.263	Medium	Poor	Medium	14.36
Woodland and forest - Other woodland broadleaved	0.726	Medium	Poor	High	3.34
Total	156.31	-	-	-	321.57
Combined Total	199.41				441.26

Table 5 Created Area-Based Habitats

Habitat type (UKHab)	Area (ha)	Distinctiveness	Target Condition	Strategic Significance	Time to Target Condition (yrs)	Habitat Units
Area-Based Habitats-- Solar and Energy Storage Park						
Grassland – Modified grassland	429.784	Low	Moderate	Medium	4	1639.88

Habitat type (UKHab)	Area (ha)	Distinctiveness	Target Condition	Strategic Significance	Time to Target Condition (yrs)	Habitat Units
Urban – Developed land sealed surface	47.754	V. Low	N/A - Other	Medium	0	0.00
Grassland – Other neutral grassland	1.994	Medium	Good	High	10	19.27
Grassland – Other neutral grassland	106.952	Medium	Good	Medium	10	988.63
Grassland – other neutral grassland	0.049	Medium	Good	Medium	10	0.45
Heathland and shrub – Mixed shrub	1.871	Medium	Good	Medium	10	17.30
Urban – developed land sealed surface	0.521	V. Low	N/A - Other	High	0	0.00
Urban – developed land sealed surface	14.677	V. Low	N/A - Other	Low	0	0.00
Urban – developed land sealed surface	4.875	V. Low	N/A - Other	Low	0	0.00
Urban – developed land sealed surface	0.204	V. Low	N/A - Other	Low	0	0.00
Woodland and forest – Other woodland broadleaved	1.036	Medium	Moderate	Medium	15	4.68
Total	609.72	-	-	-	-	2671.07
Area-Based Habitats—Grid Connection Corridor						
Cropland - Cereal crops	9.586	Low	Condition Assessment N/A	Medium	1	20.35
Cropland - Cereal crops	0.278	Low	Condition Assessment N/A	High	1	0.62
Grassland - Modified grassland	1.797	Low	Poor	Medium	1	3.82
Grassland - Modified grassland	2.068	Low	Poor	High	1	4.59

Habitat type (UKHab)	Area (ha)	Distinctiveness	Target Condition	Strategic Significance	Time to Target Condition (yrs)	Habitat Units
Heathland and shrub - Mixed scrub	0.187	Medium	Poor	Medium	1	0.79
Urban - Developed land; sealed surface	0.071	V.Low	N/A - Other	Low	0	0.00
Urban - Vacant/derelict land/ bareground	0.01	Low	Poor	Low	1	0.02
Total	14.00	-	-	-	-	30.19
Combined Total	623.72					2701.26

3.1.37 The Post-Development biodiversity value of the hedgerow habitats (retained, enhanced and created) was calculated as 227.49 retained hedgerow units, Table 6, 94.94 enhanced hedgerow units, Table 7, and 95.22 created hedgerow units, Table 8.

Table 6 Retained Hedgerow

Habitat type (UKHab)	Length (km)	Distinctiveness	Condition	Strategic Significance	Hedgerow Units
Hedgerows – Solar and Energy Storage Park					
Native Hedgerow	4.470	Low	Moderate	Medium	19.67
Native Hedgerow	0.700	Low	Moderate	High	3.22
Native Hedgerow with trees	1.936	Medium	Moderate	Medium	17.04
Native Species Rich Hedgerow	1.952	Medium	Moderate	Medium	17.18
Native Species Rich Hedgerow – Associated with bank or ditch	1.234	High	Moderate	Medium	16.29
Native Species Rich Hedgerow with trees	1.839	High	Moderate	Medium	24.27

Habitat type (UKHab)	Length (km)	Distinctiveness	Condition	Strategic Significance	Hedgerow Units
Native Species Rich Hedgerow with trees	0.232	High	Moderate	High	3.20
Native Species Rich Hedgerow with trees – Associated with bank or ditch	0.794	V.High	Moderate	Medium	13.97
Total	13.16	-	-	-	114.84
Hedgerows - Grid Connection Corridor					
Native Hedgerow	0.588	Low	Moderate	Medium	2.59
Native Hedgerow	1.447	Low	Moderate	High	6.66
Native Hedgerow - Associated with bank or ditch	0.244	Medium	Moderate	Medium	2.15
Native Hedgerow with trees	0.156	Medium	Moderate	Medium	1.37
Native Species Rich Hedgerow	0.297	Medium	Moderate	Medium	2.61
Native Species Rich Hedgerow	0.214	Medium	Moderate	High	1.97
Native Species Rich Hedgerow with trees	2.456	High	Moderate	Medium	32.42
Total	20.36	-	-	-	112.65
Combined Total	33.52				227.49

Table 7 Enhanced Hedgerow

Habitat type (UKHab)	Length (km)	Distinctiveness Change	Condition Change	Strategic significance	Hedgerow Units Delivered
Hedgerows – Solar and Energy Storage Park					
Native Hedgerow > Native Species Rich Hedgerow	6.820	Low - Medium	Moderate - Good	Medium	52.04

Habitat type (UKHab)	Length (km)	Distinctiveness Change	Condition Change	Strategic significance	Hedgerow Units Delivered
(with 1 year advanced planting)					
Native Hedgerow > Native Species Rich Hedgerow	0.318	Low – Medium	Moderate – Good	High	2.28
Native Hedgerow – Associated with bank or ditch > Native Species Rich Hedgerow Associated with bank or ditch	0.900	Medium – High	Moderate - Good	Medium	8.28
Native Hedgerow – Associated with bank or ditch > Native Species Rich Hedgerow Associated with bank or ditch	0.421	Medium – High	Poor – Good	Medium	5.43
Native Hedgerow with trees > Native Species Rich Hedgerow with trees	1.129	Medium – High	Moderate – Good	Medium	10.39
Native Species Rich Hedgerow	0.252	Medium - Medium	Moderate - Good	Medium	2.26
Native Species Rich Hedgerow - Associated with bank or ditch	0.887	High – High	Moderate – Good	Medium	5.45
Native Species Rich Hedgerow - Associated with bank or ditch	0.225	High - High	Moderate - Good	High	3.11
Native Species Rich Hedgerow with trees	0.819	High - High	Moderate - Good	Medium	4.69
Total	11.77	-	-	-	91.08
Hedgerows – Grid Connection Corridor					
Native Hedgerow – Associated with bank or ditch > Native Species Rich Hedgerow – Associated with bank or ditch	0.126	Medium – High	Moderate – Good	Medium	1.16
Native Species Rich Hedgerow	0.672	Medium – Medium	Moderate – Good	High	2.49

Habitat type (UKHab)	Length (km)	Distinctiveness Change	Condition Change	Strategic significance	Hedgerow Units Delivered
Native Species Rich Hedgerow with trees	0.037	High – High	Moderate – Good	Medium	0.21
Total	0.84	-	-	-	3.86
Combined Total	25.77				94.94

Table 8 Created Hedgerow

Habitat Type (UKHab)	Length (km)	Distinctiveness	Condition	Strategic Significance	Time to Target Condition (yrs)	Hedgerow Units
Hedgerows – Solar and Energy Storage Park						
Native Species Rich Hedgerow	6.092	Medium	Good	Medium	12	52.44
Native Species Rich Hedgerow (with 1 year advanced planting)	0.201	Medium	Good	Medium	11	1.79
Native Species Rich Hedgerow – Associated with bank or ditch	0.144	High	Good	Medium	12	1.86
Native Species Rich Hedgerow with trees	0.082	High	Good	Medium	20	0.80
Total	6.52	-	-	-		56.89
Hedgerows - Grid Connection Corridor						
Native hedgerow	0.232	Low	Moderate	Medium	5	0.85
Native hedgerow with trees	0.634	Medium	Moderate	Medium	10	3.91
Native Species Rich Hedgerow	1.954	Medium	Moderate	Medium	5	14.39
Native Species Rich Hedgerow	0.765	Medium	Moderate	High	5	5.89
Native Species Rich Hedgerow	0.365	Medium	Good	Medium	12	3.14
Native Species Rich Hedgerow	0.679	Medium	Good	High	12	6.11
Native Species Rich Hedgerow (with 1 year advanced planting)	0.260	Medium	Good	Medium	12	2.32

Habitat Type (UKHab)	Length (km)	Distinctiveness	Condition	Strategic Significance	Time to Target Condition (yrs)	Hedgerow Units
Native Species Rich Hedgerow with trees	0.186	High	Moderate	Medium	10	1.72
Total	5.08	-	-	-		38.33
Combined Total	11.60	-	-	-		95.22

3.1.38 The Post-Development biodiversity value of river and ditch habitats (retained, enhanced and created) was calculated as 19.89 retained river and ditch units, Table 9, 27.52 enhanced river and ditch units (which deliver 36.32 units), Table 10, and 0.47 created river and ditch units, Table 11.

Table 9 Retained river and ditch habitats

River Type	Reference	Length (km)	Distinctiveness	Condition	Strategic Significance	River Units
Rivers and Ditches– Solar and Energy Storage Park						
Culvert	Tributary 1 of Padmoor Drain – existing culverts	0.015	Low	Poor	Low	0.03
Culvert	Trib 2 of Padmoor Drain – existing culverts	0.030	Low	Poor	Low	0.06
Ditches	Ditch 1	0.327	Medium	Poor	High	1.50
Total	-	0.37	-	-	-	1.59
Rivers and Ditches – Grid Connection Corridor						
Other Rivers and Streams	Seymour Drain	0.286	High	Fairly Poor	High	2.22
Other Rivers and Streams	River Trent	0.150	High	Moderate	High	2.07
Ditches	Ditch 2	0.135	Medium	Poor	High	0.62
Ditches	Carr Drain	0.145	Medium	Poor	Low	0.58
Culvert	Carr Drain – existing culvert	0.005	Low	Poor	Low	0.01
Ditches	Ditch 3	0.155	Medium	Poor	Low	0.62
Ditches	Cow Pasture Lane Drain	0.616	Medium	Poor	High	2.83
Ditches	Ditch 4	1.169	Medium	Moderate	Low	9.35
Total	-	2.66	-	-	-	18.31
Combined Total		3.03	-	-	-	19.90

Table 10 Enhanced river and ditch habitats

River type	Reference	Length (km)	Distinctiveness	Target Condition	Strategic Significance	Time to Target Condition (years)	River units Delivered
Rivers – Solar and Energy Storage Park							
Other Rivers and Streams	Tributary 1 of Padmoor Drain	0.570	High	Fairly Good	High	4	6.14
Other Rivers and Streams	Tributary 2 of Padmoor Drain	1.933	High	Fairly Good	High	4	20.82
Other Rivers and Streams	Watercourse 1	0.587	High	Fairly Good	High	2	9.36
Total	-	3.09	-	-	-	-	36.32

Table 11 Created river and ditch habitats

River type	Reference	Length (km)	Distinctiveness	Target Condition	Strategic Significance	Time to Target Condition (years)	River Units Delivered
Rivers and Ditches – Solar and Energy Storage Park							
Culvert	Tributary 1 of Padmoor Drain – extension of existing culvert	0.002	Low	Poor	Low	1	0.00*
Culvert	Tributary 2 of Padmoor Drain – extension of existing culvert and creation of new culverted crossing	0.002	Low	Poor	Low	1	0.00*
Culvert	Ditch 1 – new culverted crossing	0.006	Low	Poor	Low	1	0.01
Total	-	0.01	-	-	-	-	0.02
Rivers and Ditches – Grid Connection Corridor							

Other Rivers and Streams	Marton Drain – with major riparian encroachment from new access road crossing	0.139	High	Moderate	High	5	0.40
Culvert	Marton Drain – creation of new culverted crossing	0.006	Low	Poor	Low	1	0.01
Culvert	Seymour Drain - creation of new culverted crossing	0.006	Low	Poor	Low	1	0.01
Culvert	Ditch 2 – new culverted crossing	0.006	Low	Poor	Low	1	0.01
Culvert	Carr Drain – creation of new culverted crossing	0.006	Low	Poor	Low	1	0.01
Culvert	Ditch 3 - creation of new culverted crossing	0.006	Low	Poor	Low	1	0.01
Culvert	Ditch 4 - creation of new culverted crossing	0.006	Low	Poor	Low	1	0.01
Total	-	0.18	-	-	-	-	0.47
Combined Total		0.19	-	-	-	-	0.49

*This is due to a rounding error in the metric

Summary of Results

- 3.1.39 All baseline habitats and habitats retained, created, and enhanced are present within the accompanying metric assessment for the Scheme (Appendix G).
- 3.1.40 A summary of the results is shown in Table 12. Based on the current Post-Development Plan, the Scheme is predicted to result in a net gain of 1,304.14 habitat units (70.95%), a net gain of 136.86 hedgerow units (37.24%) and a net gain of 7.06 river units (14.22%).

Table 12 Summary of Results

Habitat Type	Baseline	Post-Development	Total Net Unit Change	Total Net % Change
Habitat units	1,485.52	2790.76	1,305.24	87.86%
Hedgerow units	206.14	341.78	135.64	65.80%

Solar and Energy Storage Park	River units	29.17	37.93	8.77	30.05%
Grid Connection Corridor	Habitat units	352.86	351.76	-1.10	-0.31%
	Hedgerow units	161.39	162.61	1.22	0.76%
	River units	20.48	18.77	--1.70	-8.32%
Combined Total	Habitat units	1,838.38	3,142.52	1,304.14	70.95%
	Hedgerow units	367.53	504.39	136.86	37.24%
	River units	49.65	56.71	7.06	14.22%

Trading Rules

- 3.1.41 The trading rules within the metric are a set of rules that try to prevent the 'trading down' of habitat distinctiveness. Under the trading rules losses of habitat are to be compensated for on a "like for like" or "like for better" basis.
- 3.1.42 The trading rules within the Metric are currently satisfied for the following distinctiveness levels; Very High, High, and Low habitats (see Table 13).
- 3.1.43 The metric calculation does not satisfy the trading rules for Medium distinctiveness habitats. Medium distinctiveness habitats are Semi-natural habitats that are not classed as priority habitat types as set out in Section 41 of the Nerc Act 2006. In order to avoid impacts to a sites biodiversity value Site design should focus upon the retention, restoration and/or creation of high distinctiveness habitats and where possible the trading up of lower quality habitats, such as those listed under medium distinctiveness, for habitats of a higher band.
- 3.1.44 In this instance the trading rules are not being met due to the loss of 'Cropland – Arable field margins game bird mix'. Within the metric this habitat has no condition value, with a condition multiplier of 1. This reflects how these habitats are generally unmanaged arable headlands or are treated with a yearly resowing using a prescribed seed mix of native and non-native species. The Metric 3.1 Technical Supplement states that "*where field margins meet the definition of a 'better' or higher distinctiveness habitat they should be mapped as such within the metric*" (Ref 2). Therefore, in the schemes post development plan, these areas have been mapped as 'Grassland - Other neutral grassland' in "Good" condition, with the OLEMP outlining appropriate management prescriptions for these areas and the arable bird fauna they support. In this instance it is therefore considered that whilst the metric reports a failure of the trading rules the proposed habitat creation onsite will actually result in the real-world provision of a better outcome for biodiversity with a baseline habitat of medium distinctiveness and no condition value being replaced onsite by a medium distinctiveness habitat with a higher "Good" condition score.

Table 13 Trading Rules Summary

Distinctiveness Group	Trading Rule	Trading Satisfied?
V. High	Bespoke compensation likely to be required	Yes
High	Same habitat required	Yes
Medium	Same broad habitat or a higher distinctiveness habitat required	No
Low	Same distinctiveness or better habitat required	Yes

Summary of Changes by Broad Habitat Types

- 3.1.45 Tables 15 and 16 shows the assessed overall change in broad habitat types for both the Solar and Energy Storage Park and the Grid Connection Corridor respectively. Tables 17 and 18 show the overall changes in hedgerow types and Tables 19 and 20 show that for river habitats.
- 3.1.46 There is an overall loss of Cropland Habitat across both area. There is an overall gain for Grassland Heathland and Shrub habitats on the Solar and Energy Storage Park which is considered to sufficiently offset the losses of these habitats on the Grid Connection Corridor due to the surplus of units provided. The large loss in Cropland habitat is mostly due to the loss of Cereal Crop fields which are of a low distinctiveness and is not considered to hold extensive ecological value. However, there is also loss of arable field margins which are of medium distinctiveness due to their ecological functions, for example their suitability for nesting birds.
- 3.1.47 There is a loss of hedgerow across both the Solar and Energy Storage Park and the Grid Connection Corridor; however, the creation of/enhancement to hedgerow with higher value has been incorporated into the design. The unit increases are relating to hedgerow types of higher distinctiveness for example, Native Species Rich Hedgerow. The provision of higher distinctiveness hedgerow types is expected to offset the loss of hedgerows that are regarded as less ecologically valuable.
- 3.1.48 There is a no loss of Ditches and Culverts length across both the Solar and Energy Storage Park and the Grid Connection Corridor due to reinstatement and creation. The enhancement of Other Rivers and Streams allows for unit gains.

Table 14 Change by Broad Area-Based Habitat Type for the Solar and Energy Storage Park

Habitat group	Baseline		Post development		Change	
	Existing area	Existing value	Proposed area	Proposed value	Area change	Unit change
Cropland	578.66	1305.81	31.88	75.13	-546.79	-1230.67
Grassland	57.27	128.02	540.13	2651.49	482.86	2523.47
Heathland and shrub	5.30	23.33	6.01	35.53	0.71	12.20

Lakes	0.31	2.71	0.31	2.71	0.00	0.00
Sparsely vegetated land	0.32	1.27	0.00	0.00	-0.32	-1.27
Urban	11.88	21.60	73.46	20.33	61.58	-1.28
Woodland and forest	0.60	2.78	1.04	5.58	0.44	2.80

Table 15 Change by Broad Area-Based Habitat Type for the Grid Connection Corridor

Habitat group	Baseline		Post development		Change	
	Existing area	Existing value	Proposed area	Proposed value	Area change	Unit change
Cropland	94.02	207.22	94.01	206.46	0.01	-0.76
Grassland	55.29	122.95	55.29	122.65	0.00	-0.30
Heathland and shrub	0.32	1.42	0.32	1.39	0.00	-0.03
Lakes	0.00	0.04	0.00	0.04	0.00	0.00
Sparsely vegetated land	0.57	2.28	0.57	2.28	0.00	0.00
Urban	16.12	1.26	16.13	1.26	0.00	0.00
Woodland and forest	3.99	17.70	3.99	17.70	0.00	0.00

Table 16 Change by Broad Hedgerow-Based Habitat Type for the Solar and Energy Storage Park

Hedgerow type	Baseline		Post development		Change	
	Existing length	Existing value	Proposed length	Proposed value	Length change	Unit change
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.79	13.97	0.79	13.97	0.00	-0.76
Native Species Rich Hedgerow with trees	2.91	38.58	4.10	64.10	1.19	-0.30
Native Species Rich Hedgerow - Associated with bank or ditch	2.34	31.05	3.81	63.29	1.47	-0.03
Native Species Rich Hedgerow	3.13	27.62	15.64	160.49	12.50	132.87
Native Hedgerow - Associated with bank or ditch	1.39	10.06	0.00	0.00	-1.39	-10.06
Native Hedgerow with trees	3.15	27.73	1.94	17.04	-1.22	-10.69
Native Hedgerow	12.93	57.12	5.17	22.89	-7.76	-34.24

Table 17 Change by Broad Hedgerow-Based Habitat Type for the Grid Connection Corridor

	Baseline	Post development	Change
--	----------	------------------	--------

Hedgerow type	Existing length	Existing value	Proposed length	Proposed value	Length change	Unit change
Native Species Rich Hedgerow with trees	2.86	37.79	2.86	37.27	0.00	-0.52
Native Species Rich Hedgerow - Associated with bank or ditch	0.00	0.00	0.13	2.27	0.13	2.27
Native Species Rich Hedgerow	7.21	64.63	8.27	72.51	1.06	7.88
Native Hedgerow - Associated with bank or ditch	1.16	8.18	1.03	7.08	-0.13	-1.11
Native Hedgerow with trees	2.42	21.30	2.42	19.63	0.00	-1.67
Native Hedgerow	6.71	29.48	5.50	23.86	-1.22	-5.62

Table 18 Change by Broad River-Based Habitat Type for the Solar and Energy Storage Park

River type	Baseline		Post development		Change	
	Existing length	Existing value	Proposed length	Proposed value	Length change	Unit change
Other Rivers and Streams	3.1	27.5	3.1	36.3	0.0	8.8
Ditches	0.3	1.5	0.3	1.5	0.0	0.0
Culvert	0.0	0.1	0.1	0.1	0.0	0.0

Table 19 Change by Broad River-Based Habitat Type for the Grid Connection Corridor

River type	Baseline		Post development		Change	
	Existing length	Existing value	Proposed length	Proposed value	Length change	Unit change
Other Rivers and Streams	0.6	6.3	0.6	4.7	0.0	-1.7
Ditches	2.2	14.1	2.2	14.0	0.0	-0.1
Culvert	0.0	0.0	0.0	0.1	0.0	0.1

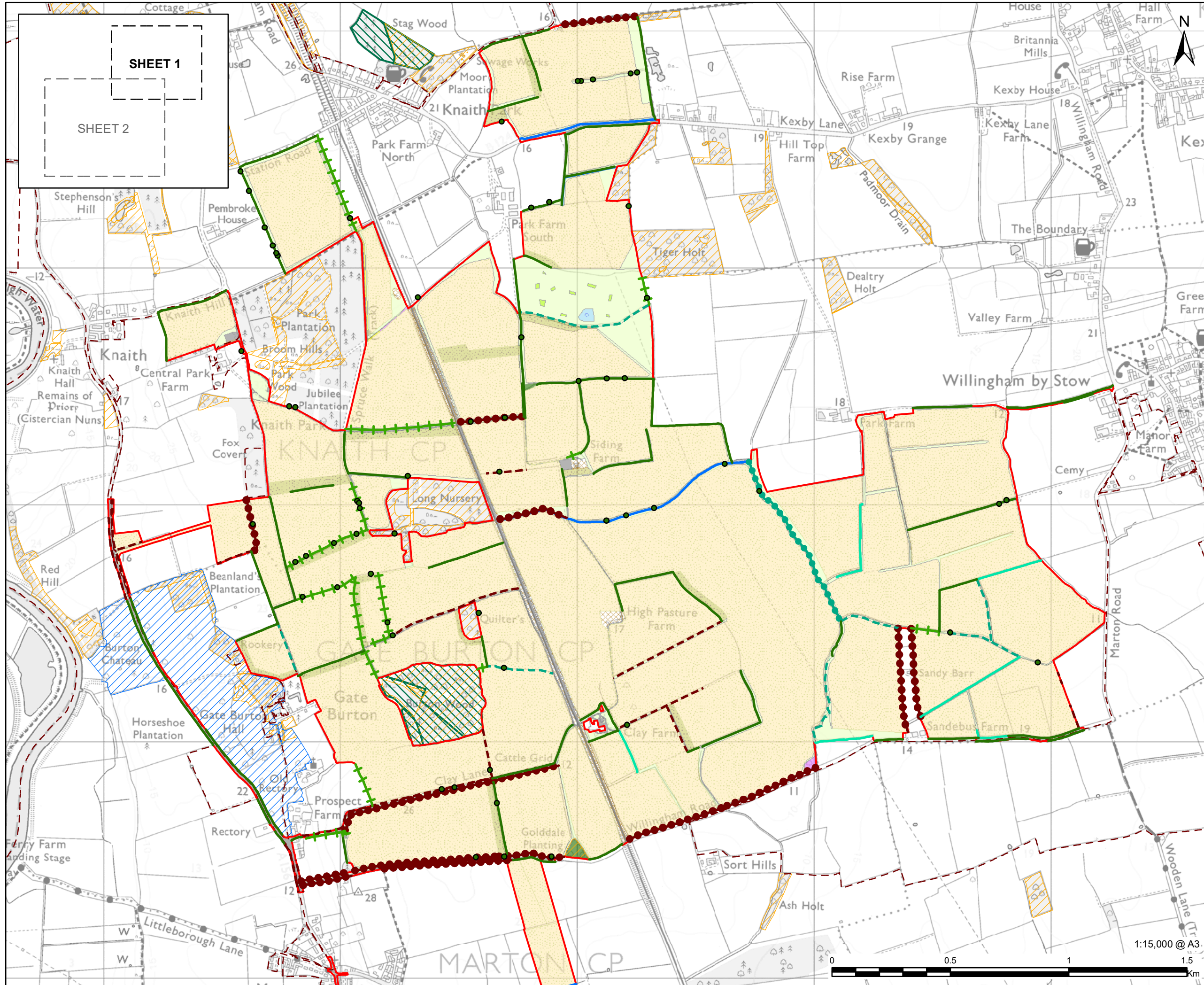
4. Conclusion

- 4.1.1 Based on current knowledge of the Order limits and Scheme design, including the commitments made in the OLEMP **[EN010131/APP/7.10]**, the Scheme is predicted to result in a net gain of 70.95% for area-based habitats, 37.24% for hedgerows and a net gain of 14.22% for rivers. The Scheme therefore meets the current no net loss requirement and exceeds the anticipated 10% net gain requirement for NSIPs set out in the Environment Act, which expected to become a material planning consideration in 2025, for all habitats.
- 4.1.2 The outputs of the metric are dependent on all retained and enhanced habitats meeting the target conditions, subject to the criteria outlined within Natural England's Biodiversity Metric 3.1 User Guide and Technical Note. Habitats would need to be monitored to ensure correct establishment and growth, and remedial action would need to be taken if this does not proceed as expected, otherwise the target conditions used in the calculations may not be met and the predicted biodiversity units might not be achieved. Detailed of monitoring prescriptions and intervals are presented in the OLEMP **[EN010131/APP/7.10]**.

5. References

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- Ref 3. Biodiversity Net Gain: Good Practice Principles for Development, A Practical Guide (2019)
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- Ref 6. Central Lincolnshire Local Plan (2017). Available at: [Local Plan | Central Lincolnshire \(n-kesteven.gov.uk\)](https://www.central-lincolnshire.gov.uk/~/media/10000000/2017/Central_Lincolnshire_Local_Plan_2017.pdf)
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- Ref 18. Nottinghamshire Biodiversity Action Group (2020) Habitat Action Plans
- Ref 19. Defra Magic Maps
- Ref 20. BRE (2014) Biodiversity Guidance for Solar Developments
- Ref 21. RSPB (2017) RSPB Policy Briefing, May 2017
- Ref 22. Environmental Agency (2021) Marton Drain Catchment (trib of Trent) Water Body. Available at: [Marton Drain Catchment \(trib of Trent\) | Catchment Data Explorer | Catchment Data Explorer](https://www.environmental.gov.uk/~/media/10000000/2021/Marton_Drain_Catchment_(trib_of_Trent)_Water_Body.pdf)
- Ref 23. Bassetlaw District Local Development Framework (2009)

Appendix A. Baseline Habitat Plan



PROJECT
Gate Burton Energy Park

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 Gate Burton ENERGY PARK

CONSULTANT
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LEGEND

- Order Limits
- UK Habitat Description**
- Cropland - Arable Field Margins Game Bird Mix
- Cropland - Cereal crops
- Grassland - Bracken
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Mixed scrub
- Lakes - Pond (non priority)
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Developed Land; Sealed Surface
- Urban - Vacant/ derelict land/ bareground
- Woodland and forest - Lowland mixed deciduous woodland
- Woodland and forest - Other woodland; Broadleaved
- Native hedgerow
- Native hedgerow with ditch
- Native hedgerow with trees
- Native species rich hedgerow
- Native species rich hedgerow with ditch
- Native species rich hedgerow with trees
- Native species rich hedgerow with trees with ditch
- Rivers - Other Rivers and Streams
- Urban tree
- BOA boundary
- Wood Pasture and Parkland
- Priority Habitats Inventory (Deciduous woodland)
- Ancient Woodland

NOTES

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Environmental Statement

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60664324

FIGURE TITLE

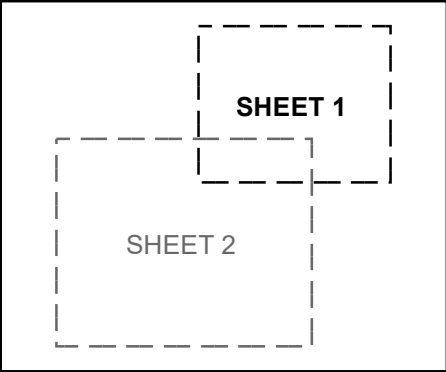
Biodiversity Net Gain - Baseline SHEET 1 of 2

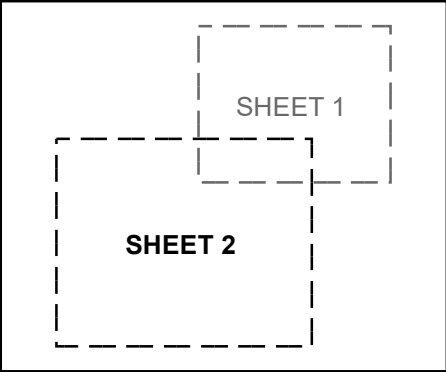
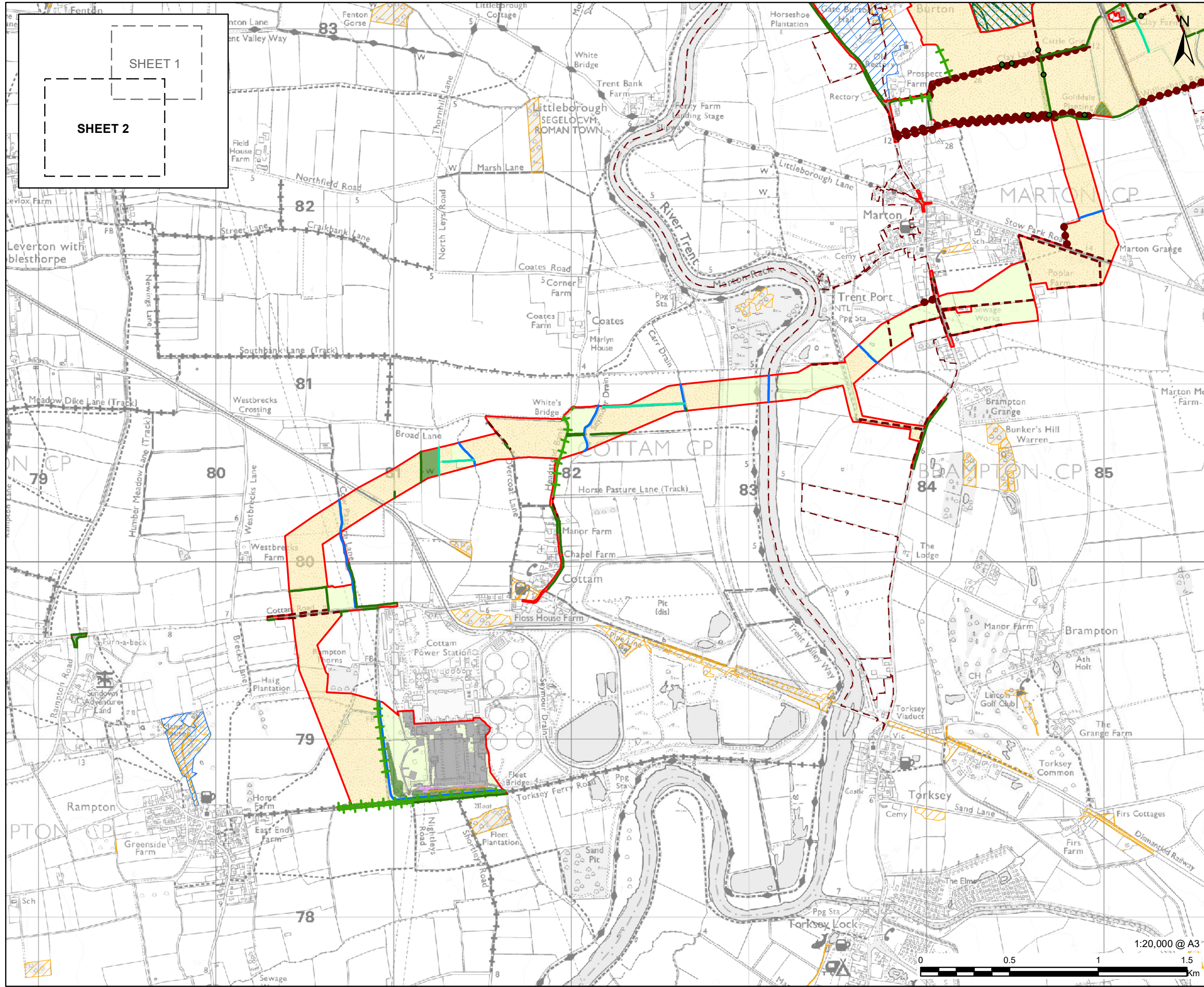
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LEGEND

- Order Limits
- UK Habitat Description**
- Cropland - Arable Field Margins Game Bird Mix
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- Native hedgerow
- Native hedgerow with ditch
- Native hedgerow with trees
- Native species rich hedgerow
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- Rivers - Other Rivers and Streams
- Urban tree
- BOA boundary
- Wood Pasture and Parkland
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FIGURE TITLE
Biodiversity Net Gain - Baseline
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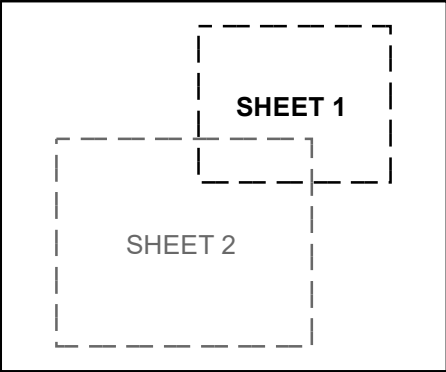
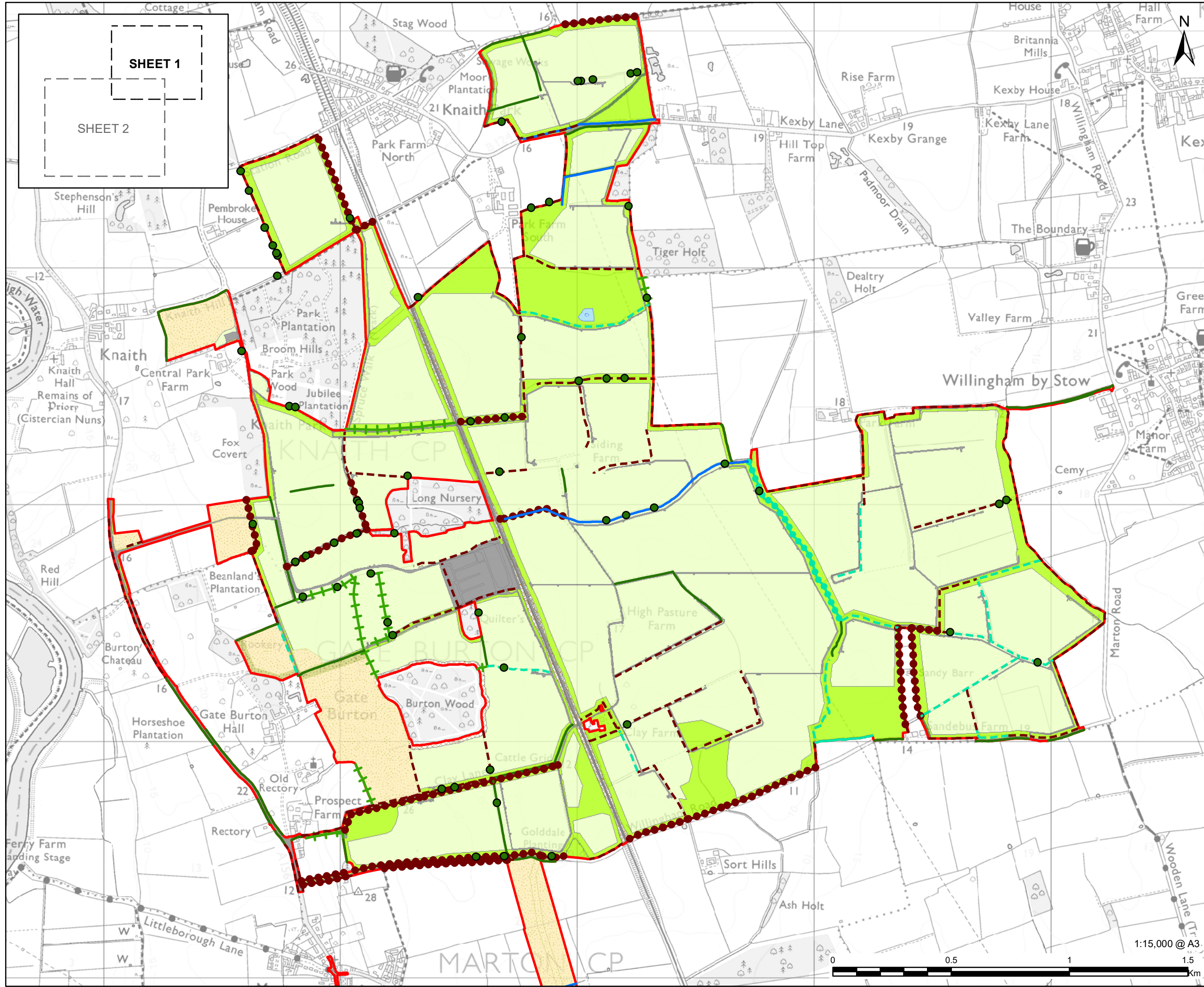
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Appendix B. Post-Development Habitat Plan



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Gate Burton Energy Park

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LEGEND
Order Limits

- UK Habitat Description**
- Cropland - Arable Field Margins Game Bird Mix
 - Cropland - Cereal crops
 - Grassland - Modified grassland
 - Grassland - Other neutral grassland
 - Heathland and shrub - Mixed scrub
 - Lakes - Pond (non priority)
 - Urban - Developed Land; Sealed Surface
 - Woodland and forest - Lowland mixed deciduous woodland
 - Woodland and forest - Other woodland; Broadleaved
 - Native hedgerow
 - Native hedgerow with ditch
 - Native hedgerow with trees
 - Native species rich hedgerow
 - Native species rich hedgerow with ditch
 - Native species rich hedgerow with trees
 - Native species rich hedgerow with trees with ditch
 - Rivers - Other Rivers and Streams
 - Urban tree

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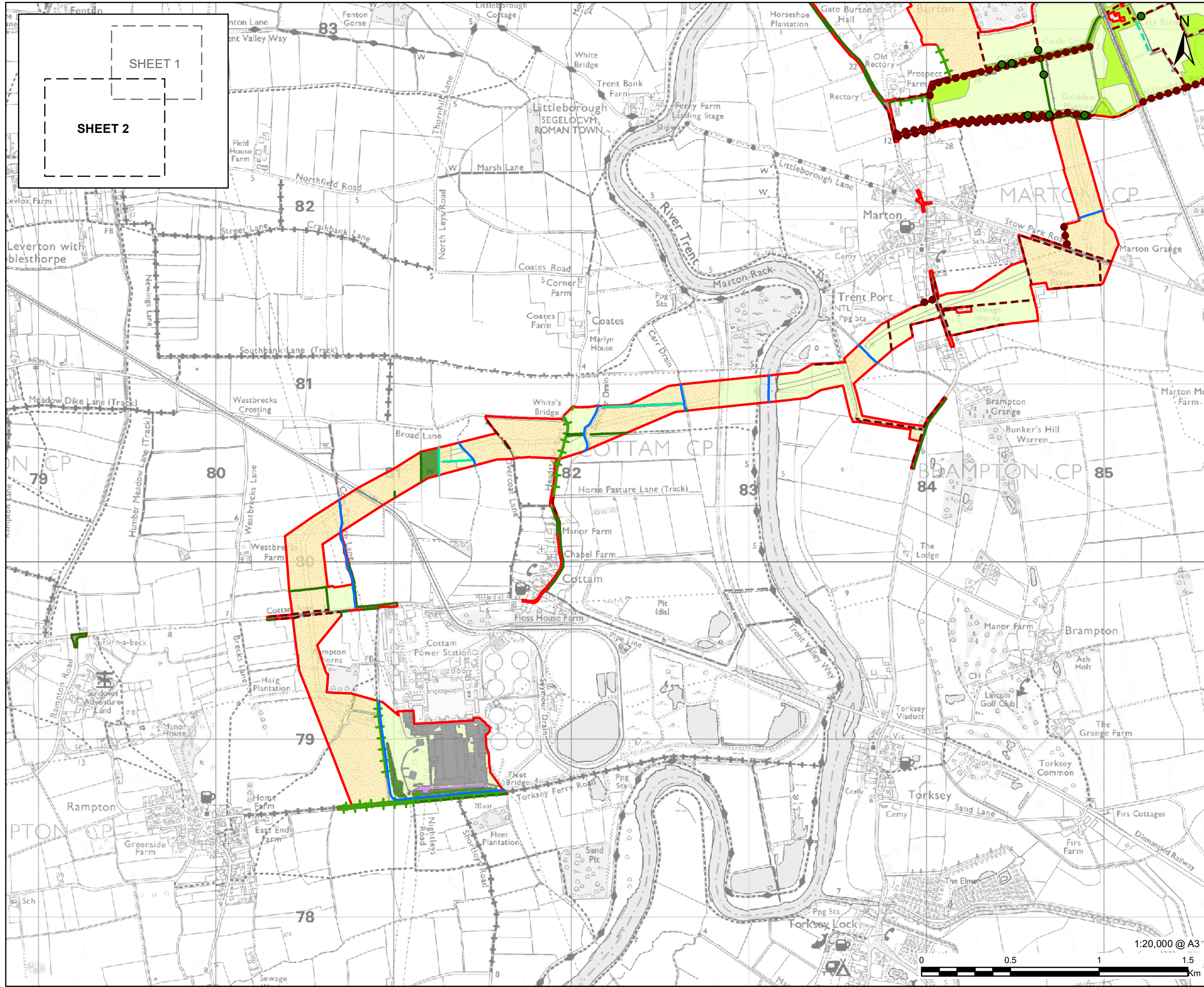
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FIGURE TITLE
Biodiversity Net Gain: Post
Development Scenario
SHEET 1 of 2

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LEGEND

- Order Limits
- UK Habitat Description**
- Cropland - Cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
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- Lakes - Pond (non priority)
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- Urban - Vacant/ derelict land/ bareground
- Woodland and forest - Other woodland; Broadleaved
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- Native species rich hedgerow with ditch
- Native species rich hedgerow with trees
- Rivers - Other Rivers and Streams
- Urban tree

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Biodiversity Net Gain: Post
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Appendix C. Phase 1 Habitat to UKHab Conversion

Phase 1 habitat classification	UKHab Classification
A1.1.1 – Broadleaved woodland – semi-natural	Woodland and forest – Lowland mixed deciduous woodland
A1.1.2 – Broadleaved woodland – plantation	Woodland and Forest – Other woodland; broadleaved
A1.3.2 – Mixed woodland – plantation	Woodland and Forest – Other woodland; mixed
A2.1 – Scrub – dense continuous	Heathland and shrub – Mixed scrub
A2.2 – Scrub – scattered	Heathland and shrub – Mixed scrub
B1.2 – Acid grassland – semi-improved	Grassland – Modified grassland
B2.2 – Neutral grassland – semi-improved	Grassland – Other neutral grassland
B4 – Improved grassland	Grassland – Modified grassland
B5 – Marsh/marshy grassland	Grassland – Other neutral grassland
B6 – Poor semi-improved grassland	Grassland – Modified grassland
C1.1 – Bracken – continuous	Grassland – Bracken
F1 – Swamp	Wetland – Fens (upland and lowland)
G1 – Standing water	Lakes – Ponds (non-priority)
G2 – Running water	Other Rivers and Streams
Hardstanding	Urban – Developed land; sealed surface
J1.1 – Cultivated/disturbed land – arable	Cropland – Cereal crops
J3.6 – Buildings	Urban – Developed land; sealed surface
J4 – Bare ground	Urban – Vacant/derelict land/bare ground

J5 – Other habitat	Cropland – Temporary grass and clover leys
J5 – Other habitat	Cropland – Cropland – Arable field margins game bird mix
A3.1 – Broadleaved parkland/scattered trees	Urban – Urban trees
J2.1.1 – Intact hedge – native species-rich	Native Species Rich Hedgerow
J2.1.1 – Intact hedge - species-poor	Native Hedgerow
J2.2.1 – Defunct hedge - native species-rich	Native Species Rich Hedgerow
J2.2.2 – Defunct hedge – species-poor	Native Hedgerow
J2.3.1 – Hedge with trees – native species-rich	Native Species Rich Hedgerow with trees
J2.3.2 – Hedge with trees – species-poor	Native Hedgerow with trees

Appendix D. Baseline Habitat Descriptions

Area Based Habitats and Hedgerow Descriptions

Habitat	Description
Cropland – Cereal crops	“The large majority of the Site is used as arable farmland. In two locations the arable weed Dwarf Spurge <i>Euphorbia exigua</i> was growing.”
Cropland -Arable field margins game bird mix	“These areas are located on the edge of a number of arable fields, species present included Yellow Bristle Grass <i>Setaria pumila</i> , Sunflower <i>Helianthus sp.</i> , Great Millet <i>Sorghum bicolor</i> , Cockspur <i>Echinochloa crus-galli</i> , Buckwheat <i>Fagopyrum esculentum</i> , Common Orache <i>Atriplex patula</i> and Lacy Phacelia <i>Phacelia tanacetifolia</i> .”
Cropland – Temporary grass and clover leys	Areas of temporary grass and clover leys within arable fields on Site.
Woodland and forest – Lowland mixed deciduous woodland	“There are two large woodlands in the west of the Solar and Energy Storage Park, species within these include Pedunculate Oak <i>Quercus robur</i> , Ash <i>Fraxinus excelsior</i> along with Hawthorn <i>Crataegus monogyna</i> , Blackthorn <i>Prunus spinosa</i> , Field Maple <i>Acer campestre</i> and Elder <i>Sambucus nigra</i> .”
Woodland and forest – Other woodland; broadleaved	“There are two small areas of broad-leaved plantation containing Pedunculate Oak, Ash and Sycamore <i>Acer pseudoplatanus</i> .”
Woodland and forest – Other woodland; mixed	“There are two small areas of mixed planation which contain Sycamore, Ash, Black Pine <i>Pinus nigra</i> and Scot’s Pine <i>Pinus sylvestris</i> .”
Heathland and shrub – Mixed scrub	“There are a number of small areas of scattered scrub throughout the Site with long lengths of continuous scrub adjacent to the railway line running through the site, species include many areas of dense Bramble <i>Rubus fruticosus agg.</i> along with Hawthorn and Blackthorn.”

<p>Grassland – Modified grassland (Acid grassland)</p>	<p>“This habitat is present in one field in the west of the Solar and Energy Storage Park Site, adjacent to the A156 and this field is of a very sandy substrate and contains a mosaic of tall ruderal and semi-improved acid grassland. Species present within this habitat were Common Bent <i>Agrostis capillaris</i>, Sheep’s Sorrel <i>Rumex acetosella</i>, Cocksfoot <i>Dactylis glomerata</i>, Flattened Meadow-Grass <i>Poa compressa</i>, Musk Thistle <i>Carduus nutans</i>, Broom <i>Cytisus scoparius</i>, Harebell <i>Campanula rotundifolia</i>, Hairy Sedge <i>Carex hirta</i> and Lady’s Bedstraw <i>Galium verum</i>.”</p>
<p>Grassland – Other neutral grassland</p>	<p>“This habitat is present on both road verges along Clay Lane which is located in the south of the Solar and Energy Storage Park Site this is a fairly thin habitat between the lane and the hedges along with planted trees. The species present included Red Fescue <i>Festuca rubra</i>, Common Knapweed <i>Centaurea nigra</i>, Lady’s Bedstraw, Oxeye Daisy <i>Leucanthemum vulgare</i>, Cocksfoot, Doves-foot Cranesbill <i>Geranium molle</i>, Perennial Rye Grass <i>Lolium perenne</i>, Red Clover <i>Trifolium pratense</i> and Smooth Meadow-Grass <i>Poa pratensis</i>.”</p>
<p>Grassland – Modified grassland</p>	<p>“There are a number of areas of this habitat across the Solar and Energy Storage Park Site including along some of the arable fields. Species present are Red Fescue, Smooth Meadow-grass, Timothy <i>Phleum pratense</i>, Perennial Rye-Grass, Creeping Bent <i>Agrostis stolonifera</i>, Oxeye Daisy, White Clover <i>Trifolium repens</i>, Bristly Oxtongue <i>Helminthotheca echioides</i>, Curled Dock <i>Rumex crispus</i>, Dandelion <i>Taraxacum officinale</i> agg. and Doves-foot Cranesbill.”</p>
<p>Grassland – Other neutral grassland (Marshy grassland)</p>	<p>“There are two areas with marshy grassland present, including a small area in a field in the west of the Solar and Energy Storage Park Site, with Soft Rush <i>Juncus effusus</i>, Hard Rush <i>Juncus inflexus</i>, Tufted Hair-Grass <i>Deschampsia cespitosa</i>, Creeping Buttercup <i>Ranunculus repens</i>, Yorkshire Fog <i>Holcus lanatus</i>, Sweet Vernal Grass <i>Anthoxanthum odoratum</i>, Meadow Cranesbill <i>Geranium pratense</i> and Greater Birdsfoot Trefoil <i>Lotus pedunculatus</i>. The other areas are small parts of the same field which contains a pond, species here include Compact Rush <i>Juncus conglomeratus</i>, Hard Rush, Creeping Bent, Creeping Cinquefoil <i>Potentilla reptans</i>, Sealfheal <i>Prunella vulgaris</i> and Creeping Buttercup.”</p>
<p>Grassland – Bracken</p>	<p>Areas of dense bracken cover within the Site.</p>
<p>Sparsely vegetated land – Ruderal / Ephemeral</p>	<p>Ruderal/Ephemeral vegetation is present throughout the Site consisting of species such as willowhelb <i>Epilobius hirsutum</i>, Burdock sp. <i>Arctium</i> sp., common nettle <i>Urtica dioica</i> and welted thistle <i>Carduus crispus</i>.</p>

Urban – Developed land; sealed surface	The majority of the hardstanding present on Site is comprised of the Cottam Power Station which is located at the southern end of the grid connection corridor.
Urban – Vacant/ derelict land/ bareground	Bare ground is present throughout the Site, mainly constituting access tracks and field entrances.
Wetland – Fens (upland and lowland)	“This vegetation surrounding the pond within the Solar and Energy Storage Park includes Common Reedmace <i>Typha latifolia</i> and Common Reed <i>Phragmites australis</i> .”
Native species rich hedgerow/ Native hedgerow/ Native species rich hedgerow with trees/ Native hedgerow with trees	“There are many hedges across the Site from species poor to species rich, the woody species recorded in the hedges included Ash, Hawthorn, Blackthorn, Dog Rose <i>Rosa canina agg.</i> , Field Maple, Buckthorn <i>Rhamnus cathartica</i> , Midland Hawthorn <i>Crataegus laevigata</i> , a Willow <i>Salix sp.</i> , Pedunculate Oak, Horse Chestnut <i>Aesculus hippocastanum</i> , Crab Apple <i>Malus sylvestris</i> , Sweet Chestnut <i>Castanea sativa</i> , Wild Privet <i>Ligustrum vulgare</i> , Guelder Rose <i>Viburnum opulus</i> , Sycamore, Wild Cherry <i>Prunus avium</i> , Elm sp. <i>Ulmus sp.</i> , Elder, Wych Elm <i>Ulmus glabra</i> and a planted Tibetan Cherry <i>Prunus serrula</i> .”
Native species rich hedgerow associated with bank or ditch/ Native hedgerow associated with bank or ditch/ Native hedgerow with trees associated with bank or ditch	A number of hedgerows within the Site, with the above described species list, are associated with a ditch.
Urban – Urban trees	Scattered trees throughout the Site, mainly along watercourses and field margins.
Other rivers and streams	“There is a stream running through a ditch on the eastern side of the Solar and Energy Storage Park, this contains species including Reed Sweet-grass <i>Glyceria maxima</i> , Reed Canary-grass <i>Phalaris arundinacea</i> , Common Duckweed <i>Lemna minor</i> , Common Valerian <i>Valeriana officinalis</i> , Meadowsweet <i>Filipendula ulmaria</i> , Great Willowherb, Bur-reed sp. <i>Sparganium sp.</i> , Brooklime <i>Veronica beccabunga</i> , Pink Water Speedwell <i>Veronica catenata</i> and Fool’s Watercress <i>Helosciadium nodiflorum</i> .”

River Baseline Descriptions

Other Rivers and Streams	Description
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Solar and Energy Storage Park

Tributary 1 of Padmoor Drain	<p>Tributary 1 of Padmoor Drain at SK 84969 85595 flows east from Knaith Park and is bordered by arable land and Kexby lane for the majority of its length; 0.58 km of the watercourse lies within the Solar and Energy Storage Park boundary, plus an additional 0.65 km of its riparian zone. The substrate consisted entirely of a silt bed, with both emergent and floating aquatic plants present downstream of the culvert at SK 84969 85593. Upstream of the culvert, the bed was not visible as the channel was choked with bankside terrestrial plants. The riparian zone was largely bare or dominated by short vegetation due to vegetation cutting on both banks and Kexby Lane running along the right bank for large sections.</p> <p>Based on the MoRPh survey, tributary 1 of Padmoor Drain has been assessed to be in “Fairly Poor” condition. The watercourse has been assigned as having major riparian encroachment, due to Kexby Lane encroaching within 4 m of the bank top. The section within the Order limits is not a Priority River Habitat, however all watercourses are mentioned as being important green and blue corridors within the Central Lincolnshire Local Plan (Ref 6). Therefore, tributary 1 of Padmoor Drain has been recorded in the metric as “Within Local plans” and classed as being of high strategic significance. A total of 0.015 km of the channel was culverted and has therefore been automatically assigned as “Poor” condition within the metric.</p>
Tributary 2 of Padmoor Drain	<p>Tributary 2 of Padmoor Drain at SK 84960 83947 flows east through arable land at Siding Farm and was bordered by arable fields for the entirety of its length within the Solar and Energy Storage Park boundary; 1.6 km of the river lies within the Order limits. At the time of survey, the channel was completely dry and dominated by terrestrial vegetation. The riparian zone consisted mainly of tall herbs and grasses, with vegetation cutting prevalent in other areas.</p> <p>Based on the MoRPh survey, tributary 2 of Padmoor Drain has been assessed as “Fairly Poor” condition. Tributary 2 of Padmoor Drain has been assigned as having major riparian encroachment, due to the existing farm track crossings and railway line encroaching within 4 m of the bank top. The section within the Site boundary is not a Priority River Habitat, however all watercourses are mentioned as being important green and blue corridors within the Central Lincolnshire Local Plan. Therefore, tributary 2 of Padmoor Drain has been recorded in the metric as “Within Local Plans” and classed as being of high strategic significance. A total of 0.03 km of the channel was culverted and has therefore automatically been assigned “Poor” condition within the metric.</p>

Grid Connection Corridor

<p>Marton Drain</p>	<p>Marton Drain (SK 83674 81172) is a WFD water body (WFD water body ID: GB104028057840) and tributary of the River Trent; 0.145 km of Marton Drain lies within the Grid Connection Corridor and is bordered by pasture fields. There was no perceptible flow due to the presence of a pumping station at the confluence with the River Trent, and the substrate consisted entirely of a silt bed. Emergent and submerged linear-leaved aquatic plants were present along the bank-water margins for most of the surveyed length. The riparian zone was unmanaged on the left bank, consisting of short and tall herbs and grasses. The riparian zone on the right bank was dominated by short vegetation due to extensive vegetation cutting.</p> <p>Based on the MoRPh survey, Marton Drain has been assigned “Moderate” condition. Marton Drain is not a Priority River Habitat but is mentioned within catchment plans (Ref 22). Therefore, Marton drain has been recorded in the metric as “Within Catchment Plans” and classed as high strategic significance.</p>
<p>Seymour Drain</p>	<p>Seymour Drain (SK 82077 80720) is a WFD water body (WFD water body ID: GB104028058340) and tributary of the River Trent; 0.296 km of Seymour Drain lies within the Grid Connection Corridor and is bordered by arable fields. The substrate consisted entirely of a silt bed, with the channel dominated by duckweed and the INNS Nuttall’s waterweed <i>Elodea nuttallii</i> (refer to Aquatic Ecology Baseline report¹⁹ for recommendations). The riparian zone was dominated by short vegetation due to extensive vegetation cutting on both banks.</p> <p>Based on the MoRPh survey, Seymour Drain has been assessed as “Fairly Poor” condition. Seymour Drain has been assigned major riparian encroachment due to the existing bridges and access tracks encroaching within 4m of the bank top. The section within the Site boundary is not a Priority River Habitat but is mentioned within catchment plans². Therefore, Seymour Drain has been recorded in the metric as “Within Catchment Plans” and classed as of high strategic significance.</p>

Wet Ditches (Ditches)	Description
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Solar and Energy Storage Park

<p>Ditch 1</p>	<p>Ditch 1 at SK 85152 85428 is a linear drainage ditch located south of Kexby Lane, bordered by arable fields and broadleaf woodland; 0.27 km of the ditch lies within the Site boundary. Based on the ditch condition assessment, ditch 1 has been assigned</p>
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² <https://environment.data.gov.uk/catchment-planning/Water body/GB104028058340>

“Poor” condition. All ditches are mentioned as being important green and blue corridors within the Central Lincolnshire Local Plan (Ref 6) and ditch 1 has therefore been classed as of high strategic significance.

Grid Connection Corridor

Ditch 2	Ditch 2 at SK 84923 81947 is a linear drainage ditch located near Marton, north of Stow Park Road, and bordered by arable fields; 0.14 km of the ditch lies within the Grid Connection Corridor. Based on the ditch condition assessment, ditch 2 has been assigned “Poor” condition. All ditches are mentioned as being important green and blue corridors within the Central Lincolnshire Local Plan(Ref 6) and ditch 2 has therefore been classed as of high strategic significance.
Carr Drain	Carr Drain (SK 82630 80923) is a linear drainage ditch located near the River Trent east of Cottam and is bordered by arable fields; 0.15 km of Carr Drain lies within the Grid Connection Corridor. A ditch condition assessment was not undertaken on Carr Drain, however there was appropriate information from previous surveys to assign a condition by way of desk-based assessment, based on which, Carr Drain has been assessed as “Poor” condition. Carr Drain is not mentioned in any plans and is therefore classed as being of low strategic significance.
Ditch 3	Ditch 3 at SK 81421 80610 is an artificial drainage ditch located south of Broad Lane near Cottam; 0.16 km of this ditch lies within the Grid Connection Corridor. There was very little water present and the substrate consisted of an entirely silt bed with small, isolated areas of aquatic plants present. The riparian zone was subject to recent vegetation cutting on both banks. Based on the ditch condition assessment, ditch 3 has been assessed as “Poor” condition. Ditch 3 is not mentioned in any local plans and is therefore classed as being of low strategic significance.
Cow Pasture Lane Drain	Cow Pasture Lane Drain (SK 80697 80258) is a linear drainage ditch and Local Wildlife Site (LWS) located next to Cow Pasture Lane, north of Cottam power station; 0.185 km of its length lies within the Grid Connection Corridor and it was bordered by arable fields. A ditch condition assessment was not undertaken on Cow Pasture Lane Drain, therefore a precautionary condition of “Moderate” has been assigned. Cow Pasture Lane Drain is a Local Wildlife Site (LWS) mentioned within the Bassetlaw District Local Development Framework (Ref 23), therefore it is recorded in the metric as “Within Local Plans” and classed as being of high strategic significance.
Ditch 4	Ditch 4 at SK 80970 78826 is a linear drainage ditch located west of Cottam power station, bordered by broadleaf woodland, arable fields, and improved grassland; 1.18 km of this ditch lies within the Grid Connection Corridor. Based on the ditch condition assessment, ditch 4 has been assigned “Moderate” condition. Ditch 4 is not mentioned in any plans and is therefore classed as being of low strategic significance.

Appendix E. Condition Assessment Rationale

Habitat type	Habitat condition assessment	Survey data reference	Habitat condition sheet	Assessment	Assigned condition
Woodland and Forest - Lowland Mixed Deciduous Woodland	Scored a total of 29 points.	Phase 1 habitat surveys undertaken by AECOM in during 2021/2022	24.Woodland- Broadleaved semi-natural	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Woodland and Forest - Other Woodland; Broadleaved	Scored a total of 19 points.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	24.Woodland- Broadleaved plantation	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Poor
Woodland and Forest - Other Woodland; Mixed	Scored a total of 26 points.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	24.Woodland- Mixed plantation	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Heathland and Shrub - Mixed Scrub	Passed conditions 1 and 3	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	19.Scrub	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Poor
Grassland - Modified Grassland	Passed conditions 2,4,5,6 and 7	Phase 1 habitat survey undertaken by AECOM in	5.Grassland Low – modified grassland	Biodiversity Metric 3.1 condition criteria and assessor	Poor

Habitat type	Habitat condition assessment	Survey data reference	Habitat condition sheet	Assessment	Assigned condition
		during 2021/2022		professional judgement	
Grassland – Other neutral grassland		Phase 1 habitat survey undertaken by AECOM in during 2021/2022	5.Grassland Low - neutral grassland	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Wetland - Fens (Upland and Lowland)	Passed conditions 1,2,3,4,5 and 6	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	23.Wetland	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Lakes – Ponds (non-priority)	Passed conditions 2,3,4,5,6 and 7	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	17.Pond	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Grassland- Bracken	No assessment required; condition is pre-set.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	5.Grassland	Pre-set	Poor
Sparsely Vegetated land – Ruderal/Ephemeral	Passed conditions 1, 2 and 4.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	21.Urban	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate

Habitat type	Habitat condition assessment	Survey data reference	Habitat condition sheet	Assessment	Assigned condition
Urban - Developed Land; Sealed Surface	No assessment required; condition is pre-set.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	21. Urban	Pre-set	N/A- Other
Cropland- Cereal Crops	No assessment required; condition is pre-set.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	Condition Assessment N/A	Pre-set	N/A- Other
Urban - Vacant/Derelict/Bare Ground	Failed all condition criteria.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	21. Urban	Poor	N/A- Other
Cropland - Temporary Grass and Clover Leys	No assessment required; condition is pre-set.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	Condition Assessment N/A	Pre-set	N/A- Other
Cropland - Arable Field Margins Game Bird Mix	No assessment required; condition is pre-set.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	Condition Assessment N/A	Pre-set	N/A- Other

Habitat type	Habitat condition assessment	Survey data reference	Habitat condition sheet	Assessment	Assigned condition
Urban - Urban Tree	No assessment required; condition is pre-set.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	21.Urban	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Native Species Rich Hedgerow	Passed conditions A1, A2, B1, B2, and D1.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	8. Species Rich Hedgerow	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Native Species Rich Hedgerow (second Native Species Rich Hedgerow present on Site)	Passed conditions A1, A2, B1 and D1.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	8. Species Rich Hedgerow	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Native Hedgerow	Passed conditions A1, A2, B1, B2, and D1.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	8.Hedgerow	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Native Hedgerow (second Native Hedgerow present on Site)	Passed conditions A1, A2, B1 and D1.	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	8.Hedgerow	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate

Habitat type	Habitat condition assessment	Survey data reference	Habitat condition sheet	Assessment	Assigned condition
Native Hedgerow with Trees	Passed conditions A1, A2, B1, B2, D1, E1 and E2	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	8. Hedgerow with trees	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate
Native Hedgerow with Trees	Passed conditions A1, A2, B1, D1, E1 and E2	Phase 1 habitat survey undertaken by AECOM in during 2021/2022	8. Hedgerow with trees	Biodiversity Metric 3.1 condition criteria and assessor professional judgement	Moderate

Appendix F. River Metric Enhancement Options

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
Tributary 1 of Padmoor Drain				
B2: Bank Top Tree Feature Richness	Increase extent and variety of bank top tree features	Tree planting in the riparian zone along the entirety of the watercourse on both banks would increase the extent and variety of bank top tree features. Trees should be non-invasive and of local provenance.	+2	+0.11
B5: Bank Top Managed Ground Cover	Reduce vegetation management of the bank top	The change in riparian land use from agricultural fields would result in reduced bank top vegetation management.	+4	+0.31
C1: Bank Face Vegetation Structure	Increase extent and variety of bank face vegetation types	Planting of different vegetation types (e.g. short herbs and grasses, long herbs and grasses, trees etc) on both bank faces for the entire length of the watercourse would help to increase bank face vegetation structure. Vegetation should be non-invasive and of local provenance.	+2	+0.11
C2: Bank Face Tree Feature Richness	Increase extent and variety of tree features	Tree planting on both bank faces along the entirety of the watercourse would increase the extent and variety of bank top tree features. Trees should be	+2	+0.11

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
		non-invasive and of local provenance.		
C4: Bank Face Natural Bank Profile Richness	Increase variety of natural bank face profiles	Reprofiling of the banks in selected locations would help to increase the variety of natural bank profiles. Bank reprofiling should mimic natural profile types.	+2	+0.11
C6: Bank Face Bare Sediment Extent	Increase extent of exposed bank face sediments	Remove vegetation in selected locations along the banks to reveal bank face sediments.	+3	+0.16
D1: Channel Margin Aquatic Vegetation Extent	Increase channel margin aquatic vegetation extent	Planting of aquatic vegetation at the channel margins along the entire length of the watercourse would help increase the extent of coverage. Vegetation should be non-invasive and of local provenance.	+1	+0.05
D2: Channel Margin Aquatic Morphotype Richness	Increase channel margin aquatic vegetation morphotype variety	Planting of a variety of aquatic vegetation types at the channel margins along the entire length of the watercourse would help to increase the aquatic morphotype richness along the channel margins. Vegetation should be non-invasive and of local provenance.	+2	+0.11
E12: Channel Bed Filamentous	Reduce extent of channel bed filamentous algae	The change in adjacent land use from agricultural fields will help to reduce the input of nutrients which could help to reduce the extent of filamentous	+2	+0.16

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
		algae in the watercourse. Existing filamentous algae should be removed.		
Tributary 2 of Padmoor Drain				
B2: Bank Top Tree Feature Richness	Increase extent and variety of bank top tree features	Tree planting in the riparian zone along the entirety of the watercourse on both banks would increase the extent and variety of bank top tree features. Trees should be non-invasive and of local provenance.	+2	+0.11
B5: Bank Top Managed Ground Cover	Reduce vegetation management of the bank top	The change in riparian land use from agricultural fields would result in reduced bank top vegetation management.	+3	+0.23
C1: Bank Face Vegetation Structure	Increase extent and variety of bank face vegetation types	Planting of different vegetation types (e.g. short herbs and grasses, long herbs and grasses, trees etc) on both bank faces for the entire length of the watercourse would help to increase bank face vegetation structure. Vegetation should be non-invasive and of local provenance.	+2	+0.11
C2: Bank Face Tree Feature Richness	Increase extent and variety of tree features	Tree planting on both bank faces along the entirety of the watercourse would increase the extent and variety of bank top tree features. Trees should be	+2	+0.11

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
		non-invasive and of local provenance.		
C4: Bank Face Natural Bank Profile Richness	Increase variety of natural bank face profiles	Reprofiling of the banks in selected locations would help to increase the variety of natural bank profiles. Bank reprofiling should mimic natural profile types.	+2	+0.11
C6: Bank Face Bare Sediment Extent	Increase extent of exposed bank face sediments	Remove vegetation in selected locations along the banks to reveal bank face sediments.	+3	+0.16
D1: Channel Margin Aquatic Vegetation Extent	Increase channel margin aquatic vegetation extent	Planting of aquatic vegetation at the channel margins along the entire length of the watercourse would help increase the extent of coverage. Vegetation should be non-invasive and of local provenance.	+2	+0.11
D2: Channel Margin Aquatic Morphotype Richness	Increase channel margin aquatic vegetation morphotype variety	Planting of a variety of aquatic vegetation types at the channel margins along the entire length of the watercourse would help to increase the aquatic morphotype richness along the channel margins. Vegetation should be non-invasive and of local provenance.	+3	+0.16
E1: Channel Aquatic Morphotype Richness	Increase channel aquatic vegetation morphotype variety	Planting of a variety of aquatic vegetation types on the channel bed along the entire length of the watercourse would help to increase the aquatic	+1	+0.05

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
		morphotype richness of the bed. Vegetation should be non-invasive and of local provenance.		
Watercourse 1				
B2: Bank Top Tree Feature Richness	Increase extent and variety of bank top tree features	Tree planting in the riparian zone along the entirety of the watercourse on both banks would increase the extent and variety of bank top tree features. Trees should be non-invasive and of local provenance.	+1	+0.05
B5: Bank Top Managed Ground Cover	Reduce vegetation management of the bank top	The change in riparian land use from agricultural fields would result in reduced bank top vegetation management.	+2	+0.15
C1: Bank Face Vegetation Structure	Increase extent and variety of bank face vegetation types	Planting of different vegetation types (e.g. short herbs and grasses, long herbs and grasses, trees etc) on both bank faces for the entire length of the watercourse would help to increase bank face vegetation structure. Vegetation should be non-invasive and of local provenance.	+1	+0.05
C2: Bank Face Tree Feature Richness	Increase extent and variety of tree features	Tree planting on both bank faces along the entirety of the watercourse would increase the extent and variety of bank top tree features. Trees should be	+1	+0.05

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
		non-invasive and of local provenance.		
C4: Bank Face Natural Bank Profile Richness	Increase variety of natural bank face profiles	Reprofiling of the banks in selected locations would help to increase the variety of natural bank profiles. Bank reprofiling should mimic natural profile types.	+1	+0.05
C6: Bank Face Bare Sediment Extent	Increase extent of exposed bank face sediments	Remove vegetation in selected locations along the banks to reveal bank face sediments.	+1	+0.05
D1: Channel Margin Aquatic Vegetation Extent	Increase channel margin aquatic vegetation extent	Planting of aquatic vegetation at the channel margins along the entire length of the watercourse would help increase the extent of coverage. Vegetation should be non-invasive and of local provenance.	+2	+0.10
D2: Channel Margin Aquatic Morphotype Richness	Increase channel margin aquatic vegetation morphotype variety	Planting of a variety of aquatic vegetation types at the channel margins along the entire length of the watercourse would help to increase the aquatic morphotype richness along the channel margins. Vegetation should be non-invasive and of local provenance.	+2	+0.10
E1: Channel Aquatic Morphotype Richness	Increase channel aquatic vegetation morphotype variety	Planting of a variety of aquatic vegetation types on the channel bed along the entire length of the watercourse would help to increase the aquatic	+1	+0.05

Descriptor	Objective	Enhancement detail	Potential increase in indicator score	Potential gain in river condition score
		morphotype richness of the bed. Vegetation should be non-invasive and of local provenance.		

Appendix G. Biodiversity Metric 3.1 Calculation (available separately to stakeholders)