EP UK Investments

South Humber Bank Energy Centre Project

Planning Inspectorate Reference: EN010107

South Marsh Road, Stallingborough, DN41 8BZ

The South Humber Bank Energy Centre Order

Document Reference: 5.11 Biodiversity Strategy

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations - Regulation 5(2)(q)

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GLOSSARY

Abbreviation	Description
AGIs	Above Ground Installations
CCGT	Combined Cycle Gas Turbine
CEMP	Construction Environmental Management Plan
CRoW	Countryside and Rights of Way
DCO	Development Consent Order
EfW	Energy from waste
EPH	Energetický A Prumyslový Holding
EPUKI	EP UK Investments Limited
EPWM	EP Waste Management Limited
ES	Environmental Statement
GLNP	Greater Lincolnshire Nature Partnership
kV	Kilovolt
LWS	Local Wildlife Site
mAOD	m Above Ordnance Datum
MW	megawatt
NCA	National Character Area
NELC	North East Lincolnshire Council
NERC	Natural Environment and Rural Communities
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
PA 2008	The Planning Act 2008
RDF	Refuse derived fuel
SHBEC	South Humber Bank Energy Centre
SHBPS	South Humber Bank Power Station
SHG	South Humber Gateway
SHIIP	South Humber Industrial Investment Programme
SoS	Secretary of State
SPA	Special Protection Area
tpa	tonnes per annum
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive

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1.0 EXECUTIVE SUMMARY

1.1.1 This Biodiversity Strategy (incorporating an Indicative Biodiversity Mitigation and Enhancement Plan) has been prepared on behalf of EP UK Investments and forms part of the application for a Development Consent Order (DCO) for the construction, operation and maintenance of a proposed energy from waste plant of up to 95 MW, referred to as the South Humber Bank Energy Centre (SHBEC) (the 'Proposed Development'). The Proposed Development is located on a parcel of land to the east of the South Humber Bank Power Station (SHBPS), off South Marsh Road, Immingham (centred on approximate grid reference TA 230 133).

1.1.2 The purpose of this document is to set out the proposed strategy to mitigate the effects of the Proposed Development on biodiversity features and to enhance the biodiversity value of the existing power station site (the 'Site').

1.1.3 Measures to protect biodiversity features during construction have been identified, including installation of a visual screen to avoid disturbance of waterbirds using a field to the south of the Site, measures to avoid piling noise and vibration disturbance of waterbirds, seasonal constraints on works to a ditch to avoid impacts on water vole, and vegetation removal outside the bird breeding season to avoid impacts on breeding birds. A Construction Environmental Management Plan (CEMP) will be implemented during the construction phase.

1.1.4 The proposed biodiversity enhancement measures to be delivered within the Site are summarised below. New habitat creation is proposed, together with protection and enhancement of existing habitats. The key measures proposed are:

- botanical enhancement of existing areas of species poor grassland;
- creation of a wildlife pond including the establishment of marginal aquatic vegetation;
- enhancement of existing ditch habitat to increase biodiversity value;
- widening of a section of ditch in the south of the Site;
- creation of species-rich native hedgerow;
- creation of log piles (refuges) in existing woodland; and
- installation of bird boxes in existing woodland.

1.1.5 Management and monitoring will be undertaken for five years to ensure habitats are successfully established.

1.1.6 Additional off-site biodiversity mitigation will be delivered through a financial contribution to NELC for strategic mitigation habitat at Cress Marsh in accordance with local planning policy.

2.0 INTRODUCTION

2.1 Overview

2.1.1 This Indicative Biodiversity Strategy document (Document Ref. 5.11) has been prepared on behalf of EP Waste Management Limited ('EPWM' or the 'Applicant'). It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy, under section 37 of 'The Planning Act 2008' (the 'PA 2008').

2.1.2 maintenance of an energy from waste ('EfW') power station with a gross electrical output of up to 95 megawatts (MW) including an electrical connection, a new site access, and other associated development (together 'the Proposed Development') on land at South Humber Bank Power Station ('SHBPS'), South Marsh Road, near Stallingborough in North East Lincolnshire ('the Site').

2.1.3 A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (a 'NSIP') under sections 14 and 15(2) of the PA 2008.

2.1.4 The DCO, if made by the SoS, would be known as the 'South Humber Bank Energy Centre Order' ('the Order').

2.1.5 Full planning permission ('the Planning Permission') was granted by North East Lincolnshire Council ('NELC') for an EfW power station with a gross electrical output of up to 49.9 MW and associated development ('the Consented Development') on land at SHBPS ('the Consented Development Site') under the Town and Country Planning Act 1990 on 12 April 2019. Since the Planning Permission was granted, the Applicant has assessed potential opportunities to improve the efficiency of the EfW power station, notably in relation to its electrical output. As a consequence, the Proposed Development would have a higher electrical output (up to 95 MW) than the Consented Development, although it would have the same maximum building dimensions and fuel throughput (up to 753,500 tonnes per annum (tpa)).

2.2 The Applicant

2.2.1 The Applicant is a subsidiary of EP UK Investments Limited ('EPUKI'). EPUKI owns and operates a number of other power stations in the UK. These include SHBPS and Langage (Devon) Combined Cycle Gas Turbine ('CCGT') power stations, Lynemouth (Northumberland) biomass-fired power station, and power generation assets in Northern Ireland. EPUKI also owns sites with consent for new power stations in Norfolk (King's Lynn 'B' CCGT) and North Yorkshire (Eggborough CCGT).

2.2.2 EPUKI is a subsidiary of Energetický A Prumyslový Holding ('EPH'). EPH owns and operates energy generation assets in the Czech Republic, Slovak Republic, Germany, Italy, Hungary, Poland, Ireland, and the United Kingdom.

2.3 The Proposed Development Site

2.3.1 The Proposed Development Site (the 'Site' or the 'Order limits') is located within the boundary of the SHBPS site, east of the existing SHBPS, along with

part of the carriageway within South Marsh Road. The principal access to the site is off South Marsh Road.

2.3.2 The Site is located on the South Humber Bank between the towns of Immingham and Grimsby; both over 3 km from the Site. The surrounding area is characterised by industrial uses dispersed between areas of agricultural land with the nearest main settlements being the villages of Stallingborough, Healing and Great Coates. The Site lies within the parish of Stallingborough although Stallingborough village lies over 2 km away.

2.3.3 The Site lies within the administrative area of NELC, a unitary authority. The Site is owned by EP SHB Limited, a subsidiary of EPUKI, and is therefore under the control of the Applicant, with the exception of the highway land on South Marsh Road required for the new Site access.

2.3.4 The existing SHBPS was constructed in two phases between 1997 and 1999 and consists of two CCGT units fired by natural gas, with a combined gross electrical capacity of approximately 1,400 MW. It is operated by EP SHB Limited.

2.3.5 The Site is around 23 hectares ('ha') in area and is generally flat, and typically stands at around 2.0 m Above Ordnance Datum (mAOD).

2.3.6 The land surrounding the Site immediately to the south, west and north-west is in agricultural use with a large polymer manufacturing site, Synthomer, and a waste management facility, NEWLINCS, both located to the north of the Site and also accessed from South Marsh Road. The estuary of the River Humber lies around 175 m to the east of the Site.

2.3.7 Access to the South Humber Bank is via the A180 trunk road and the A1173. The Barton railway line runs north-west to south-east between Barton-on-Humber and Cleethorpes circa 2.5 km to the south-west of the Site and a freight railway line runs north-west to south-east circa 300 m (at the closest point) to the Site.

2.3.8 A more detailed description of the Site is provided at Chapter 3: Description of the Proposed Development Site in the Environmental Statement ('ES') Volume I (Document Ref. 6.2).

2.4 The Proposed Development

- The main components of the Proposed Development are summarised below:
- Work No. 1— an electricity generating station located on land at SHBPS, fuelled by refuse derived fuel ('RDF') with a gross electrical output of up to 95 MW at ISO conditions;
- Work No. 1A— two emissions stacks and associated emissions monitoring systems;
- Work No. 1B— administration block, including control room, workshops, stores and welfare facilities;
- Work No. 2— comprising electrical, gas, water, telecommunication, steam and other utility connections for the generating station (Work No. 1);

- Work No. 3— landscaping and biodiversity works;
- Work No. 4— a new site access on to South Marsh Road and works to an existing access on to South Marsh Road; and
- Work No. 5— temporary construction and laydown areas.

2.4.1 Various types of ancillary development further required in connection with and subsidiary to the above works are detailed in Schedule 1 of the DCO. A more detailed description of the Proposed Development is provided at Schedule 1 'Authorised Development' of the Draft DCO and Chapter 4: The Proposed Development in the ES Volume I (Document Ref. 6.2) and the areas within which each of the main components of the Proposed Development are to be built is shown by the coloured and hatched areas on the Works Plans (Document Ref. 4.3).

2.5 Relationship with the Consented Development

2.5.1 The Proposed Development comprises the works contained in the Consented Development, along with additional works not forming part of the Consented Development ('the Additional Works'). The Additional Works are set out below along with an explanation of their purpose.

- a larger air-cooled condenser (ACC), with an additional row of fans and heat exchangers – this will allow a higher mass flow of steam to be sent to the steam turbine whilst maintaining the exhaust pressure and thereby increasing the amount of power generated;
- a greater installed cooling capacity for the generator – additional heat exchangers will be installed to the closed-circuit cooling water system to allow the generator to operate at an increased load and generate more power;
- an increased transformer capacity – depending on the adopted grid connection arrangement the capacity will be increased through an additional generator transformer operating in parallel with the Consented Development's proposed generator transformer or a single larger generator transformer. Both arrangements would allow generation up to 95 MW; and
- ancillary works – the above works will require additional ancillary works and operations, such as new cabling or pipes, and commissioning to ensure that the apparatus has been correctly installed and will operate safely and as intended.

2.5.2 The likely construction scenario is for work on the Consented Development (pursuant to the Planning Permission) to commence in Quarter 2 ('Q2') of 2020 and to continue for around three years. Following grant of a DCO for the Proposed Development (approximately halfway through the three-year construction programme), the Applicant would initiate powers to continue development under the Order instead of the Planning Permission. The Order includes appropriate powers and notification requirements for the 'switchover' between consents, to provide clarity for the relevant planning authority regarding the development authorised and the applicable conditions, requirements, and other obligations. Once the Order has been implemented the additional works would be constructed and the Proposed Development

would be built out in full. The Proposed Development would commence operation in 2023.

2.5.3 Alternative construction scenarios, involving construction entirely pursuant to the Order, are also possible. Accordingly, three representative scenarios are described within Chapter 5: Construction Programme and Management in the ES Volume I (Document Ref. 6.2) and assessed in the Environmental Impact Assessment ('EIA').

2.6 The Purpose and Structure of this Document

2.6.1 The purpose of this document is to set out the proposed strategy to mitigate the effects of the Proposed Development on biodiversity features and to enhance the biodiversity value of the Site in accordance with relevant national and local planning policies.

2.6.2 An ecological impact assessment has been undertaken to determine the ecological receptors that could be affected by the Proposed Development, and this is reported in Chapter 10: Ecology of the Environmental Statement (ES) Volume I (Document Ref. 6.2). The Proposed Development has been designed, as far as is practicable, to avoid or reduce effects on biodiversity features through development design and impact avoidance (see Section 10.5 of Chapter 10). Further mitigation and enhancement measures are identified where necessary (see Section 10.7 of Chapter 10). The impact avoidance, mitigation and enhancement measures are described in more detail in this Indicative Biodiversity Strategy.

2.6.3 The Indicative Biodiversity Strategy is structured as follows:

- Section 3 summarises relevant legislation, planning policy and guidance;
- Section 4 describes the existing biodiversity features of the Site and surrounding area;
- Section 5 describes the impacts of the Proposed Development on biodiversity features;
- Section 6 sets out the biodiversity protection plan for the Proposed Development;
- Section 7 sets out the measures to avoid impacts on the Humber Estuary SPA/ Ramsar waterbirds using fields to the south of the Site during piling activities associated with the construction of the Proposed Development;
- Section 8 describes the indicative proposals for biodiversity mitigation and enhancement, including embedded mitigation and contribution to off-site habitat creation;
- Section 9 outlines how the biodiversity mitigation and enhancement measures will be effectively managed and monitored; and
- Section 10 describes the roles and responsibilities of all parties involved in the delivery of the final approved biodiversity mitigation and enhancement plan.

2.6.4 It is proposed that the measures set out in this Biodiversity Strategy will be secured by DCO requirements.

3.0 LEGISLATION, POLICY AND GUIDANCE

3.1.1 A description of all relevant legislation and planning policy is provided in Appendix 10A in ES Volume III (Document Ref. 6.4). Key points are summarised below.

3.2 Legislation

3.2.1 The following legislation has been taken into consideration in the selection and design of biodiversity enhancement and mitigation measures in connection with the Proposed Development.

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Wildlife and Countryside Act 1981 (as amended) (WCA);
- Countryside and Rights of Way (CRoW) Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992;
- The Water Environment (Water Framework Directive) (WFD) (England and Wales) Regulations 2017; and
- The Environment Bill (if enacted and brought into force).

3.3 Planning Policy and Related Guidance

3.3.1 The following national and local planning policies and related guidance applicable to North East Lincolnshire has been taken into consideration in the selection and design of biodiversity enhancement and mitigation measures in connection with the Proposed Development.

- Overarching National Policy Statement for Energy (NPS EN-1) Part 5.3 (Department for Energy and Climate Change (DECC), 2011a);
- National Policy Statement for Renewable Energy Infrastructure (EN-3) (DECC, 2011b);
- National Planning Policy Framework (NPPF) Section 15 (Department for Communities and Local Government, 2019);
- North East Lincolnshire Local Plan 2018 (NELC, 2018);
- Natural England and Defra Standing Advice including guidance on providing and protecting habitat for wild birds; and
- National Character Area (NCA) Profile: 41 Humber Estuary (Natural England, 2012).

4.0 EXISTING BIODIVERSITY FEATURES

4.1 Habitats

4.1.1 Habitats within both the Main Development Area to the east of SHBPS (Work No. 1 on the Works Plan (Document Ref. 4.3)) and undeveloped areas of the Site situated to the immediate north, west and south of SHBPS (included within Work Nos. 2, 3 and 5 on the Works Plan), are described in the Chapter 10: Ecology of the ES Volume I (Document Ref. 6.2) and summarised below.

4.1.2 Work No. 4 comprises existing roads.

4.2 Habitats Within the Main Development Area (Work No. 1)

Semi-Improved Neutral Grassland

4.2.1 The Main Development Area is dominated by semi-improved neutral grassland created and subsequently managed for nature conservation since the late 2000s through a management regime of sheep grazing and annual September mowing.

Bare Ground

4.2.2 There are two areas nof bare ground with a sparse regenerating grassland vegetation within the Main Development Area.

Scrub

4.2.3 Small patches and lines of planted and managed native scrub are present, close to the areas of bare ground.

Ditch

4.2.4 Ditches are present along the northern and southern boundaries of the Main Development Area.

4.3 Habitats Within the Wider Site (Work Nos. 2, 3 and 5)

Semi-Improved Neutral Grassland

4.3.1 Semi-improved neutral grassland which varies from areas of fairly-low species diversity to areas originating from wild-flower seeding, of moderate quality, is present in several areas of the Site to the south and west of the SHBPS.

Plantation Broadleaved Woodland

4.3.2 Three areas of predominantly broadleaved young plantation woodland are present to the south and west of the SHBPS.

Orchard

4.3.3 A young orchard has been planted close to one of the areas of woodland to the north-west of the SHBPS.

Scattered Broadleaved Trees

4.3.4 Native broadleaved tree saplings have been recently planted within an area of semi-improved neutral grassland to the south-west of the SHBPS.

Introduced Shrub

4.3.5 Borders of introduced ornamental shrub species are present in conjunction with amenity grassland and pavements within the SHBPS operational areas.

Ditch

4.3.6 Ditch habitat is present within the Site to the north, west and south of the SHBPS.

Hedge

4.3.7 A native hedge separates the operational area of the SHBPS from a grassy track running alongside the ditches and boundary fence at the northern and western peripheries of the Site.

Amenity Grassland

4.3.8 Amenity grassland is present around the operational areas of the SHBPS and beneath overhead power lines at the west of the SHBPS. This grassland is of low species diversity and is kept short by regular mowing.

4.4 Protected and Notable Species Within the Site

4.4.1 Habitats within the Main Development Area were found to support breeding birds, wintering birds, water vole, otter and aquatic invertebrates (smooth ram's-horn snail (*Gyraulus laevis*)). Reptiles were not identified by surveys, but the potential for transitory presence of grass snake in ditch habitats has been considered in Section 6 due to the suitability of the habitat.

4.5 Biodiversity Features Off-Site

4.5.1 The Site is located approximately 175 m from the Humber Estuary Site of Special Scientific Interest (SSSI)/ Special Protection Area (SPA)/ Special Area for Conservation (SAC)/ Ramsar site, and SPA bird species use the fields to the north and south of the Site for high tide roosting, loafing and feeding during winter. These fields are therefore considered to be functionally linked to the Humber Estuary.

4.5.2 Four Local Wildlife Sites (LWS) were also identified in the desk study area:

- Healing Cress Beds Stallingborough LWS – approximately 0.7 km south-west of the Site;
- Sweedale Croft Drain LWS – approximately 0.8 km south-east of the Site;
- Laporte Road Brownfield Site LWS – approximately 1 km north-west of the Site; and
- Fish Ponds to the West of Power Station, Stallingborough LWS – approximately 1 km south-west of the Site.

5.0 PROPOSED DEVELOPMENT IMPACTS

5.1 Development Impacts on Habitats Within the Site

5.1.1 Approximately 6.7 ha of semi-improved neutral grassland and small patches of native scrub within the Main Development Area will be permanently lost to the Proposed Development at the start of construction.

5.1.2 There will be a direct impact on the ditch running along the northern boundary of the Main Development Area during construction, but this will be limited to the installation of a short culvert (approximately 8 – 10 m) required to install the new site access to the north-east of the Main Development Area from South Marsh Road. The permanent loss of habitat resulting from this part of the Proposed Development will be minimal (the total length of this ditch is around 1 km). No other ditches will be directly affected.

5.1.3 Approximately 1.37 ha of semi-improved neutral grassland to the south of SHBPS will be temporarily lost due to the construction laydown area associated with the Proposed Development Area.

5.1.4 Existing habitats in the areas of the Site to the north and west of the SHBPS will not be affected by the construction or operation of the Proposed Development.

5.2 Development Impacts on Protected and Notable Species Within the Site

5.2.1 The loss of grassland within the Main Development Area as described above will displace the low numbers of SPA/ Ramsar waterbirds that use the Site at high tide during winter. Site clearance and other construction activity have the potential to disturb breeding birds within the Site.

5.2.2 As described above a short (8-10 m) stretch of ditch habitat along the northern boundary of the Main Development Area will be lost by culverting for the new access road to the Proposed Development. There is therefore potential for impacts on water vole, otter and (if present) grass snake. No impacts on smooth ram's-horn snail are anticipated as this species was only identified in an unaffected section of ditch in the south of the Main Development Area.

5.2.3 During operation there is potential for impacts on water vole, otter and aquatic invertebrates due to surface water pollution.

5.3 Development Impacts on Biodiversity Features Off-Site

5.3.1 Construction of the Proposed Development has the potential to cause noise and visual disturbance to SPA/ Ramsar waterbirds using the functionally linked fields to the south of the Site.

5.3.2 Operation of the Proposed Development could also affect statutory and non-statutory designated nature conservation sites due to air quality changes.

6.0 BIODIVERSITY PROTECTION PLAN

6.1.1 The impact avoidance measures that will be adopted during the construction phase of the Proposed Development in order to protect biodiversity features are set out below.

6.2 Measures to Avoid Impacts on Water Vole

6.2.1 The layout of the Proposed Development has been designed to accommodate a minimum 5 m undeveloped buffer zone along the banks of all perimeter ditches, to avoid damage and disturbance to the main water vole habitats (i.e. the ditches) associated with the Main Development Area during construction and operation (with the exception of the new site access which will cross the northern perimeter ditch). The buffer zone will be fenced from the Proposed Development to prevent accidental damage during construction.

6.2.2 In the absence of mitigation, there is a risk that water voles may be accidentally killed or injured during the construction works, and their burrows damaged or destroyed. Mitigation for this species will therefore be implemented for legislative compliance. Works to install the culvert for site access at the northern boundary will be undertaken under the supervision of an ecologist holding a Class Licence for water vole. This is due to the minor extent of the works (approximately 8 – 10m) that does not trigger the requirement for a development licence from Natural England. A separate water vole mitigation strategy document will be prepared as part of the Class Licence process; however, the approach and timings are outlined below.

6.2.3 The approach to mitigation will be as follows:

- ditch vegetation (within the channel and on the banks) will be strimmed back to ground level under the supervision of the Class Licensed ecologist to displace water voles from the affected section of habitat in the period 15th February to 15th April;
- ditch vegetation will be kept strimmed short until works commence;
- arisings will be removed;
- prior to the commencement of works, the Class Licensed ecologist will inspect the working area to confirm that water voles were absent from any burrows present;
- on confirmation of the absence of water voles, works to install the culvert will commence under the supervision of the Class Licensed ecologist; and
- any amphibians (e.g. common toad) encountered during the works will be moved to a place of safety away from the working area.

6.2.4 This mitigation approach will also be sufficient to address the risk of accidental killing/ injury to water shrew (*Neomys fodiens*), which may be present in the perimeter ditches see Appendix 10E: Otter and Water Vole Survey Report in ES Volume III (Document Ref. 6.4).

6.3 Grass Snake Mitigation

6.3.1 Due to the potential for grass snake to occur on the banks of ditches, a precautionary approach to the clearance of vegetation will be undertaken

(alongside the mitigation for water vole). The strimming of vegetation from the banks of the ditch for water vole displacement in connection with culvert construction as described above will also be sufficient to displace grass snake.

6.4 Breeding Bird Mitigation

6.4.1 Grassland and marginal ditch vegetation will be removed outside the breeding bird season wherever possible. If this is not possible and vegetation removal is required during the breeding bird season, then a pre-works check for nests will be undertaken and appropriate mitigation will be implemented to avoid disturbance.

6.5 General Good Practice

6.5.1 The construction phase of the Proposed Development will comply with industry good practice and environmental protection legislation during construction in relation to prevention of surface and ground water pollution, fugitive dust management and noise prevention or amelioration. In support of this, the construction contractor will prepare and implement a Construction Environmental Management Plan (CEMP) detailing all requirements for environmental protection and legal compliance. A Framework CEMP is provided in Appendix 5A (ES Volume III, Document Ref. 6.4).

6.5.2 To ensure legislative compliance in relation to nesting birds, all clearance of suitable vegetation (notably any areas of scrub) during site preparation would be undertaken outside the breeding season (which is typically March-August inclusive for most avian species), where possible. In situations where this is not possible, an ecologist would survey the working area for nests before works commence. If nests were discovered, appropriate mitigation would be implemented to ensure that they are not disturbed or destroyed before any works can commence in that area. This would include imposing any appropriate exclusion zones between the works and nest(s) and suspending vegetation clearance works within the area until any young had fledged.

6.5.3 Precautionary measures will be implemented to prevent trapping wildlife in construction excavations, in order to ensure compliance with animal welfare legislation. Any excavations deeper than 1 m would be covered overnight, or where this is not practicable, a means of escape would be fitted (e.g. battered soil slope or scaffold plank situated at or below a 45º angle), to allow animals (e.g. otter) to vacate excavations should they fall in.

6.5.4 An ecological watching brief will be carried out during ground clearance of the Main Development Area at the start of the construction phase, including removal of the artificial hibernaculum (see Appendix 10C in ES Volume III, Target Note 5 on Figure 10C.4) and the two hay piles (Appendix 10C, Target Note 4 on Figure 10C.4) to prevent harm to reptiles and amphibians that may be present.

6.5.5 Construction temporary lighting would be arranged so that glare is minimised outside the construction site. Measures to minimise the impact of lighting will be detailed in the CEMP.

6.5.6 If construction is delayed to one of the later construction programme scenarios as set out in Chapter 5: Construction Programme and Management, in ES Volume I (Document Ref. 6.2) an update ecological walkover survey will be

required to confirm there are no changes to the baseline conditions, particularly with regard to mobile species such as badger.

7.0 MEASURES TO AVOID IMPACTS ON THE HUMBER ESTUARY SPA/ RAMSAR WATERBIRDS USING FIELDS TO THE SOUTH OF THE SITE

7.1.1 A close board fence approximately 2.5 m in height will be installed along part of the southern boundary of the Site (see Figure 1), to provide visual screening during construction and operation to the adjacent field to the south. This field has been identified as a key high tide roost for SPA/ Ramsar waterbirds, and the eastern portion of the field is allocated as part of the SHG strategic mitigation package for the SHIIP.

7.1.2 The assessment has concluded that there is the potential for significant adverse effects on waterbirds in the adjacent field to the south (field 37), which is functionally linked to the Humber Estuary SPA/ Ramsar, as a result of piling noise and vibration during construction. Although the piling activity will only be undertaken for a relatively short period of time (estimated at 2 to 4 months), it is not possible at this stage to determine whether this will overlap with the sensitive wintering bird period. It may therefore occur when birds are present and they could be disturbed or displaced.

1.1.1 At this stage, the mitigation measures to be employed have not been fixed; this is to enable sufficient flexibility for the contractor to determine the best available technique for noise abatement during piling works. Mitigation is expected to comprise:

- seasonal piling restrictions – piling will be restricted for two hours either side of high tide in the period September to March inclusive, to avoid the most sensitive winter months, and the time period when birds are most likely to be present in the fields (i.e. when they are pushed off the coastal mudflats at high tide); and/ or
- Continuous Flight Auger (CFA) piling – this technique is virtually vibration free, and one of the quietest forms of piling. If this technique is adopted, it will be possible to reduce construction noise reaching the fields to within ambient levels, and vibration disturbance effects would also be reduced.

8.0 INDICATIVE BIODIVERSITY MITIGATION AND ENHANCEMENT PLAN

8.1 Development Design: Embedded Mitigation

8.1.1 The design process for the Proposed Development has included consideration of ecological constraints and has incorporated, where possible, measures to reduce the potential for adverse ecological effects, in accordance with the mitigation hierarchy and relevant planning policy. The measures identified and adopted include those that are inherent to the design of the Proposed Development, and those that can realistically be expected to be applied as part of construction environmental best practice, or as a result of legislative requirements.

8.1.2 Measures that are embedded into the design of the Proposed Development relevant to the impacts described in Section 5 are summarised below.

Contribution to Off-Site Mitigation Habitat Creation

8.1.3 A financial contribution of £105,378 will be made to NELC in accordance with Policy 9 of the NELC Local Plan for the delivery of South Humber Gateway (SHG) strategic habitat mitigation at Cress Marsh (as part of the South Humber Industrial Investment Programme (SHIIP)), to mitigate for the loss of SPA/ Ramsar waterbird habitat from the Main Development Area. This payment will be secured via a deed of variation to the existing Section 106 agreement entered into with NELC.

8.1.4 The contribution to strategic mitigation habitat creation will ensure that the loss of functionally linked land within the Main Development Area will not result in adverse effects on the integrity of the Humber Estuary SPA/ Ramsar site (compliant with the Habitats Regulations[1] – see HRA Signposting Report (Document Ref. 5.8)).

Stack Height

8.1.5 The stack height has been determined based on the findings of air quality modelling. The top of the stack is fixed at 102 mAOD in order to disperse air pollutants and avoid effects on sensitive receptors, including ecological receptors. This will avoid any significant effects on designated nature conservation sites due to air quality.

Drainage Design

8.1.6 The Proposed Development design incorporates an appropriate drainage system, which will discharge to a ditch within the Main Development Area at the greenfield runoff rate. The design and implementation of the drainage

1 This impact avoidance habitat has not been taken into account in the Stage 1 HRA screening, because the recent People Over Wind ruling means that impact avoidance/ embedded mitigation cannot be taken into account when determining the potential for likely significant effects. However, the HRA has concluded no adverse effects on integrity at Stage 2 Appropriate Assessment.

system will prevent pollution at each phase of the Proposed Development (see Outline Drainage Strategy at Appendix 14B of the ES Volume II (Document Ref. 6.3)). Details will be approved in accordance with DCO requirements.

Lighting Design

8.1.7 Appropriate lighting design will prevent light spill outside the Site at each phase of the Proposed Development (see Indicative Lighting Strategy (Document Ref. 5.12)). Details will be approved in accordance with DCO requirements.

8.2 Biodiversity Features to be Created, Enhanced and Managed at the Site

8.2.1 As agreed with NELC in relation to the Consented Development, the following mitigation and enhancement measures have been identified:

- creation of an area of species-rich grassland to the west of SHBPS;
- creation of a new wildlife pond;
- creation of log pile refuges; and
- installation of bird boxes on mature trees to the west of SHBPS.

8.2.2 These mitigation and enhancement proposals have been further developed for the Proposed Development in response to Natural England comments on the Preliminary Environmental Information (PEI) Report (Section 42 consultation) to also include:

- species-rich hedgerow creation;
- enhancement of ditch habitats within the Site; and
- widening of a section of ditch at the south of the Site (where the ditch-edge currently comprises a gentle slope from low-lying adjacent land): re-profiling to increase water depth in this area to allow a range of aquatic plant species to establish.

8.2.3 The proposed biodiversity mitigation and enhancement measures are summarised below, and extent and locations shown in Figure 1 and quantified in Table 1 below. Detailed design specifications and locations together with management and monitoring requirements are presented in Appendix 1.

Table 1: Lengths/ areas of indicative biodiversity mitigation and enhancement measures

MITIGATION/ ENHANCEMENT MEASURE	TOTAL LENGTH (M)	TOTAL AREA (HA)
Proposed enhancement of amenity grassland to species-rich semi-improved neutral grassland.	-	0.76
Proposed enhancement of poor semi-improved neutral grassland	-	0.28
Proposed pond	-	0.07
Existing woodland areas to be retained and managed with addition of log piles and bird boxes	-	1.19
Existing orchard to be retained and managed	-	0.18
Proposed species-rich native hedge*	390	-
Existing drainage ditch to be enhanced	1870	-
Proposed ditch widening to enhance habitat for water voles	-	0.03

* Note hedges in areas of existing below ground or overhead infrastructure to be agreed with statutory undertakers

Grassland Habitat Creation and Enhancement

8.2.4 Areas of short mown amenity grassland and areas of less intensively managed semi-improved neutral grassland to the west of the SHBPS; currently assessed as poor/ fairly-poor in terms of species richness and diversity, will be botanically enhanced by scarification of the existing sward prior to the application of wildflower seeding mix suitable to the soil conditions present, followed by an annual hay-cut and autumn mowing.

Pond Creation

8.2.5 A new pond and marginal vegetation will be created in an area of amenity grassland west of the existing SHBPS. The pond will be designed with a non-uniform margin and varying depths to maximise the habitat niches available for aquatic plants, invertebrates, reptiles and amphibians. The margins of the pond will be planted with a small amount of native aquatic and marginal plant species to assist with the establishment of vegetation; although will be primarily allowed to establish naturally. The biodiversity value of the grassland area surrounding the pond and its margins will be enhanced as described above.

Log Pile Refuges

8.2.6 Log piles will be established within existing areas of broadleaved woodland in the west and south-west of the Site.

Bird Nesting Boxes

8.2.7 Bird nesting boxes will be installed on mature trees within existing areas of broadleaved woodland in the west and south-west of the Site.

Species-rich Hedgerow Creation

8.2.8 A species-rich native hedgerow will be created along the boundary of grassland to be botanically enhanced at the west of the SHBPS.

Enhancement and Widening of Ditches

8.2.9 In response to consultation in accordance with Section 42 of the Planning Act 2008 in respect of the Proposed Development, Natural England suggested that consideration be given to further enhancement works to improve habitat for water vole around the ditches. Natural England noted that, as stated in the Lincolnshire Biodiversity Action Plan, this county is considered a national stronghold for water vole, and whilst the species were present in older surveys of the ditches around the perimeter of the Site, the most recent survey only found limited evidence of water vole.

8.2.10 Existing ditches at the boundaries of the Site will be managed to provide enhanced habitat for water vole. Management specifications will include:

- leaving all ditch bank and marginal vegetation uncut between March and the end of September;
- allow marginal bank vegetation on at least one side of the ditch to persist throughout the year (rotational cutting regime);
- widening marginal habitat alongside the ditches where possible i.e. allowing the existing grassland and marginal vegetation to grow taller to provide a wider marginal corridor (to between 2 - 5 m along either side of the ditch; dependent on constraints of vehicle access tracks); and
- allowing greater cover of floating and submerged aquatic plants to establish within the ditch.

8.2.11 It is also proposed to widen a section of ditch and marginal vegetation to the south-east of SHBPS. Here, there is a small area of low-lying ground with sparse vegetation close to the ditch. This area has previously been recorded (Phase 1 Habitat Survey, 2018) as supporting swamp habitat (common reed) and is likely to be regularly inundated. This section of the ditch margin will be further excavated/ profiled to allow water to flood into it permanently, extending the area of open water and providing potential for a diverse assemblage of submerged, floating-leaved and emergent aquatic vegetation to establish. The adjacent grassland will be managed to create a 2 - 5 m wide buffer of tall grasses, rushes and other marginal vegetation to provide foraging and protection from predators for water vole as well as commuting and foraging habitat for otter.

8.3 Habitat Creation Principles

8.3.1 The aim of the mitigation proposals in connection with the Proposed Development is to enhance and complement the retained existing features of biodiversity value in the south and west of the Site, resulting in a mosaic of connected and complementary habitats providing potential foraging, refuge and breeding habitat for the following species groups: wild birds (passerines), terrestrial and aquatic invertebrates, reptiles, amphibians, water voles and other small mammals. Existing habitats of biodiversity value to the west and south of SHBPS to be retained/ enhanced comprise: broadleaved plantation

woodland, orchard, scattered trees, native hedge, semi-improved neutral grassland (including areas of unmanaged, rough grassland, suitable for small mammals) and ditches.

Grassland

8.3.2 As described at paragraph 8.2.4 above, areas of semi-improved neutral and amenity grassland to the west of the SHBPS which are currently assessed as poor/ fairly-poor in terms of species richness and diversity, will be botanically enhanced by scarification of the sward prior to the application of wildflower seeding mix suitable to the soil conditions present, followed by an annual hay cut and autumn mowing. Species-rich grassland with a good range and abundance of wild flower species, provides suitable habitat for a range of invertebrate species and a valuable source of nectar and pollen for pollinators such as bumble bees and hoverflies. Leaving some areas of grassland tall and unmanaged provides enhanced habitat for small mammals, which are a potential food source for birds of prey. Grassland (with wildflower species such as common knapweed) left unmown will provide a source of seeds for foraging birds.

Pond Creation, Ditch Enhancement and Marginal Vegetation

8.3.3 Biodiversity enhancement proposals for the Site will provide increased extent and quality of habitat for water vole, otter, grass snake and aquatic invertebrates through specification for lower intensity management of marginal ditch habitat to enhance the habitat quality of the existing ditches and margins. Creation of a new pond within the existing area of amenity grassland to the west of SHBPS and widening a section of ditch and marginal vegetation to the south-east of SHBPS will extend the area of open water with potential to support both floating and emergent aquatic macrophyte vegetation.

8.3.4 The adjacent grassland will be managed to create a 2 - 5 m wide buffer of tall grasses, rushes and other marginal vegetation to provide foraging and protection from predators for water vole as well as commuting and foraging habitat for otter. Increasing the width of the corridor of taller riparian vegetation is likely to benefit a range of bird species such as such as sedge warbler (*Acrocephalus schoenobaenus*), reed warbler (*Acrocephalus scirpaceus*) and reed bunting (*Emberiza schoeniclus*), which have been recorded using the Site.

8.3.5 A range of aquatic and terrestrial invertebrate species groups will also potentially benefit from a wider buffer of tall marginal vegetation as it will provide greater structural diversity within the (currently uniform) grassland sward. For example, some invertebrates (e.g. butterflies) will lay eggs on tall grasses, and several dragonfly species use tall rushes and other aquatic macrophyte vegetation for larval emergence and completion of metamorphosis, for which shelter from wind and predators is essential. To allow opportunity for completion of all life-stages for invertebrate species using these habitats, there should always be some sections of marginal vegetation left uncut, with sections for annual mowing or strimming being determined on a rotational basis to avoid succession to dominant scrub vegetation.

Log Pile Refuges and Bird Nesting Boxes

8.3.6 Management measures for woodland and trees within the Site are set out in the Indicative Landscape Strategy (Document Ref. 5.10).

8.3.7 The construction of log pile refuges in existing areas of woodland in the west and south-west of the Site will create refuge and hibernation habitat for reptiles, amphibians and provide deadwood habitat required for terrestrial invertebrates. Deadwood habitat (including log piles) will also be positioned in suitably sunny south-facing woodland edge habitat in the west and south-west of the Site to provide potential nesting habitat for solitary bees.

8.3.8 The installation of bird nesting boxes within the areas of plantation woodland to the west and south-west of SHBPS will provide breeding habitat for birds using the woodland, grassland and ditches for foraging.

8.3.9 Measures to enhance the suitability of marginal, grassland and woodland habitat for a range of invertebrate species groups, provides an increased abundance and variety of food sources for a range of small bird species which may use the woodland, ditch and grassland habitats of the Site for foraging and nesting.

Species-rich Hedgerow

8.3.10 The planting of a species-rich hedgerow will provide both additional habitat diversity and function as a suitable habitat to support amphibians, reptiles and birds.

9.0 MANAGEMENT AND MONITORING OF BIODIVERSITY FEATURES

9.1 Management Prescriptions

9.1.1 A summary of management prescriptions relating to each of the selected biodiversity features shown on Figure 1 is presented at Appendix 1.

Grassland Management

9.1.2 The areas of retained semi-improved neutral and amenity grassland to the west of SHBPS selected for botanical enhancement will be mown and scarified prior to seeding with a suitable wildflower and grasses seed mix. The grassland habitat will be subsequently managed by taking a 'hay cut' in late July or August after flowering, followed by mowing of re-growth to a height of approximately 5 cm in late autumn and early spring (if needed). Sapling trees and shrubs will be removed periodically, and the stumps treated to prevent regrowth.

Pond Creation

9.1.3 The wildlife pond will be created within existing amenity grassland in the west of the Site as described in Section 7. Significant areas (10-50%) of open water will be maintained clear of aquatic macrophyte vegetation within each pond with no encroachment of marginal vegetation beyond 3 m inward of original pond edge. Any necessary vegetation removal will be undertaken during the winter months and carried out on a rotational basis, ensuring that sections of tall aquatic emergent vegetation are retained around the pond margins. Tree and scrub cover should not exceed 25% of pond perimeter.

Ditch Management

9.1.4 The value of ditch habitats within the Site for water vole will be increased by reducing the intensity of ditch and marginal habitat management, allowing tall marginal vegetation to remain uncut between March and the end of September to a width of between 2 - 5 m. An additional buffer width of tall grasses/ marginal vegetation will also be established, allowing some sections to remain undisturbed throughout the year (rotational cutting).

Species-rich Hedgerow

9.1.5 The hedgerow will be planted as leafless whips during the winter and then be subject to maintenance and inspection visits through the summer where dead plant material will be recorded and re-firm plants stakes and shelters where necessary. Replacement planting of any dead or diseased plants will be undertaken as required.

9.1.6 Invasive and undesirable weed species will be monitored and controlled.

9.1.7 Further details are set out in the Indicative Landscape Strategy (Document Ref. 5.10).

9.2 Monitoring Requirements

9.2.1 Ecological monitoring is required to determine the success of the specified biodiversity measures, and to identify requirements for remedial action where objectives are not being delivered. The target habitats are those habitats that

will be subject to active management as shown on Figure 1. They encompass grassland, pond, ditch and woodland habitats which are to be actively managed for wildlife. Monitoring will be undertaken every year for the first five years to commence the year following sowing of grassland seed mix to allow time for seed mix species to germinate and establish. Appendix 1 specifies the habitat condition indicators and targets to be assessed over the 5-year monitoring period. Failure to meet targets will necessitate remedial action and/ or alteration of the specified long-term management prescriptions, as advised by the ecologist on a case by case basis.

10.0 ROLES AND RESPONSIBILITIES

10.1.1 EPWM and/ or the appointed main contractor will be responsible for:

- correct instruction of all parties contributing to delivery of the measures set out in this Biodiversity Strategy, and further details subsequently approved in accordance with DCO requirements (including but not restricted to EPWM staff, ecologist(s), construction contractors and management organisations);
- compliance with the Biodiversity Protection Plan (see Section 6) and the principles of the Indicative Biodiversity Mitigation and Enhancement Plan (see Section 7), relevant legislation and any related planning commitments;
- EPWM will appoint a qualified ecologist(s) and keep them informed of work activities that require support and supervision, so that it is clear when attendance at Site is required;
- enacting/ enforcing recommendations made by the ecologist(s) or otherwise agreeing an appropriate alternative course of action if it is subsequently determined that previous advice is not practicable or is out of date; and
- keeping a record of measures taken to deliver the requirements of the Biodiversity Protection Plan and Indicative Biodiversity Mitigation and Enhancement Plan to provide an auditable record of compliance.

10.1.2 The qualified ecologist(s) will be responsible for:

- advising EPWM on ecological matters and requirements for compliance with relevant legislation, providing support as instructed, and monitoring compliance with the Biodiversity Protection Plan and Indicative Biodiversity Mitigation and Enhancement Plan; and
- providing EPWM with survey reports and other written evidence required in accordance with the agreed scope of work and contractual obligations.

11.0 CONCLUSIONS

11.1.1 The Proposed Development will result in the loss of semi-improved neutral grassland within the Main Development Area and impacts on a short section of ditch during construction of the new site access from South Marsh Road.

11.1.2 With reference to relevant legislation, policy and guidance, the following measures are proposed to provide biodiversity protection, mitigation and enhancement:

- installation of a visual screen (for construction and operational phases) and implementation of seasonal piling restrictions or use of CFA piling during construction to avoid impacts on Humber Estuary SPA/ Ramsar site waterbirds using fields to the south of the Site;
- works to the ditch will be seasonally constrained and undertaken under the supervision of a Class Licensed ecologist to avoid impacts on water vole (and potential impacts on grass snake);
- vegetation removal will be undertaken outside the breeding bird season wherever possible (or under ecological supervision if not possible);
- construction works will comply with industry good practice and legislation to manage environmental impacts, in accordance with a CEMP (see Framework CEMP provided in Appendix 5A (ES Volume III, Document Ref. 6.4));
- a financial contribution will be made to NELC for strategic mitigation habitat creation at Cress Marsh to mitigate for the loss of waterbird habitat from the Main Development Area;
- the Proposed Development design will incorporate a fixed stack height, and approved drainage and lighting systems, to avoid adverse effects on sensitive receptors including biodiversity features;
- an area of species-rich grassland will be created to the west of SHBPS;
- a new wildlife pond will be created to the west of SHBPS;
- log pile refuges will be created in existing woodland to the west and south-west of SHBPS;
- bird boxes will be installed on mature trees to the west of SHBPS;
- species-rich native hedgerow will be created to the west of SHBPS;
- ditch habitats within the Site will be enhanced and widened for water vole; and
- biodiversity features within the Site will be managed and monitored for five years with remedial action taken as required.

11.1.3 In summary:

- the Biodiversity Protection Plan and measures to mitigation potential adverse noise and vibration effects on SPA waterbirds during construction provide appropriate mitigation during construction;

- the substantial financial contribution towards strategic habitat creation at Cress Marsh provides agreed mitigation for the loss of SPA bird habitat within the Main Development Area; and
- the Indicative Biodiversity Mitigation and Enhancement Plan for the Proposed Development has been expanded (both by geographical area and diversity of measures) since planning permission was granted for the Consented Development, to take full advantage of the opportunities to conserve and enhance biodiversity within the Site.

12.0 REFERENCES

Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews & Paul Chanin. The Mammal Society, London

Ministry for Housing, Communities and Local Government (2019) *National Planning Policy Framework*

Department for Energy and Climate Change (2011a) *Overarching National Policy Statement for Energy EN-1*

Department for Energy and Climate Change (2011b) *National Policy Statement for Renewable Energy Infrastructure EN-3*

Natural England (2012) *National Character Area Profile 41 Humber Estuary*

North East Lincolnshire Council (2018) *North East Lincolnshire Local Plan*

APPENDIX 1: MANAGEMENT AND MAINTENANCE SCHEDULE

FEATURE	CURRENT STATUS & LOCATION	MANAGEMENT	MONITORING	TIME PERIOD
Grassland creation: species-rich neutral grassland	Existing semi-improved neutral grassland and amenity grassland to the west of SHBPS will be short-mown and scarified (or harrowed) followed by seeding with meadow wildflower and grasses seed mix suitable for clay soils in September/ October.	**Initial seeding**: Grassland areas to be seeded will be mown short in August and the arisings removed. The area will then be scarified or harrowed when conditions are dry to open gaps in the sward for the new wildflower seeds to establish. No mineral fertiliser will be added. Seeding will be carried out in September/ October with a wildflower and grasses meadow mix suitable for clay soils (for example, Emorsgate EM4) which contains wildflower species that have been recorded in the Main Development Area grassland (including yellow rattle, meadow vetchling, meadow foxtail, common knapweed, ox-eye daisy, primrose and bird's-foot-trefoil). Seed will be surface sown into the existing grassland sward at an approximate density of (2-4g/m^2) by hand/ machine, then rolled/ tread to firm in, but not covered over with soil. **Subsequent management by mowing** (assuming low-density grazing not practicable): Meadow grassland should not be cut from spring through to late July/ August so that the sown wildflower species are given the opportunity to flower. After flowering, in late July or August take a 'hay cut': cut	Annual monitoring (commencing in the year after seeding) visit between June and September to determine whether any changes to the management prescription in required such as targeted weed or scrub removal or greater frequency of mowing. Monitoring will assess the grassland by recording: • % sward perennial rye-grass (*Lolium perenne*); • % sward negative indicator/ scrub / undesirable species; • % bare ground; • number of positive indicator species –	Five years

FEATURE	CURRENT STATUS & LOCATION	MANAGEMENT	MONITORING	TIME PERIOD
		back using a scythe, petrol strimmer or tractor mower to a sward height of approximately 5 cm. Leave the arisings *in situ* to dry and shed seed for 1-7 days then remove from site. Mow the re-growth in late autumn or winter to approximately 5 cm sward height, and again in spring if needed. **Scrub/sapling tree control:** Sapling trees and shrubs will be removed periodically (at least once in the five-year period) and the stumps treated to prevent regrowth.	grasses and herbs (see GLNP list) should meet LWS criteria (by Year 5) and occur evenly across the sward (use 10 x random point method – 2 x 2 m quadrats) to record presence and abundance (DAFOR) of indicator species; and, • ratio of grasses to herbs.	
Grassland creation: rough grassland	Existing un-managed semi-improved neutral grassland in the north-west corner of SHBPS to be retained; and further strips left unmanaged along ditch margins where practicable	Areas of grassland will be left uncut in any one calendar year to provide continuity of habitat for a range of fauna. The location for uncut vegetation will vary between years and priority will be given to locations where the uncut grassland: • will contribute to a buffer of up to 5 m of taller grassland and marginal vegetation along the ditch at the southern boundary of the Site; and/ or,	Annual monitoring visit to determine whether any changes to the management prescription in required such as targeted weed and/ scrub removal is required	Five years

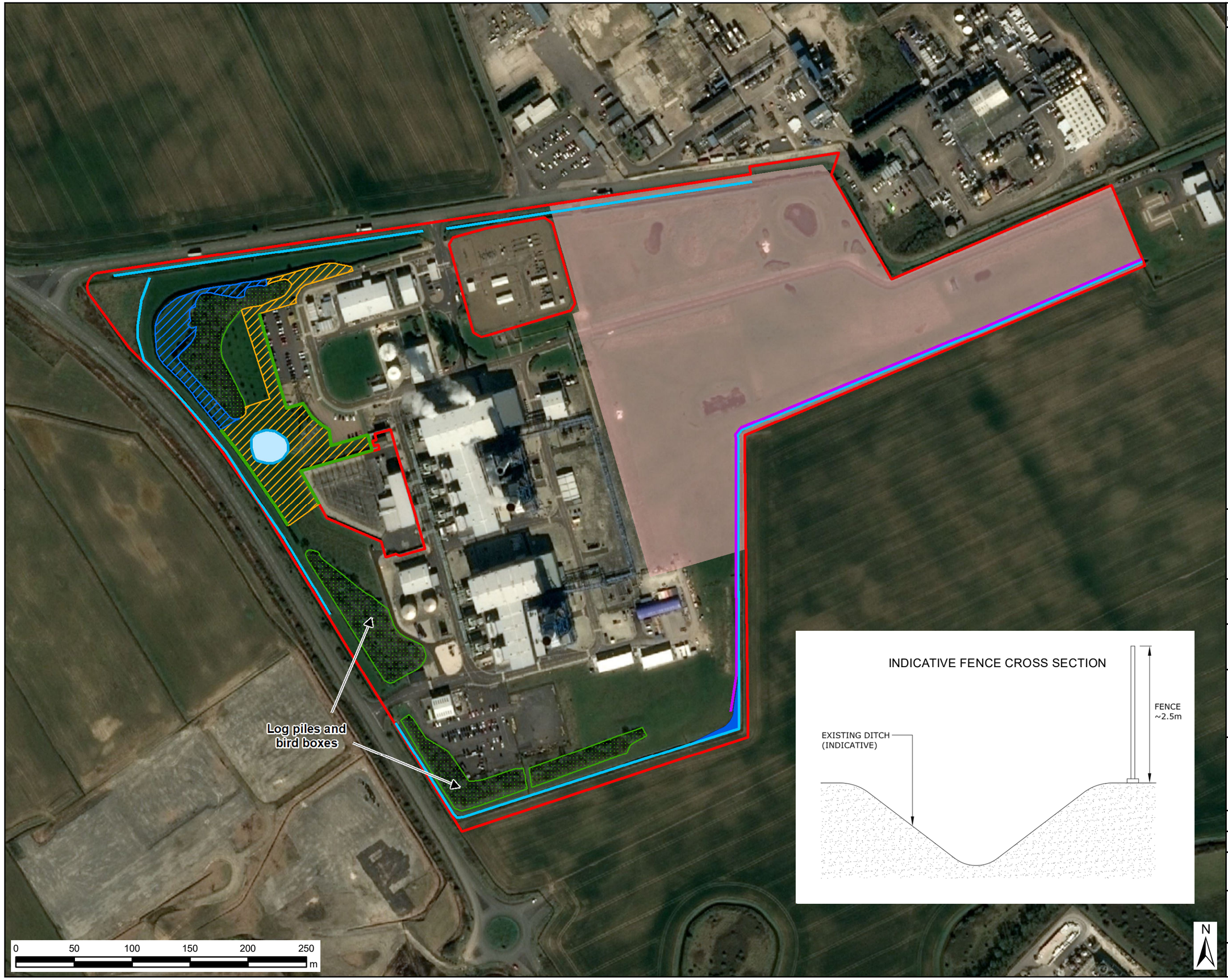
FEATURE	CURRENT STATUS & LOCATION	MANAGEMENT	MONITORING	TIME PERIOD
	(vehicle access constraints) and around the newly-created pond.	• will maintain connectivity of taller grassland vegetation between the margins of the newly created pond and the other semi-natural habitats on site such as broadleaved plantation woodland and native hedge. • Occasional scrub (bramble) clearance and removal of tall weed species (such as thistle and nettle) may be required to impede succession to tall ruderal and scrub. Clearance may be undertaken using strimmer/ brush-cutter to target patches of tall weeds or scrub, on a rotational basis, always leaving some scrub and tall ruderal species in situ.		
Pond creation	A new pond will be created in grassland to the west of the SHBPS. The pond will be designed with a non-uniform margin and varying depths to maximise habitat niches available	• Pond permanence; ensure that the pond holds water for the period March to June for all or most years. • Tree and scrub cover not to exceed 25% of pond perimeter. Any removal of vegetation will take place during the winter months. • Significant areas (10-50%) of open water to be maintained clear of aquatic macrophyte vegetation within the pond with no encroachment of marginal vegetation	Annual monitoring visit to take place between June-September to record: • pond water depth; • % open water; • presence of fish; • presence of invasive plant species;	Five years

FEATURE	CURRENT STATUS & LOCATION	MANAGEMENT	MONITORING	TIME PERIOD
	for aquatic plants, invertebrates, reptiles and amphibians. The pond margins will be planted with a small amount of native aquatic and marginal species to assist with the establishment of vegetation, but will be primarily allowed to establish naturally.	beyond 3 m inward of original pond edge. Any necessary vegetation removal will be undertaken during the winter months and carried out on a rotational basis, ensuring that sections of tall aquatic emergent vegetation are retained around the pond margins. • Maintain pond depth to a minimum of 1 m at point of greatest depth. Ensure the pond remains free of fish and invasive non-native species such as Crassula helmsii. • Exclude livestock from pond edges using fencing (if applicable). • Growth of surrounding woody species to be managed to ensure that the pond is not mostly shaded and significant areas of open water will be maintained clear of aquatic macrophyte vegetation within the pond to provide optimum conditions for amphibian breeding.	• % shading of pond margins; • presence and abundance (DAFOR) of aquatic macrophyte species; and • presence and abundance of marginal vegetation.	
Species-rich hedgerow	To be created at the boundary of enhanced	• Hedgerow to be planted during the winter months; to include a mixture of native	Annual visual inspection of the hedge to assess successful growth of woody	Five years

FEATURE	CURRENT STATUS & LOCATION	MANAGEMENT	MONITORING	TIME PERIOD
	grassland west of the SHBPS	woody species (e.g. hawthorn, blackthorn, hazel and field maple); • Subsequent replacement of woody species in sections of the hedgerow in the event of gaps occurring where some of the hedge plants do not initially thrive.	species and any gaps in the canopy	
Ditch enhancement and widening	Existing network of ditches around the boundaries of the Site	• Cutting regime to leave bank vegetation between March and the end of September. Arisings to be removed to avoid choking the ditch with dead vegetative matter. • Some sections of tall marginal ditch/ bank vegetation to be retained (uncut) throughout the year; with sections to be strimmed or cut back determined on a rotational basis year-on-year to avoid succession to dominant scrub vegetation (for example cut back vegetation from one bank of the ditch after October each year). • A margin of 2-5 m (optimal) of tall uncut grasses and marginal vegetation to be left alongside the ditches within the Site, where practicable, to increase available sources of food and cover for water vole.	Annual monitoring visit to take place between June – September, to record: • width of tall marginal vegetation/ tall grassland buffer to ditch margin; • % shading of ditch by woody species; • % surface cover of duckweed (Lemna minor); • presence and abundance (DAFOR) of aquatic	Five years

FEATURE	CURRENT STATUS & LOCATION	MANAGEMENT	MONITORING	TIME PERIOD
		• A section of the ditch to the south-east of SHBPS will be widened, by further excavation to allow it to hold water permanently, extending the area of open water allowing the establishment of submerged, floating and emergent aquatic plants.	macrophyte species in the ditch; and • water depth.	
Log piles/ refugia (hibernacula) creation	To be installed in mature trees in woodland/ grassland edges at the west and south-west of the Site.	To create potential refuge, hibernation and/ or foraging habitat for a range of species groups: to include reptiles, amphibians and terrestrial invertebrates. An increase in invertebrate populations in turn will provide increased insect food sources for birds and amphibians using the Site.	Annual visual inspection of the hibernacula to ensure that remains suitable for purpose and create an additional adjacent structure if required.	Five years
Bird box installation	To be installed in mature trees in woodland at the west and south-west of the Site.	To provide breeding habitat for birds using the woodland, grassland and ditches for foraging. An increase in invertebrate populations due to other measures will also provide increased insect food sources for birds.	Annual visual inspection of the bird boxes to ensure they remain suitable for purpose and replace if required.	Five years

Figure 1



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LEGEND

- Order Limits
- Main Development Area
- Proposed indicative extent of 2.5m close board fence to provide visual screening for waterbirds

Habitat Enhancement

- Existing drainage ditch to be enhanced
- Enhancement of amenity grassland to species-rich semi-improved neutral grassland through re-seeding and reduced mowing regime
- Enhancement of poor semi-improved neutral grassland through re-seeding and reduced mowing regime
- Ditch widening to enhance habitat for water voles

Habitat Creation

- Proposed species-rich native hedge
- Pond

Maintained and Managed

- Existing woodland areas

Hedges in areas of existing below ground or overhead infrastructure to be agreed with statutory undertakers

Purpose of Issue
SHBEC INDICATIVE BIODIVERSITY STRATEGY

Client
EP WASTE MANAGEMENT LTD

Project Title
SOUTH HUMBER BANK ENERGY CENTRE DCO

Application Document Ref
INDICATIVE ECOLOGICAL MITIGATION AND ENHANCEMENTS

Drawn	Checked	Approved	Date
LC	AR	LK	02/04/2020

AECOM Internal Project No.	Scale @ A3
60580855	1:3,000

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FIGURE 1

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