



Thurrock Flexible Generation Plant

**Preliminary Environmental Information Report
Appendix 9.2: Outline Ecological Management Plan**

Date: September 2018

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Preliminary Environmental Information Report

Volume 6

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Thurrock Power Ltd
1st Floor
145 Kensington Church Street
London W8 7LP

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Prepared by: Matthew Fasham

Contributors: Jacquelyn Kerr

Checked by: Mike Barker

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Summary

The document describes the ecology and nature conservation mitigation measures that will be implemented prior to, during and post construction of Thurrock Flexible Generation Plant, and the long-term management measures to be set in place for reinstated and enhanced habitats. This document sets out the principles which be used to produce the detailed Ecological Management Plan post submission. This document supports the assessment in Volume 3, Chapter 9: Ecology.

Qualifications

This document has been prepared by Matthew Fasham, a Chartered Environmentalist and full Member of the Chartered Institute of Ecology and Environmental Management, who has fifteen years' experience of ecological impact assessment.

This document has been checked by Mike Barker, a Fellow of the Chartered Institute of Ecology and Environmental Management and a Chartered Environmentalist, who has over twenty five years' experience of ecological impact assessment.

1. Introduction

1.1 Background

- 1.1.1 This document is an Outline Ecological Management Plan (Outline EMP) for the Thurrock Flexible Generation Plant. The Outline EMP forms Appendix 9.2 of the Preliminary Environmental Information Report (PEIR).
- 1.1.2 The PEIR is being published to inform pre-application consultation. Following consultation, comments on the PEIR will be reviewed and taken into account in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent.
- 1.1.3 This Outline EMP applies to the proposed development described in full in Volume 2, Chapter 2: Project Description PEIR.
- 1.1.4 The proposed development comprises the construction and operation of:
- reciprocating gas engines with rated electrical output totalling 600 MW;
 - batteries with rated electrical output of 150 MW and storage capacity of up to 600 MWh¹;
 - gas and electricity connections;
 - creation of temporary and permanent private access road(s) for construction haul and access in operation, including potential minor public highway widening for delivery of large loads; and
 - designation of exchange Common Land and habitat creation or enhancement for protected species translocation and biodiversity gain.
- 1.1.5 The minimum construction period for a single-phase development, after the advance works in 2020, is expected to be 12–18 months with a programme generally as follows:
- 2020: provision of exchange common land and habitat creation / enhancement outside main development site, potential protected species relocation;
 - Q1 2021: main development site preparation and ground works, creation of construction access road(s), start of gas pipeline trenching;
 - Q2-Q3 2021: construction/installation of gas engines, batteries and associated equipment; connection of gas supply pipeline and electricity export cables;

- Q3-Q4 2021: commissioning and energisation; completion of landscaping and permanent access road; and
- end of Q4 2021: facility is available for operation.

- 1.1.6 If the proposed development is constructed in three phases, each phase may last up to 18 months and the overall construction programme may last four and a half to six years, i.e. each phase may be back to back or there may be a gap of nine to 18 months between phases.

1.2 Purpose of the Outline EMP

- 1.2.1 The purpose of the Outline EMP is to provide a single document that describes the ecology and nature conservation mitigation measures that will be implemented prior to, during and post construction of Thurrock Flexible Generation Plant, and the long-term management measures to be set in place for reinstated and enhanced habitats.
- 1.2.2 This outline EMP is a 'living' document that will be updated as required post submission of the application for development consent, during the Examination Period and during the detailed design process as necessary prior to implementation. The detailed EMP will be based on the principles set out in this Outline EMP and will set out the measures that the applicant and its contractors will be required to adopt. The detailed EMP will be prepared in consultation with the Local Planning Authority (LPA).
- 1.2.3 The objective of this Outline EMP is to ensure the protection and appropriate management of Important Ecological Features (IEFs) located within the areas of permanent and temporary land take for Thurrock Flexible Generation Plant. This Outline EMP also aims to ensure adherence to legislative requirements relating to ecology and nature conservation.
- 1.2.4 Specific details and locations of one IEF (location of a disused badger sett) has been omitted from this Outline EMP due to the potential risk to badgers if sett locations are put into the public domain. For those with a legitimate reason to know the locations of these IEFs, details will be made available on request.
- 1.2.5 This Outline EMP should be read in conjunction with the Code of Construction Practice (Volume 5, Appendix 2.2: Code of Construction Practice).

¹ i.e. storing up to four hours' power at maximum discharge capacity

2. Ecological and nature conservation features

2.1 Introduction

2.1.1 This section describes the IEFs located within or adjacent to the permanent and temporary land take for the Thurrock Flexible Generation Plant, which could be affected by the proposed development. The locations of these IEFs are shown in the constraints plan provided in Figure 2.1.

2.2 Designated sites and habitats

2.2.1 It is not considered that the operation or construction of the proposed development would have adverse impacts on Local Wildlife Sites (LWS) sites > 200 m away. For operational effects, air quality assessments have been carried out on all international statutory sites within 10 km, all nationally important sites within 2 km and all LWS within 2 km which support habitats considered potentially susceptible to impacts from aerial emissions. Sites with a downstream hydrological connection have been assessed for potential impacts from surface water run-off during construction and operation.

Thames Estuary and Marshes Special Protection Area and Ramsar

2.2.2 Thames Estuary and Marshes Special Protection Area (SPA) is a European designated site, which comprises of extensive areas of grazing marsh as well as flooded clay and chalk pits, while the Thames Estuary and Marshes Ramsar site is designated for its internationally important waterfowl assemblage.

2.2.3 The Thames Estuary and Marshes SPA and Ramsar site is located just over 1 km east of the site boundary.

Mucking Flats and Marshes SSSI

2.2.4 The Mucking Flats and Marshes SSSI is located 0.77 km from the site boundary. It is a component Site of Special Scientific Interest of the SPA.

Local Wildlife Sites

2.2.5 Several non-statutory sites are located within the 2 km search radius of the site. Those covered within the Outline EMP are summarised in Table 2.1.

Table 2.1: Local Wildlife Sites

Site Name	Distance to TFGP	Description
Broom Hill	Immediately adjacent	Site is of interest for ancient acid-grassland flora, and invertebrate fauna is of exceptional importance. Seven nationally rare and 39 nationally scarce species have been recorded.
Mucking Heath	Immediately adjacent	Relict acid-grassland/heath is of interest for flora and invertebrates. Insect fauna includes 4 nationally rare and 50 nationally scarce species.
Low Street Pit	Immediately adjacent	Site lies on regionally important Thames terrace gravels, supports diverse invertebrate fauna.

Hedgerows

2.2.6 The Hedgerow Regulations 1997 protect hedgerows from removal, with particular protection for 'important' hedgerows. 'Important' hedgerows are defined in the Regulations. The Regulations apply to any hedgerow growing in, or adjacent to, any common land, protected land, or land used for agriculture (including dairy farming and the breeding and keeping of livestock), forestry or the breeding or keeping of horses, ponies or donkeys, if it: (a) has a continuous length of, or exceeding, 20 m; or (b) it has a continuous length of less than 20 m and, at each end, meets another hedgerow.

2.2.7 Hedgerows are highlighted as Priority Habitats under the UK Biodiversity Action Plan (BAP) and are listed under Section 41 of the NERC Act. Ancient hedgerows are an Essex Biodiversity Action Plan habitat. However, none of the hedgerows on site were recorded as ancient.

2.2.8 The hedgerow network within the Thurrock Flexible Generation Plant site is patchy and there is little connectivity between hedgerows. The railway line forms an obvious disconnect between the areas of the site north and south of the line, and overall the hedgerows are not considered to be of more than district value although they are UK BAP habitat.

Grassland

2.2.9 Grasslands are an Essex Biodiversity Action Plan habitat.

2.2.10 The grassland areas affected by the proposed development are not considered to have particularly high intrinsic value – the grassland is relatively homogenous and does not comprise an example of UK BAP grassland.

Ditches

- 2.2.11 Drainage ditches are present within or on the boundaries of the majority of zones. The ditches on site are considered to be of value for the protected and other species they support, and for the ecological habitat connectivity they provide.

2.3 Protected or otherwise notable species

Survey information

- 2.3.1 The sections below summarise surveys carried out for the Thurrock Flexible Generation Plant development for habitats and species relevant to this Outline EMP. The full survey reports can be found in Volume 6, Appendix 9.1: Ecological desk study and survey report.

Plants

- 2.3.2 No particularly rare or scarce plant species were identified. Analysis of the quadrat data found that the plant communities present in Zone A were a mixture of two National vegetation Classification (NVC) communities:
- MG1b (*Arrhenatherum elatius* grassland, *Urtica dioica* sub-community); and
 - OV24b (*Urtica dioica*-*Gallium aparine* community, *Arrhenatherum elatius*-*Rubus fruticosus* agg. sub-community).
- 2.3.3 MG1 grassland is a mesotrophic grassland community characteristic of semi-improved neutral soils. It is a very widespread community throughout the British lowlands of England, Wales and southern and eastern Scotland.
- 2.3.4 OV24 is a tall herb open habitat characteristic of more elevated nutrient levels, and which occurs widely throughout lowland Britain.

Invertebrates

- 2.3.5 An invertebrate scoping survey was undertaken in 2018 to appraise the invertebrate habitats present on the main site (Zone A) part of Zone C.
- 2.3.6 The southern section of Zone A comprises a uniform area of semi-improved grassland bordered by hedgerows and ditches to the north and east. The lack of structural variation within the grassland, combined with its low floristic diversity, predicts a species-poor invertebrate assemblage dominated by those with more generalist ecological requirements, which are usually of lower conservation value.

- 2.3.7 The hedgerows consist mainly of hawthorn and a narrow zone of bramble. Some of the hawthorns are becoming mature and these provide a large number of potential niches for invertebrates. The ditches are steep-sided and lacking in marginal vegetation with the exception of some common reed. They are likely to be subject to considerable fertiliser run-off and to support an impoverished invertebrate fauna.

- 2.3.8 It is acknowledged that the presence of Zone A close to the adjacent Lytag Brownfield LWS (which is known to be of considerable importance for invertebrate populations) means that it is likely to contribute to the overall diversity of invertebrate populations in the surrounding area.

Reptiles

- 2.3.9 All reptile species native to Britain are protected under Sections 9(1) and (5) of the Wildlife and Countryside Act (WCA) 1981 (as amended), which makes it an offence to intentionally or recklessly kill or injure these species, or sell, barter, exchange, or transport reptiles or any part of them. Native reptiles are also Priority Species of the UK BAP.
- 2.3.10 The site as a whole supports populations of adder, grass snake, common lizard and slow-worm. All four species were present on Zone A. Populations in other areas where direct impacts would occur from habitat loss are Zone C and Zone J, although habitat loss in these areas is relatively small.

Breeding birds

- 2.3.11 Birds are protected at a European level under the EC Directive on the Conservation of Wild Birds 2009 (2009/147/EC), the codified version of Council Directive 79/409/EEC as amended. This gives general protection to wild birds from deliberate killing, taking from the wild, egg collecting, nest destruction and keeping in captivity, but allowances are made for game birds. Specially protected birds are listed in Annex 1 of the Directive.
- 2.3.12 All species of wild bird in the UK (other than a few pest species) are protected under Part 1 section 1(1) of the WCA Act 1981 (as amended) against intentional or reckless killing, injuring or taking. Taking, damaging or destroying nests in use or being built, and taking or destroying eggs are also prohibited.

- 2.3.13 In addition to general protection for birds, certain species are also afforded special protection and are listed in Schedule 1 of the WCA 1981, as amended. These bird species are rare, endangered, declining or vulnerable. In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, it is an offence to intentionally or recklessly disturb Schedule 1 birds and their young at, on or near an 'active' nest.
- 2.3.14 Surveys for breeding birds were carried out in 2018. A total of 49 species were recorded during the survey of breeding birds within the Tilbury site area between April and June. Of these species, 28 were confirmed to be breeding and 15 species were considered to be probably / possibly breeding, resulting in a breeding bird assemblage of 43 species. Records relating to the remaining six species were considered to be of non-breeding individuals.
- 2.3.15 There were 15 species considered to be probably / possibly breeding within the survey area in 2018. Registrations for these species were not wholly indicative of behaviour that could allow confirmation of breeding on site.
- 2.3.16 One confirmed breeding species, Cetti's warbler, is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), was recorded during the survey. Five pairs of this species were recorded, four on Zone Z (outside the Thurrock Flexible Generation Plant development area) and one in Zone A. Two other Schedule 1 species, red kite and marsh harrier, were recorded but confirmed not to be breeding on site.

Water voles

- 2.3.17 Water voles are listed in Schedule 5 of the WCA 1981 (as amended) and protected under Section 9. The species is also a Priority Species of the UK BAP and Essex Local BAP.
- 2.3.18 Field signs indicating the presence of water vole were recorded in seven of the 11 ditches surveyed in May 2018.
- 2.3.19 Water voles were present in five of the ditches on or adjacent to the Main Site in Zone A, and were also present in two ditches that cross Zone C.

- 2.3.20 In the July survey, ditches north of the railway line were not surveyed. Of the eight ditches south of the railway line, four were found to be dry with no Water Vole signs observed. Of these, three of the ditches had signs of Water Voles during the May visit. In Zone A, ditch 7 had much higher numbers of Water Vole signs than in the May visit, and ditch 8 also had signs of Water Vole presence in July despite there being no signs in this ditch in May.
- 2.3.21 During the May survey, low numbers of water voles were found in ditches around and within Zone A, in a ditch west of Zone I and two ditches in Zone C. In July, water vole signs had increased considerably in central Zone A ditches 7 and 8, with ditch 8 now supporting a medium population, and the boundary ditches of Zone A were dry.
- 2.3.22 The summer of 2018 has been characterised by exceptionally low rainfall and these results indicate that the central Zone A ditches provide an important refuge habitat for water voles during periods when the boundary ditches dry out. Therefore ditches 7 and 8 are likely to be of importance in ensuring that the water vole population in the surrounding area is maintained.

Badgers

- 2.3.22.1 Badgers are protected under the Protection of Badgers Act 1992. The protection is primarily for welfare rather than conservation, since badgers are not rare but are subject to cruelty. Actions prohibited under this legislation, unless covered by licence, include the intentional or reckless damage, obstruction or destruction of a badger sett and the wilful killing, injuring or taking of badgers.
- 2.3.23 No active badger setts were found during the survey that would be directly affected by construction.
- 2.3.24 One disused sett was recorded in Zone H (alternative access road) but results suggest that the site is not well-used by badgers. The sett was considered to be disused because of debris in the sett entrance that remained in place through the duration of the survey period (April – June). No other badger setts were found.

2.4 Responsibilities

- 2.4.1 All ecology works described in this Outline EMP will be carried out under the guidance of the Ecological Clerk of Works (ECoW). All site workers will be informed of the role of the ECoW. Contact details for the ECoW will be provided in the detailed EMP and will be made available to site workers and contractors as requested or required.

- 2.4.2 Site inductions for all site workers will include reference to the requirements of the approved detailed EMP and the approved detailed Code of Construction Practice (CoCP).
- 2.4.3 Toolbox talks provided to all contractors and site workers immediately prior to the commencement of activities on site, will include reference to the requirements of the detailed EMP and detailed CoCP. The toolbox talks will include the general principles and area-specific environmental measures that must be implemented
- 2.4.4 All site workers will be informed of the role of the ECoW. Contact details for the ECoW will be provided in the detailed EMP and will be made available to site workers and contractors as requested or required. A copy of the detailed EMP will be kept on site at all times and site workers will be made aware of its location and who to contact in order to obtain a copy of, or review the document as required.
- 2.4.5 Any known breaches of the requirements of the EMP by site workers will be reported to the ECoW or to the Site Manager appointed by the principal contractor (who in turn will advise the ECoW) as soon as practicable.
- 2.4.6 Where that breach is material (e.g. if conditions pertaining to a protected species licence are breached), the ECoW, or the applicant will report the breach to the relevant LPA and/or Natural England as soon as practicable.
- 2.4.7 Where a material breach requires a response, or has the possibility of re-occurring, the applicant will be responsible for developing an appropriate (ecology and nature conservation) response strategy and will apply lessons learnt to future construction method statements. Where longer term remedial measures are required, these measures will be discussed with the LPA and Natural England.
- 2.4.8 Contact details for the ECoW will be provided in the detailed EMP.

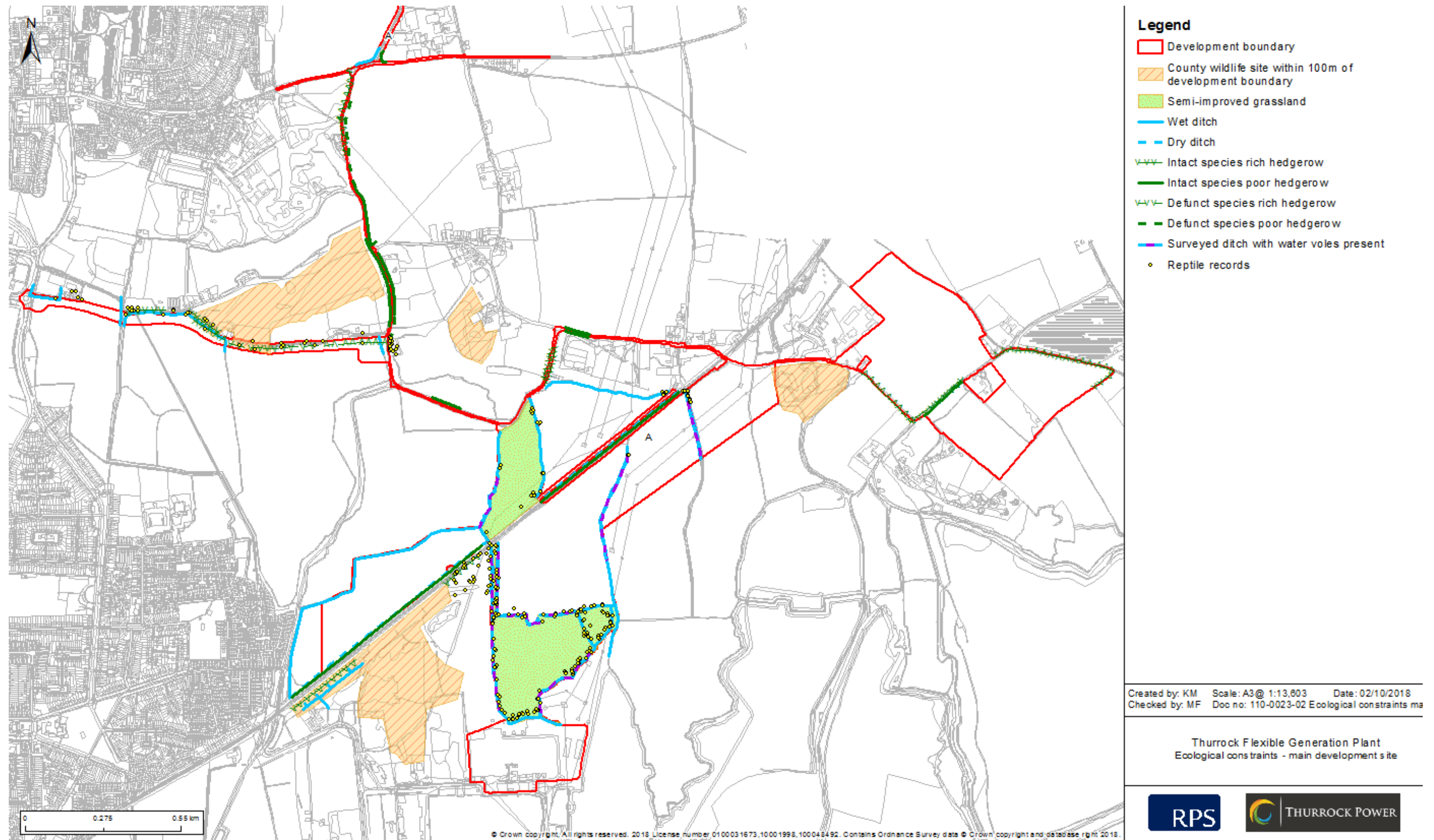


Figure 2.1: Ecological constraints.

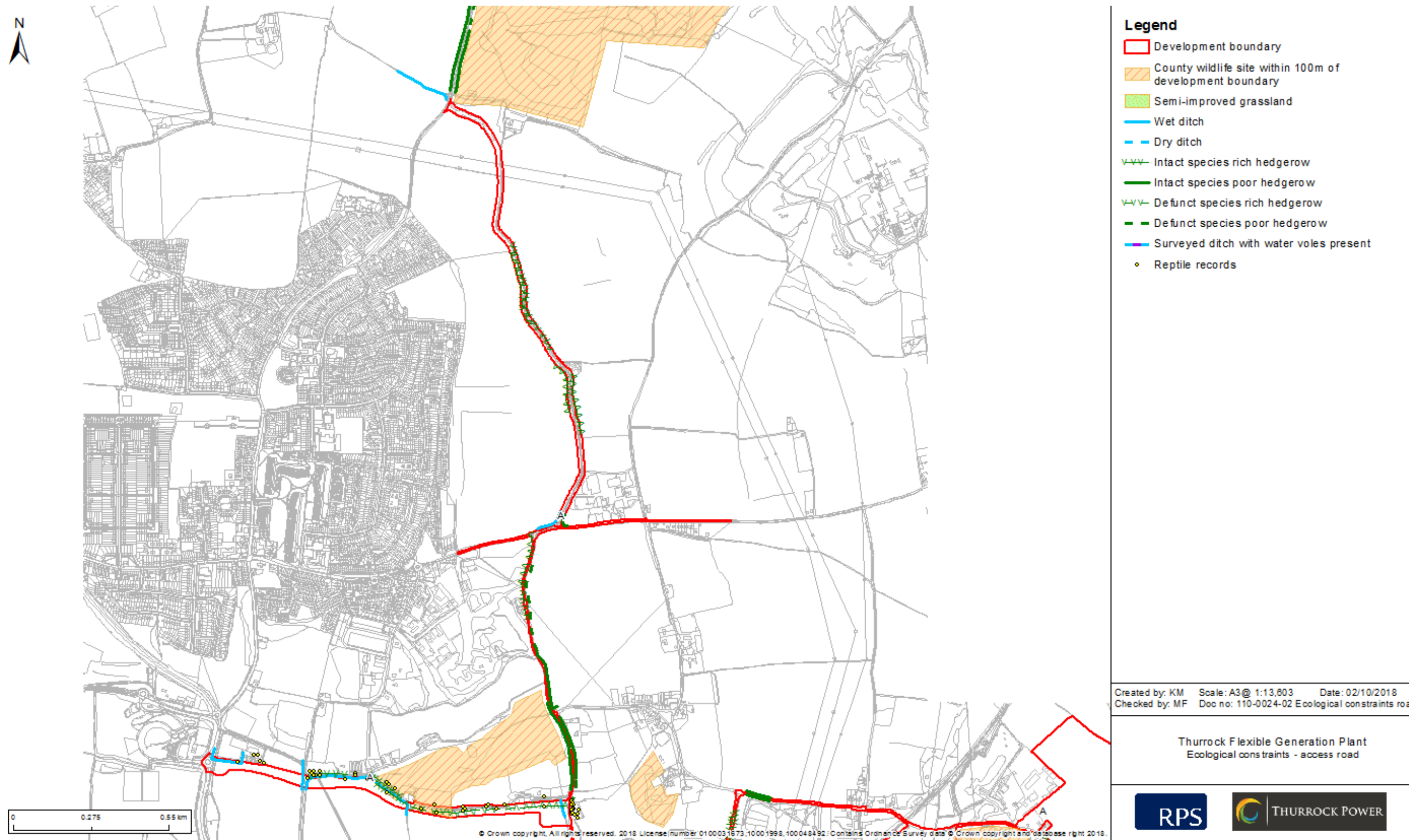


Figure 2.1: Ecological constraints

3. Designed-in mitigation measures

3.1 Introduction

- 3.1.1 This section describes the designed-in ecology and nature conservation mitigation measures adopted as part of Thurrock Flexible Generation Plant design in order to ensure the protection of IEFs.

3.2 Designated sites and habitats

- 3.2.1 The Thurrock Flexible Generation Plant design has been developed to avoid designated sites and other ecologically sensitive habitats wherever practicable. Other IEF features such as watercourses (ditches) have been retained (e.g. around the Main Site in Zone A) where it has been practicable to do so.
- 3.2.2 The use of trenchless techniques such as horizontal directional drilling (HDD) under ditches is being considered, which would reduce impacts on this habitat type. This will be further explored prior to the application for development.
- 3.2.3 Where practicable, existing highways or tracks will be used for access to the construction site to minimise loss and disturbance of species and habitats.

3.3 Protected or otherwise notable species

- 3.3.1 Where practicable, areas identified as containing protected species have been protected by providing an appropriate buffer from construction and operation works. The width of these buffer zones will be developed in accordance with standard industry requirement and best practice guidance and are expected to be applied for nesting birds and water vole colonies.

4. Pre-construction mitigation measures

4.1 Introduction

- 4.1.1 This section describes the ecology and nature conservation mitigation measures adopted as part of Thurrock Flexible Generation Plant that will be undertaken prior to the commencement of construction in the vicinity of the IEF, in order to ensure the protection of IEFs.
- 4.1.2 Pre-construction surveys, informed by existing data for protected species, will be carried out to identify potential changes in baseline conditions. These surveys will be undertaken within 12 months prior to the commencement of construction works. Surveys may need to be undertaken over several months in order to collate sufficient data to inform a licence application and any associated mitigation strategy.
- 4.1.3 Should the 12 month survey/activity period lapse between pre-construction surveys and the commencement of works, the need to repeat surveys will be assessed by an appropriately experienced ecologist. Should surveys confirm a change in baseline conditions, which result in the need for a protected species licence, a licence will be obtained prior to the commencement of licensable works.
- 4.1.4 It is possible that additional IEF species activity may be recorded during pre-construction surveys described in this section. Where this occurs, the information will be updated and, where required, the mitigation strategy set out in this document will be amended as soon as practicable.
- 4.1.5 All pre-construction surveys described in this section will be undertaken by the ECoW or an otherwise appropriately experienced and, where necessary, licenced ecologist(s), who will be pre-approved by the ECoW and will work under the guidance of the ECoW.
- 4.1.6 All surveys will be carried out in accordance with biosecurity risk assessments and safe systems of works, which will be produced by the ECoW prior to the commencement of the survey.

4.2 Habitats

- 4.2.1 In order to minimise the likely impacts on ecology and nature conservation features of interest, pre-construction studies will be carried out to update information on sensitive habitats in the vicinity of watercourse crossing locations and plans developed for the establishment of associated construction compounds and works sites, to minimise potential impacts.

Protective buffer zones

- 4.2.2 Works-free protective buffer zones (see below) will be established around retained habitats of ecology and nature conservation concern where practicable, namely hedgerows and watercourses. These buffer zones will be maintained throughout the works period.
- 4.2.3 Root protection zones around retained hedgerows and trees will be assessed by the ECoW.
- 4.2.4 Wherever practicable, buffer zones surrounding retained mature broadleaved trees will be 15 m in width or the width of the tree root protection zone, whichever is the greater, as advised by an appropriately qualified surveyor. Buffer zones around hedgerows and ditches will be at least 5 m in width where practicable.
- 4.2.5 All buffer zones will prohibit the tracking of heavy vehicles, and the storage of vehicles, machinery, equipment and soils.
- 4.2.6 The ECoW will inform the Site Manager of the locations and requirements of buffer zones in each working area prior to the commencement of construction in that area. Where necessary, locations will be discussed on site.

Ditches

- 4.2.7 Ditches that are affected will require pre-construction surveys prior to the commencement of works in order to inform any mitigation strategy required, as described under species-specific impacts.
- 4.2.8 Works will be carried out in accordance with relevant legislative requirements and best practice guidelines, as set out in the Volume 5, Appendix 2.2: Code of Construction Practice. Measures will be set in place to minimise the potential for pollution from silt deposition into watercourses and from works vehicles, including measures to prevent transfer of invasive plant or animal species between watercourses. These will include the following.

- Management of construction works to comply with the necessary standards and consent conditions as identified by the Environment Agency.
- A briefing highlighting the importance of water quality, the location of ditches and pollution prevention included within the site induction.
- Areas with prevalent runoff to be identified and drainage actively managed if needed (e.g. through bunding and/or temporary drainage).
- Vegetated strip to be left adjacent to the watercourse during construction.
- For temporary construction impacts, bankside vegetation will be reinstated following the construction phase.
- Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) to be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system.
- Additionally, the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. Bunds used to store fuel, oil etc. to have a 110% capacity.
- Excavated material to be placed in such a way as to avoid any disturbance of areas near to the banks of ditches and any spillage into the ditches.
- Construction materials to be handled and stored in such a way as to effectively minimise the risk posed to the aquatic environment.
- All plant machinery and vehicles to be maintained in a good condition to reduce the risk of fuel leaks.
- Drainage works to be constructed to relevant statutory guidance and approved via the Lead Local Flood Authority (LLFA) prior to the commencement of construction.
- Consultation with Natural England to be ongoing throughout the construction period to promote best practice and to implement proposed mitigation measures.

4.3 Protected or otherwise notable species

4.3.1 Pre-construction surveys, informed by existing data for protected species, will be carried out to identify potential changes in distribution of protected species and hence any additional mitigation requirements arising as a result of presence of protected species. These surveys will be undertaken within twelve months prior to the commencement of construction works.

Invertebrates

4.3.2 In addition to retention and management of hedgerows and ditches around the boundary of Zone A, additional habitat creation for invertebrates will be created.

4.3.3 This will comprise the creation of a managed compensation area to mitigate for this loss of pollinator habitat in Zone A. This could be provided in Zone F (Figure 4.1). This should be sown with wildflower seed mixes to provide a continuity of nectar and pollen throughout the flight season. If soil fertility is high, the plant seed mix should include Yellow Rattle to reduce the competitive growth of grasses and maintain a more open and diverse sward.

4.3.4 Given the presence of a rich aculeate Hymenoptera fauna in the surrounding area, the construction of bee banks will also be undertaken. These can provide useful habitat for many thermophilic ground-nesting invertebrate species including solitary bees, solitary wasps, beetles and spiders and are best created in open, south-facing situations. Compacted soil and gravel should be shaped into a mound with various slopes, hollows and angles that may be utilised and favoured by different species. Vertical or very steep banks often take much longer to vegetate due to the greater heat stress they experience and provide bare ground that could be used for mining/burrowing invertebrate species.

Reptiles

4.3.5 Where necessary, pre-commencement surveys of areas of suitable habitat not covered in the 2017 surveys would be undertaken to update the baseline and inform requirements for reptile mitigation.

4.3.6 Given the high numbers of reptiles recorded in Zone A and the presence of reptiles along ditches in Zone C that would be affected by construction, a habitat creation and translocation mitigation plan is proposed.

4.3.7 Zone F, which is currently of no value to reptiles, is being considered as the location for creation of replacement reptile habitat. The survey found presence of reptiles on the adjacent Zone I.

4.3.8 Creation of reptile habitat on Zone F would provide a like-for-like replacement of habitat on an area basis. However, given the homogeneity of the existing grassland in Zone A, it is considered that with appropriate design the habitat created on Zone F will be capable of supporting a higher density of reptiles than is currently present on Zone A. In addition, the creation of grassland adjacent to Zone I will result in a large single area of reptile habitat that should provide additional robustness for the reptile populations.

- 4.3.9 Habitat creation would need to be carried out prior to the translocation to allow the habitats to mature sufficiently to support reptile prey and hence reptiles. It is recommended that at least one full growing season should elapse between seeding new habitat and the release of reptiles onto it.
- 4.3.10 In summary, habitat creation would comprise:
- scraping off agricultural topsoil over the majority of the field to provide a low-nutrient substrate suitable for seeding;
 - wildflower meadow creation using an appropriate native species seed mix;
 - scrub planting;
 - construction of features to maximise habitat diversity, including hummocks / hollows, steep earth banks and a pond; and
 - construction of features to provide shelter, basking sites and hibernation sites for reptiles, including a purpose-built Adder hibernaculum, rubble mounds and log piles.
- 4.3.11 Translocation of reptiles would be undertaken prior to construction. The construction site in Zone A and affected parts of Zone C would be fenced for the duration of construction to prevent reptiles from adjacent areas (J and C) from entering. Internal drift fencing will be installed to divide Zone A into cells that will increase chances of capture. Reptile mats will be placed in the cells and checked regularly with all captured reptiles relocated to the receptor site.
- 4.3.12 The trapping effort required to capture all the reptiles is considered likely to be between 60-90 suitable days. If necessary, trapping in each cell will continue past a minimum of 60 days until five trapping days with no reptile captures have been completed. Trapping would be carried out between April and October.
- 4.3.13 Progressive and careful habitat clearance works such as the gradual strimming of above-ground vegetation such as brambles, rough grass and scrub, will be undertaken in select areas prior to construction, to deter reptiles from the working area where alternative habitat is available to them.
- 4.3.14 Uprooting of vegetation of potential value to hibernating reptiles will be undertaken prior to the commencement of the hibernation period (November to March) to deter reptiles from hibernating in the area.
- 4.3.15 Where small areas of reptile habitat are to be cleared, and where sufficient habitat is available immediately adjacent to the works area (to be identified by the ECoW), relocation of reptiles would be undertaken via progressive and careful habitat clearance works such as the gradual strimming of above-ground vegetation such as brambles, rough grass and scrub prior to construction, to deter reptiles from the working area where alternative habitat is available to them.
- 4.3.16 Where reptile habitat is required to be cleared for construction in Zone A, a detailed method statement will be developed in order to help ensure the protection of these species. The method statement will include detailed pre-construction measures designed to ensure that impacts on reptiles are minimised, through habitat creation elsewhere (e.g. Zone F, Figure 4.1) and relocation of animals from Zone A. The method statement will include habitat management requirements for reptiles in Zone F.
- 4.3.17 Reptile habitat areas that require clearance in Zones C and J will be managed prior to the commencement of construction in order to deter or displace any reptiles which might be present from the working areas. Management will be advised by the ECoW.
- 4.3.18 Habitat management will involve the clearance of ground cover in order to create unfavourable conditions.
- 4.3.19 If habitat is cleared during the reptile hibernation period (November until February inclusive, dependent on local weather conditions), trees and scrub will be cut using brushcutters or chainsaws, to a height of approximately 30 cm above ground level, to minimise the potential for disturbance to root balls where hibernating reptiles may be located. Remaining rough grass cover will be mowed short (approximately 5 cm above ground level).
- 4.3.20 Arisings will not be stacked on site as this could later provide a habitat feature of potential value to nesting birds, reptiles or other species. Instead, arisings will be removed from site.
- 4.3.21 Habitat clearance during the active reptile season (i.e. between March and October, depending on local weather conditions) will commence in the centre of the site and move outwards, so as to enable any reptiles or other animals that may be present to leave the area ahead of machinery. Scrub and tall grasses will be cut as above, to between 5 cm and 10 cm in height. Arisings will be removed from site. Uprooting of vegetation or clearance of habitat of potential value to hibernating reptiles will be undertaken during this period.

- 4.3.22 Areas will be maintained in a condition not favoured by reptiles (i.e. with minimal ground cover) until the commencement of construction, i.e. through regular mowing of ground vegetation.
- 4.3.23 Works will be carried out under the guidance of the ECoW.
- 4.3.24 In the event that the development progresses in phases, this would be repeated for each phase unless all site clearance works are undertaken in Phase 1.
- 4.3.25 A record of works will be maintained by the ECoW and will be provided to Thurrock Flexible Generation Plant and the Site Manager. A copy of this record will be made available to the LPA on request.

Breeding birds

- 4.3.26 Pre-construction surveys for nesting birds with a focus on Cetti's warbler will be undertaken where construction overlaps with the breeding season, and measures will be set in place to protect active nests until the ECoW has confirmed that young have fully fledged and left the nest. These measures are documented in more detail below.
- 4.3.27 Impacts on breeding birds from habitat loss predominantly affect ground-nesting farmland birds in arable or grassland habitats, and hedgerow nesting birds.
- 4.3.28 Where trees, hedgerows or scrub, of potential value to nesting birds, are required to be cleared for construction, clearance will be undertaken outside of the bird breeding season (14 February to 31 August inclusive) to prevent disturbance to nesting birds where possible. However, if this is not practicable, habitat will be surveyed prior to clearance. No habitat containing an active nest will be removed or disturbed, and measures will be set in place to protect the nest until young have fully fledged and left the nest. Measures may include the establishment of 5 m wide buffer zones in which heavy vehicles will not be tracked and the storage of vehicles, equipment, machinery and soil storage will be prohibited. Works in the buffer zone will be delayed until the Ecological Clerk of Works (ECoW) has confirmed young have fully fledged and left the nest.
- 4.3.29 The clearance of any habitat of potential value to nesting birds, including semi-mature and mature trees, hedgerows and areas of scrub, will be undertaken outside the bird breeding season, so as to prevent disturbance or injury to nesting birds or their young.

- 4.3.30 However, where this is not practicable, immediately prior to the commencement of works, vegetation suitable for nesting birds which will be cleared to enable works or which is located within 5 m of working areas, and large (>5 ha) open flat fields of potential value to ground-nesting species in which works will be undertaken, will be surveyed for active bird nests.
- 4.3.31 Where it is not possible to carry out a thorough visual inspection of all parts of the habitat being surveyed, e.g. due to the density of the habitat, the area will be surveyed for at least two hours between dawn and 9.00 am to identify any bird activity that might indicate the presence of nesting birds, such as birds carrying nesting material or food into the habitat being surveyed.
- 4.3.32 No habitat containing an active bird's nest will be removed or disturbed. Works-free buffer zones of a minimum of 5 m width will be established around active nests until the ECoW has confirmed to the Site Manager or site workers that the young have fully fledged and left the nest. Where considered necessary by the ECoW, works-free buffer zones will be marked out on site using high-visibility Netlon fencing or coloured tape.
- 4.3.33 The ECoW will maintain a record of all pre-construction bird nest surveys undertaken. The record will be provided to Thurrock Flexible Generation Plant and a copy will be made available to the LPAs on request.

Badgers

- 4.3.34 A pre-construction badger survey of the works area and 30 m buffer zone will be undertaken in order to locate any potential new active setts that could cause a constraint to construction. If mitigation cannot be carried out to protect any setts as required under legislation, then a Natural England licence to close or disturb the sett may be required and will be obtained prior to the commencement of works as necessary.
- 4.3.35 The ECoW will be responsible for ensuring the completion of pre-construction badger activity surveys of working areas and the surrounding buffer zone. Any such surveys would be undertaken sufficiently in advance of the commencement of works to enable a protected species licence(s) from Natural England to be obtained, should this be required.
- 4.3.36 A report of survey findings and implications for construction will be produced by the ECoW and provided to the client and the Site Manager as soon as practicable.

- 4.3.37 If new setts are identified within 30 m of the cable works corridor, or disused setts become active, micro-siting of working areas away from the setts will be undertaken where practicable and possible within the consented boundary of development. If this is not practicable, a licence for badgers will be obtained before works commence if it is considered that badgers using sett would be disturbed.
- 4.3.38 The ECoW will be responsible for ensuring a licence for badgers is applied for if necessary. The ECoW will inform the client and the Site Manager that a works-free buffer zone of 30 m should be set up around the active sett until a licence has been obtained, and that once the licence has been obtained works will need to be carried out in accordance with the requirements of the licence.
- 4.3.39 A licence application will be informed by the pre-construction survey and will include a detailed method statement and mitigation strategy.
- 4.3.40 If sett destruction cannot be avoided, a licence application will include the requirement to close the sett outside the badger breeding season (considered to be between 30 November and 1 July).
- 4.3.41 Licensable works will be carried out under the guidance of the ECoW and under a watching brief of the named licenced ecologist(s), which could be the ECoW or an appropriately experienced ecologist pre-approved by the ECoW.
- 4.3.42 A licence return form and report of the works undertaken will be completed by the licenced ecologist and approved by the ECoW. A copy of this form and report will be provided to the client, Natural England and the relevant LPA(s) as soon as practicable and as required under the conditions of the licence.
- Water voles**
- 4.3.43 Considering the mobile nature of water voles, pre-construction surveys will be undertaken to confirm the presence/absence of water voles along all ditches of potential value to water voles.
- 4.3.44 Water voles will be translocated from central ditches that will be removed within Zone A in advance of construction, under licence from Natural England and in accordance with the measures set out below.
- 4.3.45 All works involving loss of water vole habitat and capture and translocation of water voles will need to be carried out under a licence from Natural England. The licence will be obtained prior to the start of any works affecting water vole habitat.
- 4.3.46 A detailed mitigation plan will be produced prior to commencement, but the outline mitigation proposals are provided below.
- 4.3.47 Construction of the Thurrock Flexible Generation Plant would result in the loss of approximately 476 m of ditch habitat that supports water voles. In addition, ditches 7 and 8 appear to act as a refuge for water voles during dry periods. A further 1.5 km of boundary ditches around the edges of the development area would be retained.
- 4.3.48 It is therefore important to ensure that the revised ditch network post-construction includes ditches which retain water for the same length of time as ditches 7 and 8. This could be achieved by deepening retained boundary ditches in Zone A so that they hold water for longer during the summer. This would need to be carefully planned due to the presence of water voles in them. A phased programme of works would be undertaken, involving relocation of Water Voles by strimming short lengths of vegetation (no more than 50 m at any one time, as per recommendations in Dean *et al.*, (2016)) prior to deepening works being undertaken, then allowing vegetation to recover and water voles to recolonise before undertaking further work. It is likely that this would be undertaken over a period of at least two years.
- 4.3.49 This would provide replacement habitat at times of low water levels but does not address the overall loss of ditch habitat. It is therefore proposed to create approximately 500 m of ditch, which could be in Zone F.
- 4.3.50 These ditches would be used as receptor sites for water voles translocated from Zone A. Translocations would be undertaken in accordance with the methods set out in Dean *et al.*, (2016), and any new habitats would be given sufficient time to mature and be suitable for water voles before any translocations occur.
- 4.3.51 Taken together, the measures identified above should allow for the existing water vole population to be maintained around Zone A, along with additional populations being established (potentially in Zone F).

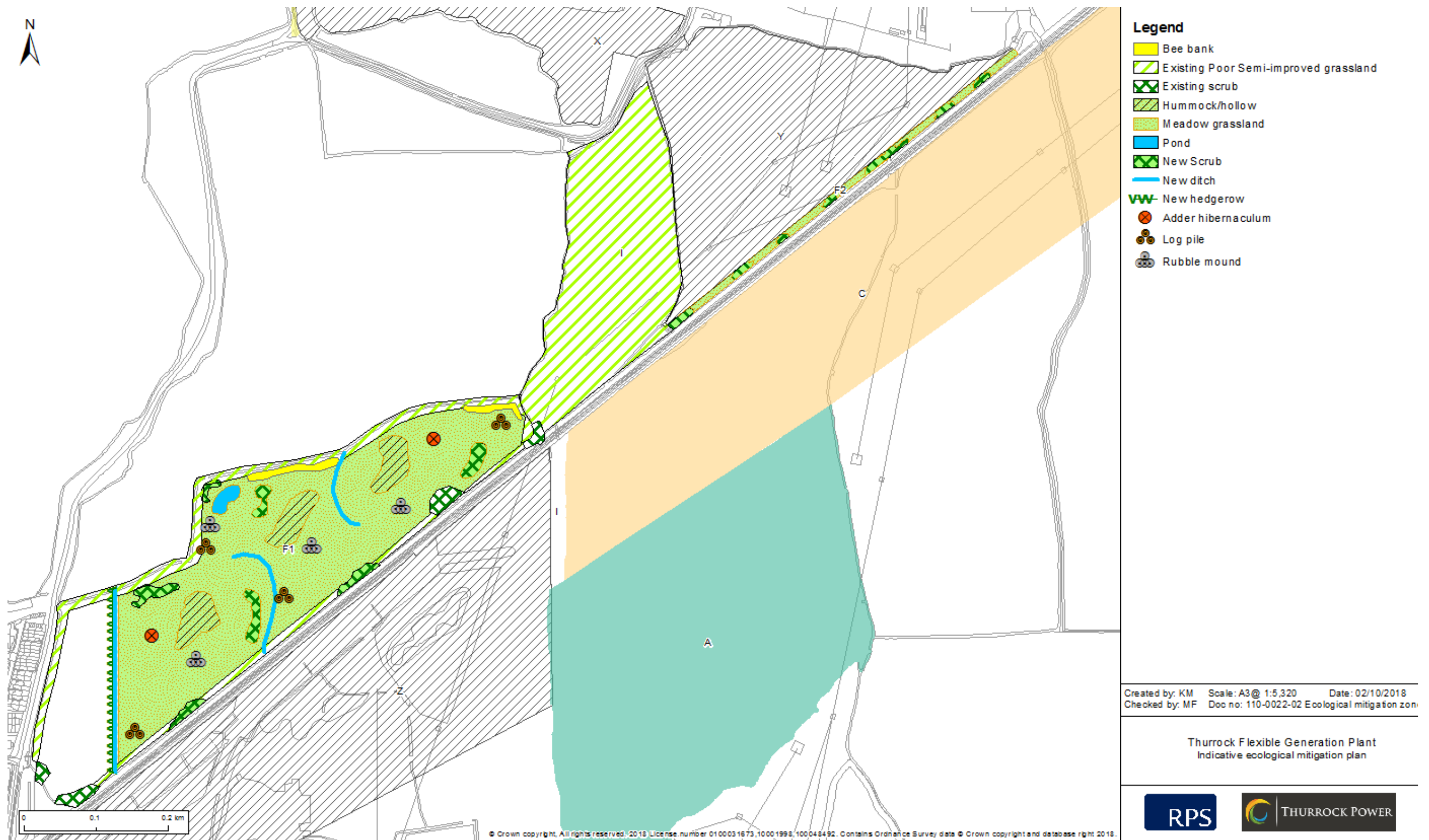


Figure 4.1: Ecological mitigation plan.

5. Construction mitigation measures

5.1 Introduction

5.1.1 This section describes the ecology and nature conservation mitigation measures adopted as part of Thurrock Flexible Generation Plant that will be undertaken during construction in order to ensure the protection of notable habitats and species.

5.2 General site-wide mitigation measures

5.2.1 Construction will be undertaken in accordance with the Volume 5, Appendix 2.2: Code of Construction Practice. The CoCP will include the following requirements:

- all works will be carried out taking full account of legislative requirements and Environment Agency guidance;
- appropriate and adequate measures will be set in place to ensure appropriate levels of dust control so that no significant off-site dust effects will occur;
- heavy machinery will not be tracked on waterlogged soils or over stored soils;
- appropriate and adequate measures will be set in place to ensure good practice in soil handling and restoration;
- site induction and toolbox talks will include mitigation requirements;
- soil storage areas will be located at adequate distances so as to ensure the protection of the retained soils and to avoid potential run-off into watercourses;
- appropriate and adequate measures will be set in place to minimise surface water flooding and to control and limit the noise and vibration levels noise; and
- vehicle speeds will be restricted within the working corridor so as to reduce the likelihood of injury to species on site.

5.2.2 Site induction and toolbox talks will include mitigation requirements included in this appendix and in Volume 5, Appendix 2.2: Code of Construction Practice.

5.2.3 Night working will be avoided where practicable. However, it may be necessary to carry out works during night time hours and where night working is unavoidable, light fixtures will be directed away from habitat of value to protected or otherwise notable species, in order to minimise likely disturbance effects of light spillage. Lighting will be kept to an absolute practicable minimum where located nearby to any active badger setts.

5.2.4 An ECoW will be present on site to oversee enabling works and construction where necessary. The ECoW will be a suitably experienced professional ecologist. The ECoW will review results of protected species surveys prior to the commencement of works and will contribute to all relevant construction method statements.

5.2.5 Further details of measures relating to pollution prevention are set out in Volume 3, Chapter 15: Hydrology and Flood Risk and are described in the Volume 5, Appendix 2.2: Code of Construction Practice. Measures will include the provision of a pollution incident response plan and a drainage management plan to minimise potential pollution effects.

5.2.6 A biosecurity protocol will be implemented to minimise risk of spreading invasive species. The main risks are associated with transfer of aquatic plants or animals (including vectors for disease) between watercourses or waterbodies. Where working in or near water, control measures will be implemented. These are documented in the Volume 5, Appendix 2.2: Code of Construction Practice and include:

- ensuring vehicle tyres and wheel arches are cleared of mud, plants and other organic material before moving from one watercourse to another;
- leaving removed material on site; and
- cleaning boots and disinfecting (away from waterbodies to prevent potential pollutant incidents) all equipment that might come into contact with water.

5.2.7 Appropriate measures will also be adopted when working in the vicinity of invasive terrestrial plants, if any are found. Where necessary, works will be supervised by the ECoW. Known locations of invasive plant species will be marked on site and vehicle movements restricted in the vicinity of these locations. Any spoil containing or likely to contain invasive plant material to be stored separately from non-contaminated spoil, and treated as appropriate, with control measures adopted.

5.3 Habitat mitigation measures

Protective buffer zones

5.3.1 Where practicable, works-free protective buffer zones will be established around retained habitats of ecology and nature conservation concern, namely hedgerows and retained ditches. These buffer zones would be maintained throughout the construction period.

5.3.2 Root protection zones around retained hedgerows and trees will be assessed by the ECoW.

5.3.3 All buffer zones will prohibit the tracking of heavy vehicles, and the storage and refuelling of vehicles, machinery, equipment and soils. All protective buffer zones will be maintained throughout the construction period. The ECoW will regularly (at least once every two weeks) monitor adherence to the requirements of the buffer zones and will maintain a record of all site checks undertaken and findings.

5.3.4 Should any breach of the requirements become evident, the ECoW will inform the applicant and the Site Manager as soon as practicable. The ECoW will inform the Site Manager of measures required to be undertaken as soon as practicable to rectify any potential impacts.

5.3.5 The applicant will be responsible for notifying Natural England of any breaches to the buffer zones if necessary and as advised by the ECoW.

Trees and hedgerows

5.3.6 Wherever practicable, a works-free buffer zone will be established around mature trees, of 15 m width or the width of the root protection zone, whichever is the greater, calculated on a tree-by-tree basis by an appropriately qualified surveyor.

5.3.7 Any tree felling works will be carried out in accordance with protected species requirements described below.

5.3.8 Where individual mature trees are to be felled, sections of dead or decaying wood will be soft-felled (felled in sections) and, where practicable, will be relocated to suitable locations as near to the source tree as practicable, as instructed by the ECoW.

5.3.9 The length of individual hedgerow sections to be removed will be reduced as far as reasonably practicable according to construction methods.

5.3.10 All sections of hedgerow temporarily removed to enable construction will be replanted as soon as practicable, with regard to appropriate planting months. Replacement planting will comprise a species-rich mix of native shallow-rooting hedgerow species typical of the area. In addition, enhancement planting to improve connectivity and/or native species diversity will be considered on a case by case basis. Enhancement planting could include the planting of native hedgerow trees, typical of the area.

5.3.11 A replanting programme to compensate for habitat loss and provide screening will be implemented in conjunction with mitigation measures considered as part of the landscape and visual impact assessment. Detailed landscaping proposals will be developed in a final Landscape Management Plan. Planting will be undertaken as soon as practicable and once it could be confirmed that works will not significantly and adversely affect new planting. Where required, newly planted hedgerows will be protected by adequate fencing until the hedgerow has become established.

5.3.12 Hedgerow clearance, including tree felling works, will be carried out in accordance with species-specific requirements described below.

5.3.13 Arisings will be removed from site or, if necessary, temporarily relocated to a suitable site more than 5 m from working areas so as to ensure that any nesting birds (or other species) which might utilise the pile of cuttings are protected against likely impacts of construction.

Grassland

5.3.14 Areas of grassland, grass margins and ditch banks that are used temporarily for construction and not ultimately incorporated into the permanent development or approved landscaping will be restored as soon as practicable after construction.

5.3.15 Detailed landscaping proposals will be developed in an accordance with the Landscape Management Plan.

5.3.16 The grassland seed mix to be used will comprise species appropriate to the local area and the nutrient levels of the substrate, full details of which will be determined when the full EMP is produced post-consent.

5.4 Terrestrial ecology

Reptiles

5.4.1 The construction site in Zone A and affected parts of Zone C would be fenced for the duration of construction to prevent reptiles from adjacent areas from entering. The condition of fencing would be monitored on a regular basis by the ECoW.

Breeding birds

5.4.2 The potential loss of active nests within in trees hedges and potentially also within arable areas, during construction would be mitigated by the following measures:

- undertaking clearance of potential bird nesting habitat outside the breeding season (March to August inclusive);
- inspection of any vegetation that needs to be removed between March and August by a professional ecologist;
- Cordoning off of any nest found during construction and protected until it has ceased to be active/young have fledged; and
- minimising disturbance from construction noise by the adoption of good working practice.

5.4.3 Mitigation measures for loss of breeding and foraging habitat will comprise habitat creation, which could be in Zone F. Habitat creation will comprise meadow grassland and scrub planting on an existing area of arable land, hedgerow planting, ditch clearance and restoration and pond creation to provide alternative breeding habitats for the bird species affected, including the Cetti's warbler.

5.4.4 These habitat mitigation measures should compensate for any local negative impacts on the breeding and foraging habitat.

Badgers

5.4.5 No active badger setts are currently known to occur within 30 m of the site. If any setts are identified during pre-commencement surveys, in addition to the above-mentioned measures, including those to control vehicle speeds and minimise the likely impacts of light spillage in the vicinity of a sett, no construction works will be carried out within minimum distances of an active sett entrance. Works within 30 m of a badger sett entrance may require a Natural England licence for badgers. Protection zones will be marked out on site, such as with high-visibility fencing or coloured tape. Excavations more than 0.5 metres deep will be fenced or covered overnight where practicable, or if this is not practicable, a method of escape (e.g. a plank to act as a ladder) will be provided for foraging mammals. In addition, large diameter pipes will be capped at the end of each working day to reduce the potential for badgers and other animals to enter them and become trapped.

5.4.6 If work is required within minimum distances of a sett and, therefore, sett closure or disturbance cannot be avoided, this will need to be carried out outside the badger breeding season (between 30th November to 1st July) and in accordance with a Natural England approved method statement and licence for badgers, prior to the commencement of works.

5.4.7 In addition to the above-mentioned measures, including those to control vehicle speeds and minimise the likely impacts of light spillage.

- No construction works will be carried out within minimum distances of an active sett entrance. Works within 30 m of a badger sett entrance may require a Natural England licence for badgers. Protection zones will be marked out on site, such as with high-visibility fencing or coloured tape.
- Areas of high badger activity, if identified, will be cordoned off to ensure these are kept fully intact and with minimal interference from construction.
- Excavations more than 0.5 m deep will be fenced or covered overnight where practicable, or if this is not practicable, a method of escape (e.g. a plank to act as a ladder) will be provided.
- Large diameter pipes will be capped at the end of each working day to reduce the potential for badgers and other animals to enter them and become trapped.

5.4.8 If work within minimum distances of a sett and, therefore, sett closure or disturbance cannot be avoided, sett closures will need to be carried out outside the badger breeding season (defined as 30 November to 1st July) and in accordance with a Natural England approved method statement and, where relevant, a Natural England licence for badgers.

5.4.9 Toolbox talks on badgers will be provided by the ECoW to all construction staff on site and an emergency procedure protocol will be given to contractors in the event of encountering a badger or discovering a sett.

5.5 Aquatic ecology

Biosecurity

5.5.1 A biosecurity protocol will be implemented to minimise risk of spreading invasive species. The main risks are associated with transfer of aquatic plants or animals (including vectors for disease) between watercourses waterbodies. Where the construction of Thurrock Flexible Generation Plant requires the crossing of ditches, control measures would include the following:

- ensuring vehicle tyres and wheel arches are cleared of mud, plants and other organic material before moving from one watercourse to another;
- leaving removed material on site; and
- cleaning boots and disinfecting (away from ditches to prevent potential pollutant incidents) all equipment that might come into contact with water.

Ditches

- 5.5.2 Further details of measures relating to pollution prevention are described in the Volume 5, Appendix 2.2: Code of Construction Practice. Measures include the provision of a pollution incident response plan and a drainage management plan to minimise potential pollution effects.
- 5.5.3 Buffer zones surrounding ditches will be at least 5 metres in width; approvals will be obtained as necessary for works closer to channels managed by LLFAs and the Environment Agency.
- 5.5.4 Where it is not practical to establish a buffer zone from retained ditches of the stipulated width due to site working constraints, additional precautions to prevent e.g. run-off from soil stockpiles into ditches will be put in place, such as silt fencing.
- 5.5.5 Crossings of ditches may be with trenched or trenchless techniques (e.g. HDD), to be defined following further design for each crossing location.

Water voles

- 5.5.6 Two ditches containing water voles would be crossed by the gas connection pipeline and the operational site access road in Zone C.
- 5.5.7 Impacts from the gas connection installation could be avoided by HDD underneath the ditches. Alternatively, water voles would need to be relocated from the works area under licence. Given that it is unlikely that more than 50 m linear length of habitat would be affected by this operation, animals would be relocated through strimming, or translocation if >50 m (length) would be affected.
- 5.5.8 The site access road would be a permanent structure that in addition to habitat loss would also, in the absence of mitigation, result in a severance effect. The site access road should therefore be designed to include a culvert of suitable width (minimum 1200 mm), with mammal ledges, so that water voles are able to access habitat on either side of the road.
- 5.5.9 Construction of the access road would result in habitat loss and therefore relocation of water voles under licence would be required in advance of construction, in a similar way to the gas pipeline.

- 5.5.10 The installation of the gas pipeline is to be undertaken beneath ditches supporting water voles. Works-free buffer zones will be established around sections of the ditches that support water voles if this is practicable. Buffer zones will prohibit the tracking of heavy vehicles and storage of vehicles, machinery, equipment and soils and should be a minimum width of 15 metres.
- 5.5.11 Methods of installing pipelines across ditches known to support water voles (such as open cut trenching) would be developed in consultation with Natural England. Where considered necessary by the ECoW, high visibility fencing will be erected between the drains and the works areas to prevent access by workers and heavy machinery, and to prevent storage of equipment or materials within this zone. To prevent water voles from becoming trapped in the pipeline installation pits, exclusion fencing will be installed around pipeline installation pits where considered necessary by the ECoW.
- 5.5.12 Where water vole activity has been/is recorded along ditches to be crossed by open cut installation, construction and installation works will be carried out in accordance with a crossing method statement and under licence from Natural England as necessary, which will include measures to protect water voles from significant disturbance.
- 5.5.13 Crossing method statements will include pre-construction measures to deter water voles from the working corridor and an adequate buffer zone (i.e. up to 15 metres where favourable habitat is present). Measures could potentially include:
- removal of vegetation from channel and bank-side vegetative cover, up to a minimum of 1.5 m inland from the top of the bank between mid-February and early April;
 - the potential capture and translocation of water voles from working areas by an appropriately qualified and experienced ecologist;
 - a destructive search of water vole burrows within the working corridor under the watching brief of an appropriately qualified and experienced ecologist; and
 - measures to protect sections of watercourses which will not be directly impacted.
- 5.5.14 Works will be conducted in accordance with best practice guidelines published in Strachan et al. (2011) and Dean et al (2016).

6. Post-construction mitigation measures

6.1 Introduction

- 6.1.1 This section describes the mitigation measures adopted as part of Thurrock Flexible Generation Plant that will be undertaken as soon as practicable following the completion of construction in an area, in order to mitigate the impacts of development on features of ecological and nature conservation interest and to provide biodiversity benefit.
- 6.1.2 Works will be carried out under the guidance of the ECoW.
- 6.1.3 All post-construction monitoring surveys described in this section will be undertaken by the ECoW or an otherwise appropriately experienced and where necessary, licensed ecologist(s), who will be pre-approved by the ECoW and will work under the guidance of the ECoW.
- 6.1.4 All surveys will be carried out in accordance with biosecurity risk assessments and safe systems of works which will be produced by the ECoW prior to the commencement of a survey.

6.2 Habitats

- 6.2.1 Reinstatement of temporarily damaged or cleared terrestrial habitat will be carried out as soon as practicable. Habitat reinstatement will involve the replacement of stripped soils and the planting of native hedgerows, shrubs and trees, typical of the local area and of local provenance where possible. Habitat reinstatement will be undertaken in accordance with a pre-approved Landscape Management Plan. The scheme will include the retention and/or replacement of habitats of nature conservation value wherever practicable.
- 6.2.2 New planting will be carried out in accordance with a Landscape Management Plan.
- 6.2.3 The ECoW will be responsible for producing a report to confirm habitat reinstatement or enhancement requirements have been carried out in accordance with the requirements of this Plan and the Landscape Management Plan.

Trees and hedgerows

- 6.2.4 Tree and shrub planting will comprise a diverse mix of native shallow-rooting broadleaved tree and understory species found in the area, with native shrub planting to provide a dense edge habitat, and an adjacent rough grass margin to add structural diversity, enhanced cover and shelter.

Grassland

- 6.2.5 In summary, habitat creation would comprise:
- scraping off agricultural topsoil over the majority of the field to provide a low-nutrient substrate suitable for seeding;
 - wildflower meadow creation using an appropriate native species seed mix; and
 - scrub planting.

Ditches

- 6.2.6 Ditches affected by temporary construction works will be restored to their previous bank profile following each phase of construction.
- 6.2.7 Works to ensure the integrity of the banks on either side of the watercourse will be undertaken. This may include geotextiles and reseeded/reinstatement of vegetation.
- 6.2.8 For watercourses where only a narrow width has been affected (e.g. where haul roads have been put in but the streams are otherwise unaffected), natural colonisation would be appropriate.

6.3 Protected or otherwise notable species

- 6.3.1 A detailed landscape and ecology management plan for would be produced that includes management regimes for ecological habitats and features as given on the indicative mitigation plan (Figure 4.1).

7. Decommissioning mitigation measures

- 7.1.1 Measures to be adopted during decommissioning will be similar to those adopted during construction and will incorporate best practice guidance available at that time. These will be implemented through a decommissioning plan.

8. Operational and long-term ecology management

8.1 Introduction

8.1.1 This section describes ecology measures adopted as part of Thurrock Flexible Generation Plant that will be undertaken following the completion of post-construction mitigation described above (Section 6) and during the operational phase.

8.2 Habitats

8.2.1 Measures to be adopted for the avoidance of pollution of the environment during the operation of the Thurrock Flexible Generation Plant are set out in Volume 3, Chapter 15: Hydrology and Flood Risk.

8.2.2 A detailed landscape and ecology management plan would be produced that includes management regimes for ecological habitats and features as given on the indicative mitigation plan (Figure 4.1).

8.2.3 During the establishment phase (three to five years following the planting or spreading of seed) any failed plants will be replaced like-for-like as required to prevent any significant gaps in planting and as agreed with land owners.

8.2.4 Once established, new planting will be managed in accordance with the Landscape Management Plan and as described below.

8.2.5 The long-term management of Zone F and other landscaped areas will remain the responsibility of the applicant or its successor.

8.3 Protected or otherwise notable species

8.3.1 Should any licences for protected species be required, the ECoW will notify the Undertaker of any additional survey and habitat requirements and these will be carried out under the guidance of the ECoW.

8.3.2 The ECoW will maintain a record of all ecology works completed, which will be provided to the applicant, Natural England and the relevant LPA(s) as soon as practicable and as required under the conditions of any licence.

9. Monitoring and reporting

9.1 Monitoring

9.1.1 The ECoW will be responsible for monitoring adherence to the construction requirements of this Plan through:

- weekly site inspections where works are active; and/or
- weekly meetings with the Site Manager.

9.1.2 The ECoW will maintain a record of these site inspections and meetings, which will be provided to the Site Manager and the applicant and will be made available to the relevant LPA(s) and Natural England as required or requested.

9.1.3 The ECoW will regularly (at least once every four weeks) monitor adherence to the requirements of the protective buffer zones and fencing. Should any breach of these requirements become evident, the ECoW will inform the Site Manager as soon as practicable. The ECoW will inform the Site Manager of measures required to be undertaken as soon as practicable to rectify any potential impacts. If the breach is material, the ECoW, Site Manager or applicant will then be responsible for notifying Natural England of any breaches to the buffer zones.

9.1.4 New planting will be monitored during the establishment phase (up to three to five years post planting) by the applicants' landscape contractor (or land owner or farm manager if so agreed between those parties). Failed plants will be replaced on a like-for-like basis as required to prevent the development of a significant gap in planting. If plants or grassland areas are confirmed to be established after three years of planting, monitoring will cease.

9.1.5 Post-construction monitoring of protected species as required under any protected species licences will be undertaken by the ECoW or appropriately experienced and if necessary, licensed ecologist(s), who will be pre-approved by the ECoW.

9.2 Summary of reporting requirements

9.2.1 The ECoW will maintain a record of all pre-construction works undertaken as they relate to the protection of IEFs.

9.2.2 The ECoW will produce pre-construction survey reports listed below:

- invertebrates;
- reptiles;
- breeding birds; and
- water voles.

9.2.3 Survey reports, including advice regarding implications for construction, will be provided to the appointed Site Manager and the applicant. A copy will be made available to the relevant LPA(s) on request.

9.2.4 Should any Natural England development licences be required, the ECoW will produce protected species licence applications which will be submitted to Natural England. Reports will support licence applications where required. The applicant reserves the right to review any application prior to submission but must not unreasonably delay its submission to the appropriate authority.

9.2.5 The LPAs and Natural England will be invited to attend regular meetings (typically monthly where active works are about to or are occurring) during the pre-construction and construction phases. The need for and regularity of meetings will be held as requested or required by the LPAs or Natural England during the operational phase. Meetings will be held to enable the ECoW, Site Manager or applicant to report on progress and the effectiveness of the implemented EMP and to provide an opportunity to discuss measures considered necessary to ensure adherence to the requirements of the Plan and relevant legislation.

9.2.6 Where necessary (i.e. where topics or work areas to be discussed are relevant) invitations to meetings will be extended to other relevant stakeholders including the Environment Agency. Frequent and ad hoc meetings will be held by the ECoW, Site Manager or applicant as considered necessary.

During construction

9.2.7 The ECoW will maintain a record of all ecology works undertaken during the construction period, including any ecological watching briefs or protected species surveys and findings of any site visits. Reports will be provided to the applicant and the Site Manager and, where appropriate, to Natural England and the relevant LPA.

9.2.8 The ECoW will maintain a record of any breaches of the requirements of this Plan and any measures undertaken in order to mitigate potential impacts of a breach. Records will be provided to the applicant, Site Manager and if necessary the relevant LPA and Natural England.

- 9.2.9 If any reasonable changes to the measures described in this Plan are considered necessary by the ECoW in order to achieve the objectives and adhere to the timetable of suitable work periods requirements of the Plan (Section 10) and any relevant legislation, the ECoW will produce a report of these proposed changes, detailing the reasons for them, and this report will be provided to the LPA for approval prior to the measures being carried out on site.
- 9.2.10 Should a protected species licence be required during the construction period, the ECoW will be responsible for applying for a licence.
- 9.2.11 The ECoW and/or licence holder will be responsible for producing any required Natural England licence return forms and report of the works undertaken. A copy of the forms and reports will be provided to the Undertaker, Natural England and the relevant LPA(s) as soon as practicable and as required under the conditions of the licence.

Post-construction

- 9.2.12 Should any licences be required, the ECoW and / or Natural England licence holder will be responsible for producing and distributing any required licence return forms and report of the works undertaken as described above.
- 9.2.13 The ECoW will be responsible for producing a report to confirm habitat reinstatement or enhancement requirements have been carried out in accordance with this Plan and the Landscape Management Plan.

10. Timetable of suitable work periods

10.1.1 Table 10.1 provides optimal and optional months during which the works detailed in this Outline EMP could be undertaken.

Table 10.1: Timetable of suitable work periods.

Key	
	Ecology survey or mitigation period (optimal time).
	Optional ecology survey or mitigation period, as advised by the ECoW (sub-optimal time).
	Period where survey or mitigation cannot be carried out.

Works Description	January	February	March	April	May	June	July	August	September	October	November	December
Pre-construction												
Pre-construction survey for breeding birds.												
Pre-construction survey for reptiles.												
Pre-construction survey for badgers – sett locations.												
Pre-construction survey for badgers – badger activity.												
Pre-construction survey for water vole burrows.												
Pre-construction survey for signs of water vole activity.												
Habitat creation (up to 1 year prior to translocation)												
Reptile translocation												
Water vole translocation												
Habitat management to deter water voles from working areas.												
Up-rooting of vegetation or clearance of materials (e.g. piles of rubble) of potential value to hibernating reptiles.												

Works Description	January	February	March	April	May	June	July	August	September	October	November	December
Above ground habitat management to deter reptiles.												
Applications for Natural England licence(s)												
Construction												
Clearance of hedgerows, scrub and trees of potential value to nesting birds. NOTE: sub-optimal period requires immediately preceding survey to confirm no active nests.												
Reinstatement and enhancement planting in accordance with the Landscape Scheme and Management Plan, which will be submitted with the Environmental Statement.												
Post-construction: Long-term Management												
Replanting to replace failed plants during establishment period (3-5 years post planting).												

11. References

Dean, M., Strachan, R., Gow, D. & Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. The Mammal Society, London.

Department for Environment, Food and Rural Affairs (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. London, Department for Environment, Food and Rural Affairs.

Joint Nature Conservation Committee and the Department for Environment, Food and Rural Affairs (on behalf of the Four Countries' Biodiversity Group) (2012) The UK Post-2010 Biodiversity Framework. [Online] Available from: <http://jncc.defra.gov.uk/page-6189> [Accessed 22 January 2018].

Neal, E. and Cheeseman, C. (1996) Badgers. London, Poyser Natural History.

Strachan, R. Moorhouse, T. & Gelling, M. (2011) *The Water Vole Conservation Handbook*. Third Edition. Oxford, WildCRU.