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Appendix 6.E – Report on Surveys for Reptiles

NeuConnect GB Onshore Scheme

Environmental Statement

Appendix 6E – Report on Surveys for Reptiles

NeuConnect Britain Limited

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1. Introduction

- 1.1 AECOM was instructed by NeuConnect Britain Limited (the 'Applicant') to undertake a survey of reptile presence or absence for the proposed development (the 'Proposed Development') of an electricity convertor station and substation at Grain, Isle of Grain, Kent. The proposed electricity converter station and substation will form part of a Direct Current (DC) electricity link (referred to as an interconnector) between Great Britain and Germany. The Preliminary Ecological Appraisal (PEA), undertaken in April 2018 (AECOM, 2019), recommended surveys to investigate the grassland habitat on the Site for its potential to support reptiles.

Proposed Development

- 1.2 NeuConnect (the 'Project'), is a 1400 megawatt (MW) interconnector between Great Britain and Germany. The Project will create the first direct electricity link between Great Britain and German energy networks. The new link will create a connection for electricity to be passed in either direction between Great Britain and Germany. The Project will be formed by approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HVDC) cables, with on-shore converter stations linking into the existing electricity grids in Great Britain and Germany.
- 1.3 The Proposed Development will comprise of three structures, a Converter Station, Sub-station and a Direct Current (DC) cable route (see Figure 1).
- 1.4 The footprint of the proposed converter station is expected to be up to approximately 250 metres (m) by 250 m (to the perimeter security fence), with a maximum height of up to 26 m.
- 1.5 The footprint of the proposed substation is expected to be approximately 80 m by 80 m (to the perimeter security fence), with a maximum height of 14 m.
- 1.6 The proposed DC cable corridor will be approximately 1.6 km long (from landfall to the converter station). The preferred installation method will be underground, which will result in a temporary loss of land during installation. The working corridor for the installation of the cable corridor will be 30 m.
- 1.7 Additional laydown areas will be required for construction, comprising 1.5 hectare (ha) for the converter laydown and 0.3 ha for the substation laydown.

Site Description

- 1.8 The Proposed Development areas (the 'Site') is entirely within the boundary of Medway Council and is centred on the Isle of Grain located at the tip of the Hoo Peninsula between the Thames Estuary to the north and the Medway Estuary to the south. The Site is located to the west of the village of Grain, Isle of Grain, Kent at Ordnance Survey (OS) central grid reference TQ 88205 76727. Land use comprises a mix of industrial development to the south, the small settlement of Grain to the southeast and undeveloped land, much of which is designated for ecological interests, to the north (along the coastline) and to the west. Land within the Site and in the immediate vicinity has historically been used for the extraction of gravel and sand and the resultant voids used for landfill.
- 1.9 Figure 1 shows the Site boundary (red-line), the cable corridor (purple line) and proposed location of each structure.

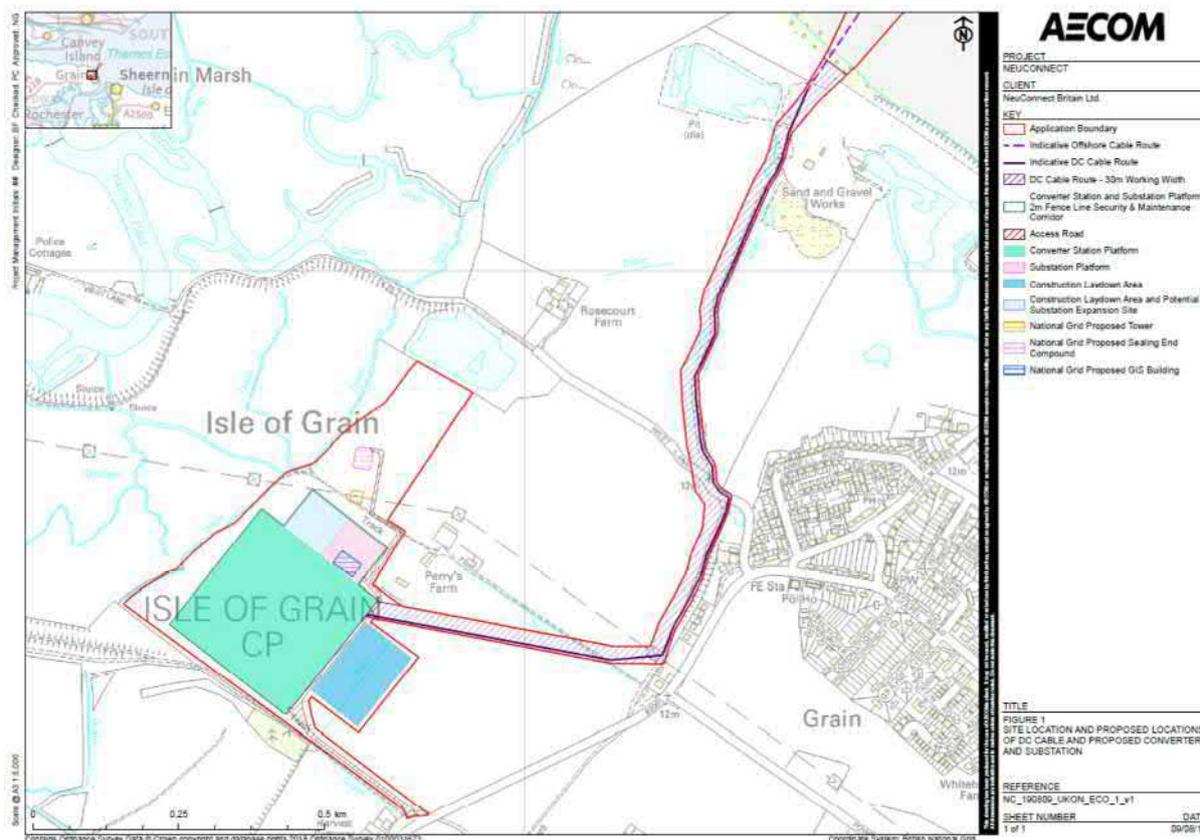


Figure 1 - Site boundary and proposed locations of DC cable route, converter station and substation

Survey Area

- 1.10 The survey area included suitable terrestrial habitat for reptiles within 100 metres (m) of the cable corridor (which included ephemeral / short perennial, scrub, semi-improved grassland and ditches) and an area of habitat suitable for reptiles, where the cable corridor makes landfall. The survey areas (highlighted in orange) are displayed in Figure 2.
- 1.11 The total survey area is 9.4 ha, with the northern section measuring 5.7 ha in size and the southern section 3.7 ha.
- 1.12 The areas proposed for the substation and converter station (see Figure 1) comprise two large arable fields, which are not suitable for reptiles. Therefore, these areas were not surveyed for reptile presence / absence.

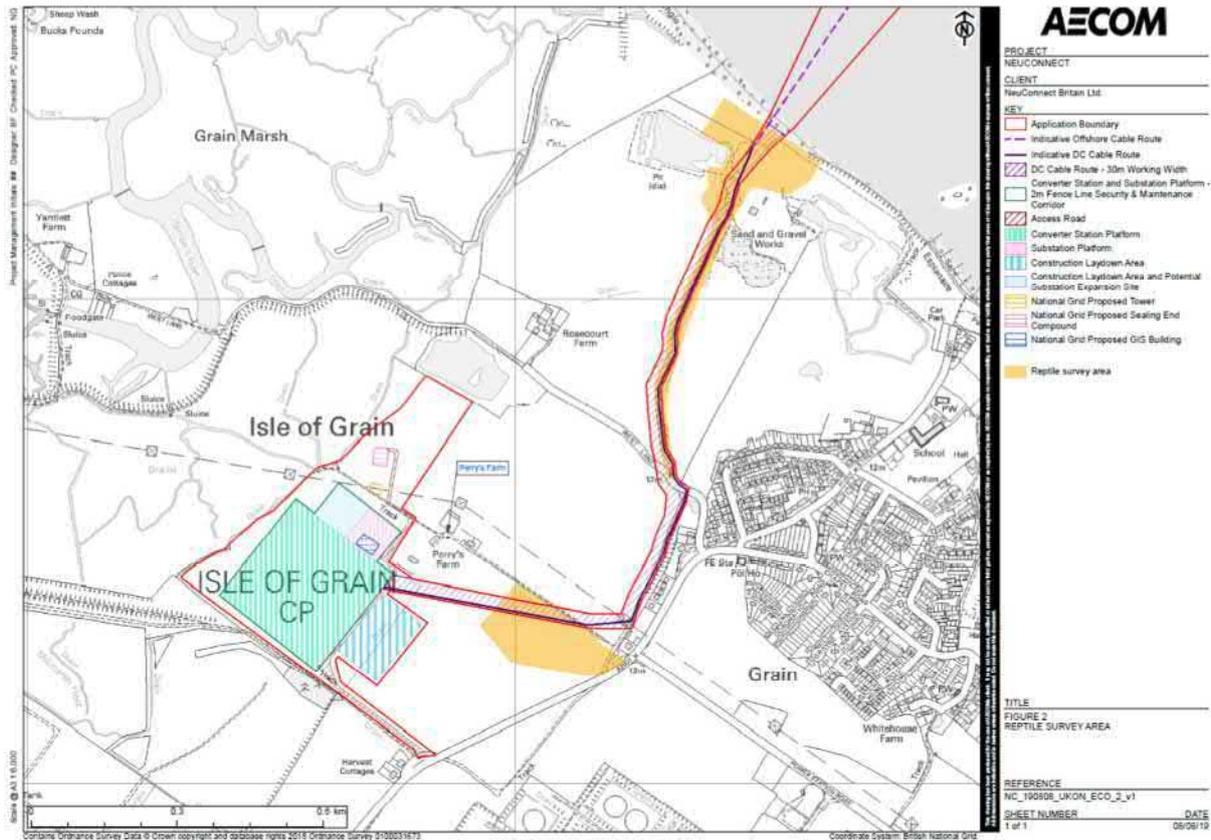


Figure 2 – Reptile Survey Areas (orange filled areas)

Scope of report

1.13 The objective of the reptile survey was to determine the presence or absence of reptiles in areas of suitable habitat located within the Proposed Development areas (Figure 1).

2. Legislative and Policy Framework

Relevant Legislative Context

- 2.1 All reptiles native to the UK are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). The four most widespread species of reptile: the Adder *Vipera berus*, Grass Snake *Natrix helvetica*, Common Lizard *Zootoca vivipara* and Slow Worm *Anguis fragilis* are protected under Section 9 (1 and 5) of the Act. This prohibits:
- intentional injuring or killing of a reptile;
 - selling, offering or exposing for sale, or having in possession or transporting a reptile for the purpose of sale, any live or dead wild animal or any part of, or anything derived from, such an animal; or
 - publishing or causing to be published any advertisement likely to be understood as conveying, buying or selling, or intending to buy or sell, any of those things.
- 2.2 There are no licensing provisions within the Act for development activities affecting these species. However, developers are expected to take adequate precautions to avoid breaches of the legislation, including undertaking adequate surveys and mitigation to avoid or minimise the risk of killing or injuring reptiles.

National and Local Planning Policy

- 2.3 The National Planning Policy Framework (NPPF) was originally published on 27th March 2012 and detailed the Government's planning policies for England and how these are expected to be applied. The NPPF was then revised on 24th July 2018 and 19th February 2019.
- 2.4 The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.
- 2.5 It specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this is to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.
- 2.6 The NPPF is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.
- 2.7 National and local planning policy relevant to nature conservation and reptile protection is provided in detail in the Preliminary Ecological Appraisal for the Proposed Development (AECOM, 2018).

UK Post-2010 Biodiversity Framework

- 2.8 The UK Biodiversity Action Plan (UKBAP) was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority species of conservation concern were published, and have subsequently been succeeded by the UK Post-2010 Biodiversity Framework (July 2012).
- 2.9 The UK Post-2010 Biodiversity Framework sets a broad enabling structure for action across the UK between now and 2020, including a shared vision and priorities for UK-scale activities to help deliver the Aichi targets and the EU Biodiversity Strategy. A major commitment by Parties to the Convention of Biological Diversity is to produce a National Biodiversity Strategy and/or Action Plan.
- 2.10 The UK Post-Development Framework is relevant in the context of Section 40 of the Natural Environment and Rural Communities (NERC Act) 2006, meaning that Priority Species and Habitats are material considerations in planning. These habitats and species are identified as those of conservation concern due to their rarity or a declining population trend.

2.11 The Natural Environment and Rural Communities (NERC) list of Species of Principal Importance is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act (2006); under Section 40 every public authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. In addition, with regard to those species on the list of Species of Principal Importance prepared under Section 41 (S41), the Secretary of State must:

“(a) take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or

(b) promote the taking by others of such steps.”

2.12 All widespread reptile species were added to the UK Biodiversity Action Plan (UKBAP) as priority species in September 2007 and subsequently were included as Species of Principal Importance in England under Section 41 of the NERC Act (2006) (as well as Sand Lizard (*Lacerta agilis*) and Smooth Snake (*Coronella austriaca*)) meaning that they are of material consideration in planning.

Local Biodiversity Action Plan

2.13 The Kent Biodiversity Action Plan (1997)¹ sets out Action Plans for 13 Species within the county. No reptile species are included as a priority species in Kent.

¹ The Kent Biodiversity Action Plan: A framework for the future of Kent's wildlife. Kent Biodiversity Action Plan Steering Group (1997)

3. Methods

Desk Study

- 3.1 A desk study was undertaken in July 2018 to obtain ecological records within a 2 km radius of the Proposed Development from Kent & Medway Biological Records Centre. This data request was limited to records of reptiles recorded within the last ten years of the request date.

Field survey

- 3.2 The field surveys utilised two recognised methods to record reptile presence / absence within the Proposed Development area:
- refugia surveys; and
 - visual observation of banks / other suitable habitat within the Proposed Development area.
- 3.3 Seven refugia surveys were undertaken between 4th September and 4th October 2018, in accordance with Froglife's Advice Sheet 10 for Reptile Surveys (Froglife, 1999) and Natural England's Standing Advice Sheet for Reptiles (<https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences>, accessed March 2019).

Refugia Surveys

- 3.4 Artificial refugia, in the form of sheets of bitumen roofing felt, measuring approximately 0.5m² in size, were placed in likely basking spots for reptiles. These areas included un-shaded patches next to cover, in areas of suitable grassland and adjacent to potential hibernation sites such as piles of rubble, logs, rabbit burrows and near vegetation waste such as arisings from grass cutting and wood chips.
- 3.5 A total of 118 refugia sheets were placed in suitable reptile habitat within the survey area in August 2018 (see Figure 2). The density of sheets was as advised by Froglife (1999)
- 3.6 The artificial refugia were left in situ for two weeks and were then checked on seven separate occasions, commencing on the 4th September 2018. Existing refugia on site, including pieces of wood and debris, were also searched for reptiles.
- 3.7 Reptile activity is greatly influenced by weather conditions, with reptiles most likely to use artificial refugia in temperatures of between 9°C and 18°C (Froglife, 1999), in hazy or intermittent sunshine with light winds (Gent & Gibson, 1998). The optimal survey period for reptiles (as recommended in the Herpetofauna Worker's Manual (Gent & Gibson, 1998)) is April, May and September.
- 3.8 Surveys were undertaken between 4th September and 4th October 2018 under suitable weather conditions on warm, dry days (see Table 4.1 for dates of survey and weather conditions).

Visual Inspections

- 3.9 Whilst checking artificial refugia, each area of suitable reptile habitat was searched in order to 'spot' basking common lizards. This species will often sit on top of grass tussocks, debris and felts and will quickly move from sight upon disturbance. Consequently, spotting this species can be more effective than searching under roof felt. Common lizards are often very territorial and will often reuse favourite basking sites (Beebee & Griffiths, 2000). Once these sites are known, spotting can become a relatively successful method of lizard recording.

Population Assessment

- 3.10 Where reptiles are present, estimating population sizes of reptiles can be undertaken using guidance within Froglife's advice sheet Number 10 (Froglife, 1999). This advice sheet provides a simple means of evaluating a species population as 'low', 'good', or 'exceptional' on the basis of the maximum number of adult reptiles (of each species) recorded during a single visit (see Table 3.1).

Table 3.1: Population Estimates of Reptile Species (Froglife, 1999)

Species	Low population	Good population	Exceptional population
Adder	<5	5 -10	>10
Grass Snake	<5	5 -10	>10
Common Lizard	<5	5 -20	>20
Slow Worm	<5	5 -20	>20

3.11 This method of population size estimate uses the assumption of a reptile survey using a density of 10 reptile sheets per hectare, although it can be difficult to determine a population size through interpretation of data using peak counts and densities. An average score across all survey visits will provide a more robust estimate of the population size of each reptile species present within suitable on-site habitat.

Survey Limitations

- 3.12 There were access limitations to the areas of land proposed for the converter and substation (see Figure 2) during the surveys for reptile presence / absence in September / October 2018 and therefore these areas were not surveyed for reptile presence / absence. However, an evaluation has been made of the potential suitability of the habitat within these areas to support reptiles relative to those areas that were surveyed and this evaluation is included further on in this report. This limitation is not considered to have affected the efficacy of the survey results.
- 3.13 The majority of ecological data is valid only for short periods due to the inherently transient nature of the subject (CIEEM, 2019²). On this basis, it is recommended that surveys for reptiles will need repeating in two years (i.e. in 2020).

² CIEEM: Advice Note on the lifespan of ecological surveys and reports <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf> (Accessed May 2019)

4. Results

Desk Study

4.1 The desk study returned nine records of reptiles recorded within 2 km of the Proposed Development area and within the last ten years. These were:

- a single record of Adder approximately 100 m from the Proposed Development area in 2010;
- two records of Grass Snake, with one recorded approximately 100 m from the Proposed Development area in 2010; and
- six records of Common Lizard, with the closest record located approximately 60m from the Proposed Development area in 2010 and the most recent record was found within 200 m of the Proposed Development area in 2013.

Field survey

4.2 Field surveys were undertaken between 4th September and 4th October 2018 in suitable weather conditions, with seven survey visits undertaken. Three species of reptile (Common Lizard, Grass Snake and Slow-worm) were recorded during these surveys. No Adder were recorded within the survey area during field surveys. The results of the surveys and weather conditions are presented in Table 4.1.

Table 4.1: Reptile Survey Dates, Numbers of Reptiles found and Weather Conditions

Survey number	Survey Date	Weather Conditions and Temperature (°C)	Reptile Species (and numbers) Recorded within the Survey Area	Reptile Species (and numbers) Recorded within the Proposed DC cable corridor (Redline Boundary)
1	04/09/2018	Dry, Cloud 7/8. Wind F2. c. 15°C	Eleven Common Lizard and one Slow-worm	Four Common Lizard
2	06/09/2018	Dry, Cloud 4/8. Wind F2. c. 15°C	21 Common Lizard and two Slow-worm	Nine Common Lizard
3	11/09/2018	Dry, Cloud 1/8. Wind F4 SW. c. 18°C	Four Grass Snake and 14 Common Lizard	Five Common Lizard and three Grass Snake
4	19/09/2018	Dry, Cloud 6/8. Wind F4 SW. c. 18°C	36 Common Lizard and two Slow-worm	17 Common Lizard and one Slow-worm
5	21/09/2018	Dry, Cloud 1/8. Wind F6 W. c. 14°C	24 Common Lizard and two Slow-worm	12 Common Lizard and one Slow-worm
6	26/09/2018	Dry, Cloud 0/8. Wind F2 SW. c. 18°C	19 Common Lizard	Seven Common Lizard
7	04/10/2018	Dry, Cloud 2/8. Wind F2 SW. c. 15°C	23 Common Lizard	Seven Common Lizard

Notes on Table 4.1: Wind speed is shown using the Beaufort scale, which is an empirical measure of force 0-12 that relates wind speed to observed conditions. Cloud cover is shown in a scale of 0-8 where the number represents the amount of cloud cover e.g. 2/8 is 25% cover 4/8 is 50% etc.' – the survey area was limited to the DC cable corridor only

4.3 The maximum counts of each reptile species recorded on a single survey within the survey area were as follows:

- 36 Common Lizard on 19th September 2018;
- four Grass Snake on 11th September 2018; and

- two Slow-worm on 19th September 2018.
- 4.4 The maximum counts of each reptile species recorded on a single survey within the Proposed Development areas were as follows:
- 17 Common Lizard on 19th September 2018;
 - three Grass Snake on 11th September 2018; and
 - one Slow-worm on 19th September 2018.
- 4.5 Given that all reptile species native to the UK are protected from injury or killing under the Wildlife and Countryside Act 1981 (as amended), in the absence of any mitigation, the presence of reptiles within the Proposed Development area presents a potential constraint to the Proposed Development and suitable mitigation will be required prior to the commencement of development to avoid any breaches of legislation.
- 4.6 The distributions of reptiles found within the Proposed Development area is shown in Appendix A.

5. Evaluation

- 5.1 Three species of reptile were recorded within the Proposed Development area in 2018. These were Common Lizard, Grass Snake and Slow-worm. No Adder were recorded during field surveys, however, the desk study identified that this species was recorded within 100 m of the Proposed Development area in 2010.

Habitat Suitability for reptiles in areas not surveyed

- 5.2 Access to two compartments, proposed for the location of the substation and converter station (see Figure 1), was granted after the presence / absence surveys were completed in September 2018 and outside of the survey season for reptiles. These areas (Figure 1), therefore, were not surveyed for reptiles using the methods detailed in section 3 of this report, but the habitat quality was appraised for its suitability to support a population of reptiles relative to those areas which were surveyed along the Cable Corridor.
- 5.3 The habitat within these compartments comprised managed arable farmland, with narrow field margin which were ecologically connected to habitat within the wider survey area, found to support populations of reptiles in 2018.
- 5.4 Managed arable farmland is largely unsuitable for reptiles as these areas are heavily disturbed, however, the field margins offer potential habitat to support reptiles. On the basis of reptile presence across the wider Site, it is reasonable to assume presence of Common Lizard within the margins of these compartments. Grass Snake may also occur in these margins, particularly where any wet habitat (ditches) occurs. Slow-worm is unlikely to occur in these margins, given the localised population recorded within the survey area in 2018.
- 5.5 In consideration of the assumed presence of Common Lizard and Grass Snake, outline mitigation in the substation and converter station locations is also proposed on a precautionary basis.

Population distribution and size class estimate

- 5.6 Table 3.1 is used to obtain a basic evaluation of the size and importance of Proposed Development for reptiles. When determining the population size of reptiles on a site, consideration must be made of other factors that may influence the assessment such as habitat quality and species ecology.
- 5.7 Estimating the population size of reptiles on a site (see Table 3.1) is difficult to achieve because each survey visit may only reveal a small sample of the population and the proportion of animals that may be detected during surveys will vary according to, for example, weather, migration patterns.
- 5.8 To allow for focussed estimation of the population size, relevant to the Proposed Development, only the maximum counts of each species on a single visit within the Proposed Development areas have been used. This allows for pertinent assessment of the potential impacts of the Proposed Development on reptiles, rather than considering populations of reptiles outside of these areas.

Common Lizard

- 5.9 Common Lizard was widely recorded across the Proposed Development area and the maximum count on a single survey visit was of 17 animals. When the maximum count of 17 animals is evaluated against Froglife's 'Key reptile site register' (Froglife, 1999), the population of Common Lizard on site is classified as 'good'.
- 5.10 The average 'score' of Common Lizard across all survey visits would amount to 8.7 Common Lizards per survey, which would still place the population of Common Lizard at 'good'. When factoring in an assumed population of Common Lizard within suitable habitat of un-surveyed areas of the Site, this 'score' may be higher.
- 5.11 Therefore, the population of Common Lizard on Site is classified as 'good'.

Grass Snake

- 5.12 Grass Snake is a transient species, hibernating during winter months and often travelling away from hibernation sites to lay eggs. Grass Snake was recorded in reptile refugia close to ditches and the maximum count on a single survey visit was of three animals. The average 'score' of Grass Snake across all survey visits would amount to 0.43 Grass Snake per survey.
- 5.13 To estimate population density, when the maximum count of three animals is evaluated against Froglife's 'Key reptile site register' (Froglife, 1999), the population of Grass Snake on site is classified as 'low'. When factoring in the potential for Grass Snake to occur in similar numbers within un-surveyed areas of the Site, the population estimate could increase slightly to 'good'. However, there are limited features of interest for Grass Snake within the arable fields (and their margins) of the un-surveyed areas and these are unlikely to support numbers of Grass Snake, a species that prefers to be close to water.
- 5.14 Therefore, with all things considered, the population of Grass Snake on site is classified as being 'low'.

Slow-worm

- 5.15 Records of Slow-worm were confined to single records of animals on two occasions, possibly relating to the same individual. Over seven visits, the average 'score' of Slow-worm amounts to 0.29 Slow-worm per survey.
- 5.16 To estimate population density, when the maximum count of one animal is evaluated against Froglife's 'Key reptile site register' (Froglife, 1999), the population of Slow-worm on site is classified as 'low'.
- 5.17 Given the limited distribution of this species across the survey area, it is unlikely that this species occurs in similar numbers within un-surveyed areas.
- 5.18 Therefore, the population of Slow-worm on site is classified as being 'low'.

6. Conclusions and Recommendations

- 6.1 The reptile surveys undertaken in 2018 identified the presence of three reptile species (Common Lizard, Grass Snake and Slow-worm) within the Proposed Development area.
- 6.2 The Proposed Development has the potential to impact on these reptile populations and habitat loss. In the absence of appropriate mitigation, these impacts are:
- risk of incidental injury and mortality during the construction of the development;
 - temporary loss of foraging habitat, used by three species of reptile, within the cable corridor;
 - temporary loss of areas within the cable corridor used by hibernating reptiles; and
 - temporary disturbance of reptiles using arable field margins, during construction and operation of the converter and substation.
- 6.3 Common Lizard, Grass Snake and Slow-worm are listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which prohibits intentional injuring or killing of a reptile. Therefore, through the implementation of mitigation, formalised through a Construction and Environment Management Plan (CEMP), the potential for killing and injuring of reptiles is avoidable. Mitigation is required to:
- ensure compliance with relevant legislation; and
 - avoid impacts that would give rise to a potential "significant effect", therefore contrary to planning policy and biodiversity obligations of the NERC Act 2006.
- 6.4 A significant negative effect is one which undermines nature conservation objectives, or changes the conservation status of a species population (CIEEM, 2016).
- 6.5 Therefore, outline recommendations for mitigation and / or enhancement of the Proposed Development area are presented further in Section 7 of this report.

7. Outline Mitigation Strategy

7.1 To mitigate for potential incidental killing or injury of animals and for the loss of reptile habitat, the following outline mitigation is proposed:

- clearance of vegetation, under ecological supervision, within the cable corridor to reduce the suitability of habitat for reptiles;
- inclusion of temporary fencing around the Proposed Development, to exclude reptiles from entering the construction areas from adjacent habitat;
- creation of habitat suitable for reptiles in the vicinity of the Proposed Development to mitigate for loss of reptile habitat; and
- avoidance of construction through potential reptile hibernation areas during periods when reptiles are hibernating (typically October to March), or removal of such features during the reptile 'active' periods (typically April to September).

Vegetation clearance within the cable corridor to minimise potential for incidental injury or mortality

7.2 The installation of the cable corridor will lead to temporary habitat loss, with the potential for incidental injury or mortality to reptiles. Therefore, the habitat within the cable corridor will be managed, through vegetation clearance, to reduce the suitability of the habitat and encourage reptile dispersal away from the construction areas.

7.3 The exact prescription of works will be dependent on the time of year within which the construction works will be undertaken and in consideration of how reptiles will be affected during their life cycle.

7.4 Broadly, the vegetation management will comprise:

- strimming vegetation within the cable corridor; and
- removal of arisings from within the cable corridor.

7.5 The vegetation within the cable corridor will be cleared to ground level, using hand trimmers, under the supervision of an Ecological Clerk of Work (ECoW). The vegetation will be cut in two passes, with the first cut of the vegetation cutting to no less than 0.3 m (1 foot) from above ground level. After a period of no less than 24 hours, a second cut of the vegetation will be made to ground level.

7.6 Vegetation strimming will be undertaken during suitable weather conditions, when the weather conditions are dry, with little to no wind and the temperature is between 9°C and 20°C.

7.7 All arisings will be raked by hand and removed from the cable corridor to prevent potential usage by reptiles.

7.8 Where possible, the vegetation clearance should be undertaken during September and October. This is inside the active reptile season (March to October), but outside of the breeding bird season, which is typically March to August inclusive.

Inclusion of temporary fencing around working areas

7.9 On completion of the vegetation clearance within the Proposed Development areas, exclusion fencing will be installed around the Proposed Development areas to ensure that no reptiles stray into the working areas.

7.10 Fencing, as detailed within Gent and Gibson, 1998) comprises a 1000 gauge polythene material, buried to a depth of 200 millimetres (mm) and with an above-ground height of 600 mm. The material is fastened to wooden stakes and set at a slight angle at the top, facing away from the Proposed Development area and is pulled tight so that reptiles (particularly Common Lizard) cannot climb up the fence.

7.11 Whilst fencing is being installed, a fingertip search will be undertaken within the Proposed Development areas to ensure that no reptiles are trapped within the construction areas.

7.12 Fencing will remain in place for the duration of construction and will only be removed on completion.

Habitat creation to mitigate for loss of reptile habitat

7.13 To mitigate for the loss of reptile foraging habitat, new habitat will need to be created to offset the loss of current habitat and should be formalised through the landscaping design. Any newly created habitat should be, minimally, like for like in terms of quality and area and should maintain connectivity across the wider area. To follow the principles set out in the NPPF to ensure biodiversity gain, additional habitat would also be created to allow for species population expansion. However, it should be acknowledged that although the footprint of the Proposed Development will lead to a loss of terrestrial habitat available to reptiles, the majority of this habitat does not contain reptiles or is of poor quality to support reptiles. Therefore, the majority of habitat that will be lost is of no value for reptiles.

7.14 The mitigation habitat for foraging reptiles should include the creation of grassland habitat, which will be suitable as foraging habitat for Common Lizard, Grass Snake and Slow-worm.

Avoidance of Hibernating Reptiles

7.15 If construction works, including ground clearance works, are undertaken between November and early March, then these works are likely to affect reptiles during their hibernation period, when reptiles are typically below ground. Reptiles usually hibernate between October/November and March, although this can vary as reptile activity is highly influenced by weather conditions and hibernation is triggered by a response to temperature fluctuations above ground. Hibernation spots for reptiles includes rubble piles, log piles and under large rocks.

7.16 Therefore, supervision by an ECoW of intrusive ground works will be undertaken to locate any areas of hibernacula, or potential hibernacula. Any such areas of hibernacula, or potential hibernacula, will be avoided, where construction occurs during winter months and when reptiles are hibernating. Reptile activity is highly influenced by weather conditions and hibernation is triggered by a response to decreasing temperatures above ground. Typically, the hibernation period for reptiles is October / November to March, although this can vary depending on the weather.

7.17 Alternatively, potential hibernation spots could be removed in advance of construction, within the reptile active period and replaced outside of the Proposed Development area (but within a suitable distance so that reptiles can find it). Removal would be under the supervision by an ECoW.

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Appendix A Figures

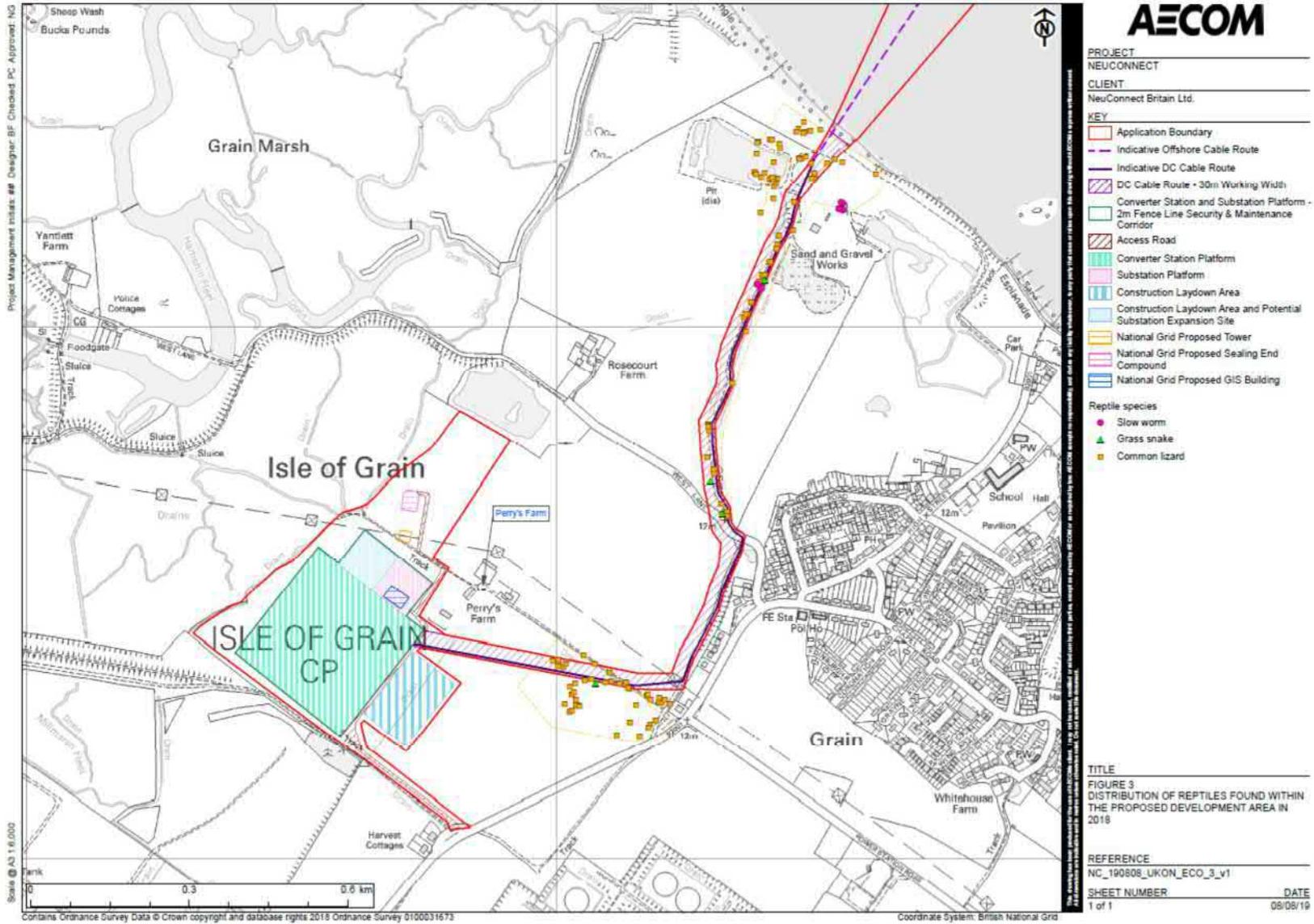


Figure 3 - Distribution of reptiles found within the Proposed Development area in 2018

Appendix 6.F – Report on Surveys for Great Crested Newts

NeuConnect Great Britain to Germany Interconnector

GB Onshore Scheme

Report on Surveys for Great Crested Newt

NeuConnect Britain Ltd

May 2019

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1. Introduction

In 2018, AECOM undertook a Preliminary Ecological Appraisal (PEA)¹ on behalf of Neuconnect Britain Ltd (the 'Applicant'). This PEA survey identified the need for follow-up ecological surveys to determine the potential impacts of the Neuconnect project (hereby known as the 'Proposed Development') on certain protected and, or notable species. Therefore, AECOM was instructed to undertake a survey of Great Crested Newt *Triturus cristatus* presence or absence, as recommended in the PEA report for the Proposed Development and to make any recommendations based on the results of the survey.

Proposed Development

NeuConnect (the Project) is a 1400 megawatt (MW) interconnector between Great Britain and Germany. The Project will create the first direct electricity link between the energy networks in Great Britain and Germany energy networks. The new link will create a connection for electricity to be passed in either direction between Great Britain and Germany. The Project will be formed by approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HVDC) cables, with on-shore converter station at either end linking into the existing electricity grids in Great Britain and Germany.

The Proposed Development will comprise of three structures, a converter station, sub-station and a direct current (DC) cable route (see Figure 1).

The footprint of the proposed converter station to the perimeter security fence is expected to be up to approximately 250 metres (m) by 250 metres, with a maximum height of up to 26 m.

The footprint of the proposed substation to the perimeter security fence is expected to be approximately 80 m by 80 m with a maximum height of 14 m.

The proposed DC cable corridor will be approximately 1.6 km long (from landfall to the converter station). The preferred installation method will be underground, which will result in a temporary loss of land during installation. The working corridor for the installation of the cable corridor will be 30 m.

Additional laydown areas will be required for construction, comprising 1.5 hectares (ha) for the converter laydown and 0.3 ha for the substation laydown.

Site Description

The Proposed Development area (the Site) is entirely within the boundary of Medway Council and is centred on the Isle of Grain located at the tip of the Hoo Peninsula between the Thames Estuary to the north and the Medway Estuary to the south. The Site is located to the west of the village of Grain, Isle of Grain, Kent at Ordnance Survey (OS) central grid reference TQ 88205 76727. Land use comprises a mix of industrial development to the south, the small settlement of Grain to the south-east and undeveloped land, much of which is designated for ecological interests, to the north (along the coastline) and to the west. Land within the Site and in the immediate vicinity has historically been used for the extraction of gravel and sand and the resultant voids used for landfill.

Figure 1 shows the site boundary (red-line), the cable corridor (purple line) and proposed location of each structure.

¹ AECOM, Neuconnect, Isle of Grain: Preliminary Ecological Appraisal Report, 2019

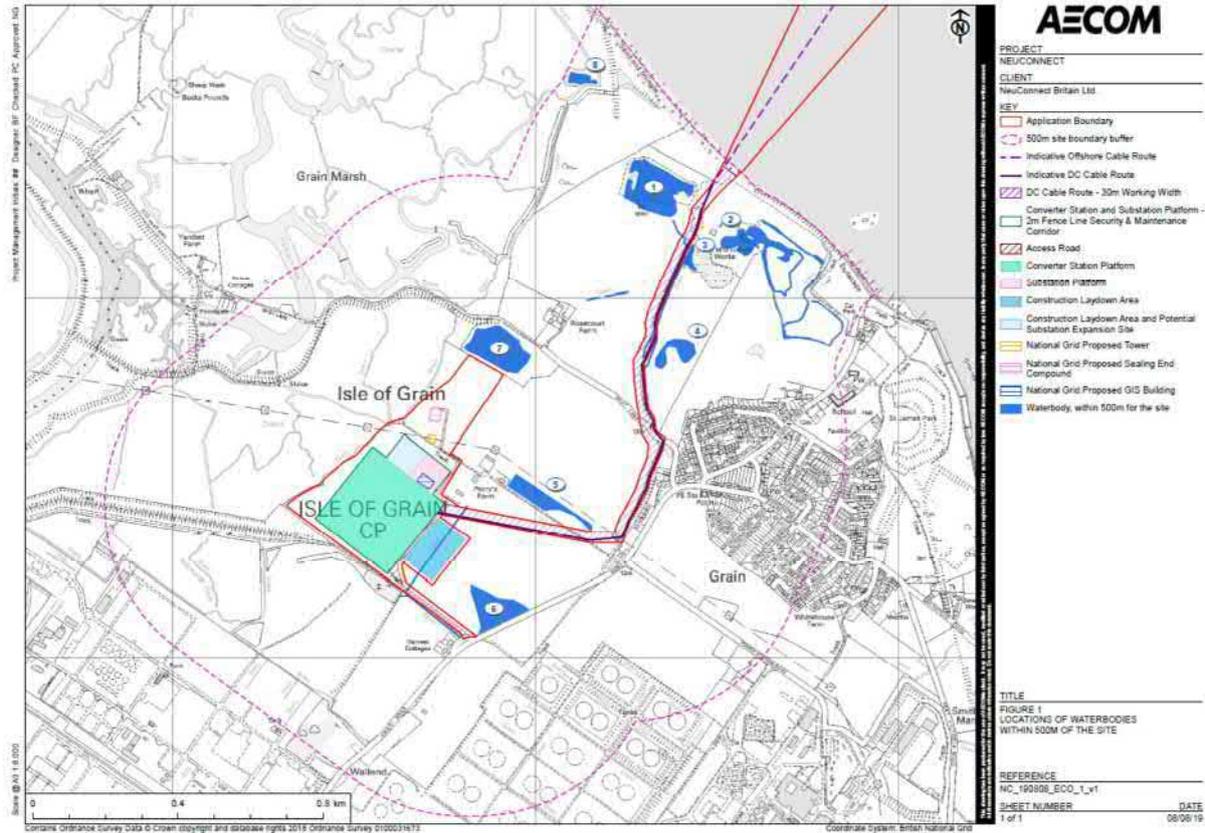


Figure 1 - Proposed locations of DC cable route, converter station and substation and suitable waterbodies within 500 m of the Site Boundary.

Survey Area

The survey area included waterbodies and ditches on the Site and those considered as being potentially suitable for Great Crested Newt within 500 m of the Site (see Figure 1).

Scope of Report

The objective of the Great Crested Newt survey, reported in this document, is to determine the presence or absence of the species within the Proposed Development area and surrounding area and, if present, to determine the population size present and mitigation required.

2. Great Crested Newt Ecology

Great Crested Newt is one of seven species of amphibian considered native to Britain and in common with other UK amphibians, they spend the majority of their lives on land, returning to standing water (water bodies and ditches) in the spring in order to breed.

Temperature Effects on Great Crested Newt Activity

Great Crested Newts are ectothermic, meaning that they regulate their temperature through exchange of heat with the external environment. Gaseous exchange (oxygen/carbon dioxide) is achieved largely by absorption through their permeable skins, which must be moist for this purpose. Behaviour and activity are therefore strongly linked to external environmental conditions, especially daily and seasonal cycles. Great crested newts are mainly active at night (usually when temperatures exceed 5° Celsius (C) and following recent rainfall). With the onset of winter frosts, Great Crested Newts hibernate. Activity recommences when the frosts subside (which may be as early as January / February), with adults migrating to breeding water bodies. Peak breeding activity is usually between mid-March and mid-May.

Reproduction

Breeding takes place within water bodies with males performing a courtship 'dance' in order to attract and encourage females to take up a spermatophore (a packet containing sperm). Females deposit eggs (up to 200 per season) on the submerged leaves of aquatic broadleaved plants. Each egg is individually sealed for protection from predators within a folded leaf. Adults begin to leave the water bodies around May, but may return in order to feed.

Larvae hatch after three weeks and feed on small aquatic invertebrates and the larvae/eggs of other amphibians for approximately three months. They metamorphose into land-adapted juveniles called efts and begin to emerge from their water bodies around August.

Habitat Requirements

During their terrestrial phase, Great Crested Newts require a complex habitat structure in order to provide both food and shelter. These are most commonly provided by broadleaved woodland, rough / tussocky grassland and scrub habitats. They also require a secure area in which to hibernate. Hibernacula generally need to provide a stable temperature, be free from frost and provide protection from flooding and predation. These requirements are commonly met by log/rubble piles, underground crevices or mammal burrows.

For breeding, Great Crested Newts require water bodies that provide suitable protection and food for their developing larvae. Generally, such water bodies should be of relatively good water quality so as to provide a diverse range of invertebrate prey. Un-shaded water bodies tend to provide more of the required broadleaf aquatic vegetation, upon which Great Crested Newt eggs can be laid. Water bodies with large fish populations (which can prey on newts) or heavy grazing pressure from waterfowl (which can prey on newts and reduce water quality and egg laying habitat) tend not to support Great Crested Newt. Connectivity between water bodies and good quality terrestrial habitat tend to favour large, viable, populations of Great Crested Newt. In rural landscapes in Britain, such connectivity is often provided by the hedgerow network.

Range

Great Crested Newts are thought to commonly move between water bodies within 250 m of each other, although there are studies showing Great Crested Newt travelling much further than this (Great Crested Newt Mitigation Guidelines, English Nature 2001). The range of Great Crested Newt may be impacted by a range of factors, including the type and quality of habitat surrounding a breeding water body, the availability of hibernation sites and the presence or absence of barriers to dispersal (e.g. large and busy roads with no features that great crested newt could move through).

3. Legislative and Policy Framework

Legislative Context

All stages of the Great Crested Newt life cycle as well as their habitat are fully protected under Schedule 2 of The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018. Great Crested Newt is listed on Schedule 5 of the Wildlife & Countryside Act 1981, which affords them protection under Section 9, as amended by the Countryside Rights of Way Act (2000). They are also listed on Annex II and VI of the EC Habitats Directive, are included as Species of Principal Importance in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and are UK Biodiversity Action Plan Species. In combination, this makes it an offence to:

- intentionally, or recklessly kill, injure or take (capture etc.);
- possess;
- intentionally or recklessly damage, destroy, obstruct access to any structure or place used by a scheduled animal for shelter or protection, or disturb any animal occupying such a structure or place; and, or
- sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative) or advertise for buying or selling such things.

Natural England licencing

Where Great Crested Newt habitat, including their breeding sites and resting places, is present on a site and a development has the potential to cause one or more offences under The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018, a European Protected Species Licence (EPSL) is required from Natural England to allow the development to proceed. This licence allows the development to proceed with exemption from offences, provided works are undertaken with strict accordance of the terms of the licence. A licence cannot, however, be obtained to provide protection against offences under the Wildlife and Countryside Act, 1981 (as amended).

In determining whether to grant a licence, Natural England must apply the requirements of Regulation 535 of the Regulations, these being:

(1) Regulation 53(2)(e) states: a licence can be granted for the purposes of “*preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment*”.

(2) Regulation 53(9)(a) states: the appropriate authority shall not grant a licence unless they are satisfied “*that there is no satisfactory alternative*”.

(3) Regulation 53(9)(b) states: the appropriate authority shall not grant a licence unless they are satisfied “*that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*”

A local planning authority must also apply these tests when determining a planning application, where a proposed development is likely to cause an offence under The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018.

In order for a European Protected Species Licence to be approved by Natural England for works with Great Crested Newt, it must be demonstrated that the proposed development will minimise any potential impacts upon Great Crested Newt and will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Offences can be avoided through the implementation of appropriate mitigation that will minimise the potential for any offences to be committed. Mitigation can include the undertaking of vegetation clearance works at an appropriate time of the year and completing works in accordance with methods that will minimise or avoid potential disturbance or destruction of habitats. In such circumstance it is sensible for works to be completed using Reasonable Avoidance Measures (RAMs).

National Planning Policy Framework

The National Planning Policy Framework (NPPF) was originally published on 27th March 2012 and detailed the Government's planning policies for England and how these are expected to be applied. The NPPF was then revised on 24th July 2018 and 19th February 2019. The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

It specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this is to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

The NPPF is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

Local Planning Policy

Medway Council's local planning policy relevant to nature conservation and Great Crested Newt is provided in detail in the Preliminary Ecological Appraisal for the Proposed Development (AECOM, 2019).

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UKBAP) was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority species of conservation concern were published, and have subsequently been succeeded by the UK Post-2010 Biodiversity Framework (July 2012).

The UK Post-2010 Biodiversity Framework sets a broad enabling structure for action across the UK between now and 2020, including a shared vision and priorities for UK-scale activities to help deliver the Aichi targets and the EU Biodiversity Strategy. A major commitment by Parties to the Convention of Biological Diversity is to produce a National Biodiversity Strategy and/or Action Plan.

The UK Post-Development Framework is relevant in the context of Section 40 of the Natural Environment and Rural Communities (NERC Act) 2006, meaning that Priority Species and Habitats are material considerations in planning. These habitats and species are identified as those of conservation concern due to their rarity or a declining population trend.

The Natural Environment and Rural Communities (NERC) list of Species of Principal Importance is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006; under Section 40 every public authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. In addition, with regard to those species on the list of Species of Principal Importance prepared under Section 41 (S41), the Secretary of State must:

“(a) take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or

(b) promote the taking by others of such steps.”

Fifty-six habitats of principal importance are included on the list which includes freshwater habitats such as ponds. Great Crested Newt is included as a Priority Species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and is also included as a UKBAP and Local Biodiversity Action Plan (LBAP) priority species.

4. Methods

This section describes the survey methods used to determine the status of Great Crested Newt on the Site, which included:

- a desk study;
- a habitat suitability index (HSI) survey;
- a terrestrial habitat survey; and
- a presence / absence survey using traditional methods (bottle trapping, torching, egg-searching).

Desk Study

A desk study was undertaken in July 2018 to obtain ecological records within a 2 km radius of the centre of the Proposed Development from Kent & Medway Biological Records Centre (KMBRC). This data request was limited to records of Great Crested Newt recorded within the last ten years of the request date.

Aerial photographs and Ordnance Survey (OS) maps were reviewed to identify water bodies of potential value to Great Crested Newt within 1 km of the Proposed Development that were not separated by major barriers to Great Crested Newt dispersal (such as main roads and large rivers). The review of aerial photography and mapping included identifying any key routes of potential connectivity to the Proposed Development and significant barriers to Great Crested Newt dispersal.

Habitat Suitability Index (HSI)

The Habitat Suitability Index (HSI) is a measure of habitat suitability, developed by Oldham *et al.* (2000) for evaluating the suitability of ponds as habitat for Great Crested Newt, which considers ten habitat and ecological suitability indices. Ponds with higher HSI scores are considered more likely to support Great Crested Newt than those with lower scores.

A value is recorded for each parameter and combined to determine an index of breeding suitability for Great Crested Newt (Table 1).

Table 1. Great Crested Newt Suitability Indices and Descriptions

Suitability Indices	Suitability Indices Title	Suitability Indices Description
(SI1)	Geographic location	Different areas of the UK represent different indices scores
(SI2)	Water body area	The optimum water body size is between 500 and 750 m ² .
(SI3)	Water body permanence	The optimal frequency of drying is one year per decade.
(SI4)	Water quality	The presence of indicator organisms (the same that are used to assess running water) is the water quality indicator.
(SI5)	Water body shading	Great crested newt occurrence is significantly reduced above a threshold of 75% shade.
(SI6)	Impact of waterfowl	Waterfowl impact on water body vegetation and water turbidity is a negative indicator for great crested newt.
(SI7)	Occurrence of fish	The effect of fish presence is related to the species. Some species can have negative impacts and great crested newt hardly ever coexist with larger predatory fish species. Other species (depending on conditions) are not detrimental.
(SI8)	Water body density	Water body densities above four water bodies/km ² are taken as optimal.
(SI9)	Terrestrial habitat	In general, scrub, unimproved grassland, woodland (deciduous and coniferous) and gardens are regarded as being suitable terrestrial habitat, unlike improved pasture, arable and hardstanding. The SI ₉ is the combination between positive factors (suitable habitat) and negative factors (e.g. inherent in

Suitability Indices	Suitability Indices Title	Suitability Indices Description
(SI10)	Macrophyte content	barriers to movement such as roads). The surrounding habitat is scored according to the extent of high quality terrestrial newt habitat. The highest occurrence of great crested newt is found in water bodies with emergent vegetation cover between 25% and 50% and submerged vegetation between 50% and 75%.

The HSI generates a numerical index which scores ponds and other waterbodies on a scale of between 0 and 1, using a geometric mean of the ten suitability indices, with the following suitability categories for the results:

- <0.5: poor likelihood of Great Crested Newt presence;
- 0.5 – 0.59: below average likelihood of Great Crested Newt presence;
- 0.6 – 0.69: average likelihood of Great Crested Newt presence;
- 0.7 – 0.79: good likelihood of Great Crested Newt presence; and
- >0.8: excellent likelihood of Great Crested Newt presence.

Any waterbody with a HSI score of average or greater, should then be subject to further surveys to determine Great Crested Newt presence or absence.

The HSI survey of waterbodies within 500 m of the Site, where access was permitted, was undertaken in April 2018.

Great Crested Newt survey using traditional methods

Natural England recommends the following methods are used to determine presence or likely absence of Great Crested Newt in ponds (English Nature, 2001):

- three methods (preferably torch surveys, bottle-trapping and egg searching) undertaken during each visit with netting as another technique which can be applied if one of the other techniques is not possible;
- visits must be undertaken in suitable weather conditions, i.e. warm, still evenings without rain;
- four presence or absence surveys should be undertaken and, if Great Crested Newt is confirmed, two additional visits (total of six visits) would be required to estimate population class size; and
- surveys to be undertaken between mid-March and mid-June with at least 2 surveys in peak season (usually mid-April to mid-May) with three surveys required between mid-April to mid-May if Great Crested Newt is confirmed within the waterbody.

All waterbodies within 500 m of the Proposed Development areas, where access was permitted, and with an HSI score of average, or greater, were surveyed using traditional methods, with a total of four surveys undertaken between April and May 2018, which is considered as the optimal survey period for Great Crested Newt and is when this species are most active and abundant within the water. All surveys were carried out by two suitably qualified ecologists, with at least one surveyor holding an appropriate Natural England survey licence and one surveyor used for Health and Safety. The survey dates and weather conditions recorded during surveys are presented in Table 2.

Table 2. Great Crested Newt Survey Dates and Weather Conditions

Survey number	Date of survey	Weather conditions, including night time air temperature (°C)
1	10/04/2018	Dry, Cloud 4/8. Wind F2, S. Temp. 9°C
2	24/04/2018	Dry, Cloud 3/8. Wind F2, SE. Temp. 9 °C
3	18/05/2018	Dry, Cloud, 1/8. Wind F1,E. Temp 10°C
4	23/05/2018	Dry, Cloud, 0/8. Wind F2, NE. Temp 14°C

Bottle Trapping

Prior to sunset, bottle-traps were set at approximately one trap every 2 m of water's edge, where practicable, in accordance with the Great Crested Newt mitigation guidance (English Nature, 2001). Where access was restricted, due to vegetation overgrowth or other factors, this method was amended for the purposes of practicality and safety. The traps were left set overnight and were checked again the following morning, soon after sunrise. No trap was left set for longer than 11 hours. Any animals caught were identified, aged (*i.e.* juvenile or adult) and sexed and then released at the trap location.

Torch Survey

Cluson torches, with 1-million candlepower, were used for the torch counts. Surveyors walked slowly around the water's edge after dark, looking for Great Crested Newt which would have emerged to begin courtship and feeding.

Egg Searching

Aquatic and marginal vegetation (both living and dead vegetation) within the waterbodies were searched for Great Crested Newt eggs. Once an egg is found and confirmed as that of a Great Crested Newt, the search would be terminated to ensure that no damage or further disturbance to eggs would occur. Great crested newt eggs, like those of other newts, are typically laid within a folded leaf. In order to determine the species of newt egg found, the leaf must be unfolded, rendering it more prone to predation or damage. Numbers of eggs present are not indicative of population sizes.

Population size class assessment

If Great Crested Newt was found to be present during surveys, the results of the six survey visits were used to produce an approximate indication of the population size class. Based on the maximum count of adult Great Crested Newt, counted per water body per night, the Great Crested Newt population in each waterbody can be classified as small, medium or large, in line with the Great Crested Newt Mitigation Guidelines (English Nature, 2001).

The assessment was based on a spring survey of adult numbers of Great Crested Newt found during bottle trapping and torching methods. Egg searches and larval and juvenile counts may give a misleading indication of overall population size without complex interpretation and were not be used.

A population of Great Crested Newt is classified using the following indices:

- 'small': for maximum counts up to 10;
- 'medium': for maximum counts between 11 and 100; and
- 'large': for maximum counts over 100.

Survey Limitations

There were difficulties encountered with safely accessing two of the Lagoons (Lagoons 3, and 5) for bottle trapping, egg-searching and netting, due to steep sided banks and therefore these were not accessed during the survey due to health and safety concerns. However, both lagoons were accessible at some points along the banks to allow a torch survey.

There were limitations with accessing all banks of Lagoons 1, 2 and 6 and therefore, for bottle-trapping and egg-searching, these were only surveyed where access allowed. However, the surveys undertaken were robust enough to determine whether Great Crested Newt were present within these lagoons and this limitation did not have a significant impact on the efficacy of the survey.

Waterbodies to the west of the Site (deep channels and waterbody 8) are within Ministry of Defence (MoD) land and therefore there was no access to these waterbodies during surveys.

Waterbody 7 was not surveyed as there was no access to this waterbody at the time of the surveys. However, this waterbody is a used by anglers and the presence of large fish, which would prey on Great Crested Newt, means that it is unlikely that Great Crested Newt would be present within this waterbody.

The majority of ecological data is valid only for short periods due to the inherently transient nature of the subject (CIEEM, 2019²). On this basis, it is recommended that the surveys for Great Crested Newt will need repeating within two years (*i.e.* in 2020).

² CIEEM: Advice Note on the lifespan of ecological surveys and reports <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf> (Accessed May 2019)

5. Results

Desk Study

The desk study returned a count of three Great Crested Newts from 2009, c. 600m to the south-east of the Proposed Development areas.

A total of eight waterbodies, within 500 m of the Site which were not separated from the Site by major roads or large rivers were identified from aerial photography. These waterbodies are summarised below in Table 3.

Table 3. Summary of identified waterbodies within 500 m of the Site (see Figure 1 for location of lagoons).

Waterbody number / reference	Within the site boundary?	Within the footprint of the Proposed Development?	HSI index score
Lagoon 1	X	X	Good (0.75)
Lagoon 2	X	X	Good (0.78)
Lagoon 3	✓	✓	Good (0.72)
Lagoon 4	X	X	Poor (0.48)
Lagoon 5	✓	✓	Good (0.75)
Lagoon 6	X	X	Good (0.76)
Lagoon 7	X	X	Not surveyed due to access
Lagoon 8	X	X	Not surveyed due to access

Habitat Suitability Index

Six waterbodies (see Figure 1) were assessed for their potential to support a breeding population of Great Crested Newt, using HSI methods, as described in Section 4.2 of this report.

Using the calculated values for the ten HSI indices, an HSI value was calculated for each water body within 500 m of the Site and where access allowed and these are presented, in full in Tables A.1-A.6 in Appendix A. The 500 m buffer was used as Great Crested Newt typically occur within this distance from a breeding site. The HSI value was then categorised against the criteria within Section 4.2 to describe the suitability of the water body for Great Crested Newt on a scale of poor to excellent.

The HSI survey concluded that five lagoons (Lagoons 1, 2, 3, 5 and 6) were of 'good' suitability to support breeding Great Crested Newt. Lagoon 4 was of 'poor' suitability to support Great Crested Newt.

Great Crested Newt survey using traditional methods

Four survey visits, using traditional methods, were undertaken between April and May 2018 to determine Great Crested Newt presence / absence within 500 m of the Site. Surveys were undertaken on five of the lagoons with a score of 'average' suitability (or higher) for Great Crested Newt (see Section 5.2) and where there were no limitations with safely accessing the waterbodies. Details of the survey methods used on these waterbodies are presented in Table 4.

Table 4. Summary of survey effort on each waterbody within 500 m of the Site.

Waterbody number / reference	Torching	Bottle-trapping	Egg Searching
Lagoon 1	✓	✓	✓
Lagoon 2	✓	✓	✓

Waterbody number / reference	Torching	Bottle-trapping	Egg Searching
Lagoon 3	✓	X	X
Lagoon 5	✓	X	X
Lagoon 6	✓	✓	✓

No Great Crested Newts were recorded during any of the surveys on the five waterbodies.

Smooth Newt *Lissotriton vulgaris* was recorded in Lagoon 1. Marsh Frog *Pelophylax ridibundus* was located across the Site in all waterbodies.

6. Conclusions and Recommendations

Eight waterbodies were identified within 500 m of the Site and detailed Great Crested Newt presence or absence surveys were completed on five waterbodies. The remaining three waterbodies were either not accessible due to land access restrictions, or in the case of Lagoon 4, classified as unsuitable due to 'poor' HSI classification.

The surveys did not record any Great Crested Newt in any of the surveyed waterbodies (Lagoons 1, 2 and 6) using traditional methods. Great Crested Newt was not recorded in Lagoons 3 and 5 using torching methods.

However, Great Crested Newt was recorded during the desk study, within 600 m of the Site. Great Crested Newt is also known to be widespread across much of the Isle of Grain (Max Wade (AECOM), personal communication).

Therefore, given the known presence of Great Crested Newt in the wider area and in consideration of the limitations with surveying all waterbodies within 500 m of the Proposed Development, a Precautionary Method of Working (PMW) will be employed to minimise and avoid any adverse impacts to Great Crested Newt and to reduce the risk of offences being committed under wildlife law during construction of the Proposed Development.

7. Potential Impacts of Development

7.1 Construction Impacts

Great Crested Newt was not recorded during surveys in 2018. However, there were limitations with accessing all waterbodies within 500 m of the Proposed Development and Lagoons 3 and 5 could only be surveyed by torch and even then from only a few locations. A single record of three Great Crested Newts was returned during the desk study. This was from 2009, c. 600m to the south-east of the Proposed Development areas and this species has been known from across the Isle of Grain for at least the last 20 years (personal communication Max Wade, AECOM). Therefore the potential impacts arising from construction of the Proposed Development on Great Crested Newt are based on potential presence from the development proposals, namely:

- the construction of the DC cable will be within 100 m of Lagoons, 1, 2, 3, 4 and 5 but will not lead to the loss of these habitats nor any part of them; and
- the footprint of the Proposed Development will necessitate the removal of terrestrial habitat on site, potentially used by Great Crested Newt.

Therefore, the following impacts on Great Crested Newt, if present, are envisaged:

- Water Bodies: No waterbodies, potentially used by breeding Great Crested Newt, would be lost as a result of the Proposed Development.
- Terrestrial Habitat (loss and fragmentation): Great Crested Newt will disperse across the landscape from their breeding water bodies to other water bodies and hibernation sites. All suitable terrestrial habitats within the footprint of the DC cable corridor, which will be temporarily lost during construction, and within the footprint of the proposed converter and substation, which will be permanently lost through land take from the Proposed Development should all be considered for their suitability to support foraging Great Crested Newt. ; and
- Hibernation Features: The Site contains features such as mammal burrows and log and brush piles which offer good potential sites for Great Crested Newt hibernation. Some of these features are likely to be lost as part of the vegetation clearance process.

In summary, in the absence of mitigation, the Proposed Development has the potential to negatively impact on any Great Crested Newt population that might be present on the Site or within 500 m of it during the construction of the development, through loss of terrestrial habitats and incidental mortality.

However, the potential for killing and injuring of Great Crested Newts and permanent loss of habitat is avoidable through the appropriate implementation of a Great Crested Newt Strategy. Therefore, in habitats on site where Great Crested Newt is potentially present, mitigation is required to:

- ensure compliance with relevant legislation; and
- avoid impacts that would give rise to a potential “significant effect”, therefore contrary to planning policy and biodiversity obligations under the NERC Act 2006.

A significant effect can be considered one which supports or undermines nature conservation objectives, or changes the conservation status of a species population (CIEEM, 2016).

7.2 Operation impacts

The Proposed Development, when operational, will introduce additional lighting and noise. However, with the implementation of mitigation during construction, these will not have any impact on Great Crested Newt during operation of the Proposed Development.

8. Approach and justification to Precautionary Working

Methods and defining a zone of potential impact

For European Protected Species, such as Great Crested Newt that are subject to the Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018, Natural England's view is that: *"If the consultant ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably unlikely to result in an offence under Regulation 41 or 45 then no licence is required"* (European Protected Species Guidance Note WML-G12 (Natural England, 2013).

A range of factors are taken into consideration when assessing whether the Proposed Development can proceed in the absence of a licence. These include: the nature of the proposals, the suitability of habitats within the site to support protected species, evidence of such species' presence and the proximity of existing known populations.

In cases where a licence is not required, Natural England urges that reasonable precautions be taken to avoid affecting European Protected Species during works and that an audit trail is kept on the decision-making process.

At this stage, the presence of a Great Crested Newt population on site is considered as possible, on the basis of desk study records from within 500 m of the Site and knowledge of the presence of this species across the Isle of Grain. Therefore, a zone of potential impact has been determined on the Site which comprises the areas of the Proposed Development that could impact upon Great Crested Newt, or the habitat within which they might be present. The zone of potential impact has been used to determine whether works associated with the construction of the Proposed Development require a European Protected Species Licence or can proceed using Risk Avoidance Measures.

To inform the definition of the zone of potential impact at Kings Lynn, reference is made to research undertaken by Natural England (then English Nature) in 2004. Research Report number 576 assessed the value of different habitats for great crested newt and the efficiency of capture techniques. The non-technical summary states that:

'By far the most captures were recorded within 50m of ponds and few animals were captured at distances greater than 100 m.'

and that:

'Captures on fences (and by other methods) at distances between 100m and 200 - 250m from breeding ponds tended to be so low as to raise serious doubts about the efficacy of this as an approach, although a small number of projects did report captures on significant linear features at distances approximately 150 – 200m from ponds.'

Therefore, there is an indication in that report that the risk of Great Crested Newt being present at distances greater than 100 m from a waterbody is low and that the risk of their presence at this distance is greatest where populations of Great Crested Newt are large or present within favourable habitat. As outlined previously, the no evidence of Great Crested was found on the Site, but conservatively it is assumed that there is a low population.

The Proposed Development area comprises good quality aquatic habitat that could be used for breeding (Lagoons 1, 2, 3, 5 and 6) and moderate quality terrestrial habitat (rubble piles and brash piles), interspersed with smaller areas of high quality habitat, that could be used for foraging and hibernating. The ditch running adjacent to the DC cable corridor could act as a commuting route around the Site for Great Crested Newt and offer potential connectivity to off-site habitat.

It is considered extremely unlikely that Great Crested Newt occur in habitats greater than 100 m from any of the lagoons. The rationale for this being:

- the population of Great Crested Newt in Lagoon 1, 2, 3, 5 and 6 (of good HSI suitability) is considered to be 'low', owing to the absence of Great Crested Newt during field surveys in 2018;
- the amount of high quality terrestrial habitat that is potentially suitable for Great Crested Newt is predominantly within 100 m of the lagoons on site. Habitat beyond 100 m of these areas is of moderate quality, with largely tall ruderal habitat and scrub in these areas; and
- there are few suitable off-site waterbodies for Great Crested Newt from within 500 m of the Site.

When considering the habitats present within the footprint of the Proposed Development in areas more than 100 m from the lagoons on site, it is therefore considered unlikely that the works will result in **deliberate capture, injury or killing** of Great Crested Newt.

Due to the limited potential for Great Crested Newt to be using the terrestrial habitats in the habitats more than 100 m from Lagoons 1, 2, 3, 5 and 6, it is also reasonably unlikely that the commencement of enabling works of the Proposed Development in areas more than 100 m from these areas will result in **deliberate disturbance** to Great Crested Newt in such a way as to be likely to impair their ability to survive, breed, reproduce, rear or nurture their young, hibernate or migrate; or to affect significantly the local distribution or abundance of the species. It is also unlikely that the proposed works will result in **damage or destruction of their resting places**, provided appropriate mitigation is implemented.

As the works would avoid any waterbodies on site and therefore will not affect a breeding pond during the breeding season, they will not involve **deliberate taking or destroying the eggs of Great Crested Newt**.

Therefore, on the basis of specialist knowledge and experience working with the species concerned, it is considered, on balance, that the construction of the Proposed Development in areas >100m from any waterbodies on site is unlikely to result in an offence under Regulation 41 of the Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018 and no development licence is required for these works.

Similarly it is reasonably unlikely that works will result in **disturbing a Great Crested Newt in its place of shelter or obstructing access to such a place** and therefore the proposed works described in this section are reasonably unlikely to result in an offence under the Wildlife & Countryside Act 1981 (as amended).

Construction works are therefore proposed without a Natural England licence, but using the Precautionary Methods of Work outlined in Section 8.1.

8.1 Precautionary method of working

The risk of affecting Great Crested Newt during construction of the Proposed Development is low, but the following approaches to mitigation would be used during its construction

Such methods can be used during minor vegetation clearance and involve clearance of vegetation to encourage any amphibians to move away from any affected areas into adjacent areas using habitat manipulation. To mitigate against harm to any amphibians present, the following precautionary methods of working are deemed appropriate for the works on site for Great Crested Newt and other amphibians.

Habitat manipulation should be overseen by a suitably qualified ecologist (SQE) acting as an Ecological Clerk of Works (ECoW) and will comprise the following general principles:

- the on-site vegetation is cut short during winter (when amphibians are hibernating) if possible. If not possible (*i.e.* works during active season), the vegetation will be cut in a phased approach, firstly cutting to 30 cm, then, following a period of no less than 24 hours, can be cut to 15 cm and then to ground level, after another 24 hours;
- the vegetation should then be kept short to displace any amphibians, which may be present, away from the works when they emerge in the early spring, and discourage amphibians from moving into the Site from the surrounding habitat;
- vegetation (including top soil) should be carefully removed using an excavator using a toothed bucket. These works should be supervised by an SQE if this is deemed appropriate to do so;
- any habitat features which may conceal sheltering amphibians (*e.g.* log piles, rubble mound bunds or any other debris etc. will be dismantled by hand under supervision of the SQE; and
- dismantling of any on-site rubble piles should be conducted during the amphibian active season (*i.e.* April to October) during warm weather conditions (*i.e.* above 5 °C) to avoid killing or injuring potential hibernating amphibians.

In the unlikely event that any Great Crested Newt is discovered during these works, then such works must cease immediately and a SQE must be consulted to determine how to proceed. If other amphibians are discovered during vegetation clearance it is proposed that these are translocated to suitable habitat nearby in suitable weather conditions.

9. References

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10. Appendices

Appendix A: HSI scores

Table A.1. HSI score for Lagoon 1

Index	Description	HSI Score
Pond Location	A (optimal)	1.00
Pond Approximate Area (m ²)	10500	-
Pond Permanence	Never dries	0.90
Water Quality	Good	1.00
Percentage Shade	20%	1.00
Waterfowl Presence	Minor	0.67
Fish Presence	Minor	0.33
Ponds within 1 km	1.27	0.70
Terrestrial Habitat Quality	Good	1.00
Percentage Macrophyte Cover	10%	0.40
	HSI Score	0.75

Table A.2. HSI score for Lagoon 2

Index	Description	HSI Score
Pond Location	A (optimal)	1.00
Pond Approximate Area (m ²)	10000	-
Pond Permanence	Never dries	0.90
Water Quality	Good	1.00
Percentage Shade	10%	1.00
Waterfowl Presence	Minor	0.67
Fish Presence	Minor	0.33
Ponds within 1 km	1.27	0.70
Terrestrial Habitat Quality	Good	1.00
Percentage Macrophyte Cover	30%	0.60
	HSI Score	0.78

Table A.3. HSI score for Lagoon 3

Index	Description	HSI Score
Pond Location	A (optimal)	1.00
Pond Approximate Area (m ²)	1200	0.92
Pond Permanence	Never dries	0.90
Water Quality	Moderate	0.67
Percentage Shade	10%	1.00

Waterfowl Presence	Minor	0.67
Fish Presence	Minor	0.33
Ponds within 1 km	1.27	0.70
Terrestrial Habitat Quality	Good	1.00
Percentage Macrophyte Cover	10%	0.40
	HSI Score	0.72

Table A.4. HSI score for Lagoon 4

Index	Description	HSI Score
Pond Location	A (optimal)	1.00
Pond Approximate Area (m ²)	14000	-
Pond Permanence	Never dries	0.90
Water Quality	Moderate	0.67
Percentage Shade	70%	0.90
Waterfowl Presence	Minor	0.67
Fish Presence	Major	0.01
Ponds within 1 km	1.91	0.80
Terrestrial Habitat Quality	Moderate	0.67
Percentage Macrophyte Cover	5%	0.35
	HSI Score	0.48

Table A.5. HSI score for Lagoon 5

Index	Description	HSI Score
Pond Location	A (optimal)	1.00
Pond Approximate Area (m ²)	4000	-
Pond Permanence	Never dries	0.90
Water Quality	Good	1.00
Percentage Shade	30%	1.00
Waterfowl Presence	Minor	0.67
Fish Presence	Minor	0.33
Ponds within 1 km	1.27	0.70
Terrestrial Habitat Quality	Good	1.00
Percentage Macrophyte Cover	10%	0.40
	HSI Score	0.75

Table A.6. HSI score for Lagoon 6

Index	Description	HSI Score
Pond Location	A (optimal)	1.00
Pond Approximate Area (m ²)	5000	-
Pond Permanence	Never dries	0.90
Water Quality	Good	1.00

Percentage Shade	40%	1.00
Waterfowl Presence	Minor	0.67
Fish Presence	Minor	0.33
Ponds within 1 km	0.64	0.55
Terrestrial Habitat Quality	Good	1.00
Percentage Macrophyte Cover	30%	0.60
	HSI Score	0.76