

# Riverside Energy Park

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## Great Crested Newt HSI and eDNA Survey 2019

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## Executive Summary

Peter Brett Associates, now part of Stantec (PBA), was commissioned to undertake great crested newt surveys in relation to the Riverside Energy Park (REP) project in Belvedere, London Borough of Bexley. The overall aim of the study was to confirm whether great crested newts are present within the Survey Area along the proposed Electrical Connection route within the Dartford Marshes area.

To establish whether great crested newts could be present within the Application Site, Habitat Suitability Index (HSI) surveys and Environmental DNA (eDNA) surveys were undertaken at a number of waterbodies on the 2nd and 3rd of May 2019.

The surveys confirmed the absence of great crested newts within all waterbodies present within the Survey Area.

# 1 Introduction

## 1.1 Overview

- 1.1.1 Peter Brett Associates (PBA), now part of Stantec, has been commissioned by Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory)) ('the Applicant') to undertake great crested newt Habitat Suitability Index (HSI) surveys and Environmental DNA (eDNA) surveys for the Riverside Energy Park (REP) project in Belvedere, London Borough of Bexley (from here on referred to as the Proposed Development). This information will establish whether great crested newts could be present within the Application Site to validate the assessment of ecological effects and confirm any required mitigation measures for the Proposed Development.
- 1.1.2 The aim of the surveys is to establish whether great crested newts could be present or absent within the Application Site. The Survey Area includes land within and adjacent to the Electrical Connection route along the A206 between Crayford Way and Joyce Green Lane (as shown on **Figure 1**).
- 1.1.3 A full description of REP can be found in **Chapter 3 Project and Site Description** of the **Environmental Statement (ES) (6.1, Rev 1)**, and in **Schedule 1** to the **Draft Development Consent Order (dDCO) (3.1, Rev 1)**.
- 1.1.4 A full description of habitats within the Survey Area can be found in **Chapter 11 Terrestrial Biodiversity** of the **ES (6.1, Rev 1)**.

## 1.2 Ecological Background

- 1.2.1 A suite of ecological surveys was undertaken during 2017 and 2018 to inform an Environmental Impact Assessment for the Proposed Development, the results of which are presented in **Chapter 3 Project and Site Description** of the **ES (6.1, Rev 1)**. Due to the evolution of the scheme design together with seasonal restrictions associated with ecological surveys, it was not possible to collect all ecological survey data for the Electrical Connection route.
- 1.2.2 As identified in **Paragraph 11.9.59** of **Chapter 11 Terrestrial Biodiversity** of the **ES (6.1, Rev 1)** the limitations in relation to ecological data were only in relation to the presence/absence of great crested newt survey data for the Dartford Marshes area where installation of the Electrical Connection route may affect terrestrial habitat which could support great crested newts if present.
- 1.2.3 This report presents the results of the further great crested newt surveys undertaken in May 2019 to address this limitation in survey data.

## 1.3 Report Objectives/Aims

- 1.3.1 The aim of this report is to:
- Provide details of the methods used for the study;

- Provide the results of the eDNA surveys and HSI assessments undertaken in May 2019; and
- Interpret the results of the survey in relation to the Proposed Development.

#### **1.4 Relevant Legislation**

- 1.4.1 Great crested newts and their habitats (aquatic and terrestrial) are afforded strict protection under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). Therefore, it is important to identify the presence or absence of great crested newts and to identify suitable habitat for this species on site in order that legal obligations regarding this species can be observed.
- 1.4.2 Great crested newt is a UK Species of Principal Importance, under Section 41 of the Natural Environmental and Rural Communities (NERC) Act 2006. Circular 06/2005, produced by The Office of the Deputy Prime Minister (ODPM) Circular 06/2005, states that habitats and species listed as priorities, with reference to the former UK Biodiversity Action Plan, are capable of being a material consideration in the making of planning decisions.
- 1.4.3 Further information regarding legislation is detailed within **Appendix C**.

## 2 Methods

### 2.1 Establishing the Survey Area

2.1.1 In order to establish if the land within and surrounding the Application Site could be used as terrestrial habitat for great crested newts, Ordnance Survey maps and aerial imagery have been used to initially identify the presence of waterbodies within 250 m of the Application Site in areas where the installation of the Electrical Connection route may affect road verge and adjacent habitats where great crested newts could be present. This species typically uses suitable terrestrial habitat up to 500 m from a breeding pond<sup>1</sup>, however there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond<sup>2</sup>. In this instance 250 m was used to define the Survey Area, although this was extended in some instances if ponds were present just outside this zone and terrestrial habitat links between the waterbody and the Application Site were present.

2.1.2 Where suitable terrestrial habitats were separated from the Application Site by features which would provide a barrier to the movement of great crested newts, such as major roads or rivers, these were excluded from the survey area.

### 2.2 Habitat Suitability Index Assessment (HSI)

2.2.1 The HSI for great crested newts was developed by Oldham *et al.* (2000)<sup>3</sup>. It is a scoring system of evaluating habitat quality and quantity using a numerical index, between 0 and 1. A score of 0 indicates unsuitable habitat, and 1 represents optimal habitat, as detailed below:

- <0.5                      Poor suitability
- 0.5 – 0.59              Below average suitability
- 0.6 – 0.69              Average suitability
- 0.7 – 0.79              Good suitability
- >0.8                      Excellent suitability

2.2.2 The HSI for great crested newts incorporates ten suitability indices, all of which are factors thought to affect great crested newts including:

- Geographic location;
- Waterbody area;

<sup>1</sup> Great Crested Newt Mitigation Guidelines (English Nature, 2001).

<sup>2</sup> Natural England. An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576) <http://publications.naturalengland.org.uk/publication/134002>.

<sup>3</sup> Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155.

- Waterbody permanence;
- Water quality;
- Shading;
- Presence of waterfowl;
- Presence of fish;
- Waterbody density in area;
- Terrestrial habitat quality; and
- Macrophyte cover in waterbody.

2.2.3 There is a positive correlation between HSI scores, and the numbers of great crested newts observed in waterbodies. In general, high HSI scores are likely to be associated with greater numbers of great crested newts. However, the relationship is not sufficiently strong to allow predictions to be made about the numbers of newts in any particular waterbody.

2.2.4 The HSI for great crested newts is a measure of habitat suitability. It is not a substitute for aquatic amphibian surveys. In general, waterbodies with high HSI scores are more likely to support great crested newts than those with low HSI scores. However, the system is not sufficiently precise to allow the conclusion that any particular waterbody with a high suitability score will support newts, or that any waterbody with a low suitability score will not do so.

### **2.3 Environmental (e) DNA Survey**

2.3.1 Following the HSI survey, waterbodies which were potentially suitable for great crested newt were subject to eDNA surveys. The method used to collect the eDNA followed the approved standard survey guidelines<sup>4</sup>. Upon collection the water samples were sent by courier to NatureMetrics for eDNA analysis.

2.3.2 The water samples were taken on the 2<sup>nd</sup> and 3<sup>rd</sup> May 2019; this period adheres to the eDNA survey guidelines.

### **2.4 Survey Limitations**

2.4.1 All survey visits were carried out under suitable weather conditions.

2.4.2 A number of land parcels within the Survey Area could not be accessed due to not receiving permission from landowners (as can be viewed on **Figure 1**). However, access was available to survey waterbodies within the majority of land parcels immediately adjacent to the Application Site, therefore it is considered

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<sup>4</sup> Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford. Document Date 30<sup>th</sup> September 2014.

that the level of survey provides reasonable confidence in the likely status of great crested newt within the Survey Area.

- 2.4.3 Access was declined at Joyce Green Quarry to the north of the A206, however the landowner provided results of their own great crested newt surveys undertaken at their site<sup>5</sup> (no great crested newts identified). The data provided is from surveys undertaken between 2000-2013, and whilst this data is historic, given the relative geographical isolation of this land parcel by the River Darent and the A206, it is considered unlikely that great crested newts would have colonised it in the intervening years. This is further supported by the absence of great crested newts in ponds surveyed in 2019 within the surrounding area.
- 2.4.4 No eDNA surveys were undertaken at waterbody 14 due to health and safety concerns. This waterbody is isolated from other waterbodies by the River Darent, the A206 and industrial areas which will prevent movement of great crested newts were they present. As this species typically lives in metapopulations across a number of waterbodies<sup>6</sup>, it is considered unlikely that an isolated population of great crested newts would be present in this waterbody. This is further supported by the absence of great crested newts in ponds surveyed in 2019 within the surrounding area.

## 2.5 Survey Personnel

- 2.5.1 The eDNA and HSI surveys were undertaken by Molly Dailide, Senior Ecologist, Graduate member of Chartered Institute of Ecology and Environmental Management (CIEEM), and Kelly Brown, Ecologist, GCIEEM.
- 2.5.2 Both Molly Dailide and Kelly Brown have 5 years' experience and hold great crested newt licences accordingly, Class 1 (2016-19915-CLS-CLS) and Class 1 (2018-34528-CLS-CLS).

## 2.6 Method and Report Qualification

- 2.6.1 All survey work and reporting was undertaken by experienced and qualified ecologists (see above), in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- 2.6.2 All ecological surveys have an expected validity period owing to the tendency of the natural environment to change over time. This validity period varies from receptor to receptor and is also dependent on the degree of change in a site's management and overall landscape ecology. Where the potential for change is considered to be relevant to the site, this is highlighted in the appropriate section.

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<sup>5</sup> ECOSA (2017) Joyce Green Quarry, Ecological Assessment.

<sup>6</sup> Citation: Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.



### 3 Results and Interpretation

3.1.1 Results of the HSI and eDNA survey are provided below. The Survey Area along with waterbodies surveyed can be viewed on **Figure 1**. Photographs of the waterbodies are shown in **Appendix B**.

3.1.2 Waterbodies 1 to 22 were subject to an HSI assessment to determine their suitability to support great crested newts. Where waterbodies were found to be unsuitable for great crested newts, either because they were dry or contained running water, these were scoped out of further survey. Results are presented in **Table 1** below.

Table 1: Summary Results of HSI and eDNA Assessment

Waterbody reference <sup>7</sup>	HSI Score	Waterbody Suitability	eDNA results (present/absent)
1	0.70	Good	Absent
2	0.84	Excellent	Absent
3	0.82	Excellent	Absent
4	0.78	Good	Absent
5	0.73	Good	Absent
6	0.64	Average	Absent
7	0.70	Good	Absent
8 (ditch 2)	0.79	Good	Absent
9 (ditch 1)	0.62	Average	Absent
10	-	Waterbody dry – scoped out of further survey	N/A
11	-	Waterbody dry – scoped out of further survey	N/A
12 (ditch 3)	0.78	Good	Absent
13	-	Too dry to sample – scoped out of further survey	N/A
14	0.72	Good – surveyed from distance due to presence of horses.	Not surveyed for H&S reasons
15	-	Running water – scoped out of further survey	N/A
16	-	Running water – scoped out of further survey	N/A
17	-	Running water – scoped out of further survey	N/A

<sup>7</sup> Reference given in brackets is that used in the NatureMetrics report in Appendix A.

Waterbody reference <sup>7</sup>	HSI Score	Waterbody Suitability	eDNA results (present/absent)
18	-	Waterbody dry – scoped out of further survey	N/A
19		Waterbody dry – scoped out of further survey	N/A
20	-	Waterbody dry – scoped out of further survey	N/A
21	-	Waterbody dry – scoped out of further survey	N/A
22	-	Waterbody dry – scoped out of further survey	N/A

3.1.3 The eDNA sampling results show great crested newts were absent from all waterbodies surveyed.

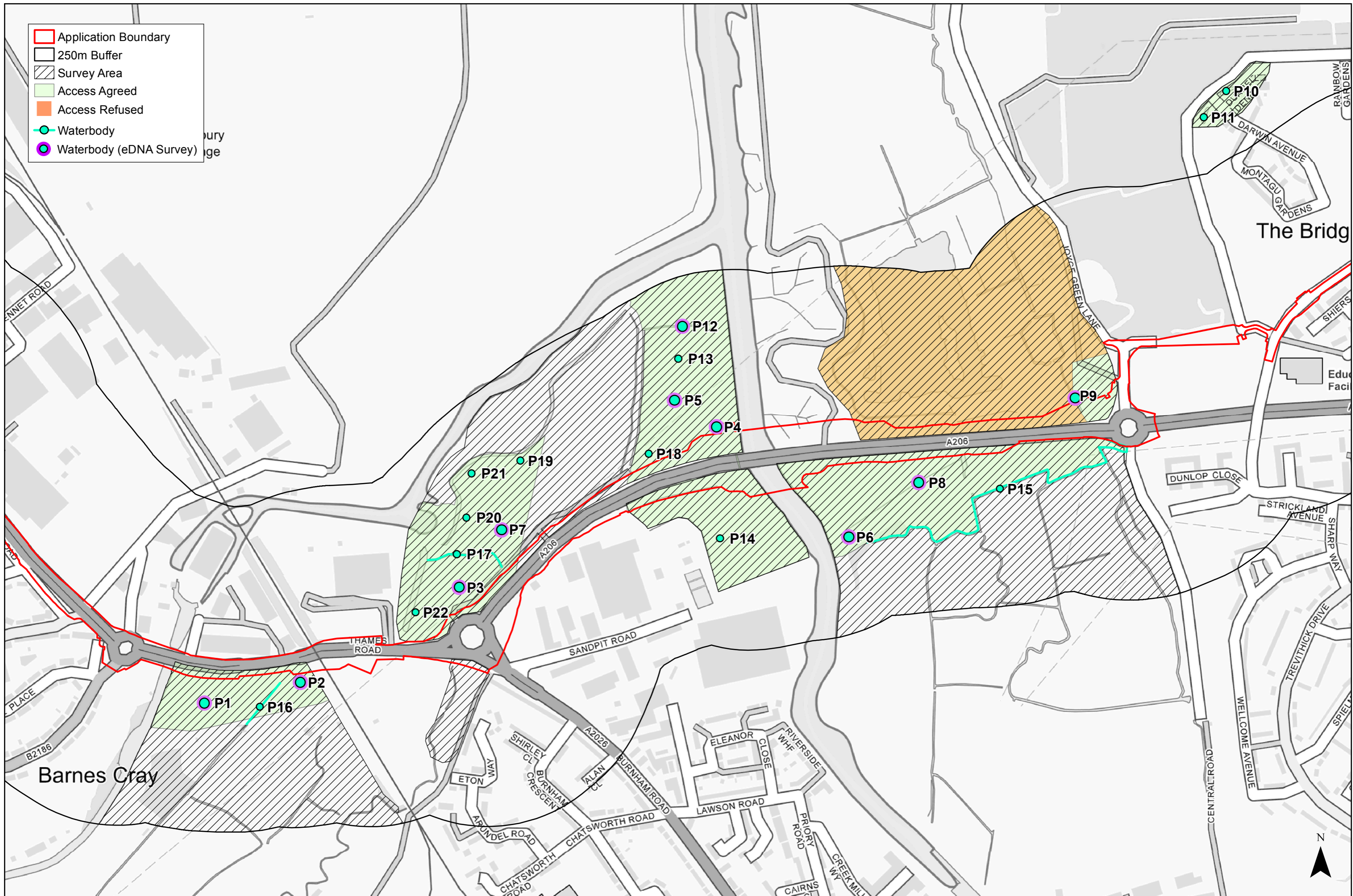
3.1.4 The Technical Report received from NatureMetrics is presented in **Appendix A**.

## 4 Discussion and Next Steps

- 4.1.1 The great crested newt surveys show great crested newts to be absent from all waterbodies surveyed for eDNA.
- 4.1.2 Waterbodies 10, 11, 13, 15, 16, 17, 18, 19, 20, 21 and 22 were unsuitable for great crested newts and it is considered that great crested newts are also likely to be absent from these waterbodies.
- 4.1.3 Due to access constraints and health and safety reasons it was not possible to undertake detailed survey at a number of land parcels and waterbodies within the Survey Area. However, it is considered that the current level of survey provides reasonable confidence in the likely status of great crested newt within the Survey Area.
- 4.1.4 Following detailed design of the Electrical Connection route where there will be further refinements around the alignment and areas of potential impact, all information on great crested newts will be reviewed by an ecologist to determine if further surveys or precautionary methods of working are required.

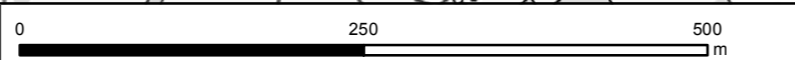
## 5 Figures

Figure 1: Waterbodies



- Application Boundary
- 250m Buffer
- Survey Area
- Access Agreed
- Access Refused
- Waterbody
- Waterbody (eDNA Survey)

RIVERSIDE ENERGY PARK



Contains Ordnance Survey data © Crown copyright and database right [2018]  
Based on Babco/EDF plan - RRRL Cable Route Landowners - 2-01-2010 - Drawing NO. Cable Route Plan



Client  
1:5,500 @ A3  
15/05/19  
Drawn: CM  
Checked: JS

Waterbodies

## **Appendix A NatureMetrics eDNA Report**

Report: 19159-RSE-RS-1

Order number: RSE-19001-RS

# Great Crested Newt eDNA Results

Company: RammSanderson Ecology Ltd  
Project code | Task code: Brexley REP - RSE\_2175 | GCN1  
Date of Report: 15 May 2019  
Number of samples: 10

Thank you for sending your samples for analysis by NatureMetrics. Your samples have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014).

DNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen Blood and Tissue extraction kits.

qPCR amplification was carried out in 12 replicates per sample, using the primers and probe described by Biggs et al. (2014), in the presence of both positive and negative controls.

Results indicate GCN absence in 'Ditch 1', 'Ditch 2', 'Ditch 3', 'P1', 'P2', 'P3', 'P4', 'P5', 'P6', and 'P7'. Inhibition was detected in 'Ditch 2', 'P2', 'P3', 'P4', 'P5', 'P6', and 'P7', which was overcome by diluting the DNA. All controls performed as expected and so the results are conclusive.

Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection.



Sample	Pond ID	Arrived	Inhibition	Degradation	Score	GCN status
69	'Ditch 1'	08-May	No	No	0	Negative
64	'Ditch 2'	08-May	No	No	0	Negative after dilution
72	'Ditch 3'	08-May	No	No	0	Negative
66	'P1'	08-May	No	No	0	Negative
65	'P2'	08-May	No	No	0	Negative after dilution
73	'P3'	08-May	No	No	0	Negative after dilution
70	'P4'	08-May	No	No	0	Negative after dilution
71	'P5'	08-May	No	No	0	Negative after dilution
68	'P6'	08-May	No	No	0	Negative after dilution
67	'P7'	08-May	No	No	0	Negative after dilution

End of report

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Report issued by: Dr. Cuong Tang

Contact: ct@naturemetrics.co.uk | 01491 829042






## Understanding your results



- Positive:** GCN DNA has been detected in this sample, meaning that at least one of the 12 replicates has amplified. Remember that this is not a quantitative test, so you should not interpret a high eDNA score (e.g. 12/12) as necessarily indicating a larger population of GCN than a low eDNA score (e.g. 1/12).
- Negative:** No GCN DNA has been detected in this sample, and the internal and external controls worked as expected. This tells us that if there had been GCN DNA in the sample, we would have detected it, so we can be confident in its absence from the sample provided. Samples marked as 'Negative after dilution' are those where inhibition was detected (when the marker added in the lab fails to amplify) but overcome by diluting the DNA. Inhibition can be caused by certain chemicals or organic compounds that may be present in the water sample.
- Inconclusive:** No GCN DNA was detected in the sample, but the internal controls failed to amplify as expected. This means that any GCN DNA in the sample might also have failed to amplify properly, so we cannot have confidence in this negative result. Inconclusive results can be caused by degradation of the DNA (when the DNA marker contained in the ethanol in the kits fails to amplify) or by inhibition of the reaction (when the marker added in the lab fails to amplify) caused by certain chemicals or organic compounds that may be present in the water sample.




## Appendix B Photographs




Waterbody No.	
1	
2	

Waterbody No.	
3	

Waterbody No.	
4	
5	



Waterbody No.	
6	 The image contains two photographs stacked vertically. The top photograph shows a dense thicket of tall, thin, brownish-yellow grasses or reeds. In the foreground, there is a patch of shorter, green grass. The bottom photograph shows a similar area of tall grasses, but with a small, shallow pool of water visible in the lower-left quadrant. The water appears slightly murky and is surrounded by mud and debris.




Waterbody No.	
7	 <p>The top photograph shows a field of tall, green and brown grasses. In the background, a water tower and some buildings are visible under a cloudy sky. The bottom photograph shows a similar field of tall grasses, with a single tall stalk of grass standing out in the center. The background shows a line of trees and a cloudy sky.</p>
8	 <p>The top photograph shows a wetland area with tall, green grasses and a small body of water. In the background, there are trees and a cloudy sky. The bottom photograph shows a field of tall, brown and green grasses, with a small body of water visible in the distance. The background shows a line of trees and a cloudy sky.</p>

Waterbody No.	
9	
10	<p data-bbox="954 705 1154 737">Dry Waterbody</p> 
11	<p data-bbox="954 1131 1154 1163">Dry Waterbody</p> 


Waterbody No.	
12	 <p data-bbox="857 953 1247 989">Waterbody too dry to sample</p> 
13	



Waterbody No.	
14	 <p>The first photograph shows a group of horses, including a black and white pinto, standing in a grassy field next to a metal fence. The second photograph is a wide landscape shot of a green field with some trees in the foreground and buildings in the distance under a blue sky with white clouds. The third photograph shows a similar landscape view from a slightly different perspective, also featuring a green field and buildings in the background under a cloudy sky.</p>
15	<p>Running water – scoped out of survey</p>  <p>The photograph shows a narrow stream with dark water flowing through a dense thicket of green trees and bushes. The water appears to be moving over rocks or a similar natural structure.</p>
16	<p>Running water - scoped out of survey</p>

Waterbody No.	
17	<p data-bbox="802 296 1305 327">Running water – scoped out of survey</p>  A narrow stream flows through a field of tall, green and yellowish grasses. The water is dark and reflects the sky. The stream is bordered by dense vegetation on both sides.
18	<p data-bbox="954 905 1149 936">Waterbody dry</p>  A wide, flat area covered in dry, brown grasses. In the background, there is a line of green trees under a blue sky with scattered white clouds.
19	<p data-bbox="954 1346 1149 1377">Waterbody dry</p>  A wide, flat area covered in dry, brown grasses. In the background, there is a fence and a line of trees under a clear sky.
20	<p data-bbox="954 1829 1149 1860">Waterbody dry</p>

Waterbody No.	
	
21	<p data-bbox="954 1150 1154 1184">Waterbody dry</p> 

Waterbody No.	Waterbody No.
22	<p data-bbox="954 296 1154 327">Waterbody dry</p> 

## Appendix C Relevant Legislation

### C.1 Introduction

C.1.1 This section summarises the relevant national and local planning policies and legislation pertaining to habitats and species mentioned within this report.

### C.2 National Legislation

#### **Wildlife and Countryside Act 1981 (as amended)**

C.2.1 The protection for European Protected Species (EPS), such as great crested newts, is supplemented by the Wildlife and Countryside Act (1981). It is an offence to:

- Intentionally or recklessly disturb an EPS while it is occupying a structure or place of shelter or protection.
- Intentionally or recklessly obstruct access to a structure or place used by an EPS for protection or shelter.

#### **The Natural Environment and Rural Communities Act 2006**

C.2.2 Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 placed a duty on the Secretary of State to publish, review and revise lists of living organisms in England that are of principal importance for the purpose of conserving biodiversity. Great crested newts are on this list.

C.2.3 The NERC Act also required the Secretary of State to take, and promote the taking of, steps to further the conservation of the listed organisms. Decision-makers such as public bodies, including local and regional authorities, have a duty under the related section 40 of the NERC Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions and therefore should be mindful of potentially significant effects of development on these species when considering planning applications.