



# **Five Fords AAD**

Great Crested Newt - Method Statement

15 February 2017

Mott MacDonald Bentley  
Ty Awen  
Spooner Close  
Celtic Springs Business  
Park  
Coedkernew  
Newport NP10 8FZ  
United Kingdom

[www.mottmacbentley.co.uk](http://www.mottmacbentley.co.uk)

# Five Fords AAD

## Great Crested Newt - Method Statement

15 February 2017

# Issue and Revision Record

| Revision | Date          | Originator | Checker | Approver   | Description  |
|----------|---------------|------------|---------|------------|--------------|
| P01      | January 2017  | J Brown    | J Bates | C Williams | First Issue  |
| P02      | February 2017 | C Houlker  | J Bates | C Williams | Second Issue |
|          |               |            |         |            |              |
|          |               |            |         |            |              |
|          |               |            |         |            |              |
|          |               |            |         |            |              |

**Document reference:** DCWW-4791-S-201-MMB-06-XX-RP-NX-19150

**Information class:** Standard

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## Template Method Statement to be used within a Great Crested Newt Development Licence Application

This template Method Statement is to be used to form part of your Licence Application for a European Protected Species Development Licence. It will be used to determine the impact of the application on the favourable conservation status of the species concerned (Regulation 53(9) (b) of the Conservation of Habitats and Species Regulations 2010). It must be prepared by a consultant ecologist or other suitably qualified person. You are strongly advised to refer to the Great Crested Newt Mitigation Guidelines<sup>1</sup>. Please submit your Application and supporting Method Statement electronically to the contact details provided below.

### **Contact Details**

**Natural Resources Wales  
Species Permitting Team  
Maes Y Ffynnon  
Penrhosgarnedd  
Bangor  
LL57 2DW**

03000 654974 / 03000 654921

[specieslicence@naturalresourceswales.gov.uk](mailto:specieslicence@naturalresourceswales.gov.uk)

[trwyddedrhywogaeth@cyfoethnaturiolcymru.gov.uk](mailto:trwyddedrhywogaeth@cyfoethnaturiolcymru.gov.uk)

|                                         |                                                                                                                |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>Method Statement Title:</b>          | Five Fords AAD                                                                                                 |
| <b>Method Statement Version Number:</b> | A                                                                                                              |
| <b>Method Statement Issue Date:</b>     | 20/01/2017                                                                                                     |
| <b>Site Address:</b>                    | Dŵr Cymru Welsh Water<br>Five Fords Wastewater Treatment Works<br>Cefn Road<br>Abenbury<br>WREXHAM<br>LL13 0PA |

<sup>1</sup> Great Crested Newt Mitigation Guidelines (NEWT1) available from Natural England website

## A Executive summary

Dŵr Cymru Welsh Water Limited (DCWW) is proposing to construct an Advanced Anaerobic Digestion plant (AAD) at the existing Five Fords Wastewater Treatment Works (WwTW), near Wrexham. The site of the proposed AAD plant is located within the administrative boundaries of Wrexham County Borough Council (WCBC).

The proposed works have been submitted for planning permission (reference: P/2016/0709). As part of the planning response, NRW (CAS-21696-L5H7) and WCBC (Case No. P/2016/0709) have requested that a Habitats Directive development licence be applied for the proposed works. The proposed works are located on an area of hardstanding (compacted stone) and bare ground area that was previously used as a compound area for the Solar Array development, the gas to grid scheme and the Five Fords Sludge Treatment & Sustainable Energy project.

The licencing actions required for the proposed works include the potential disturbance of great crested newts from direct impacts if they are found to be present within the area of the constructions works during the active season.

Monitoring the GCN populations within the created breeding ponds will be undertaken over a 10-year period as requested by NRW. Monitoring is to be reviewed after 5 years to consider how or if monitoring should be amended to reflect the success of the mitigation at that time. Population surveys are to be undertaken to establish the likely success of the mitigation and provide population counts for the created ponds. Surveys will be undertaken by licenced and accredited or capable GCN ecologists.

## B Introduction

### B.1 Background to activity/development

Dŵr Cymru Welsh Water Limited (DCWW) is proposing to construct an Advanced Anaerobic Digestion plant (AAD) at the existing Five Fords Wastewater Treatment Works (WwTW), near Wrexham. The site of the proposed AAD plant is located within the administrative boundaries of Wrexham County Borough Council (WCBC).

The proposed AAD plant will supplement the operation of the existing digesters and will treat sewage sludge arising from the wastewater treatment process, to produce methane gas. This gas will be fed into the national gas supply grid via the existing “gas-to-grid” facility already operating at the WwTW site. The proposed AAD plant will accept sewage sludge arising from both Five Fords WwTW and from other WwTW in order to provide sufficient feedstock for the plant’s economic operation.

The proposed AAD plant comprises a number of new tanks and buildings, together with the demolition of and modifications to some existing items of plant. The process solution for this project is centred around a Thermal Hydrolysis Plant (THP). Ancillary processes of the solution include sludge cake imports, mechanical sludge dewatering, sludge screening, sludge tank storage and mixing, sludge/cake transfer stations, centrifugal pump stations, steam generation, final effluent treatment and distribution and potable water distribution.

Five Fords WwTW is located, centred on Ordnance Survey Grid Reference SJ 3645 4811. The WwTW is situated in a predominantly rural area with the surrounding areas consisting of agricultural land, within the village and (ancient) parish of Marchwiell, approximately two kilometres to the south west of Wrexham. The WwTW is immediately bordered by areas of woodland, arable and pastoral fields and their associated hedgerows. The River Clywedog is on the northern boundary of the WwTW and the town of Marchwiell is located just south of the WwTW.

### B.2 Full details of proposed works on site that are to be covered by the licence

The proposed works have been submitted for planning permission (reference: P/2016/0709). As part of the planning response, NRW (CAS-21696-L5H7) and WCBC (Case No. P/2016/0709) have requested that a Habitats Directive development licence be applied for the proposed works. The proposed works are located on an area of hardstanding (compacted stone) and bare ground area that was previously used as a compound area for the Solar Array development, the gas to grid scheme and the Five Fords Sludge Treatment & Sustainable Energy project.

Historically the area was used for growing arable crops.

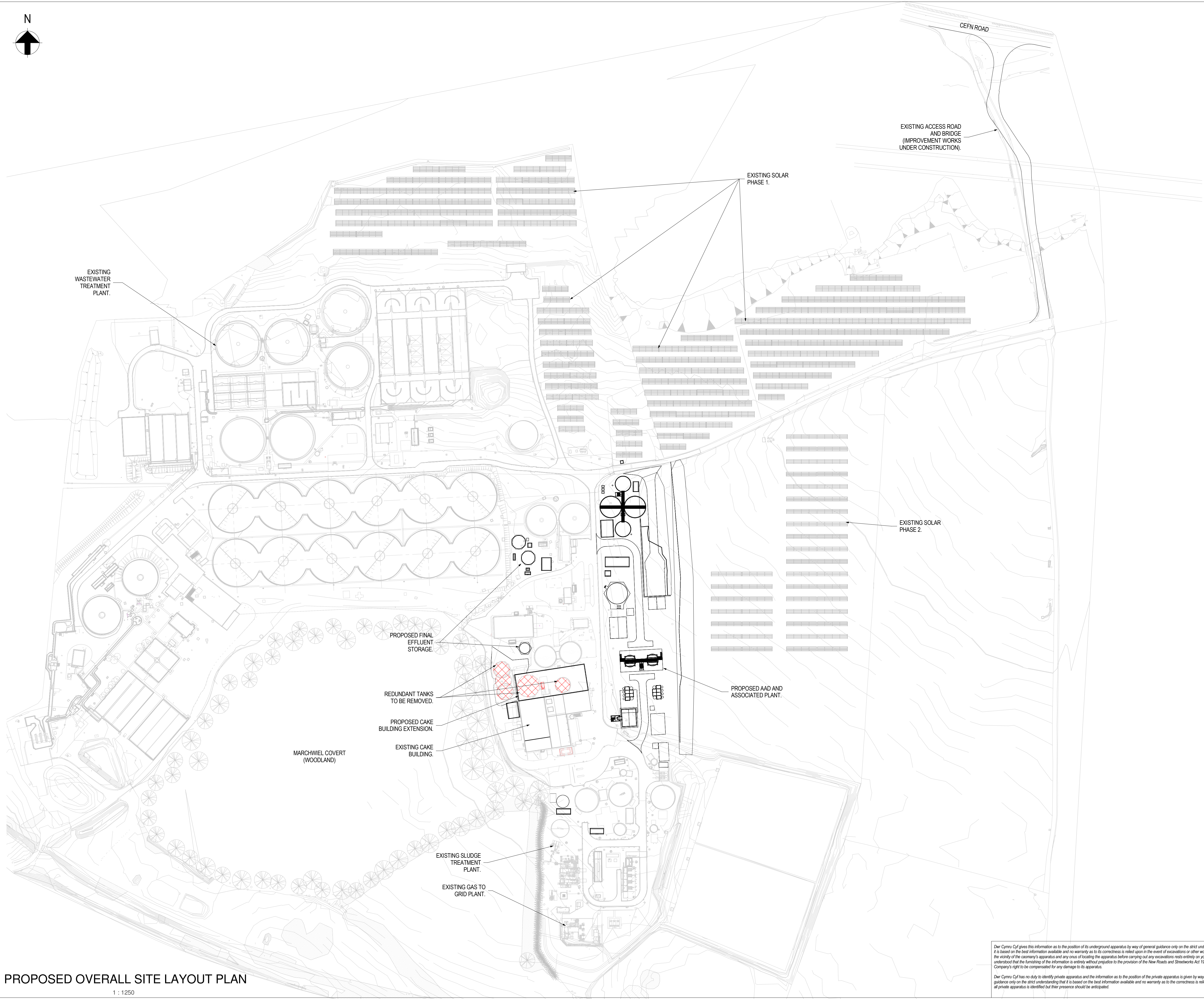
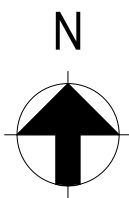
The proposed AAD plant comprises a number of new tanks and buildings, together with the demolition of and modifications to some existing items of plant. The process solution for this project is centred around a Thermal Hydrolysis Plant (THP). Ancillary processes of the solution include sludge cake imports, mechanical sludge dewatering, sludge screening, sludge tank storage and mixing, sludge/cake transfer stations, centrifugal pump stations, steam generation, final effluent treatment and distribution and potable water distribution.

The proposed works and timescale are shown below.

| <b>Construction Program</b>         |                   |                  |
|-------------------------------------|-------------------|------------------|
|                                     | <b>Start date</b> | <b>End Date</b>  |
| <b>Newt fence installation</b>      | April-2017        | April -2017      |
| <b>Construction Main Works</b>      | April -2017       | 19-November-2019 |
| <b>Commissioning &amp; Handover</b> | 01-February-2017  | 21-April-2020    |
| <b>Operate</b>                      | 22-April -2020    |                  |

## **B.2 Proposed works**

Please find overleaf a scaled drawing (Drawing Number 4791-S-201-MMB0XX-DR-XX-1901) of the proposed overall site layout plan.



PROPOSED OVERALL SITE LAYOUT PLAN

1 : 1250

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN MAOD, UNLESS NOTED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING.
3. ONLY SIGNIFICANT PIPES, METALWORK AND SERVICES ARE SHOWN. THE REMAINDER HAVE BEEN OMITTED FOR CLARITY.
4. NEW TANKS AND KIOSKS TO BE HOLLY GREEN CODE 14-C-39 TO BS4800 UNLESS STATED OTHERWISE.
5. ALL EXTERNAL STEELWORK TO BE HOT DIPPED GALVANISED.
6. POSITION OF SOLAR INFRASTRUCTURE BASED ON LATEST INFORMATION PROVIDED BY DCWW.

KEY:

- EXISTING FEATURES.
- PROPOSED DEVELOPMENTS AS PART OF ADVANCED ANAEROBIC DIGESTION (AAD) PROJECT.
- EXISTING FEATURE TO BE DEMOLISHED.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

CONSTRUCTION:

TBC DURING DESIGN

MAINTENANCE / CLEANING / OPERATION:

TBC DURING DESIGN

DECOMMISSIONING / DEMOLITION:

TBC DURING DESIGN

REFERENCE DRAWINGS:

4791-S-201-MMB-06-XX-VS-XX-19100 EXISTING OVERALL SITE LAYOUT PLAN.  
4791-S-201-MMB-06-XX-VS-XX-19101 PROPOSED OVERALL SITE LAYOUT PLAN.  
4791-S-201-MMB-06-XX-VS-XX-19102 EXISTING ELEVATIONS.  
4791-S-201-MMB-06-XX-VS-XX-19103 PROPOSED ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19106 EXISTING AAD AREA SITE LAYOUT.  
4791-S-201-MMB-06-XX-DR-XX-19107 PROPOSED AAD AREA SITE LAYOUT PLAN.  
4791-S-201-MMB-06-XX-DR-XX-19109 PROPOSED CAKE BUILDING EXTENSION ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19110 PROPOSED CAKE BUILDING EXTENSION ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19111 PROPOSED CAKE BUILDING EXTENSION ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19115 PROPOSED LTP PLAN.  
4791-S-201-MMB-06-XX-DR-XX-19116 PROPOSED LTP ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19117 PROPOSED LTP ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19118 PROPOSED PRE-THP CENTRIFUGE BUFFER TANK PLAN.  
4791-S-201-MMB-06-XX-DR-XX-19119 PROPOSED PRE-THP CENTRIFUGE BUFFER TANK ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19120 PROPOSED THP FEED SILOS PLAN.  
4791-S-201-MMB-06-XX-DR-XX-19121 PROPOSED THP FEED SILOS ELEVATIONS.  
4791-S-201-MMB-06-XX-DR-XX-19123 PLANNING APPLICATION BOUNDARY.  
4791-S-201-MMB-06-XX-DR-XX-19124 SECURITY FENCING CLASS 2.  
4791-S-201-MMB-06-XX-DR-XX-19125 SITE LOCATION PLAN.  
4791-S-201-MMB-06-XX-DR-XX-19126 SITE COMPOUND LAYOUT.  
4791-S-201-MMB-06-XX-DR-XX-19127 PROPOSED LANDSCAPING PLAN.

|      |          |       |                                   |       |        |          |
|------|----------|-------|-----------------------------------|-------|--------|----------|
| P02  | 07.07.16 | AB    | AMENDED TO SUIT COMMENTS RECEIVED | CB    | DB     | 07.07.16 |
| P01  | 03.06.16 | AB    | PLANNING APPLICATION ISSUE        | CB    | DB     | 03.06.16 |
| Rev. | Date     | Drawn | Description                       | Chkd. | Appld. | Date     |



Project Name: FIVE FORDS WwTW AAD SCHEME

Drawing Title: PROPOSED OVERALL SITE LAYOUT PLAN

|              |                   |
|--------------|-------------------|
| Suitability. | Suitability Code. |
| INFORMATION  | S2                |

|                          |                                  |           |                   |       |          |
|--------------------------|----------------------------------|-----------|-------------------|-------|----------|
| Originator.              | AB                               | Designer. | CB                | Date. | 05.02.16 |
| Internal Project Number. | 329011NN26                       | Scale.    | As indicated @ A1 | Rev.  | P02      |
| Drawing Number.          | 4791-S-201-MMB-06-XX-DR-XX-19101 |           |                   |       |          |

Dwr Cymru Cyf gives this information as to the position of its underground apparatus by way of general guidance only on the shnd understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. It must be understood that the furnishing of the information is entirely without prejudice to the provision of the New Roads and Streetworks Act 1991 and of the Company's right to be compensated for any damage to its apparatus.

Dwr Cymru Cyf has no duty to identify private apparatus and the information as to the position of the private apparatus is given by way of general guidance only on the strict understanding that it is based on the best information available and no warranty as to the correctness is relied upon. Not all private apparatus is identified but their presence should be anticipated.

### **B.3 Actions requiring licensing**

The licencing actions required for the proposed works include the potential disturbance of great crested newts from direct impacts if they are found to be present within the compacted stone during the active season and indirect impacts such as noise, light or vibration as part of the proposed works.

## C Survey and Site Assessment

### C.1 Existing information on great crested newts at the survey site

A desk based study was undertaken to highlight existing data within 2km of the site. Records have been limited to those collected within the last ten years to regulate the validity of the data being reviewed. Information was gathered from COFNOD North Wales Environmental Information Service (<http://www.cofnod.org.uk>), received 9<sup>th</sup> January 2015.

**Table C.1.1: Existing records from desk based study**

| Scientific Name    | English Name       | Grid Reference   | Site Name                                        | Year | Abundance                |
|--------------------|--------------------|------------------|--------------------------------------------------|------|--------------------------|
| Triturus cristatus | Great Crested Newt | SJ360478         | Wrexham; Marchwiell Marsh Nature Reserve         | 2005 | +                        |
| Triturus cristatus | Great Crested Newt | SJ360478         | Wrexham; Marchwiell Marsh Nature Reserve         | 2005 | 2 Male; 4 Female         |
| Triturus cristatus | Great Crested Newt | SJ36010478<br>55 | Marchweil Nature Reserve                         | 2005 | 19 L, 1JF                |
| Triturus cristatus | Great Crested Newt | SJ366489         | Little Llwyn Onn                                 | 2007 | 3 Male, 2 Female, (2001) |
| Triturus cristatus | Great Crested Newt | SJ37166474<br>48 | The Hollies                                      | 2007 |                          |
| Triturus cristatus | Great Crested Newt | SJ37574477<br>23 | Maelor Abbatoir                                  | 2007 |                          |
| Triturus cristatus | Great Crested Newt | SJ373475         | Agricultural field west of Bedwell Road, Wrexham | 2011 | Adult male               |
| Triturus cristatus | Great Crested Newt | SJ373475         | Agricultural field west of Bedwell Road, Wrexham | 2011 | Juvenile                 |
| Triturus cristatus | Great Crested Newt | SJ373475         | Agricultural field west of Bedwell Road, Wrexham | 2011 | Adult female             |
| Triturus cristatus | Great Crested Newt | SJ373475         | Agricultural field west of Bedwell Road, Wrexham | 2011 | Adult male               |
| Triturus cristatus | Great Crested Newt | SJ357464         | Pond at Pool House                               | 2011 | 1 larva                  |
| Triturus cristatus | Great Crested Newt | SJ381488         | Firestones, wrexham Industrial Estate            | 2012 | 3 Adult                  |

Source: COFNOD

Table C.1.2 below outlines the details of confirmed great crested surveys records undertaken on site between 05/05/2015 - 19/06/2015 by MML.

**Table C.1.2 Summary of results of great crested newt surveys on site**

| Water Body Reference | Water Body Type | Summary of survey findings                                            | Limitations of surveys                                                              |
|----------------------|-----------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| P2                   | Pond            | GCN eggs                                                              | Only two survey techniques undertaken – 4 surveys instead of 6 were undertaken.     |
| P3                   | Pond            | GCN eggs<br>2 smooth newts<br>1 common newt                           | Only two survey techniques undertaken – 4 surveys instead of 6 were undertaken.     |
| P4b                  | Pond            | 13 GCN<br>2 palmate newts<br>1 smooth newt<br>1 common newt.          | N/A                                                                                 |
| C1                   | Pond            | 2 GCN<br>4 smooth newts<br>1 palmate newt                             | 4 surveys completed; pond dried out and further surveys were not possible.          |
| C2                   | Pond            | 14 GCN<br>4 palmate newt<br>5 smooth newt<br>2 common newt            | N/A                                                                                 |
| C5                   | Pond            | 1 GCN<br>2 smooth newts<br>8 common newts<br>Tadpoles present in pond | 4 surveys completed: Pond dried out and therefore bottle trapping was not possible. |
| C6                   | Pond            | 21 GCN<br>40 common newts<br>35 smooth newts<br>3 palmate newts       | N/A                                                                                 |
| Puddle               | Puddle          | 4 GCN.                                                                | Was not subject to a survey regime.                                                 |

## C.2 Statutory sites notified for the species (SSSIs or SACs) within 10km

**Table C.2: Designated sites for GCN located within 10 km of the site.**

| Name                 | Status                                      | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Distance |
|----------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Johnstown Newt Sites | Special Areas of Conservation (SAC)         | This site lies near to Wrexham in north-east Wales and is composed of two post-industrial sites where coal and clay have been extracted. The population of GCN is one of the largest known in Great Britain and has been the focus of much conservation management over the last few years. Breeding sites are provided in part by a mining subsidence pool, and natural water-filled hollows on clay, whilst other ponds have been created as part of nature conservation management. Terrestrial habitat varies from marshy grassland, grazed farmland and swamp through to scrub and broad-leaved woodland. Good populations of the widespread amphibian species are also present.                                                  | 5 km W   |
| Stryt Las A'r Hafod  | Sites of Special Scientific Interest (SSSI) | Stryt Las a Hafod is a composite site located close to the village of Johnstown, south west of Wrexham. The majority of the water bodies originated following the cessation of mineral extractive industries including coal mining and quarrying for clay and associated industrial developments. Certain ponds, particularly at Hafod, were specifically created for amphibian conservation purposes. The water bodies at Stryt Las and Hafod support one of the largest known breeding populations of GCN in Great Britain. Surrounding areas of land support a mosaic of scrub and planted trees, grassland, and tall ruderal vegetation. These form important foraging and over wintering areas for adult and juvenile amphibians. | 5 km W   |

Source: MAGIC and CCW

### C.3 Objectives of the survey

The objectives of the 2015 surveys and of the GCN report was to:

- Determine presence of GCN within 500m of the works footprint;
- Identify any GCN suitable ponds within the development footprint and assess if these ponds will be impacted by the proposed works;
- Assess the population of GCN in the local area;
- Identify key habitat features and corridors present within the site; and
- Develop appropriate site-specific recommendations and mitigation.

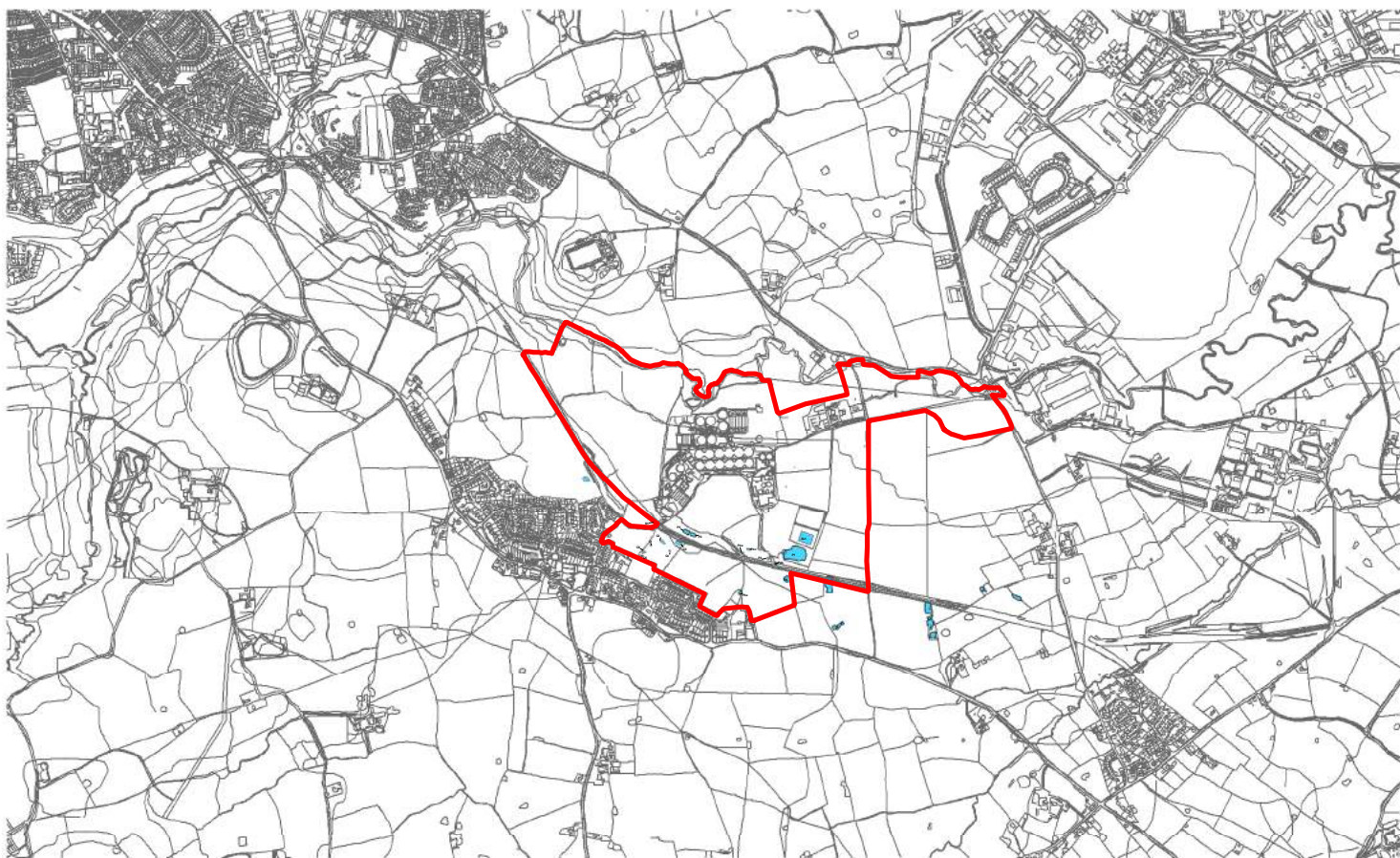
### C.4 Scaled plan/map of survey area



See Annexes J for map C.4 showing scaled plan on the survey area.

### C.5 Site/habitat description

Some areas within the boundary surveyed provided suitable habitat for GCNs. These include several ponds within 500 m of the proposed works, within the marshy grassland, under the hedgerows, within the broadleaved woodland and within the areas of tall ruderal, and dense scrub. The hedgerows provide suitable connective habitat for commuting between ponds.



A3

 Site extent

 G1 - Standing water

|      |            |        |                 |       |       |            |
|------|------------|--------|-----------------|-------|-------|------------|
| P1   | 26/01/2017 | GW     | For information | TC    | ECP   | 26/01/2017 |
| Rev. | Date.      | Drawn. | Description.    | Chkd. | Appd. | Date.      |



|               |                                        |
|---------------|----------------------------------------|
| Project Name. | Five Fords Enhanced Digestion Facility |
|---------------|----------------------------------------|

Drawing  
Title.

Great Crested Newt Survey - Pond Scoping

|              |                   |
|--------------|-------------------|
| Suitability. | Suitability Code. |
| Preliminary  | PRE               |

|                  |                |                     |
|------------------|----------------|---------------------|
| Originator<br>GW | Designer<br>PB | Date.<br>26/01/2017 |
|------------------|----------------|---------------------|

|                                       |                   |            |
|---------------------------------------|-------------------|------------|
| Internal Project Number<br>366660NN26 | Scale<br>1:25,000 | Rev.<br>P1 |
|---------------------------------------|-------------------|------------|

Drawing Number. DCWW-4791-S-20-MMB-00-XX-DR-N-19154

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## C.6 Field survey(s)

Survey work was undertaken by the following suitably qualified ecologists Joanne Bates (55598:OTH:SA:2014), Gareth Starr (69538:OTH:SA:2016) and accredited licence holders Polly Bointon and Charlotte Houlker (WML-CL09/ 2014-878-CLS-CLS).

### Equipment used:

Torching: Surveys used a 100,000-candlepower torch.

Sweep netting: a long-handled dip net.

Following tables detail species, gender and abundance of newts found in each pond. Tables C.6.1 & C.6.2 also include survey method, timings (PM/AM) and weather conditions.

**Table C.6.1: Survey Methodology**

| Water body reference | Bottle Trapping | Torchlight survey | Sweep netting | Egg Search | Departure from best practice                                               |
|----------------------|-----------------|-------------------|---------------|------------|----------------------------------------------------------------------------|
| P4b                  | Yes             | Yes               | No            | No         | No vegetation to egg search                                                |
| C1                   | Yes             | Yes               | No            | Yes        | -                                                                          |
| C2                   | Yes             | Yes               | No            | Yes        | -                                                                          |
| C3                   | No              | Yes               | No            | Yes        | Too shallow to bottle trap or net and currently unsuitable for GCN         |
| C4                   | No              | Yes               | No            | No         | Too shallow to undertake any survey technique other than torchlight survey |
| C5                   | No              | Yes               | Yes           | Yes        | Frog and tadpoles present                                                  |
| C6                   | Yes             | Yes               | No            | Yes        | Egg search undertaken, but very shallow                                    |
| SL1                  | No              | No                | Yes           | Yes        | No night-time access                                                       |
| P1                   | No              | No                | Yes           | Yes        | No night-time access                                                       |
| P4                   | No              | No                | Yes           | Yes        | No night-time access, Very shallow                                         |
| PN                   | No              | No                | Yes           | Yes        | No night-time access                                                       |
| P4A                  | No              | No                | Yes           | Yes        | No night-time access. Very shallow.                                        |
| P2                   | No              | No                | Yes           | Yes        | No night-time access                                                       |
| P3                   | No              | No                | Yes           | Yes        | No night-time access                                                       |
| P4C                  | No              | No                | No            | No         | Unsuitable (newly created)                                                 |
| P5                   | No              | No                | No            | No         | No access.                                                                 |
| P6                   | No              | No                | No            | No         | No access.                                                                 |
| P6A                  | No              | No                | No            | No         | No access.                                                                 |

**Table C.6.2: Survey Visits and Weather Summary**

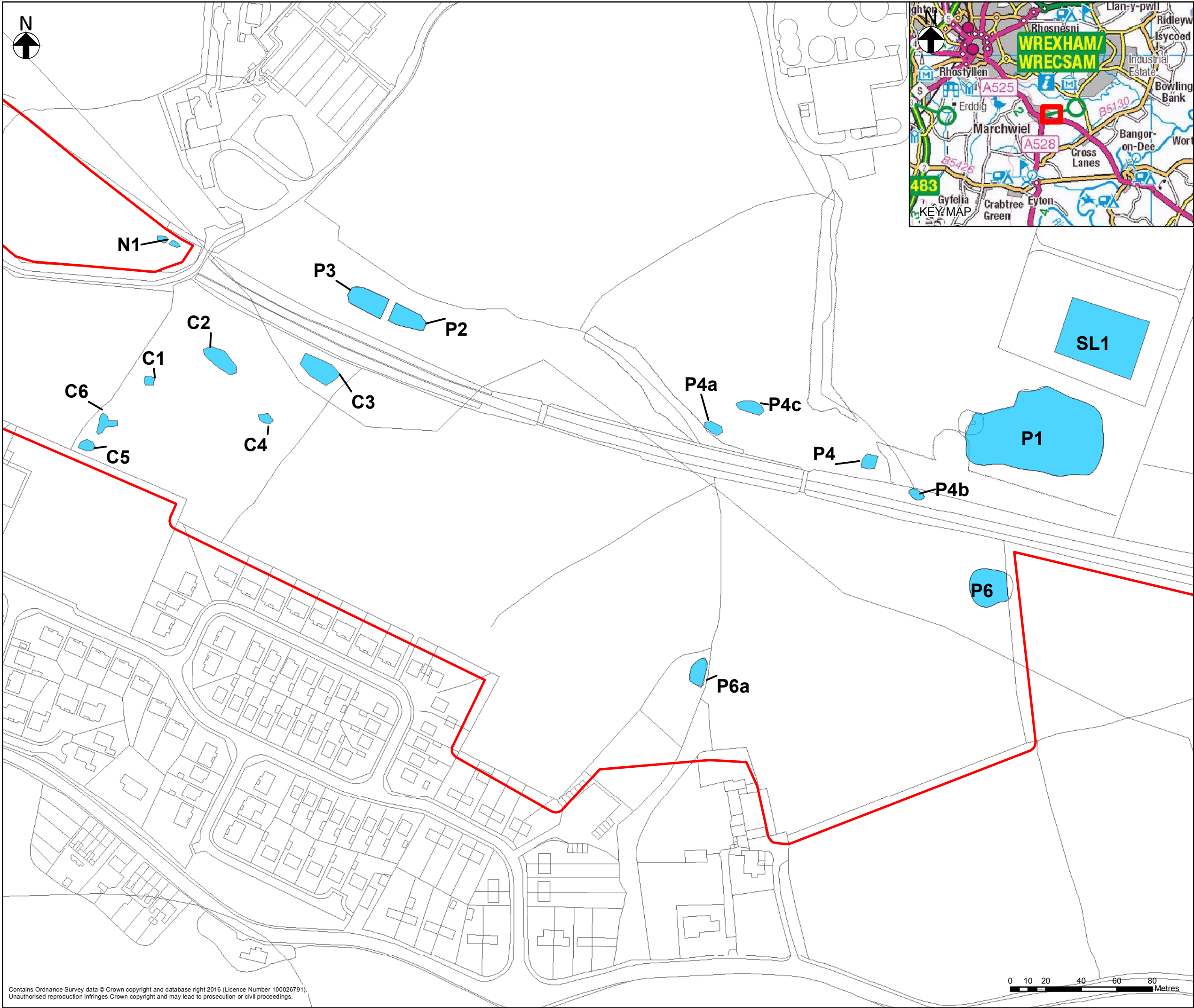
| Survey No. | Date       | Weather                                                            |
|------------|------------|--------------------------------------------------------------------|
| 1          | 05/05/2015 | PM 9°C dry, 5% cloud, light wind. AM 8°C light showers, light wind |
| 2          | 11/05/2015 | PM 15°C dry, sunny and windy. AM clear, 40% cloud, light wind      |
| 3          | 21/05/2015 | PM 13°C dry, light wind. AM 11°C, light wind                       |
| 4          | 28/05/2015 | PM 13°C dry, light wind. AM 11°C, light wind                       |
| 5          | 02/06/2015 | PM 11°C patchy rain showers. AM 10°C, dry.                         |
| 6          | 19/06/2015 | PM 11°C patchy rain showers. AM 10°C, dry.                         |

## C.7 Survey Results

**Table C.7.1: Survey Results**

| Water Body Reference | Water Body Type | Summary of survey findings                                            | Limitations of surveys                                                              |
|----------------------|-----------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| P2                   | Pond            | GCN eggs                                                              | Only two survey techniques undertaken – 4 surveys instead of 6 were undertaken.     |
| P3                   | Pond            | GCN eggs<br>2 smooth newts<br>1 common newt                           | Only two survey techniques undertaken – 4 surveys instead of 6 were undertaken.     |
| P4B                  | Pond            | 13 GCN<br>2 palmate newts<br>1 smooth newt<br>1 common newt.          | N/A                                                                                 |
| C1                   | Pond            | 2 GCN<br>4 smooth newts<br>1 palmate newt                             | 4 surveys completed; pond dried out and further surveys were not possible.          |
| C2                   | Pond            | 14 GCN<br>4 palmate newt<br>5 smooth newt<br>2 common newt            | N/A                                                                                 |
| C5                   | Pond            | 1 GCN<br>2 smooth newts<br>8 common newts<br>Tadpoles present in pond | 4 surveys completed: Pond dried out and therefore bottle trapping was not possible. |
| C6                   | Pond            | 21 GCN<br>40 common newts<br>35 smooth newts<br>3 palmate newts       | N/A                                                                                 |
| N1                   | Puddle          | 4 GCN.                                                                | Was not subject to a survey regime.                                                 |
| C3                   | Pond            | No newts found                                                        | 4 surveys completed:<br>Pond dried out and surveys were not possible.               |
| SL1                  | Pond            | No GCN eggs found.<br>eDNA results negative.                          | 2 survey techniques undertaken. Pond dried out in later surveys                     |
| P1                   | Pond            | No GCN eggs found.<br>eDNA results negative.                          | 2 survey techniques undertaken. Pond dried out in later surveys                     |
| P4                   | Pond            | No GCN eggs found.                                                    | 2 survey techniques undertaken Pond dried out in later surveys.                     |
| P4A                  | Pond            | No GCN eggs found.<br>Pond dried out.                                 | 2 survey techniques undertaken. Pond dried out in later surveys                     |
| P4C                  | Pond            | N/A                                                                   | Unsuitable (newly created)                                                          |
| P5                   | Pond            | N/A                                                                   | No access.                                                                          |
| P6                   | Pond            | N/A                                                                   | No access.                                                                          |
| P6A                  | Pond            | N/A                                                                   | No access.                                                                          |
| C4                   | Pond            | N/A                                                                   | 0 surveys completed:<br>Pond dried out.                                             |

See Annexes J for map C.7 showing pond location.



Survey date: 10/12/2015

A3

Legend

Site extent

G1 - Standing water

|      |          |       |                 |       |       |          |
|------|----------|-------|-----------------|-------|-------|----------|
| P1   | 11/02/16 | GW    | For information | TC    | ECP   | 11/02/16 |
| Rev. | Date.    | Drawn | Description.    | Chkd. | Appd. | Date.    |

MMB

Mott MacDonald Bentley

Capital Delivery Alliance

Cynghrair Cyflawni Cyfalaf

Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name.

Five Fords Enhanced Digestion Facility

Drawing Title.

Great Crested Newt Survey - Pond Scoping

Suitability.

Preliminary

Suitability Code.

PRE

Originator

GW

Designer

PB

Date.

11/02/16

Internal Project Number

366660NN26

Scale

1:2,000

Rev.

P1

Drawing Number.

DCWW-4791-S-20-MMB-00-XX-DR-N-06007

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## C.8 Interpretation/evaluation of survey results

If GCN presence was confirmed an additional two survey visits were required in order to allow population size class assessments to be made. The size class assessment will then be estimated using the peak adult count of GCN from one night of surveying through either torching or bottle trapping (the method with the higher count should be used). The population size class can then be represented as small, medium or large (please see Table C.8.1) The methods used were torch surveys and bottle trapping and were undertaken within the timescales as stated above for presence / absence surveys, hence one additional visit was required between mid-April and mid-May.

The ponds that dried out were very shallow at the start of the survey season, and had dried out by May. It is considered that these ponds regularly dry out, although GCN were shown to be using some of them. Due to drying out it was not possible to get a population size class for GCN using these ponds. There is not enough time within the proposed construction programme to try to re-survey these ponds again next year.

**Table C.8.1 Categorisation of Population Size Class**

| Population Size Class | Peak Counts |
|-----------------------|-------------|
| Small                 | 1 -10       |
| Medium                | 11 – 100    |
| Large                 | >100        |

Source: English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough. Or <https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects>

**Table C.8.2 Population Results**

| Water Body Reference | Peak Adult Count                          | Population Size Class Assessment | Limitations of surveys                                                              |
|----------------------|-------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
| P2                   | GCN eggs                                  | Unknown                          | Only two survey techniques undertaken – 4 surveys instead of 6 were undertaken.     |
| P3                   | GCN eggs                                  | Unknown                          | Only two survey techniques undertaken – 4 surveys instead of 6 were undertaken.     |
| P4B                  | 6                                         | Low                              | N/A                                                                                 |
| C1                   | 2                                         | Unknown                          | 4 surveys completed; pond dried out and further surveys were not possible.          |
| C2                   | 5                                         | Low                              | N/A                                                                                 |
| C5                   | 1                                         | Unknown                          | 4 surveys completed: Pond dried out and therefore bottle trapping was not possible. |
| C6                   | 7                                         | Low                              | N/A                                                                                 |
| N1                   | 4                                         | Unknown                          | Was not subject to a survey regime.                                                 |
| C3                   | No newts found                            | N/A                              | 4 surveys completed: Pond dried out and surveys were not possible.                  |
| SL1                  | No GCN eggs found. eDNA results negative. | N/A                              | Two survey techniques undertaken                                                    |
| P1                   | No GCN eggs found.                        | N/A                              | Two survey techniques undertaken                                                    |

| Water Body Reference | Peak Adult Count                             | Population Size Class Assessment | Limitations of surveys                           |
|----------------------|----------------------------------------------|----------------------------------|--------------------------------------------------|
|                      | eDNA results negative.                       |                                  |                                                  |
| P1                   | No GCN eggs found.<br>eDNA results negative. | N/A                              | Two survey techniques undertaken                 |
| P4                   | No GCN eggs found.                           | N/A                              | Two survey techniques undertaken Pond dried out. |
| P4A                  | No GCN eggs found.<br>Pond dried out.        | N/A                              | Two survey techniques undertaken                 |
| P4C                  | N/A                                          | N/A                              | Unsuitable (newly created)                       |
| P5                   | N/A                                          | N/A                              | No access.                                       |
| P6                   | N/A                                          | N/A                              | No access.                                       |
| P6A                  | N/A                                          | N/A                              | No access.                                       |
| C4                   | N/A                                          | N/A                              | 0 surveys completed:<br>Pond dried out.          |

The surveys undertaken confirmed the presence of GCN within the site and surrounding area; all water bodies that contained GCN were considered to be breeding populations as both male and female GCN were recorded. It is very difficult to establish accurate population sizes of GCN due to a range of factors, mainly survey effort and timings. However, it is possible to estimate the population size using the peak count methodology, and as such, water bodies P4B, C2 and C6 are considered to contain small populations of GCN when viewed individually.

GCN within a local area often form a meta-population; a series of sub-populations that are linked by the dispersal of individuals (and hence genes) between water bodies. Due to the close proximity and connective suitable habitat between the water bodies it is likely that there is an interchange of GCN within these breeding ponds, as such, they are considered to form a meta-population. When the peak counts of all the water bodies are cumulated over a single survey visit, the peak count is 18. The GCN meta-population is therefore considered to be of a medium size although at the lower end of the size class.

### Valuation

Based on the result of the surveys and within the context of the site and the wider surrounding area, the site is considered to be of **Local value** for GCN.

## D Impact Assessment

The current conservation status of the GCN population within Wrexham and the wider area over time has been subject to decline and is considered to be in an unfavourable conservation status (Countryside Council for Wales, n.d.). The report suggests that the loss of suitable breeding habitat and decline in pond densities across northeast Wales has resulted in a severe decline in great crested newt status in the region.

The conservation status of species will be taken as 'favourable' when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The favourable conservation status will be achieved through mitigation and enhancements in areas, where possible. This can include additional ponds and terrestrial habitat and regular focussed maintenance of these features.

No ponds will be directly impacted by the proposed works. No vegetation clearance is required for the proposed works as the works are situated on hardstanding or bare ground habitat. The works are not considered to kill or injure GCN within the proposed works area. There would be no impacts to core refuge sites (habitat within 50m of breeding ponds). Impacts on the population are assessed as having a negligible impact on GCN due to no loss of breeding ponds or loss of terrestrial habitat.

### D.1 Short-term impacts: disturbance

The site is located on negligible habitat for foraging and commuting GCN. It is considered unlikely that GCN will be present within the compacted stone however there is a risk that we may kill or disturb GCN during construction. Short-term impacts may include disturbance from site lighting and noise on adjacent habitat that may be used for dispersal. Disturbance may occur within the compensation area when the area is enhanced.

### D.2 Long-term impacts: site modification

There will be no destruction of breeding habitat as there are no ponds or waterbodies located within the proposed works area. No long-term impacts to GCN will occur as part of the proposed works. The existing stone pad has been in situ since 2009 and is considered sub optimal habitat for GCN. The compensation area from the previous licence held by Dŵr Cymru Welsh Water (Licence number GCN/2044/WAG/IND) detailed a compensation area for the previous improvement works on the site. During a meeting held on the 17<sup>th</sup> January 2017 mitigation and restoration was agreed with Matthew Ellis (NRW), Philip Forster (Wrexham Planning) and Emma Broad (Wrexham Ecologist), it was requested that the compensation area was extended and the existing compensation area further enhanced. The GIS boundary of the new compensation area will be provided to NRW, WCBC, Cofnod and ARC once the enhancement works are completed.

### D.3 Long-term impacts: site loss

The proposed works are not considered to have a direct impact on the different sub populations within the area. The nearest known population is located 3.5km north east in Wrexham Industrial Estate, separated by the Clywedog River and several local roads. 4km to the east is

another population near Sontley, this site is separated by Gefeiliau Brook and various roads. 5km to the east is Johnson's newt site (SAC); one of the largest in Britain, this site is separated by the A483, Gefeiliau Brook and various roads. As no suitable habitat to support GCN will be lost as part of the proposed works, the works are not considered to have a local impact to this species.

#### **D.4 Long-term impacts: fragmentation and isolation**

There will be no destruction of breeding habitat as there are no ponds or waterbodies in the proposed works area. The proposed works are occurring on negligible habitat to support GCN and as such are not considered to cause any fragmentation or isolation from suitable habitat.

#### **D.5 Post-development interference impacts**

No post-development interference impacts are anticipated to occur given that the works are located within habitat that has negligible suitability to support GCN. There will be no increase in pressure or any land-use change from the proposed works. No post-development interference impacts are envisaged on the local GCN population apart from management of the compensation site as discussed in the Five Fords GCN Mitigation Specification (see Annex J.3.)

#### **D.6 Predicted scale of impact**

The predicted impact of scale is to be negligible for the GCN population on site. There will be no destruction of breeding or suitable foraging and commuting habitat

## E Works to be Undertaken

Mitigation and restoration for GCN have been discussed during a meeting held on the 17<sup>th</sup> January 2017. Mitigation and restoration was agreed with Matthew Ellis (NRW), Philip Forster (Wrexham Planning) and Emma Broad (Wrexham Ecologist). Details of the agreed mitigation and restoration is provided below.

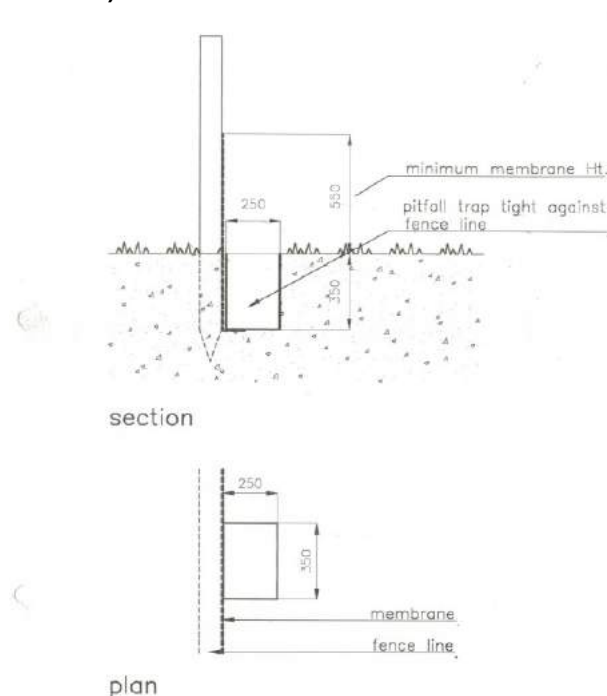
### E.1 Great Crested Newt capture and exclusion (if applicable).

Exclusion fencing will be installed around the work areas adjacent to the bare ground habitat. No pitfall traps are to be installed and no trapping is proposed within the construction area. Destructive searches will be undertaken within all fenced areas prior to the fence installation. Access gates to exclusion fencing will be installed and will be kept shut when not in use. No vegetation clearance is required for the installation of the fence.

The fence is to be installed March / April after 10 consecutive days where the temperature is above 5 Degrees Celsius. In the unlikely event that GCN are found during the installation of the exclusion fence they will be relocated to habitat located within the existing compensation area. This area was created as part of the 2010 Five Fords Sludge Treatment and Sustainable Energy Plant.

The fence will be inspected by site operatives during the construction phase of the works. Any damage is to be repaired within 48 hours. A documented record shall be kept.

**Figure 1: Fencing Specification (Please note that pitfall traps are not proposed for this scheme)**



Source: Countryside Council for Wales

## **E.2 Great Crested Newt habitat**

### **E.2.1 Receptor site modification, enhancement or creation**

The habitat located within the existing compensation area is to be extended to include the woodland and enhanced to help restore the GCN population in the wider area. The new (extended boundary is illustrated in drawing DCWW-4791-S-201-MMB-06-XX-RP-NX-19152). The enhancement works will include creating four hibernacula's, one new pond and another pond will be re-profiled as it no longer supports GCN. A detailed management plan for this area will be prepared by 31 December 2017.

Details of the biosecurity can be found in Annexes J.4. See E.2.4 map below for the proposed GCN mitigation layout and pond design.

### **E.2.2 Temporary loss of breeding sites, resting places**

There will be no temporary loss of breeding habitat or resting places. The proposed works will involve re-profiling pond P4 that is dry, had no previous evidence of GCN and is currently considered unsuitable to support GCN. Re-profiling of this pond will be undertaken during the GCN hibernation period under ecological supervision.

### **E.2.3 Destruction of existing breeding sites, resting places**

There will be no destruction of breeding habitat or resting places.

### **E.2.4 Scaled maps/plans**

See Annexes J map E.1 for the proposed GCN mitigation layout and E.2.1 for pond design.

## **E.3 Mechanisms for ensuring delivery of mitigation and compensation measures**

### **E.3.1 Measures to ensure compliance with this method statement**

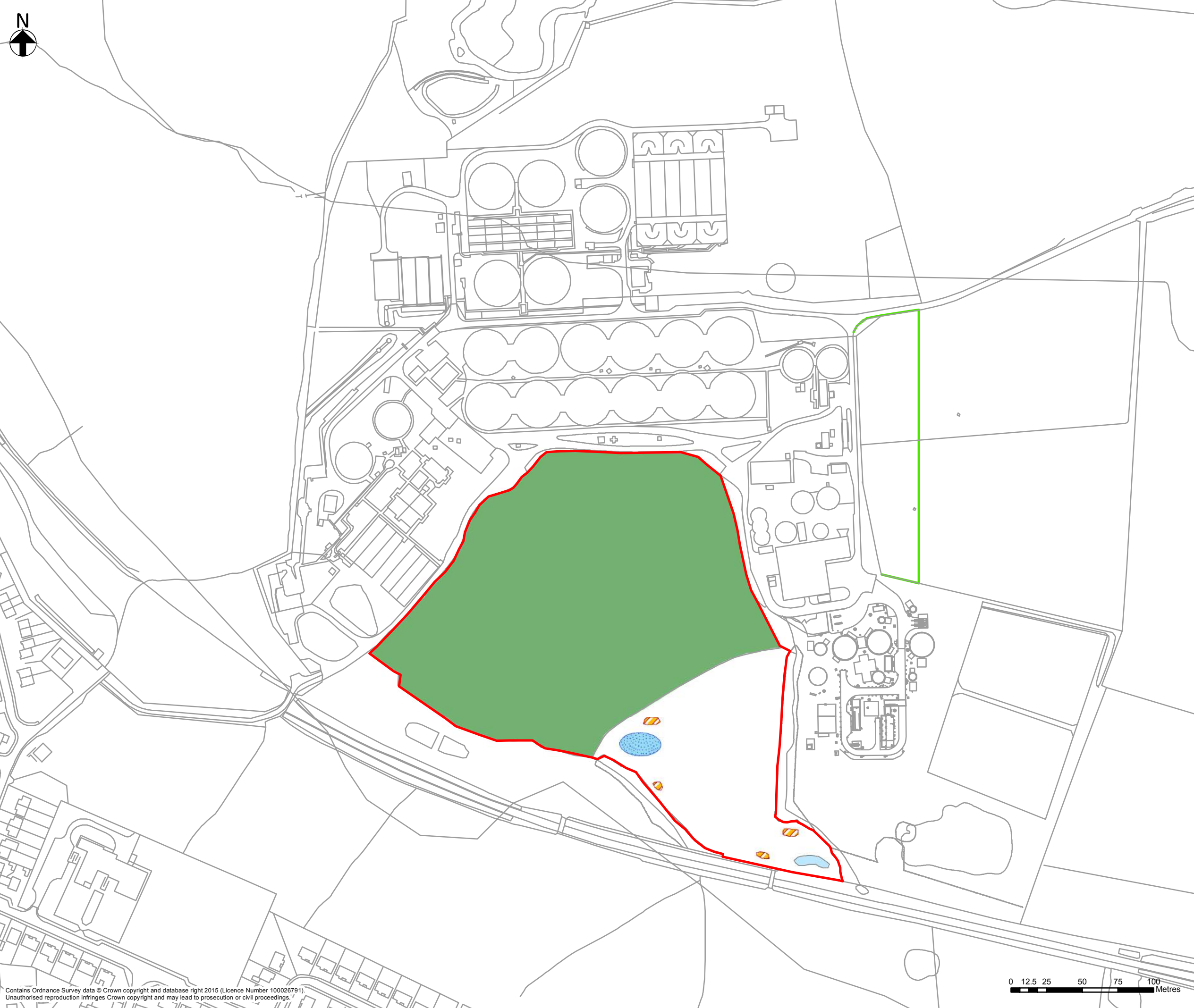
MMB will initially be responsible for implementing all of the licence conditions (exclusion fence installation of all areas and maintenance for the duration of works, supervision of the recommended habitat enhancement, monitoring and management) including any post-development works. Once the project has been handed over to DCWW, the DCWW operator will hold the license. The licence holder will ultimately be responsible for delivery of all elements of the licence. Please refer to the GCN Mitigation Specification document for Five Fords AAD in Annexes J.3. A compliance audit (template included in Annex J.5) will be undertaken once when the works are being undertaken, once when the compensation habitat works are complete and will included in the post construction reporting for the licence return.

### **E.3.2 Ensure that sufficient land has been acquired for compensation purposes**

The compensation habitat has been agreed with NRW and WCBC. This included the existing compensation area and Marchwiell Covert.

### **E.3.3 Ensure that designs of subsequent development are newt friendly**

The proposed works and associated infrastructure is located within hardstanding habitat that is considered negligible habitat to support GCN. In the unlikely event that GCN venture within the hardstanding habitat all drains within the site will have a wildlife kerb that prevents small animals such as newts from entering the drain. Examples is shown below:



### Legend

- Proposed Great Crested Newt Exclusion Fence
- New Pond (Refer to pond design drawing: DCWW-4791-S-201-MMB-06-XX-RP-NX-19153)
- Proposed Hibernacula
- Re-profiling of Pond
- Marchwiel Covert (Identified as a GCN area)
- Existing Compensation Area

|      |            |       |                 |       |       |            |
|------|------------|-------|-----------------|-------|-------|------------|
| P1   | 27/01/2017 | GT    | For Information | JB    | CW    | 27/01/2017 |
| Rev. | Date.      | Drawn | Description.    | Chkd. | Appd. | Date.      |

Mott MacDonald Bentley

Cynghrair Cyflawni Cyfalaf

Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name:

Five Fords WwTW AAD Scheme

Drawing Title:

Great Crested Newt Mitigation Plan

Suitability:

For Information

Suitability Code:

INF

|                                       |                  |                     |
|---------------------------------------|------------------|---------------------|
| Originator<br>GT                      | Designer<br>JB   | Date.<br>27/01/2017 |
| Internal Project Number<br>381177NN26 | Scale<br>1:2,500 | Rev.<br>P1          |

Drawing Number:

DCWW-4791-S-201-MMB-06-XX-RP-NX-19152

0 12.5 25 50 75 100 Metres

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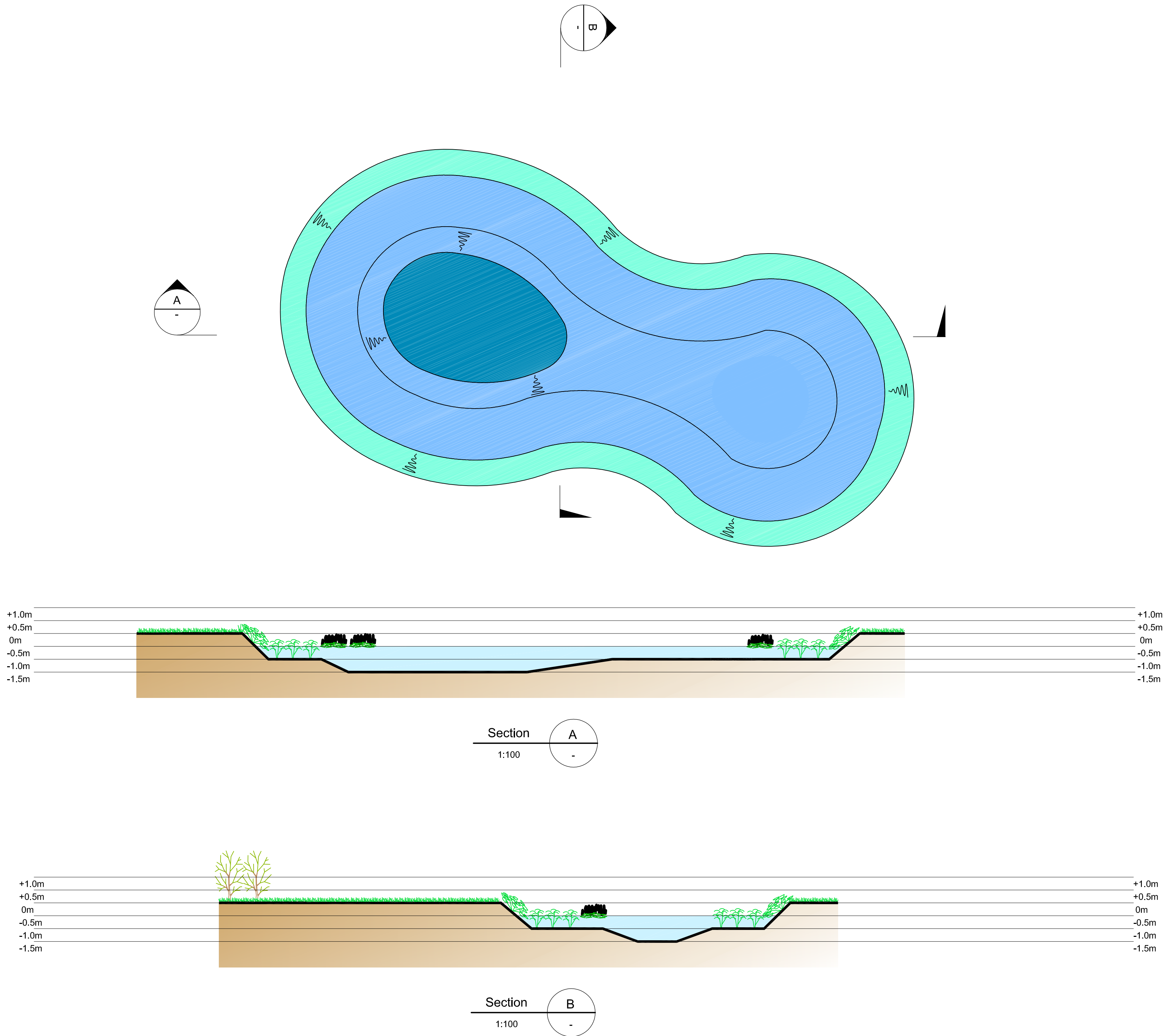
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NOTES:

LEGEND

- DEEP WATER: 1.5M DEEP
- OPEN WATER SHELF: 0.5M - 1.0M DEEP
- SHALLOW WATER MARGIN: 0M - 0.5M DEEP



|                                                                                                                                                                                                                                                                   |          |                  |                 |                   |                   |          |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|-----------------|-------------------|-------------------|----------|--|
| P1                                                                                                                                                                                                                                                                | 27.01.17 | RT               | FOR INFORMATION | JJB               | CW                | 27.01.17 |  |
| Rev.                                                                                                                                                                                                                                                              | Date.    | Drawn.           | Description.    | Chkd.             | Appd.             | Date.    |  |
| <div><div></div><div><div>Capital Delivery Alliance</div><div>Cynghrair Cyflawni Cyfaloaf</div></div></div> <div>Ty Awon, Spooner Close, Coad Kernew, Newport, NP108FZ</div> |          |                  |                 |                   |                   |          |  |
| Project Name:<br>FIVE FORD WTW AAD SCHEME                                                                                                                                                                                                                         |          |                  |                 |                   |                   |          |  |
| Drawing Title:<br>GREAT CRESTED NEWT<br>PROPOSED POND DESIGN                                                                                                                                                                                                      |          |                  |                 |                   |                   |          |  |
| Suitability.                                                                                                                                                                                                                                                      |          |                  |                 |                   | Suitability Code. |          |  |
| Originator.<br>RT                                                                                                                                                                                                                                                 |          | Designer.<br>JJB |                 | Date.<br>27.01.17 |                   |          |  |
| Internal Project Number.<br>381177/NN26                                                                                                                                                                                                                           |          | Scale.<br>1:100  |                 | Rev.<br>P1        |                   |          |  |
| Drawing Number.<br>DCWW-4791-S-201-MMB-06-XX-RP-NX-19153                                                                                                                                                                                                          |          |                  |                 |                   |                   |          |  |



ACO Wildlife Kerb [www.aco.co.uk](http://www.aco.co.uk).

These kerbs will be kept clear of debris on a regular basis to ensure the function of the kerb.

#### **E.3.4 Provide sufficient resources**

DCWW will be responsible for ensuring funding for the monitoring and management of the compensation area on site once the project has been handed over from MMB post construction.

## E.4 Mitigation contingencies

Monitoring the GCN populations within the created breeding ponds will be undertaken over a 10-year period as requested by NRW. All historic data for the site will be uploaded onto the online Wales GCN Monitoring Scheme by 31 December 2017 and data will then be entered annually for an initial period of 10 years. Monitoring is to be reviewed after 5 years to consider how or if monitoring should be amended to reflect the success of the mitigation at that time.

## E.5 Biosecurity risk assessment

Bio-security measures are to follow Amphibian disease precautions: a guide for UK fieldworker ARG-UK Advice Note 4 (2008). See Table E.5.1 and Annexes J 4 for biosecurity risk assessment information.

**Table E.5.1: Biosecurity Risk Assessment**

|                                           |                                                                       |                 |                                                                                                  |                       |                                                                                                                                                                                   |
|-------------------------------------------|-----------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.Assessment of presence</b>           | Is there any evidence of invasive species in ponds subject to survey? | No              | Review presence and risks of invasive species on each visit.                                     |                       |                                                                                                                                                                                   |
| <b>2.If present, which plant species?</b> | <b>Species</b>                                                        | <b>Presence</b> | <b>Potential Contamination Route</b>                                                             | <b>Degree of Risk</b> | <b>Action</b>                                                                                                                                                                     |
|                                           | Fern, Water (Azolla filiculoides)                                     | No              | Dispersal of species through contaminated equipment entering the ponds during monitoring surveys | High Risk             | Avoid entering ponds whenever possible.                                                                                                                                           |
|                                           | Pennywort, Floating (Hydrocotyle ranunculoides)                       | No              |                                                                                                  | High Risk             | Consider using survey techniques that constitute a lower bio-security risk i.e. torching without entering the water.                                                              |
|                                           | Stonecrop, Australian swamp (Crassula helmsii)                        | No              |                                                                                                  | Very High Risk        | Use bottle traps on a site-specific basis.                                                                                                                                        |
|                                           | Water hyacinth (Eichornia crassipes)                                  | No              |                                                                                                  | Medium                | Consider using nets and other equipment on a site-specific basis where non-native species have been recorded.                                                                     |
|                                           | Water Primrose (Ludwigia peploides)                                   | No              |                                                                                                  | Medium                | Clean equipment, boots/waders and clothes after each survey. Where surveys entail surveys of two or more ponds, consider provision of duplicate equipment including boots/waders. |
|                                           | Ludwigia uruguayensis (= L. grandiflora)                              | No              |                                                                                                  |                       |                                                                                                                                                                                   |
|                                           | Waterweed, Canadian (Elodea Canadensis)                               | No              |                                                                                                  | Medium                | Based on degree of risk, consider surveying ponds supporting invasive species last or use a team to specifically survey ponds supporting non-native species.                      |
|                                           | Waterweed, Curly (Lagarosiphon major)                                 | No              |                                                                                                  | Medium                |                                                                                                                                                                                   |
|                                           | Waterweed, Nuttall's (Elodea nuttallii)                               | No              |                                                                                                  | Medium                |                                                                                                                                                                                   |

|                                                             |                                                                       |                                                           |                                                                                                  |                                                                                             |
|-------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>1. Assessment of presence</b>                            | Is there any evidence of invasive species in ponds subject to survey? | No                                                        | Review presence and risks of invasive species on each visit.                                     |                                                                                             |
|                                                             | Waterweeds (other Elodea) (Elodea spp)                                | No                                                        | Medium                                                                                           |                                                                                             |
|                                                             | Least duckweed (Lemna minuscule)                                      | No                                                        | High                                                                                             |                                                                                             |
| <b>3. Surveys: Numbers of ponds and geographical extent</b> | Total number of ponds to be surveyed per annum                        | 2                                                         | Low                                                                                              |                                                                                             |
|                                                             | Geographical extent of all surveys carried out per annum              | 0.6Km <sup>2</sup>                                        | Low                                                                                              |                                                                                             |
| <b>4. If present, which disease?</b>                        | <b>Disease</b>                                                        | <b>Presence</b>                                           | <b>Potential Contamination Route</b>                                                             | <b>Action</b>                                                                               |
|                                                             | Ranavirus                                                             | Unknown                                                   | Dispersal of disease through contaminated equipment entering the ponds during monitoring surveys | ARG-UK Advice Note 4 provides generic guidance in respect of amphibian disease precautions. |
|                                                             | Chytridiomycosis (Batrachochytrium dendrobatidis)                     | Unknown, present at Johnstown Newt Sites SAC (5.0km West) |                                                                                                  |                                                                                             |

## **F Post-Development Site Safeguard**

### **F.1 Habitat/site management and maintenance**

DCWW will be responsible for management and maintenance, on going running costs, site/structure ownership and monitoring development of the compensation area.

The grassland habitat within the mitigation area requires annual sensitive maintenance for GCN. The grassland will require cutting or grazing at least annually at a time when newts are less likely to be harmed. The grassland should be cut during hot and dry weather in September - October. Sections of the pond, woodland and hedgerow margins should be left uncut up to 5 m in width to allow some dense cover throughout the year. Please see Annex J. 3 for further details.

Scrub and woodland within the site should be managed. Small areas of felling or coppicing using hand held tools on a rotational basis is to occur to ensure minimal disturbance to GCN. Areas to be managed are to be identified by the licenced ecologist.

### **F.2 Population monitoring**

Monitoring the GCN populations within the created breeding ponds will be undertaken over a 10-year period as requested by NRW. Population surveys are to be undertaken to establish the likely success of the mitigation and provide population counts for the created ponds. Surveys will be undertaken by licenced and accredited or capable GCN ecologists. Population surveys are to follow the National Amphibian and Reptile Recording Scheme (NARRS: v2013) Amphibian Survey Protocols.

### **F.3 Post-development mitigation contingencies**

During the yearly GCN population surveys the condition of the ponds and their functionality to support GCN will be assessed. If the ponds decline, then pond restoration may be required. Any pond restoration works are to follow guidance as detailed within Langton et al. (2001).

### **F.4 Mechanism for ensuring delivery of post-development works**

MMB and DCWW will be responsible for implementing all the licence conditions including any post-development works. The licence holder will ultimately be responsible for delivery of all elements of the licence.

## G Timetable of Works

| DCWW Five Fords DCWW GCN Mitigation Timeframe |               |                      |                           |                        |                    |
|-----------------------------------------------|---------------|----------------------|---------------------------|------------------------|--------------------|
| Dates / visits                                | Pond Creation | Hibernacula Creation | Newt Fencing Installation | GCN population Surveys | Habitat Management |
| <b>2017</b>                                   |               |                      |                           |                        |                    |
| April                                         |               |                      |                           |                        |                    |
| November - December                           |               |                      |                           |                        |                    |
| <b>2018</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |
| 2-3 days September - October                  |               |                      |                           |                        |                    |
| <b>2019</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |
| 2-3 days September - October                  |               |                      |                           |                        |                    |
| <b>2020</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |
| 2-3 days September - October                  |               |                      |                           |                        |                    |
| <b>2021</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |
| 2-3 days September - October                  |               |                      |                           |                        |                    |
| <b>2022</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |
| 2-3 days September - October                  |               |                      |                           |                        |                    |
| <b>2023</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |
| 2-3 days September - October                  |               |                      |                           |                        |                    |
| <b>2024</b>                                   |               |                      |                           |                        |                    |
| 6 site visits March - June                    |               |                      |                           |                        |                    |

|                                    |  |  |  |  |  |
|------------------------------------|--|--|--|--|--|
| 2-3 days<br>September -<br>October |  |  |  |  |  |
| <b>2025</b>                        |  |  |  |  |  |
| 6 site visits March -<br>June      |  |  |  |  |  |
| 2-3 days<br>September -<br>October |  |  |  |  |  |
| <b>2026</b>                        |  |  |  |  |  |
| 6 site visits March -<br>June      |  |  |  |  |  |
| 2-3 days<br>September -<br>October |  |  |  |  |  |
| <b>2027</b>                        |  |  |  |  |  |
| 6 site visits March -<br>June      |  |  |  |  |  |
| 2-3 days<br>September -<br>October |  |  |  |  |  |

# **H Land Ownership – Mitigation Site/Compensation Site**

## **H.1 Mitigation Site/Compensation Site Ownership**

The construction area and mitigation site is located within land owned by DCWW.

## **H.2 Mitigation Site/Compensation Ownership post construction**

The construction and mitigation site located within DCWW land will remain under DCWW ownership after construction of the proposed works.

# I References

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# **J Annexes**

## **J.1 & J.2 Pre-existing Survey Reports and Raw Survey Data**



# Five Fords Wastewater Treatment Works

Great Crested Newt Survey Report

June 2016

Dŵr Cymru Welsh Water Limited

# Five Fords Wastewater Treatment Works

Great Crested Newt Survey Report

June 2016

Dŵr Cymru Welsh Water Limited

Tŷ Awen, Spooner Close, Celtic Springs Business Park, Newport, NP10 8FZ

# Issue and revision record

| Revision | Date             | Originator  | Checker    | Approver  | Description  |
|----------|------------------|-------------|------------|-----------|--------------|
| P01      | 08 February 2016 | Jason Brown | R Purslow  | C Probert | First Issue  |
| P02      | June 2016        | Jason Brown | C Williams | C Probert | Second Issue |

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# Executive Summary

Dŵr Cymru Welsh Water Limited (DCWW) is proposing to install an Advanced Anaerobic Digestion (AAD) system at Five Fords Wastewater Treatment Works (WwTW) near Wrexham

Mott MacDonald Bentley (MMB) has been commissioned to provide ecological services to support the development of the thermal hydrolysis plant and its associated processes. A number of previous ecological reports for the site were reviewed and a preliminary ecological appraisal (PEA) was conducted including a site visit in December 2014. The information obtained from the previous reports highlighted that great crested newts (GCN) have been confirmed present on site and the subsequent site visit identified the potential for GCN within 250m of the proposed construction area. In line with wildlife legislation, MMB advised that a GCN Development Licence is sought to carry out the works within 250m of the identified breeding ponds. Works that are deemed to have a lower risk to GCN are to be carried out under a non-licensed Method Statement as a precautionary approach to reduce the risk of injuring GCN.

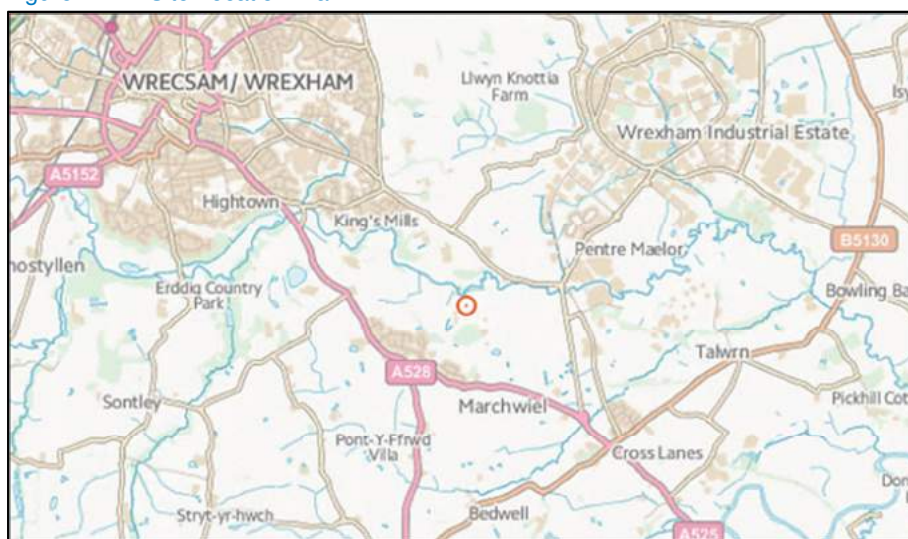
This report details the methodology and results of surveys conducted to support the licence application.

# 1 Introduction

## 1.1 Project Background

Mott MacDonald Bentley (MMB) was commissioned by Dŵr Cymru Welsh Water Limited (DCWW) in December 2014 to provide ecological services to support proposals to install a thermal hydrolysis plant at Five Fords Wastewater Treatment Works (WwTW). The site lies to the south east of Wrexham between Wrexham Industrial Estate and the town of Marchwiell as shown in Figure 1.1 below.

Figure 1.1: Site Location Plan



Source: Ordnance Survey Crown Copyright data @ Crown copyright and database 2014

The proposed thermal hydrolysis plant and associated development will be located within the existing site boundary.

## 1.2 Potential Impacts to Great Crested Newt

The proposed works involve the provision of several new buildings and units as well as the conversion or modification of existing equipment and general site improvements to increase sludge storage capacity and improve sludge treatment.

To facilitate these works, vegetation clearance and earthworks will be required, which have the potential to disturb, kill or injure great crested newts (GCN) as well as impact GCN habitat.

## 1.3 Legislative Context

GCN are fully protected under the Conservation of Habitat and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended). These enactments decree that it is an offence to intentionally or recklessly kill, injure or take GCN. In addition the following are also classified as a breach of the legislation: To possess or control any live or dead specimen or anything derived from a GCN; To intentionally or recklessly damage, destroy or obstruct access to any structure or place used as shelter or

protection by a GCN; and To intentionally or recklessly disturb a GCN while it is occupying a structure or place, which it uses for that purpose. The legislation applies to all life stages of great crested newts.

To undertake an activity which is prohibited under wildlife legislation, a protected species development licence may be applied for from the Statutory Regulator; in this instance the Statutory Regulator is Natural Resources Wales (NRW). The Development Licence allows works, which otherwise may constitute an offence, to be conducted in accordance with an agreed method statement.

#### **1.4 Scope of the Report**

To obtain a GCN licence, a baseline of the GCN population class size is required, in order to fully assess the potential impacts on the GCN, and this is obtained by undertaking GCN surveys. This report documents the findings of the GCN habitat suitability assessments (undertaken on ponds within 500m of the site) and the results of the GCN presence / absence surveys (undertaken on selected ponds following the habitat suitability assessment).

The objectives of the surveys and of this report are to:

- Determine presence of GCN within 500m of the works footprint;
- Identify any GCN suitable ponds within the development footprint and assess if these ponds will be impacted by the proposed works;
- Assess the population of GCN in the local area;
- Identify key habitat features and corridors present within the site; and
- Develop appropriate site-specific recommendations and mitigation.

#### **1.5 Limitations**

It was not possible to access some areas within the survey extent; this was largely due to limited and/or irregular land access (i.e. where a land owner, tenant or agent has refused entry). Several ponds also dried out during the survey period which resulted in bottle trapping and sweep netting not being possible. Further details of limitations during surveys can be found in Section 3.2.2.

Biological records obtained from third parties and presented in the desk study do not represent a full and complete species list for the area. They are mostly given by individuals on an ad hoc basis, often meaning there are areas of deficiency in the data.

## 2 Methodology

### 2.1 Desk Study

A data search was undertaken in order to determine the presence of records of great crested newts. The data search was conducted over a 2km radius from the centre of the site. Waterbodies within 500m of the site were also searched for, in order to assess which waterbodies may be suitable for great crested newts. The consultees for the desk study were:

- Multi Agency Geographical Information for the Countryside (MAGIC) website for statutory conservation sites; and
- Cofnod; the North Wales Environment Information Service.

### 2.2 Habitat Suitability Index Assessment

As part of the initial site assessment, ponds within 500m of the proposed works were identified and assessed using the Habitat Suitability Index (HSI) assessment (Oldham *et al.* 2000).

The HSI assessment is a standard approach adopted by ecological consultants for assessing a ponds potential to support GCN. The HSI is essentially a measure of habitat suitability and incorporates ten indices (all of which are environmental variables), which are thought to affect GCN:

- Geographic location (SI1);
- Pond area (SI2);
- Pond permanence (SI3);
- Pond quality (SI4);
- Pond shading (SI5);
- Number of waterfowl (SI6);
- Occurrence of fish (SI7);
- Pond density (SI8);
- Proportion of suitable habitat in the study area (SI9); and
- Macrophyte cover (SI10).

The HSI score is the geometric mean of the ten habitat variables listed above, obtained by multiplying each of the variable scores together, and then taking the 10th root of the product.

The resulting HSI scores were cross-referenced with the National Amphibian and Reptile Recording Scheme (NARRS) (2008) guidance (as shown in Table 2.1) to estimate the suitability of each pond to support a breeding population of great crested newts.

Table 2.1: HSI and Pond Suitability for GCN

| HSI Score   | Pond Suitability for GCN |
|-------------|--------------------------|
| 0.00 – 0.49 | Poor                     |
| 0.50 – 0.59 | Below average            |
| 0.60 – 0.69 | Good                     |
| 0.80 – 1.00 | Excellent                |

Source: NARRS, 2008

The index produces a score of between 0 and 1 (in increments of 0.1), with 0 being unsuitable habitat and 1 representing optimal habitat. In general, ponds with high HSI scores (>0.6) are more likely to support GCN than those with low scores (<0.5) but the method is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so. However, the HSI score can be used as an aid in the decision whether to undertake GCN presence/absence surveys on a pond.

As a cautious approach, water bodies with a HSI score of 0.5 and above were scoped in for further surveys. An exception to this was where the water body qualified for further surveys due to overriding suitability reasons e.g. reports of GCN within a water body.

### 2.3 Presence / Absence Surveys

In order to accurately establish the presence of GCN, a minimum of four survey visits must be undertaken during the GCN breeding season between mid-March and mid-June, with half of these surveys required to take place during the peak breeding phase between mid-April and mid-May. If GCN are found during these visits and it is likely that a GCN Derogation Licence will be required for the works to proceed, then an estimate of the GCN population size class is required. This is calculated by undertaking two further visits (six surveys in total). In the event that no GCN are identified during the first four visits, no further surveys are required as GCN are assumed absent.

Survey work was undertaken by suitably qualified ecologists with possession of a GCN Survey Licence, or by ecologists accredited on another licence holder's GCN Survey Licence.

Survey work only took place if the average night time air temperatures were greater than 5 °C.

There are six different types of survey techniques, as detailed below. Five of these are recognised in the best practice guidance 'Great Crested Newt Mitigation Guidelines, 2001'. A total of three methods must be employed on each survey visit to determine the presence or absence of GCN. The five recognised survey techniques include:

#### 1. Torching

GCN are nocturnal and actively court at night, in open water during the breeding season where they can be observed and counted using million candle watt torches. After night fall, surveyors move slowly along the bank sweeping with the torch to identify newts in the water, on emergent vegetation, or moving on land between water bodies. For this method to be effective there must be a certain amount of visibility through the water. This method cannot be effectively carried out in heavy rain.

#### 2. Bottle Trapping

Specially designed bottle traps (1.5 to 2.0 litre inverted bottles) are submerged in the water body on stakes at intervals of one trap per 2m length of shoreline. The bottle traps are designed and installed by experienced surveyors to ensure sufficient air pockets for captured newts, which will provide ample oxygen for at least 12 hours. Bottle traps are placed in the water at dusk. After night fall active newts enter the traps, from which they cannot escape, and the surveyors return in the morning soon after dawn to record the species, gender and number of newts captured. They are then returned to the water. In order to ensure that newts are not harmed during the trapping, newt traps are not left in situ for more than 12 hours.

### 3. Egg Searching

Newts lay jelly capsule eggs singly on aquatic plants, folding the leaf around the egg. If aquatic plants are absent, newts will lay on dead leaves and litter. GCN eggs can be distinguished readily from those of the smaller newt species by their larger size, shape and colour. It is not possible to distinguish smooth newt *Lissotriton vulgaris* from palmate newt *Lissotriton helveticus* eggs.

Surveyors search for folded leaves and gently open them to check for eggs. Once unfolded, leaves will not re-adhere to eggs, and these unwrapped eggs may suffer a higher predation rate. The presence of great crested newts can be confirmed by a single GCN laid egg. It is not possible to get any measure of population size or viability from egg counts, therefore once one GCN egg is found within a water body, this method is discontinued at that location. Egg searching is best carried out from April to June, although eggs can sometimes be found in March and July in smaller numbers.

### 4. Netting

This technique is not as efficient at identifying the presence of newts as egg searching, bottle trapping or torching. The technique involves using a sturdy net, with 2 - 4mm holes to sweep-net the pond. This method can cause a great deal of disturbance to a pond and its inhabitants and should be employed with care to minimise this impact. If invasive exotic plants, particularly New Zealand stonecrop *Crassula helmsii* and water fern *Azolla filiculoides* are present within a pond, this method should not be employed as it can transfer these species between ponds via the nets.

The optimum time for netting is generally from March to May, when most adults are in the pond, and mid-July to August when larvae are bigger and easier to identify. By standardising the netting to fifteen minutes of netting per 50m of pond shoreline, a relative abundance score can be produced.

### 5. Terrestrial Searches

Between March and October, juvenile and adult newts may be found under refuges such as piles of logs and rocks. However, as a technique to detect the presence of newts, it is not very reliable and newts may be present at a site but not found under searched refuges.

### 6. eDNA Testing

There is a sixth technique (eDNA testing) however NRW has only recently begun to accept eDNA test results as evidence of presence or absence of GCN. The accepted process of DNA testing is quantitative Polymerase Chain Reaction (qPCR) which detects nuclear or mitochondrial DNA that is released from the GCN into the environment. Sources of eDNA include secreted faeces, mucous, and gametes, shed skin, and carcasses. This technique cannot be used for population size class assessment but providing that samples were taken between 15<sup>th</sup> April to 30<sup>th</sup> June and in strict accordance with the published technical advice note (Defra, 2014) NRW will accept the results for a licence application.

Each technique has a number of advantages and disadvantages that may make them more suitable for use according to the nature of the water bodies and habitat. Due to the inability of the eDNA technique to provide population size class assessments, the level of disturbance caused by netting and the limited results from terrestrial searches, torching, bottle trapping and egg searching (provided there is suitable emergent vegetation for egg laying) are considered to be the preferred survey techniques.

The species, gender and abundance of all captured specimens should be accurately recorded and records of GCN passed to the Licensing Body NRW.

By following these survey methods, the data collected is considered sufficient to apply for a derogation licence from NRW, should one be required for the works to be undertaken.

## 3 Results

### 3.1 Species Records

There are 12 Cofnod records of GCN within a 2km radius of the site within the past 10 years with the closest record being 280m at Marchwiel Marsh Nature Reserve. These records include larva, juveniles and adult individuals.

### 3.2 Field Surveys

#### 3.2.1 Habitat Suitability Index Assessment

All HSI assessment surveys were carried out in December 2014. Appendix A provides tables of all HSI scores. 18 water bodies had a HSI assessment. Of these water bodies 2 were scoped out for suitability for GCN – i.e. their HSI score was less than 0.5, or varying factors resulted in unsuitable conditions. Access was also prohibited to a further 2 ponds and therefore no further surveys were completed at these sites.

A total of 13 water bodies were identified that achieved a HSI score of 0.5 or greater, or qualified for further surveys due to overriding suitability features. Presence / absence surveys were recommended for all these ponds as detailed in the following section of this report.

#### 3.2.2 Further GCN Surveys

Presence / absence surveys were recommended for the following ponds:

- |       |       |
|-------|-------|
| ■ P2  | ■ SL1 |
| ■ P3  | ■ P1  |
| ■ P4b | ■ P4  |
| ■ C1  | ■ P4a |
| ■ C2  | ■ P5  |
| ■ C3  | ■ P6  |
| ■ C5  | ■ P6a |
| ■ C6  | ■ C4  |

Table 3.1 below outlines the details of these surveys. Raw data from the surveys detailing the species, gender and abundance of newts found in each pond are provided in appendix B and a plan of the pond locations can be found in appendix C of this document.

Table 3.1: Summary of results of great crested newt presence / absence surveys

| Water Body Reference | Water Body Type | Summary of survey findings                                            | Limitations of surveys                                                                                                                                                                                                                                                                   |
|----------------------|-----------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P2                   | Pond            | GCN eggs                                                              | Only two survey techniques were undertaken as night time access was refused. Due to the levels of disturbance associated with the possible techniques (egg searching and sweep netting), surveys were terminated once a positive result was obtained to prevent unnecessary disturbance. |
| P3                   | Pond            | GCN eggs<br>2 smooth newts<br>1 common newt                           | Only two survey techniques were undertaken as night time access was refused. Due to the levels of disturbance associated with the possible techniques (egg searching and sweep netting), surveys were terminated once a positive result was obtained to prevent unnecessary disturbance. |
| P4b                  | Pond            | 13 GCN<br>2 palmate newts<br>1 smooth newt<br>1 common newt.          | No limitations, 6 surveys conducted using three survey techniques.                                                                                                                                                                                                                       |
| C1                   | Pond            | 2 GCN<br>4 smooth newts<br>1 palmate newt                             | 4 surveys completed; pond dried out and further surveys were not possible.                                                                                                                                                                                                               |
| C2                   | Pond            | 14 GCN<br>4 palmate newt<br>5 smooth newt<br>2 common newt            | No limitations, 6 surveys conducted using three survey techniques.                                                                                                                                                                                                                       |
| C5                   | Pond            | 1 GCN<br>2 smooth newts<br>8 common newts<br>Tadpoles present in pond | 4 surveys completed: Pond dried out and therefore bottle trapping was not possible.                                                                                                                                                                                                      |
| C6                   | Pond            | 21 GCN<br>40 common newts<br>35 smooth newts<br>3 palmate newts       | No limitations, 6 surveys conducted using three survey techniques.                                                                                                                                                                                                                       |
| N1                   | Puddle          | 4 GCN.                                                                | A puddle appeared after rainfall, despite being seemingly unsuitable, on the 4 occasions the puddle contained water it was surveyed by torchlight as a precaution.                                                                                                                       |
| C3                   | Pond            | No newts found                                                        | 4 surveys completed:<br>Pond dried out and further surveys were not possible.                                                                                                                                                                                                            |
| SL1                  | Pond            | No GCN eggs found.<br>eDNA results negative.                          | Only two survey techniques were undertaken as night time access was refused.<br>eDNA testing was undertaken to support findings.                                                                                                                                                         |
| P1                   | Pond            | No GCN eggs found.<br>eDNA results negative.                          | Only two survey techniques were undertaken as night time access was refused.<br>eDNA testing was undertaken to support findings.                                                                                                                                                         |
| P4                   | Pond            | No GCN eggs found.                                                    | Only two survey techniques were undertaken as night time access was refused. Pond had dried out by the second survey.                                                                                                                                                                    |
| P4a                  | Pond            | No GCN eggs found.<br>Pond dried out.                                 | Only two survey techniques were undertaken as night time access was refused. Pond had dried out by the third survey.                                                                                                                                                                     |

| Water Body Reference | Water Body Type | Summary of survey findings | Limitations of surveys                |
|----------------------|-----------------|----------------------------|---------------------------------------|
| P4c                  | Pond            | N/A                        | Unsuitable (newly created)            |
| P5                   | Pond            | N/A                        | No access.                            |
| P6                   | Pond            | N/A                        | No access.                            |
| P6a                  | Pond            | N/A                        | No access.                            |
| C4                   | Pond            | N/A                        | No surveys completed: Pond dried out. |

## 4 Recommendations

### 4.1 Further GCN Surveys

Access to some of the ponds was denied, and this is unlikely to change in the near future, therefore no further surveys are planned on these ponds.

The ponds that dried out were very shallow at the start of the survey season, and had dried out by May. It is considered that these ponds regularly dry out, although great crested newts were shown to be using some of them. Due to drying out it was not possible to get a population size class for great crested newt using these ponds.

### 4.2 GCN Derogation Licence

It has been identified that the local GCN population would be potentially adversely affected by the proposed works within any suitable habitat located within 250m of any identified breeding ponds. A GCN Derogation Licence will be required for the proposed works within this area.

The licence will require that mitigation is undertaken prior to works commencing to ensure that GCN are removed from the works site before works commence. This is normally undertaken by fencing the works site, and using methods to translocate the GCN out from within this area. Translocating GCN can only be done in Spring and Autumn.

Due to the lack of data for some of the survey ponds, it would be advisable to contact Natural Resources Wales before submitting the licence, in order to discuss the extent of the surveys and rational for our proposals. Evidence of the refusal of access for ponds is likely to be required to be submitted with the licence application.

The licence application can be prepared by a suitably experienced ecologist, who would also act as the named ecologist on the licence. The licence holder however is usually a person from the developer – in this case MMB. MMBs input will be required to complete some of the information in the documents, and MMB will also need to read the documents, agree to the mitigation proposed, and sign to confirm they will abide by the conditions of the licence.

A GCN Derogation Licence application can take about 3 weeks to prepare. Natural Resources Wales, have a statutory period of 6 weeks to consider the licence application.

Works that are deemed to have a lower risk to GCN are to be carried out under a non-licensed Method Statement as a precautionary approach to reduce the risk of injuring GCN.

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# Appendices

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## Appendix A. Habitat Suitability Index Scores

Table A.1: Water body assessment details - HSI scores

| Water Body Reference | Water Body type | Survey Buffer 250 m/500 m (distance from A5025) | HSI Score                                         |
|----------------------|-----------------|-------------------------------------------------|---------------------------------------------------|
| SL1                  | Pond            | 500 m                                           | No HSI completed – eDNA undertaken                |
| P1                   | Pond            | 250 m                                           | 0.0                                               |
| P2                   | Pond            | 250 m                                           | 0.60                                              |
| P3                   | Pond            | 250 m                                           | 0.68                                              |
| P4                   | Pond            | 250 m                                           | 0.40                                              |
| P4a                  | Pond            | 250 m                                           | 0.37                                              |
| P4b                  | Pond            | 250 m                                           | No HSI completed – known to be suitable           |
| P4c                  | Pond            | 250 m                                           | Scoped out – unsuitable for GCN – no HSI          |
| P5                   | Pond            | 500 m                                           | No access – no HSI                                |
| P6                   | Pond            | 250 m                                           | Scoped out – unsuitable for GCN – no HSI          |
| P6a                  | Pond            | 500 m                                           | No access – no HSI                                |
| C1                   | Pond            | 250 m                                           | 0.70                                              |
| C2                   | Pond            | 250 m                                           | 0.76                                              |
| C3                   | Pond            | 250 m                                           | 0.64                                              |
| C4                   | Pond            | 250 m                                           | 0.52                                              |
| C5                   | Pond            | 250 m                                           | 0.38                                              |
| C6                   | Pond            | 250 m                                           | 0.37                                              |
| N1                   | Puddle          | 250 m                                           | Not present on initial survey - no HSI undertaken |

## Appendix B. Raw Data

Insert Table which details species, gender and abundance of newts found in each pond.

Table B.1: Survey Visit 1 Results

| Survey Visit 1 05/05/2015                                                   |                |                                          |                           |                 |            |                                                                          |
|-----------------------------------------------------------------------------|----------------|------------------------------------------|---------------------------|-----------------|------------|--------------------------------------------------------------------------|
| Weather: PM 9°C dry, 5% cloud, light wind. AM 8°C light showers, light wind |                |                                          |                           |                 |            |                                                                          |
| Water body reference                                                        | No. of bottles | Torchlight survey                        | Bottle trapping           | Sweep netting   | Egg Search | Comments                                                                 |
| P4b                                                                         | 8              | -                                        | 1 palmate ♂               | N/A             | N/A        | No vegetation to egg search                                              |
| C1                                                                          | 5              | -                                        | -                         | N/A             | -          | -                                                                        |
| C2                                                                          | 8              | 1 palmate ♂                              | 1 smooth ♂<br>1 palmate ♂ | N/A             | -          | -                                                                        |
| C3                                                                          | 0              | -                                        | N/A                       | N/A             | -          | Too shallow to bottle trap or net and currently unsuitable for GCN       |
| C4                                                                          | 0              | -                                        | N/A                       | N/A             | N/A        | Too shallow to undertake any survey technique other than bottle trapping |
| C5                                                                          | 0              | 4 common newts                           | N/A                       | -               | -          | Frog and tadpoles present                                                |
| C6                                                                          | 6              | 6 ♂ GCN, 1 ♀ GCN, 4 ♂ smooth, 6 ♀ smooth | -                         | N/A             | -          | Egg search undertaken, but very shallow                                  |
| SL1                                                                         | 0              | N/A                                      | N/A                       | -               | -          | No night-time access                                                     |
| P1                                                                          | 0              | N/A                                      | N/A                       | -               | -          | No night-time access                                                     |
| P4                                                                          | 0              | N/A                                      | N/A                       | -               | -          | No night-time access Very shallow                                        |
| PN                                                                          | 0              | N/A                                      | N/A                       | -               | -          | No night-time access                                                     |
| P4A                                                                         | 0              | N/A                                      | N/A                       | -               | -          | No night-time access. Very shallow.                                      |
| P2                                                                          | 0              | N/A                                      | N/A                       | 1 ♂ smooth newt | 1 GCN egg  | No night-time access                                                     |
| P3                                                                          | 0              | N/A                                      | N/A                       | -               | 1 GCN egg  | No night-time access                                                     |

Footnote: - denotes that nothing was found by the survey technique. N/A denotes that this survey technique was not undertaken.

Table B.2: Survey Visit 2 Results

| Survey Visit 2 11/05/2015                                              |                |                                  |                 |               |            |          |
|------------------------------------------------------------------------|----------------|----------------------------------|-----------------|---------------|------------|----------|
| Weather: PM 15°C dry, sunny and windy. AM clear, 40% cloud, light wind |                |                                  |                 |               |            |          |
| Water body reference                                                   | No. of bottles | Torchlight survey                | Bottle trapping | Sweep netting | Egg Search | Comments |
| P4b                                                                    | 10             | 1 ♂ GCN, 1 ♀ smooth, 1 ♀ palmate | 2 ♀ GCN         | N/A           | -          | -        |
| C1                                                                     | 5              | -                                | 2 ♀ GCN         | N/A           | -          | -        |
| C2                                                                     | 10             | 1 ♀ smooth, 1 ♀                  | 4 ♀ GCN, 3 ♂    | N/A           | -          | -        |

| Survey Visit 2 11/05/2015                                              |                |                                  |                                  |               |            |                                        |
|------------------------------------------------------------------------|----------------|----------------------------------|----------------------------------|---------------|------------|----------------------------------------|
| Weather: PM 15°C dry, sunny and windy. AM clear, 40% cloud, light wind |                |                                  |                                  |               |            |                                        |
| Water body reference                                                   | No. of bottles | Torchlight survey                | Bottle trapping                  | Sweep netting | Egg Search | Comments                               |
|                                                                        |                | palmate                          | smooth, 1 ♀ palmate              |               |            |                                        |
| C3                                                                     | 0              | N/A                              | N/A                              | N/A           | N/A        | Dried up- not surveyed                 |
| C4                                                                     | 0              | N/A                              | N/A                              | N/A           | N/A        | Dried up – not surveyed                |
| C5                                                                     | 0              | 2 ♀ smooth                       | N/A                              | N/A           | -          | Frog and tadpoles present              |
| C6                                                                     | 8              | 2 ♂ GCN, 13 ♂ smooth, 2 ♀ smooth | 1 ♂ GCN, 2 ♂ smooth, 1 ♀ palmate | N/A           | -          | -                                      |
| SL1                                                                    | 0              | N/A                              | N/A                              | -             | -          | No night-time access                   |
| P1                                                                     | 0              | N/A                              | N/A                              | -             | -          | No night-time access                   |
| P4                                                                     | 0              | N/A                              | N/A                              | -             | -          | No night-time access<br>Very shallow   |
| PN                                                                     | 0              | N/A                              | N/A                              | -             | -          | No night-time access                   |
| P4A                                                                    | 0              | N/A                              | N/A                              | -             | -          | No night-time access.<br>Very shallow. |
| P2                                                                     | 0              | N/A                              | N/A                              | -             | N/A        | No night-time access                   |
| P3                                                                     | 0              | N/A                              | N/A                              | 1 ♂ palmate   | N/A        | No night-time access                   |

Footnote: - denotes that nothing was found by the survey technique. N/A denotes that this survey technique was not undertaken.

Table B.3: Survey Visit 3 Results

| Survey Visit 3 21/05/2015                             |                |                                                |                                  |               |            |                                                |
|-------------------------------------------------------|----------------|------------------------------------------------|----------------------------------|---------------|------------|------------------------------------------------|
| Weather: PM 13°C dry, light wind. AM 11°C, light wind |                |                                                |                                  |               |            |                                                |
| Water body reference                                  | No. of bottles | Torchlight survey                              | Bottle trapping                  | Sweep netting | Egg Search | Comments                                       |
| P4b                                                   | 10             | -                                              | 1 ♂ GCN, 3 ♀ GCN                 | N/A           | -          | -                                              |
| C1                                                    | 0              | -                                              | N/A                              | N/A           | -          | A lot less water than previous surveys         |
| C2                                                    | 10             | 2 ♀ GCN, 1 ♂ palmate                           | 1 ♀ GCN, 1 ♂ GCN                 | N/A           | -          | -                                              |
| C3                                                    | 0              | N/A                                            | N/A                              | N/A           | N/A        | Dried up- not surveyed                         |
| C4                                                    | 0              | N/A                                            | N/A                              | N/A           | N/A        | Dried up – not surveyed                        |
| C5                                                    | 0              | 2 ♀ unidentified common newts                  | N/A                              | N/A           | -          | Too shallow to survey other than by torchlight |
| C6                                                    | 8              | 3 ♂ GCN, 2 ♀ GCN, 11 unidentified common newts | 2 ♀ GCN, 8 ♂ smooth, 2 ♀ palmate | N/A           | -          | -                                              |
| SL1                                                   | 0              | N/A                                            | N/A                              | -             | -          | No night-time access                           |
| P1                                                    | 0              | N/A                                            | N/A                              | -             | -          | No night-time access                           |
| P4                                                    | 0              | N/A                                            | N/A                              | N/A           | -          | No night-time access, too                      |

| Survey Visit 3 21/05/2015                             |                |                   |                 |               |            |                                             |
|-------------------------------------------------------|----------------|-------------------|-----------------|---------------|------------|---------------------------------------------|
| Weather: PM 13°C dry, light wind. AM 11°C, light wind |                |                   |                 |               |            |                                             |
| Water body reference                                  | No. of bottles | Torchlight survey | Bottle trapping | Sweep netting | Egg Search | Comments                                    |
|                                                       |                |                   |                 |               |            | shallow to be suitable or to survey         |
| PN                                                    | 0              | N/A               | N/A             | N/A           | N/A        | No night-time access, Too shallow to survey |
| P4A                                                   | 0              | N/A               | N/A             | N/A           | N/A        | No night-time access, Too shallow to survey |
| P2                                                    | 0              | N/A               | N/A             | -             | -          | No night-time access                        |
| P3                                                    | 0              | N/A               | N/A             | -             | -          | No night-time access                        |

Footnote: - denotes that nothing was found by the survey technique. N/A denotes that this survey technique was not undertaken.

Table B.4: Survey Visit 4 Results

| Survey Visit 4 28/05/2015                             |                |                                       |                                  |               |            |                                                               |
|-------------------------------------------------------|----------------|---------------------------------------|----------------------------------|---------------|------------|---------------------------------------------------------------|
| Weather: PM 13°C dry, light wind. AM 11°C, light wind |                |                                       |                                  |               |            |                                                               |
| Water body reference                                  | No. of bottles | Torchlight survey                     | Bottle trapping                  | Sweep netting | Egg Search | Comments                                                      |
| P4b                                                   | 5              | -                                     | 3 ♂ GCN, 3 ♀ GCN                 | N/A           | -          | Almost completely dried up                                    |
| C1                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | Completely dried out. Could not survey                        |
| C2                                                    | 8              | -                                     | 2 ♀ GCN, 3 ♂ GCN, 1 juvenile GCN | N/A           | -          | -                                                             |
| C3                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | Dried up- not surveyed                                        |
| C4                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | Dried up – not surveyed                                       |
| C5                                                    | 0              | N/A                                   | N/A                              | N/A           | -          | Dried up – not surveyed                                       |
| C6                                                    | 6              | 1 ♀ GCN, 18 unidentified common newts | 3 ♂ GCN                          | N/A           | -          | -                                                             |
| SL1                                                   | 0              | N/A                                   | N/A                              | -             | -          | No night-time access                                          |
| P1                                                    | 0              | N/A                                   | N/A                              | -             | -          | No night-time access                                          |
| P4                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | No night-time access, too shallow to be suitable or to survey |
| PN                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | No night-time access, Too shallow to survey                   |
| P4A                                                   | 0              | N/A                                   | N/A                              | N/A           | N/A        | No night-time access, Too shallow to survey                   |
| P2                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | No night-time access                                          |
| P3                                                    | 0              | N/A                                   | N/A                              | N/A           | N/A        | No night-time access                                          |

Footnote: - denotes that nothing was found by the survey technique. N/A denotes that this survey technique was not undertaken.

Table B.5: Survey Visit 5 Results

| Survey Visit 5 02/06/2015                           |                |                                                            |                                    |               |            |                                                     |
|-----------------------------------------------------|----------------|------------------------------------------------------------|------------------------------------|---------------|------------|-----------------------------------------------------|
| Weather: PM 11°C patchy rain showers. AM 10°C, dry. |                |                                                            |                                    |               |            |                                                     |
| Water body reference                                | No. of bottles | Torchlight survey                                          | Bottle trapping                    | Sweep netting | Egg Search | Comments                                            |
| P4b                                                 | 8              | 1 ♂ smooth newt                                            | 1 ♀ GCN                            | N/A           | -          | Almost completely dried up                          |
| C1                                                  | 5              | N/A                                                        | N/A                                | N/A           | N/A        |                                                     |
| C2                                                  | 10             | 1 ♀ GCN                                                    | 1 ♀ GCN, 1 ♂ GCN, 1 ♂ palmate newt | N/A           | -          | -                                                   |
| C3                                                  | 0              | N/A                                                        | N/A                                | -             | -          | Could not bottle trap or torch due to lack of water |
| C4                                                  | 0              | N/A                                                        | N/A                                | N/A           | N/A        | Dried up – not surveyed                             |
| C5                                                  | 0              | 1 ♀ palmate newt, 1 juvenile palmate newt, 1 ♀ smooth newt | N/A                                | N/A           | -          | Too shallow to bottle trap                          |
| C6                                                  | 5              | 1 ♀ GCN, 17 unidentified common newts                      | 1 ♂ smooth newt                    | N/A           | -          | -                                                   |

Footnote: - denotes that nothing was found by the survey technique. N/A denotes that this survey technique was not undertaken.

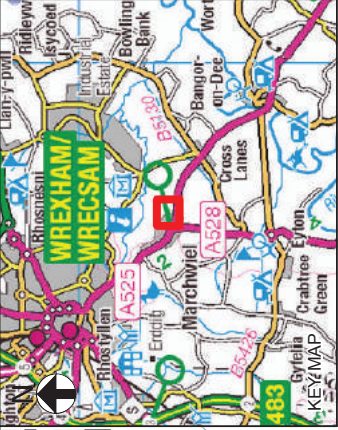
N.B 4 ♂ GCN were found in puddle adjacent to C2.

Table B.6: Survey Visit 6 Results

| Survey Visit 6 19/06/2015                           |                |                   |                 |               |            |                            |
|-----------------------------------------------------|----------------|-------------------|-----------------|---------------|------------|----------------------------|
| Weather: PM 11°C patchy rain showers. AM 10°C, dry. |                |                   |                 |               |            |                            |
| Water body reference                                | No. of bottles | Torchlight survey | Bottle trapping | Sweep netting | Egg Search | Comments                   |
| P4b                                                 | 3              | -                 | -               | N/A           | -          | Almost completely dried up |
| C1                                                  | 0              | N/A               | N/A             | N/A           | N/A        | Dried up – not surveyed    |
| C2                                                  | 0              | 2 ♀ GCN           | -               | N/A           | -          | -                          |
| C3                                                  | 0              | N/A               | N/A             | N/A           | N/A        | Dried up – not surveyed    |
| C4                                                  | 0              | N/A               | N/A             | N/A           | N/A        | Dried up – not surveyed    |
| C5                                                  | 0              | -                 | N/A             | -             | -          | Too shallow to bottle trap |
| C6                                                  | 5              | -                 | 1 ♀ GCN         | N/A           | -          | -                          |

Footnote: - denotes that nothing was found by the survey technique. N/A denotes that this survey technique was not undertaken.

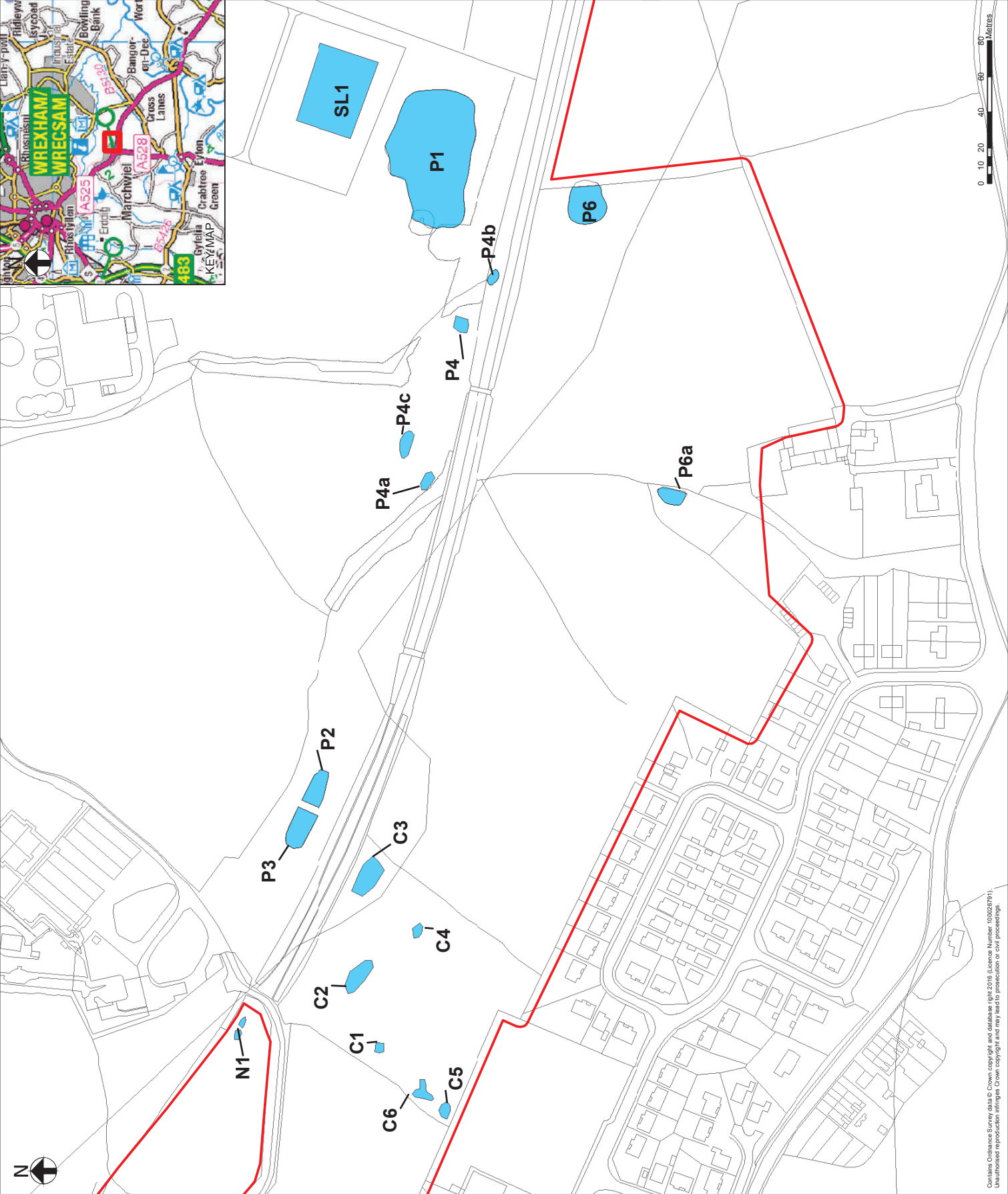
## Appendix C. Pond Location Plan



Survey date: 10/12/2015

Legend  
Site extent  
G1 - Standing water

A3



|      |          |       |                 |      |       |          |
|------|----------|-------|-----------------|------|-------|----------|
| P1   | 11/02/16 | GW    | For information | TC   | ECF   | 11/02/16 |
| Rev. | Date     | Drawn | Description     | Chkd | Appld | Date     |

**Capital Delivery Alliance**  
Mott MacDonald Bentley  
Cynghrair Cyflawni Cymalaf

*Ty Awen, Spooner Close, Caud Ynys, Newport, NP23 5EY*

Project Name: Five Fords Enhanced Digestion Facility

Drawing Title: Great Crested Newt Survey - Pond Scoping

|                |                                     |                |
|----------------|-------------------------------------|----------------|
| Subsidiary     | Preliminary                         | Stability Code |
| Originator     | GW                                  | PRE            |
| Designer       | PB                                  | 11/02/16       |
| Scale          | 1:2,000                             | Rev. P1        |
| Drawing Number | DOWW-4791-S-20-MMB-00-XX-DR-N-06007 |                |

### **J.3. GCN Mitigation Specification**



# **Five Fords AAD**

## **Great Crested Newt Mitigation Specification**

27 January 2017

Mott MacDonald Bentley  
Tŷ Awen  
Spooners Close  
Celtic Springs Business  
Park  
Coedkernew  
Newport NP10 8FZ  
United Kingdom

[www.mottmacbentley.co.uk](http://www.mottmacbentley.co.uk)

# Five Fords AAD

## Great Crested Newt Mitigation Specification

27 January 2017

# Issue and Revision Record

| Revision | Date         | Originator | Checker | Approver   | Description |
|----------|--------------|------------|---------|------------|-------------|
| P01      | January 2017 | J Brown    | J Bates | C Williams | First Issue |
|          |              |            |         |            |             |
|          |              |            |         |            |             |
|          |              |            |         |            |             |
|          |              |            |         |            |             |
|          |              |            |         |            |             |

**Document reference:** DCWW-4791-S-201-MMB-06-XX-RP-NX-19151

**Information class:** Standard

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| B.  | Great Crested Newt Proposed Pond Design | 7        |

## 1.1 Introduction

This great crested newt (*Triturus cristatus*) (GCN) mitigation specification was produced to provide details of the standard methodology for the implementation of mitigation measures detailed in the GCN Mitigation Licence currently under consideration by Natural Resources Wales. Mitigation for GCN for Five Fords AAD was discussed during a meeting held on the 17<sup>th</sup> January 2017. The mitigation detailed within this document was agreed with Matthew Ellis (NRW), Philip Forster (Wrexham Planning) and Emma Broad (Wrexham Ecologist). Details of the agreed mitigation is provided below.

## 1.2 Exclusion Fence

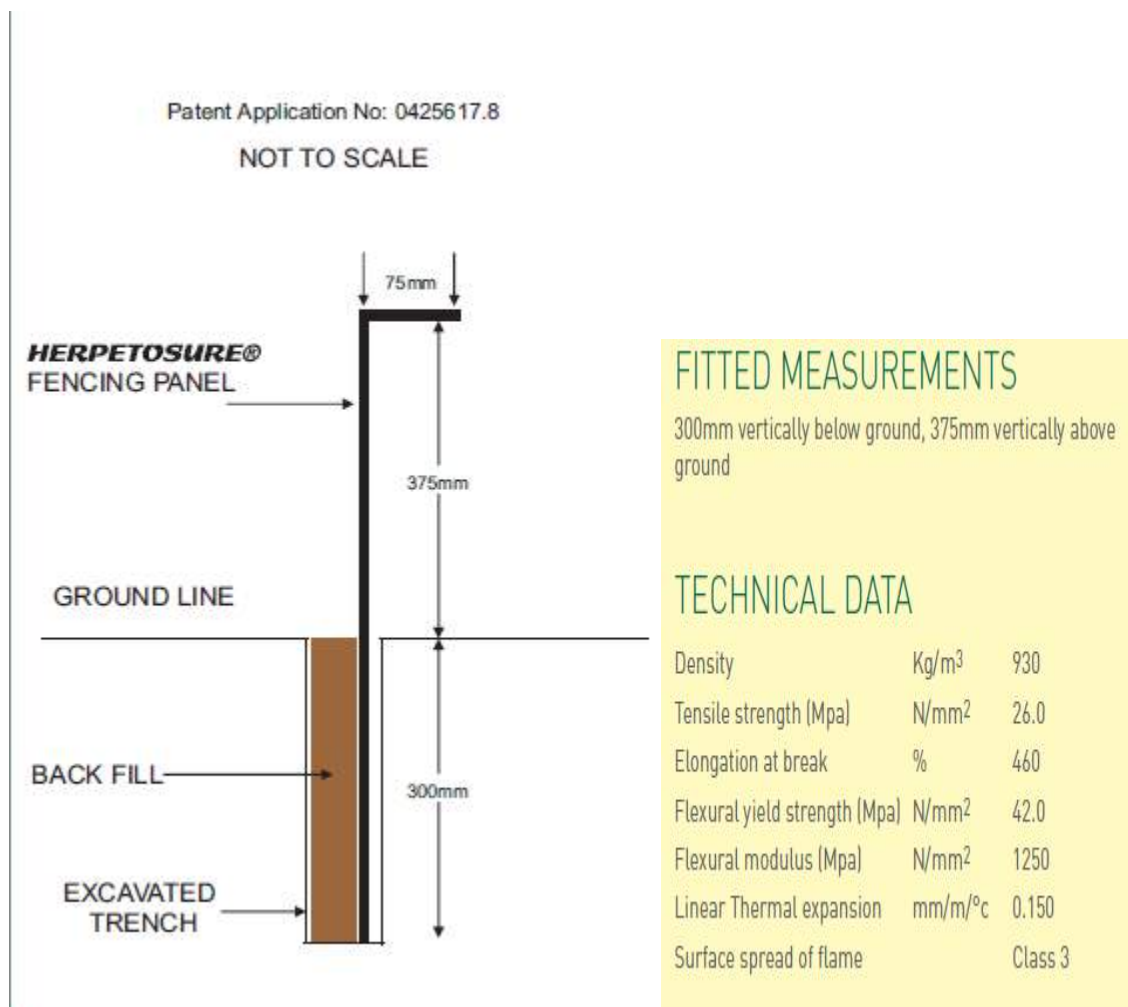
An exclusion fence acts as a wildlife barrier to keep newts, other amphibians and reptiles in or out of a specific area. The use of exclusion fencing can provide a suitable barrier to exclude GCN from site. The exclusion fence conforms to the installation methodology detailed within Natural England's (2001) great crested newt mitigation guidelines and Figure 1 below:

- Fencing installation should be instructed by, and if necessary carried out under the supervision of, an appropriately experienced ecologist see Appendix A for location.
- The proposed fence-line should first be searched and cleared of amphibians if it is likely that they are present. No vegetation clearance of the fence-line is required as the fence is to be located within an area comprising of bare ground containing minimal vegetation cover.
- The fencing layout should avoid gaps through which newts could pass, thus avoiding capture. Stiles can be constructed where a fence crosses a footpath.
- The fence should be installed to the correct height and depth and with an adequate 'under-lap' to prevent newts from passing underneath.
- The backfill should be placed turf downwards in the trench (to suppress growth of grass) and well compacted to eliminate any lumps or gaps. Backfill must not remain un-compacted overnight, and all fence trenches must be filled the same day as they have been dug, as amphibians may seek shelter within any un-compacted soil or turf.
- Exclusion fencing should have an overhang or 'top curl' to prevent newts from climbing over the fence.
- The fencing membrane should be of high-density polyethylene (HDPE) that will not break down or become brittle under exposure to the elements, notably UV light. Ensure that the sheet width is sufficient to permit the forming of the 'under-lap' and 'top-curl' (1m is sufficient for most fences).
- The fence should ideally be secured to the supporting posts by pads and nails or staples if required (not battens, which may allow newts to scale the fence).
- Fence posts (if required) should be positioned on the outside of any receptor area fence.
- Any joins in the membrane must be 'curl-joined' and well secured to a post with pads and nails. This jointing method should continue underground as well as above. Adhesive taped joins are not normally acceptable for long-term repairs to important parts of the fence, as they are not durable.
- A record of fence inspection and damage repair work should be kept by the licence holder as evidence that the newt-proof barrier has been properly maintained.
- Newts may seek refuge in the shrinkage cracks that will occur between the fence and the backfill; therefore special care needs to be exercised when removing fencing. Should any fencing need replacement (including any that has to be replaced due to faulty installation), or during the final fence removal process, then all backfill should be removed carefully by hand

under the supervision of the licence holder or an agent, if it is thought likely that newts are present. This will minimise the risk of damaging or killing any amphibians that may be sheltering in the back-fill along the fence line.

- It is sometimes necessary to control the vegetation along the fence-line to prevent the fence becoming overgrown, which helps the newts to breach the fence.
- On completion of the works the fence is to be removed under ecological supervision. The licenced ecologist will undertake a hand search / destructive search of the fence during removal as per best practice guidance.

**Figure 1 Requirements for exclusion fencing (Herpetosure [www.newtfencing.com](http://www.newtfencing.com))**



It is recommended that a more substantial type of fencing, such as modular panel fencing, is to be installed due to the anticipated construction completion date of 2019.

### 1.3 Access Gates in Exclusion Fencing

Access gates into the exclusion area can be constructed to allow access for vehicles or for crossing areas of hardstanding. Heavy duty plastic flaps which are able to deform under vehicles and then spring back can be installed in the ground across gateways, flush with fencing either side. Or gates can be constructed from the same material as the exclusion fence with a heavy duty plastic flap secured to the bottom of the gate preventing GCN access.

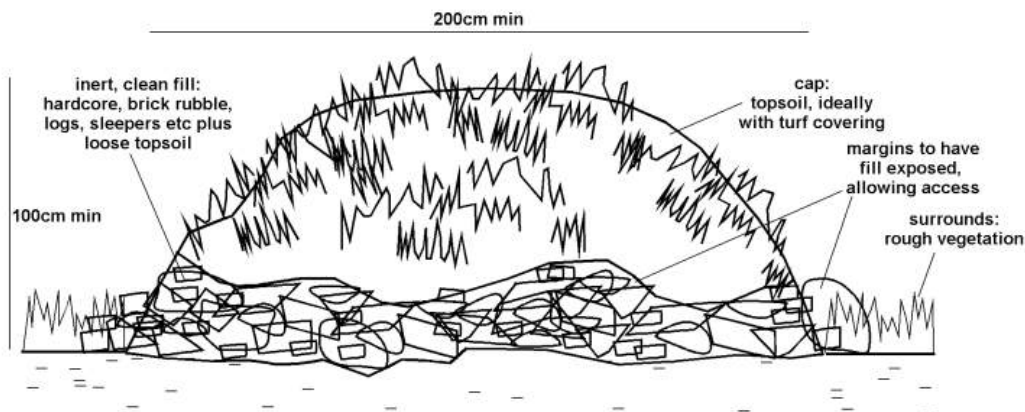
## 1.4 Habitat Enhancement

### Hibernacula Design

To improve the terrestrial habitat within the previously created compensation area, four hibernacula will be created within designated areas (Appendix A). These will provide suitable shelter for any newts within the compensation area.

Hibernacula can be created using a mixture of topsoil, rubble, rock, log piles etc. They should be located on free draining soils away from areas prone to winter flooding or freezing. They should be connected to breeding ponds or suitable terrestrial habitat. Figure 2 provides an example of hibernacula design from Natural England's (2001) great crested newt mitigation guidelines. Dimensions should not be below 2 m length x 1 m height. It can either be located on top of an impermeable substrate, or filled in a depression in the ground.

Figure 2: Example of a Hibernacula



### Pond Creation

To improve the breeding ponds within the previously created compensation area one new pond is to be created and another pond, will be re-profiled as it is no longer suitable to support GCN. Both ponds will be created with a surface area approximately of 100m<sup>2</sup> to 300m<sup>2</sup>. The pond design will contain shallow sloping ledges with an area of a maximum depth of 1.5m. The typical arrangement: shape, depth and profile is shown in Appendix B. The ponds will allow natural colonisation of aquatic plants for egg laying to prevent any transfer of alien / invasive plant species or diseases into the ponds.

## 1.5 Monitoring and Management

### Monitoring

Monitoring the GCN populations within the created breeding ponds will be undertaken over a 10-year period as requested by NRW. Population surveys are to be undertaken to establish the likely success of the mitigation and provide population counts for the created ponds. Population surveys are to follow the National Amphibian and Reptile Recording Scheme (NARRS: v2013) Amphibian Survey Protocols. This will include four surveys over the survey season (mid March to mid June) and will include three out of four methods. It is recommended that the use of netting the pond is avoided for the first 5 years to allow establishment of flora and fauna in the pond.

## Management

During the yearly GCN population surveys the condition of the ponds and their functionality to support GCN will be assessed. If the ponds decline, then pond restoration may be required. Any pond restoration works are to follow guidance as detailed within Langton *et al.* (2001).

The grassland habitat within the mitigation area requires annual sensitive maintenance for GCN. The grassland will require cutting or grazing at least annually at a time when newts are less likely to be harmed. The grassland should be cut during hot and dry weather in September - October. Sections of the pond, woodland and hedgerow margins should be left uncut up to 5 m in width to allow some dense cover throughout the year.

Scrub and woodland within the site should be managed. Small areas of felling or coppicing using hand held tools on a rotational basis is to occur to ensure minimal disturbance to GCN. Areas to be managed are to be identified by the licenced ecologists.

### 1.6 Drainage maintenance

The amphibian friendly drainage kerbs will be swept clear of any debris on a monthly basis in order to maintain its function.

### 1.7 Reference

Herpetosure (2016) *Newt & Slow Worm Fencing*

<http://www.newtfencing.com/include/herpetosure-newt-slow-worm.pdf> accessed 25/01/2017

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), *Great Crested Newt Conservation Handbook*, Froglife, Halesworth.

National Amphibian and Reptile Recording Scheme (NARRS) (v. 2013) *NARRS Amphibian Survey Protocols*.

Natural England's (2001) *Great Crested Newt Mitigation Guidelines* 1 August 2001.

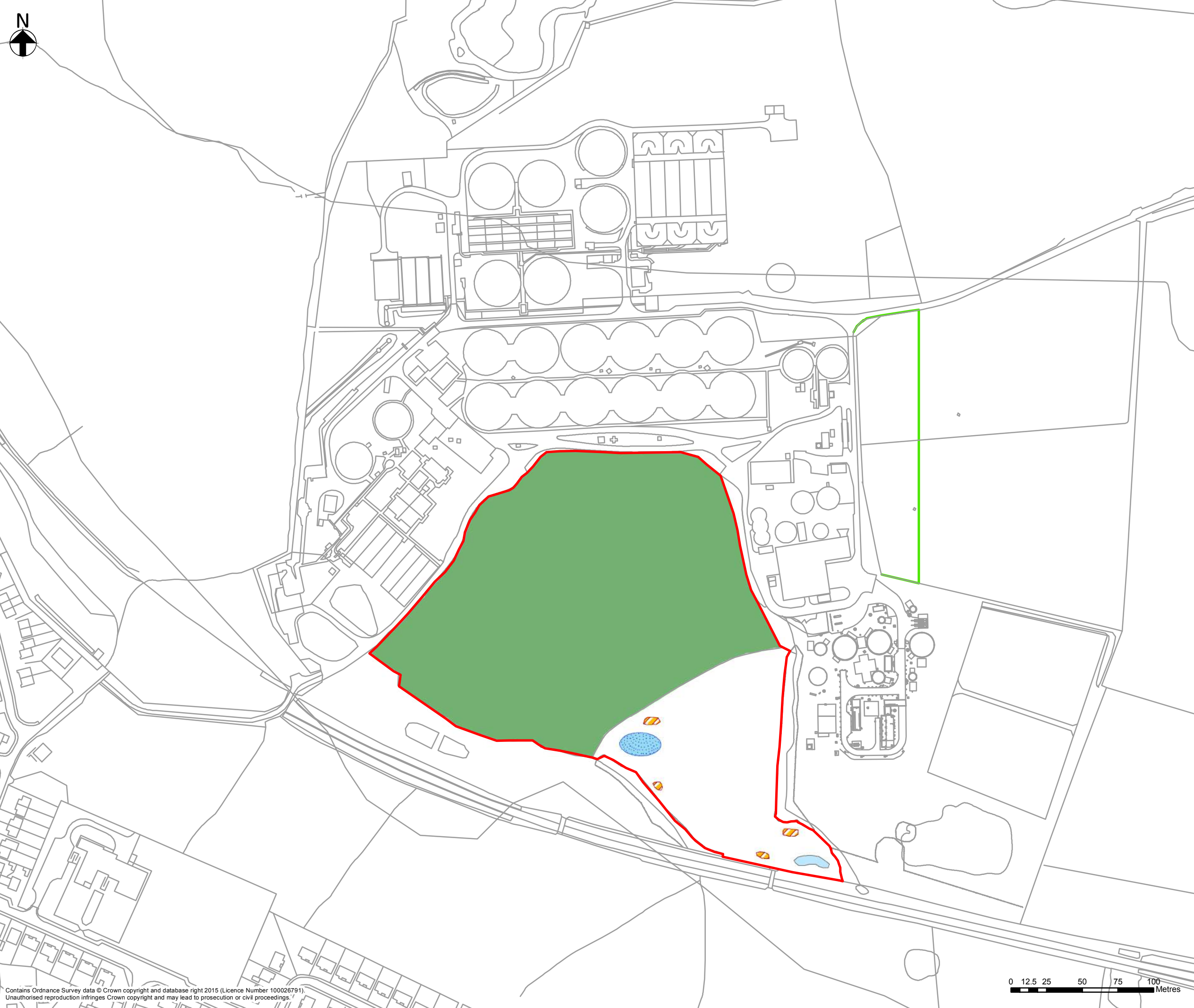
Natural England's (2015) *Great Crested Newt: Survey and Mitigation for Development Project Guidance*. Updated 24 December 2015 <https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects>

Imtech Process Limited (2010) *Ecological Method Statement and Timetable of Works*, Five Fords Sludge Treatment and Sustainable Energy Plant July 2010.

# Appendices

|    |                                         |   |
|----|-----------------------------------------|---|
| A. | Great Crested Newt Mitigation Plan      | 6 |
| B. | Great Crested Newt Proposed Pond Design | 7 |

## **A. Great Crested Newt Mitigation Plan**



### Legend

- Proposed Great Crested Newt Exclusion Fence
- New Pond (Refer to pond design drawing: DCWW-4791-S-201-MMB-06-XX-RP-NX-19153)
- Proposed Hibernacula
- Re-profiling of Pond
- Marchwiel Covert (Identified as a GCN area)
- Existing Compensation Area

|      |            |       |                 |       |       |            |
|------|------------|-------|-----------------|-------|-------|------------|
| P1   | 27/01/2017 | GT    | For Information | JB    | CW    | 27/01/2017 |
| Rev. | Date.      | Drawn | Description.    | Chkd. | Appd. | Date.      |

Mott MacDonald Bentley

Cynghrair Cyflawni Cyfalaf

Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name:

Five Fords WwTW AAD Scheme

Drawing Title:

Great Crested Newt Mitigation Plan

Suitability:

For Information

Suitability Code:

INF

|                                       |                  |                     |
|---------------------------------------|------------------|---------------------|
| Originator<br>GT                      | Designer<br>JB   | Date.<br>27/01/2017 |
| Internal Project Number<br>381177NN26 | Scale<br>1:2,500 | Rev.<br>P1          |

Drawing Number:

DCWW-4791-S-201-MMB-06-XX-RP-NX-19152

0 12.5 25 50 75 100 Metres

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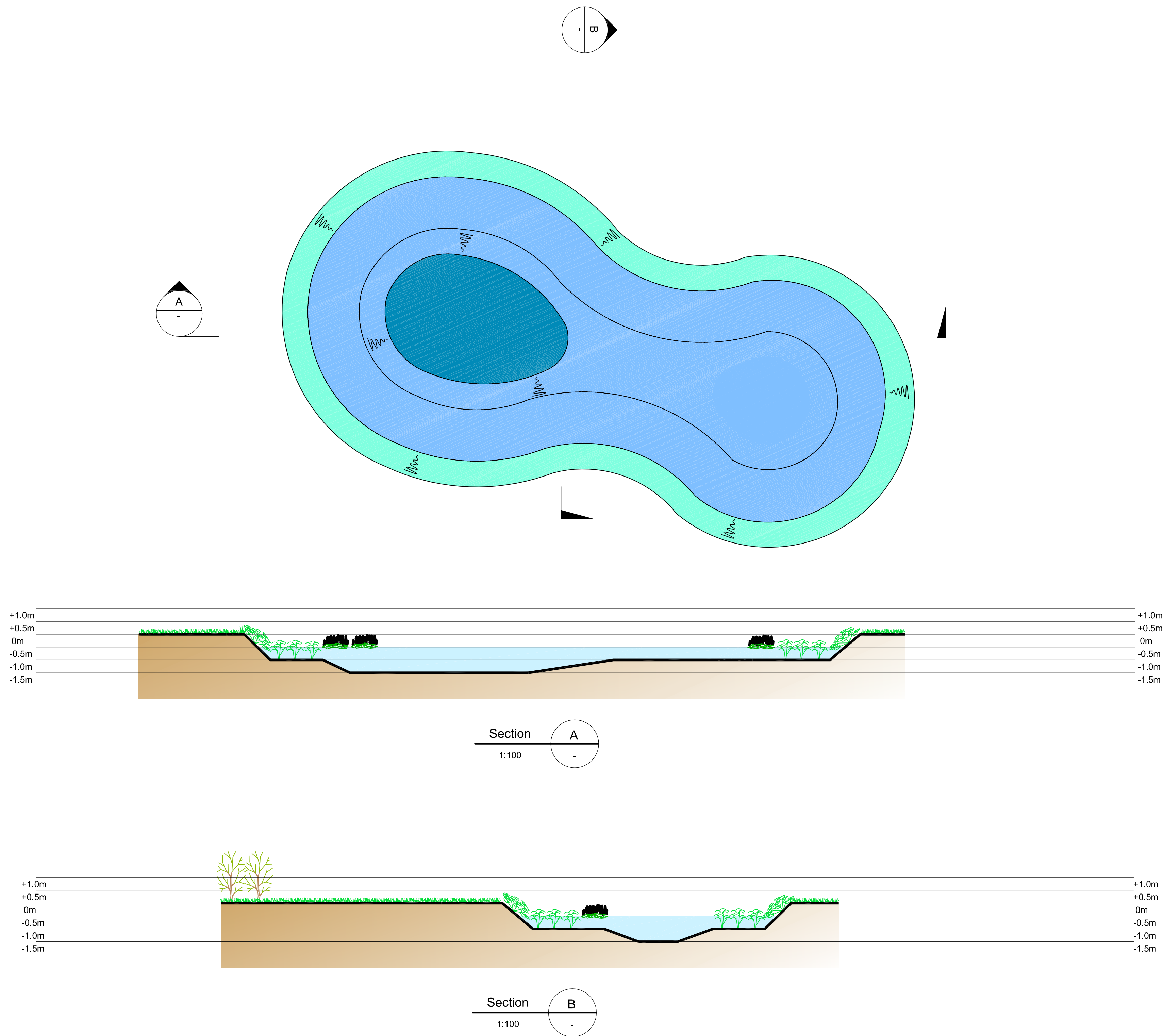
THIS MAP IS BASED UPON THE ORDNANCE SURVEY MATERIAL WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE. © CROWN COPYRIGHT 2015 LICENCE NUMBER

## **B. Great Crested Newt Proposed Pond Design**

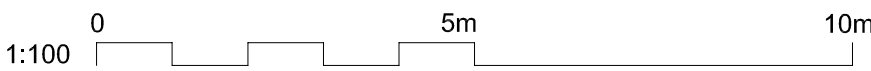
NOTES:

LEGEND

- DEEP WATER: 1.5M DEEP
- OPEN WATER SHELF: 0.5M - 1.0M DEEP
- SHALLOW WATER MARGIN: 0M - 0.5M DEEP



|                                                                                                                                                                                                                                                                   |          |                  |                 |                   |                   |          |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|-----------------|-------------------|-------------------|----------|--|
| P1                                                                                                                                                                                                                                                                | 27.01.17 | RT               | FOR INFORMATION | JJB               | CW                | 27.01.17 |  |
| Rev.                                                                                                                                                                                                                                                              | Date.    | Drawn.           | Description.    | Chkd.             | Appd.             | Date.    |  |
| <div><div></div><div><div>Capital Delivery Alliance</div><div>Cynghrair Cyflawni Cyfaloaf</div></div></div> <div>Ty Awon, Spooner Close, Coad Kernew, Newport, NP108FZ</div> |          |                  |                 |                   |                   |          |  |
| Project Name:<br>FIVE FORD WTW AAD SCHEME                                                                                                                                                                                                                         |          |                  |                 |                   |                   |          |  |
| Drawing Title:<br>GREAT CRESTED NEWT<br>PROPOSED POND DESIGN                                                                                                                                                                                                      |          |                  |                 |                   |                   |          |  |
| Suitability.                                                                                                                                                                                                                                                      |          |                  |                 |                   | Suitability Code. |          |  |
| Originator.<br>RT                                                                                                                                                                                                                                                 |          | Designer.<br>JJB |                 | Date.<br>27.01.17 |                   |          |  |
| Internal Project Number.<br>381177/NN26                                                                                                                                                                                                                           |          | Scale.<br>1:100  |                 | Rev.<br>P1        |                   |          |  |
| Drawing Number.<br>DCWW-4791-S-201-MMB-06-XX-RP-NX-19153                                                                                                                                                                                                          |          |                  |                 |                   |                   |          |  |



#### **J.4 Invasive Species and Biosecurity Risk Assessment.**



# **Five Fords Thermal Hydrolysis Plant**

Invasive Species and Biosecurity Method  
Statement

17 February 2017

Mott MacDonald Bentley  
Ty Awen  
Spooner Close  
Celtic Springs Business  
Park  
Coedkernew  
Newport NP10 8FZ  
United Kingdom

[www.mottmacbentley.co.uk](http://www.mottmacbentley.co.uk)

# **Five Fords Thermal Hydrolysis Plant**

## **Invasive Species and Biosecurity Method Statement**

17 February 2017

# Issue and Revision Record

| Revision | Date             | Originator | Checker | Approver   | Description                                                                  |
|----------|------------------|------------|---------|------------|------------------------------------------------------------------------------|
| P01      | April 2015       | D Hatuqa   | J Bates | EC Probert | First Issue                                                                  |
| P02      | 28 January 2016  | C Williams | J Bates | EC Probert | Second Issue                                                                 |
| P03      | 06 October 2016  | J Brown    | R Smith | C Williams | Update for AAD site                                                          |
| P04      | 17 February 2017 | J Bates    | J Brown | C Williams | Update to include for aquatic species as part of the GCN Licence application |
|          |                  |            |         |            |                                                                              |
|          |                  |            |         |            |                                                                              |
|          |                  |            |         |            |                                                                              |

**Document reference:** 4791-S-201-MMB-06-XX-RP-NX-19002

## Information class: Standard

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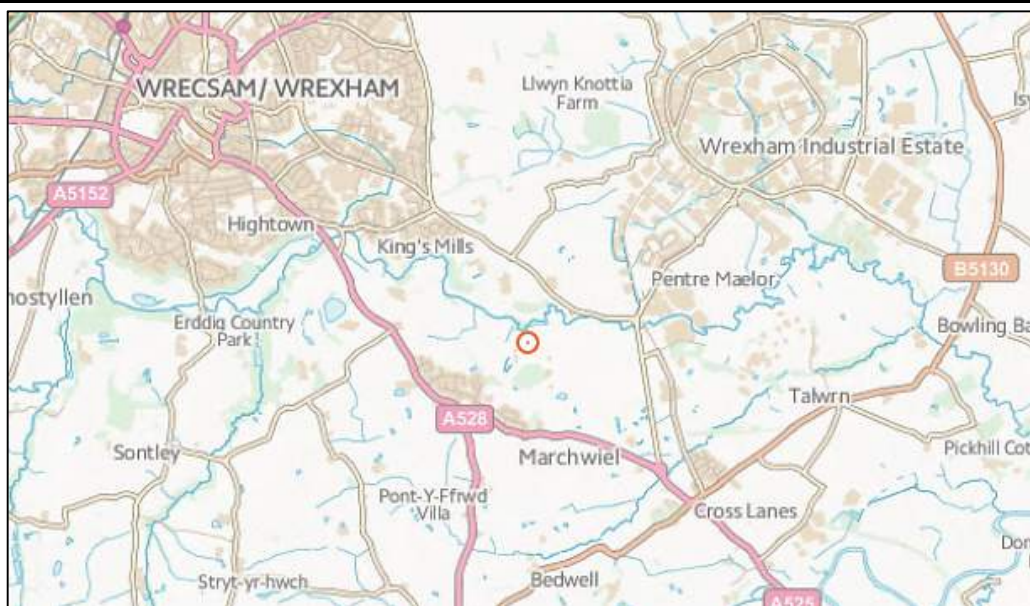
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# 1 Introduction

## 1.1 Project Background

Mott MacDonald Bentley (MMB) were commissioned by Dŵr Cymru Welsh Water (DCWW) to provide ecological support for the proposed Thermal Hydrolysis Plant at Five Fords Wastewater Treatment Works (WwTW). The WwTW lies between Wrexham, Wrexham Industrial Estate and the village of Marchwiel as shown in Table 1.1 below centred on Ordnance Survey Grid Reference SJ 36054 48054.

**Table 1: Site Location Plan.**



Source: Ordnance Survey Crown Copyright data @ Crown copyright and database 2017

The WwTW is situated in a predominantly rural area with the surrounding areas consisting of agricultural land, within the village and (ancient) parish of Marchwiel, approximately 2km to the south west of Wrexham. The WwTW is immediately bordered by areas of woodland, arable and pastoral fields and their associated hedgerows. The River Clywedog forms the northern boundary of the WwTW and the village of Marchwiel is located to the south.

## 1.2 Scope of the Report

A Preliminary Ecological Appraisal (PEA) was conducted by MMB to inform the design for the proposed works. The PEA included an extended Phase 1 habitat survey and a desk study. The Phase 1 survey did not identify any invasive species on site, probably due to seasonal identification constraints. However, the desk study reviewed previous ecological investigations that were carried out on site which included a study carried out by AECOM (2008) that observed Japanese knotweed and Himalayan balsam on the banks of the River Clywedog. The Ordnance Survey Grid Reference location for the Japanese knotweed was SJ 36159 48437, 750m upstream of the access bridge onto the site, and for the Himalayan balsam SJ 36310 48414, 600m upstream of the bridge.

Whilst these invasive species are not known to be present within the Thermal Hydrolysis Plant working area the recorded presence of Japanese knotweed and Himalayan balsam upstream of the River Clywedog means that there is potential for this plant to be present at the access road to the site, through seeds and plant debris migrating with the river flow and settling along the bank. Although not recorded on site, records indicate that Giant hogweed has also been identified within the local area and as such this has been included in the assessment.

During the 2016 WwTW access road improvement works, Himalayan balsam was recorded along the River Clywedog. No invasive species were recorded within the proposed works area for the Thermal Hydrolysis Plant. As a precautionary approach the works are to follow this method statement if any invasive species colonise the site during the works.

### 1.3 Scope of Works

The aim of this method statement is to provide a precautionary method of working if any invasive species are found within the site or colonise the site from the surrounding area during construction. The primary method for minimising the spread of these weeds should be to avoid disturbing any of the plants by altering working areas wherever possible. However, where this is not possible, the plant stands will be treated appropriately to prevent them from spreading as described in Section 3 of this report.

### 1.4 Relevant Legislation

The following list contains the relevant legislation in relation to invasive plants and their proposed treatment and disposal:

- Environmental Protection Act 1990. Defines the legal framework for duty of care for waste, contaminated land and statutory nuisance;
- Ragwort Control Act 2003. Inserts into the Weeds Act 1959 a new section enabling the government to make a code of practice on preventing the spread of ragwort;
- Weeds Act 1959. Enables the Secretary of State for the Environment, Food and Rural Affairs (or their delegates through the Natural Environmental and Rural Communities Act 2006) to enforce land occupiers where injurious weeds (including ragwort) are growing to take action to stop them spreading and fined if the order is not complied with;
- Wildlife and Countryside Act 1981 (Section 14) Bans certain methods of killing or taking wild animals, including birds, and restricts the introduction and sale of certain non-native animals and plants. Also sets out the amended laws relating to public rights of way;
- Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order SI 2010/609. Amends the Wildlife and Countryside Act 1981 by adding new species to the list of plants not to be planted or allowed to grow in the wild, including Himalayan balsam, floating pennywort and cotoneaster;
- Environmental Permitting (England and Wales) Regulations SI 2010/675. Provides a consolidated system for environmental permits and exemptions for industrial activities, mobile plant, waste operations, mining waste operations, water discharge activities, groundwater activities and radioactive substances activities. It also sets out the powers, functions and duties of the regulators; and
- Control of Pesticides Regulations 1986 – requires any person who uses pesticides to take all reasonable precautions to protect the health of human beings, creatures and plants, and to safeguard the environment and in particular avoid pollution of water.

## 1.5 Identification of Invasive Weed Species

Appendix A provides a guide to Japanese knotweed, Himalayan balsam and Giant hogweed identification (NNSS, 2015).

## 1.6 How Invasive Plants Spread

The following section presents a short account of how invasive plants spread, as given by the Department of the Environment Food and Rural Affairs (DEFRA, 2013).

### How Japanese Knotweed Spreads

Japanese knotweed does not spread from seeds in the UK as all of the plants recorded in the UK are female. It is spread when small pieces of the plant or rhizomes (underground root-like stems) are broken off. One piece of rhizome or plant the size of a fingernail can produce a new plant.

Pieces of plant or rhizome can be transported to a new location by:

- Water - if the parent plant is close to a river or stream;
- Moving soil which contains them; and
- Fly-tipping cut or pulled stems.

Individual plants can cover several square meters of land, joined up below ground by an extensive rhizome network. Herbicide treatment can be a very effective way of controlling Japanese knotweed, but a lack of regrowth does not mean the underground rhizome is dead. If the soil is disturbed, knotweed often regrows.

### How Giant Hogweed Spreads

Giant hogweed produces large, umbrella-like flowers, each of which can produce up to 50,000 seeds. These seeds fall typically within 4m of the parent plant. Seeds can be transported by:

- Vehicles - particularly along roads and railways;
- Water - if the parent plant is close to a river or stream;
- Footwear; and
- Moving soil which contains them.

The seeds can remain dormant in the soil for up to 15 years. Even if you treat the plants with herbicides and they die, several thousand seeds are waiting in the ground below for the opportunity to take their place. Any control program needs to continue for several years, including checks for new growth. When managing giant hogweed it is important to maintain a healthy grass sward, either by using selective herbicides or by sowing grass mixes. A dense grass sward helps to prevent giant hogweed seeds from germinating.

Giant hogweed contains sap that is released when the plant is cut or by brushing against the plant. Contact with the sap causes skin to become sensitive to sunlight, resulting in painful blisters which appear up to two days after contact and may reoccur for several years.

### How Himalayan Balsam Spreads

Himalayan balsam plants can produce around 2,500 seeds each year. The seedpods open in such a way that the seeds are thrown up to 7m away from the parent plant, helping the species to quickly spread. Seeds can also be transported by:

- Water - if the parent plant is close to a river or stream;

- Tracked vehicles;
- Footwear; and
- Moving soil which contains them.

Even if you remove these plants, or treat them with herbicides and they die, several hundred seeds can be waiting in the ground below for the opportunity to take their place. The seeds can survive for several years, so any control program needs to continue for a couple of years, including checks for new growth.

### **How Australian Swamp- stonecrop spreads**

Also known as New Zealand Pigmyweed. This species can be a submerged, emergent or terrestrial plant and easily recognisable by its fleshy leaves. The plant spreads rapidly forming a mat or carpet within ponds often with 100% cover and it displaces other aquatic species. The plant does not produce viable seeds in the UK and reproduces from very small stem fragments.

There are three typical growth forms which change according to conditions.:

- a terrestrial form with creeping stems and aerial, succulent leaves;
- an emergent form with densely packed stems, found in water less than 0.6m deep; and
- a submerged form that grows from a basal rosette with long, sparsely-leaved stems reaching the surface.

Pieces of plant or rhizome can be transported to a new location by:

- Water - if the parent plant is close to a river or stream;
- Moving soil which contains them;
- Footwear and pond survey equipment; and
- Fly-tipping cut or pulled stems.

## 2 Biosecurity Risk Assessment

This section of the report assesses the risk of encountering invasive plants during construction of the Thermal Hydrolysis Plant. The methodology adopted is taken from local planning guidance provided by Wrexham County Borough Council.

### 2.1 Methodology

The following approach was adopted:

- Activities and associated hazards posed by invasive species were identified;
- For each activity/hazard, an assessment of the severity of impact and likelihood of activity to cause spreading of invasive species prior to control measures was undertaken;
- The overall risk factor was calculated; and
- Control measures to reduce the likelihood of invasive species spread were considered and the residual risk determined.

The assessment is shown in Table 2.1. Risks are assessed qualitatively using the following descriptors of severity and likelihood:

|                       |                 |
|-----------------------|-----------------|
| Severity of Impact:   | 1 Minimal       |
|                       | 2 Minor         |
|                       | 3 Moderate      |
|                       | 4 Likely        |
|                       | 5 Massive       |
| Likelihood of Impact: | 1 Very Unlikely |
|                       | 2 Unlikely      |
|                       | 3 Possible      |
|                       | 4 Probable      |
|                       | 5 Very Likely   |

The risk factor is calculated as the product of the severity and likelihood so that an activity with a Moderate severity that was considered Probable to occur would have a risk factor of  $3 \times 4 = 12$ . Guidance is provided on actions to be taken dependent upon the calculated residual risk factor:

|                  |                                                                |
|------------------|----------------------------------------------------------------|
| Risk Factor 1-4  | OK to proceed                                                  |
| Risk Factor 5-12 | Further controls should be applied to further reduce risk; and |
| Risk Factor 12+  | Unacceptable risk.                                             |

This Method Statement is concerned with the potential for invasive plants to be present within the construction area; whilst no invasive plants have been positively identified within the site their presence in the wider area has been noted and consequently the potential for plants to be encountered requires consideration.

**Table 2: Risk Assessment**

| Activity/ Hazard                                                                                                                            | Severity | Likelihood | Risk Factor | Mitigation                                                                                                                                                                                                                                | Severity | Likelihood | Residual Risk Factor |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|----------------------|
| Top soil strip                                                                                                                              | 3        | 5          | 15          | Site inspection prior to excavation to identify presence of invasive plants.<br>Any invasive plants to be removed and disposed of.<br>Stockpiles controlled to prevent unnecessary spreading. Any affected soils to be stored separately. | 3        | 1          | 3                    |
| Himalayan balsam and Giant hogweed seeds and Japanese knotweed infected soils spread to other parts of the wider site through reuse of soil | 3        | 5          | 15          | No soil to be moved from the construction site.                                                                                                                                                                                           | 3        | 1          | 3                    |
| Spreading of infected soil on machinery                                                                                                     | 3        | 4          | 12          | All machinery to be cleaned following use.                                                                                                                                                                                                | 3        | 1          | 3                    |
| Australian Swamp – stonecrop infected in ponds or terrestrial habitat. Impact on GCN                                                        | 4        | 3          | 12          | Site inspection prior to excavation to identify presence of invasive plants.<br>Any invasive plants to be treated appropriately.<br>Ensure that all footwear and pond survey equipment is cleaned and check for presence of the plant     | 4        | 2          | 8                    |

The control measures proposed will prevent the spread of invasive plants that may be present within the soil on the construction site.

## 3 Treatment of Invasive Weed Species

### 3.1 Method Statement

Prior to the commencement of works all construction staff shall be briefed in relation to the contents of this method statement which should then be displayed prominently within the site office.

### 3.2 Site Preparation

No invasive species have been recorded within the proposed Thermal Hydrolysis Plant works area. Construction staff are to remain vigilant during the works and are to report if any invasive plants have spread on site. Any new stands of invasive weeds will also need to be noted on the plans and marked out on site.

The outer edges of all unprotected stands of invasive weeds will be marked with highly visible orange mesh fencing, or similar to denote the presence of invasive weeds. Fencing is to be retained in place for the duration of the contract. Signs warning site workers of the presence of invasive weeds will be attached to the fencing at agreed locations.

### 3.3 Avoidance of Contamination and Suitable Treatment Methods

If the presences of invasive plants are confirmed, it may be possible to exercise avoidance measures to avoid their spread if the number of individual plants is low and if they are located away from high activity areas. If avoidance is not feasible, then suitable treatment methods are recommended.

#### Japanese knotweed

As previously discussed, the main cause for the spread of Japanese knotweed is either via fragmentation of the plant above ground, or through disturbance to its underground root system.

If a small number of knotweed plants are identified, and the plants can be avoided, fencing should be erected to provide an 'Exclusion Zone' around the plants. As the area of Japanese knotweed infestation can extend 7m horizontally from the nearest stem growth that can be seen, the exclusion zone should take this into account. Signs warning site operatives of the presence of Japanese knotweed should be put up in this area to prevent inadvertent trafficking.

Where access routes and working areas cannot be altered to avoid the plants, the focus should be on avoiding breaking the surface of the soil within these areas and containment of the plant parts within the areas which are already contaminated. Where this is not possible, then digging out the plants and the soil around it within a 7m diameter may be undertaken. This method should be employed with caution because it is likely that this soil will contain rhizomes which can establish themselves and spread the infestation. Potential contaminated soil should be regarded as 'controlled waste' under the Environmental Protection Act 1990, and as discussed earlier, this requires disposal at licensed landfill sites or treatment on site in accordance with the Japanese knotweed code of practice.

It is highly recommended that the guidance document produced by the Environment Agency Managing Japanese knotweed on development sites is referred to prior to undertaking management works (Environment Agency, 2013).

## **Himalayan balsam**

As the main cause for the spread of Himalayan balsam is via seed dispersal, the focus should be to avoid moving the soil within both the infected and adjacent areas where the seeds may have fallen. As with Japanese knotweed, where possible, fencing should be erected to provide an 'Exclusion Zone' around the plants. Where avoidance is not possible, it is recommended that bashing down or brush cutting to ground level is carried out before the plants set seed in April or early May. Small infestations can be controlled by hand-pulling as the species is shallow rooted. If cutting or hand pulling is to be carried out after this time, bag plant tops to prevent seed spread.

## **Giant hogweed**

Giant hogweed spreads through seed dispersal. However, the main driver behind setting an exclusion zone around this plant is to protect the public and employees from the hazards of its toxic sap, as well as avoiding its spread.

For a small number of plants mechanical control can be employed by cutting down to ground level. It's imperative that the operator is wearing full protective clothing (with gloves, a hood and a full-face visor) to prevent skin contamination by the sap. Protective clothing should be washed down before being removed. If sap gets on the operator's skin, then the area should be covered to keep it out of the sun, and the person should go indoors immediately and wash the sap off their skin with soap and lots of water.

For larger infestations, chemical control can be undertaken using a non-residual herbicide such as glyphosate. The plants can be sprayed when the plants are growing actively but still less than about 1 m high. This is usually in April and May. The herbicide can be applied as a spot treatment to individual plants, using hand-held equipment, or as an overall spray using machine-mounted spray booms. In the latter instance, total weed control of all vegetation will occur and it may be necessary to reseed the treated area with grass and other native plants.

## **Australian Swamp- stonecrop**

Yearly monitoring of the ponds will be undertaken as part of the Great Crested Newt licence and as such the pond should be inspected for infestation prior to surveys or any maintenance works being undertaken. If a small number of plants are identified then treatment should commence immediately.

Emergent growth can be controlled using a highly dilute, high volume solution of glyphosate (5ml/l), applied at a walking rate of 6 seconds per metre. The plant must not be cut. To minimise harm to breeding newts, invertebrates and other wildlife, pygmyweed should be removed outside of the main macrophyte growing period between late autumn and winter. This is also a period where it grows less readily and therefore less likely to encounter risk of fragmented plant material been spread through the site. Alternatively if the pond does dry out during the summer, pygmyweed can be removed in the summer once advice is sort from the site ecologist. Dredged material should be piled in heaps and covered with thick black polythene sheeting or at least 20cm of soil.

Take care to check that any machinery and equipment is clean once works have been completed. Clean down any excavator buckets from the digger machinery after works have been completed.

### 3.4 Cleaning

All machines and equipment are to be in a clean condition before entering an infected area. On leaving an infected area all machines are to be thoroughly cleaned only within these areas with a road pin, brush or shovel. The use of chemicals and washing with water is not advised.

## 4 References

AECOM, (2008). Five Fords Ecology Report.

GB Non-native Species Secretariat (2015). website.

<http://www.nonnativespecies.org/home/index.cfm>

DEFRA (2013). Environmental Management –Guidance. Japanese knotweed, giant hogweed and other invasive plants. <https://www.gov.uk/japanese-knotweed-giant-hogweed-and-other-invasive-plants#identifying-invasive-plants> (accessed February 2015).

MMB (2014). Five Fords Access Road Improvements. Preliminary Ecological Appraisal.

Non- Native Species Secretariat, Invasive species sheets:

Japanese Knotweed

Himalayan Balsam

Giant Hogweed

New Zealand Pigmyweed

# Appendices

|    |                                       |    |
|----|---------------------------------------|----|
| A. | Invasive Plants Identification Sheets | 12 |
|----|---------------------------------------|----|

## **A. Invasive Plants Identification Sheets**

# Giant Hogweed

## Species Description

**Scientific name:** *Heracleum mantegazzianum*

**AKA:** Efwr enfawr (Welsh)

**Native to:** Caucasus mountains in south west Russia and Georgia

**Habitat:** Widespread, most common on river banks

Easy to identify when fully grown by height, size of leaves and size of flowers. Can be confused with native hogweed when not fully grown or when growth is stunted (e.g. regrowth after cutting).

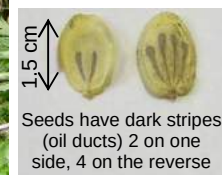
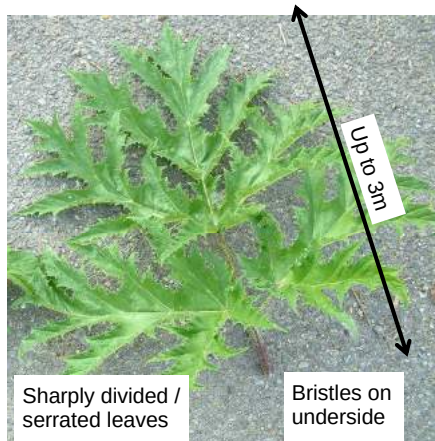
Introduced as an ornamental. First recorded wild in the UK in the late 19th century. Spreads solely by seeds, mainly through deliberate planting, wind dispersal and in water courses. Now common across much of the UK. Contact with any part of this plant must be avoided as even minute amounts of sap can cause blistering of the skin following exposure to sunlight. Other negative impacts include out-competing native flora, river bank erosion and increase in flood risk. Can cause delays/ additional costs on development sites where the plant must be removed as controlled waste in order to comply with legislation.

Giant hogweed is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England, Wales and Scotland. As such it is an offence to plant or otherwise cause this species to grow in the wild. Under the Environmental Protection Act 1990, giant hogweed is also classified as controlled waste.

For details of legislation go to [www.nonnativespecies.org/legislation](http://www.nonnativespecies.org/legislation).



## Key ID Features



# Identification throughout the year

## Spring



## Summer



## Winter

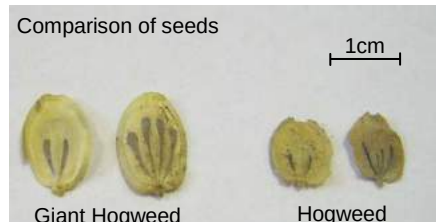
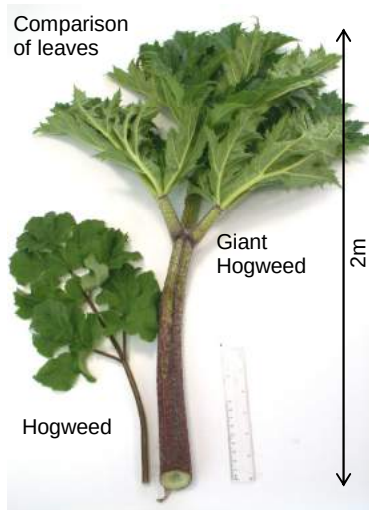


## Similar Species



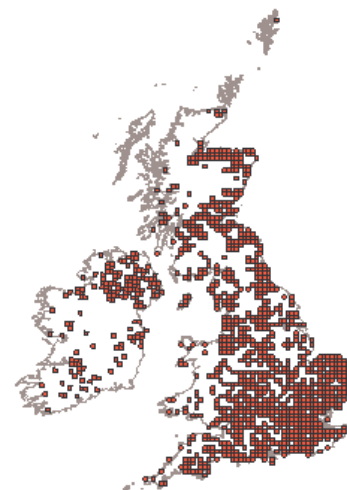
When in full height it is difficult to confuse giant hogweed with any other plant. While still growing or stunted, possibly as a result of disturbance, it can be confused with some other native plants. The most likely species with which it might be confused is hogweed.

Key differences between hogweed and giant hogweed include the height, width of stem, size of leaf, size of flower head and size of seed.



## Distribution

Widespread and common across much of the UK. Extensive infestations are found particularly in Scotland and the north of England. Less abundant in Cornwall. Often associated with large rivers.



Source: NBN Gateway. Check website for current distribution

## References and further reading:

- Blamey, M, Fitter, R and Fitter, A (2003) "*The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora.*" A & C Black
- Booy, O and Wade, P M (2007) "*Giant Hogweed Management in the United Kingdom.*" RPS Group plc
- Pyšek P, Cock, M J W, Nentwig, W & Ravn, H P (2007) "*Ecology and Management of Giant Hogweed (Heracleum mantegazzianum).*" CAB International
- Stace, C (1999) "*Field Flora of the British Isles.*" Cambridge University Press

# Himalayan Balsam

## Species Description

**Scientific name:** *Impatiens glandulifera*

**AKA:** Policeman's Helmet, Indian Balsam, Jac y Neidiwr (Welsh)

**Native to:** West and central Himalayas

**Habitat:** Found mostly on river banks and in damp woodland, can grow in other damp habitat

A tall, attractive, annual herb with explosive seed heads. Although easy to identify as a mature plant with its pink-purple flowers, fleshy stem and characteristic leaves, the seedlings and last year's dead stems of this annual are more difficult to spot.

Introduced as a garden plant in the early 19<sup>th</sup> century and first recorded in the wild in 1855. Often favoured by the general public for its aesthetic appeal and is still deliberately planted on occasion. Now widespread in the UK, especially along urban rivers. Spreads solely by seeds, which are small and easily carried by wind or water.

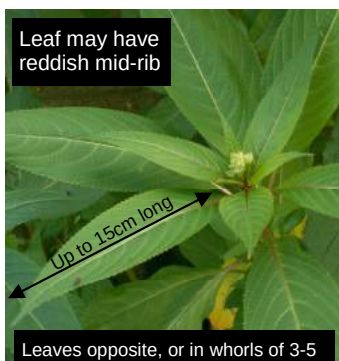
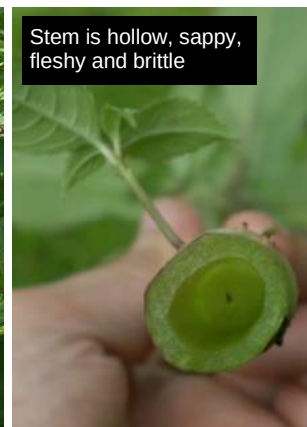
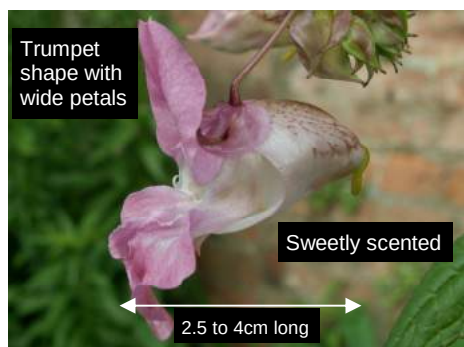
Out-competes native species in ecologically sensitive areas, particularly river banks. Where it grows in dense stands along river banks it can impede flow at times of high rainfall, increasing the likelihood of flooding. Die back of extensive stands over winter can leave river banks bare and exposed to erosion.

Himalayan balsam is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

For details of legislation go to [www.nonnativespecies.org/legislation](http://www.nonnativespecies.org/legislation).



## Key ID Features



# Identification throughout the year

Can be identified at most times of the year: March-June by its seedlings, stem and leaf shape, from July to September by its stem, leaf shape and flowers. More difficult to identify over winter (October to February), look for hay like remains and distinctive root structure.



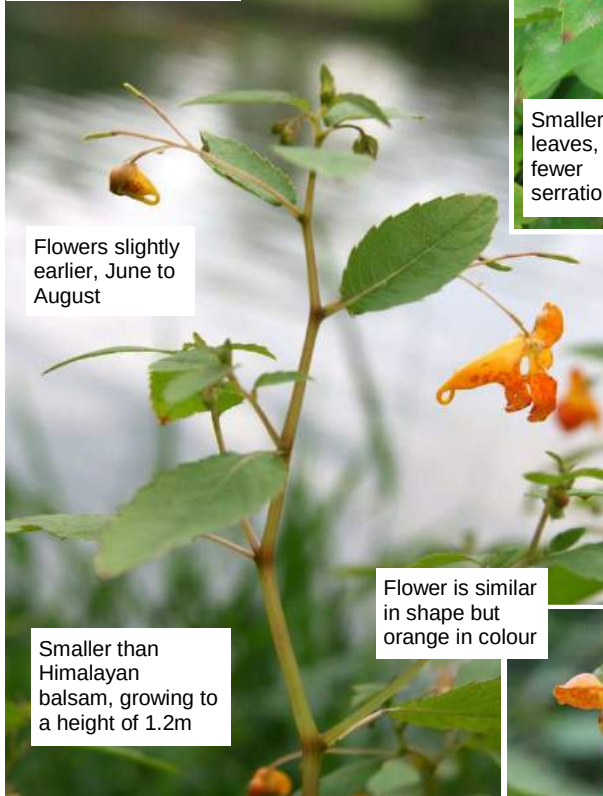
Hay like remains in winter



Root structure in winter

## Similar Species

### Orange Balsam Non-Native (*Impatiens capensis*)



Smaller leaves, with fewer serrations

Flowers slightly earlier, June to August

Orange balsam is much less aggressive than Himalayan balsam, forming smaller less dense stands

Flower is similar in shape but orange in colour

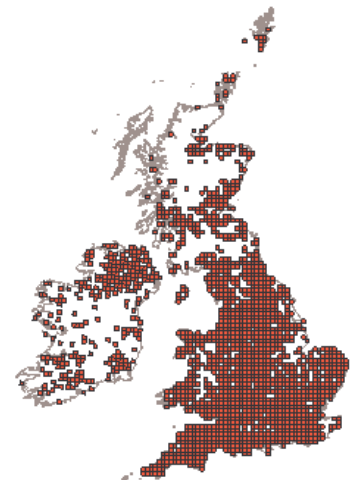
Smaller than Himalayan balsam, growing to a height of 1.2m



## Distribution

Widespread and common across the whole of the UK. Primarily on riverbanks and in other damp areas.

Source: NBN Gateway. Check website for current distribution



### References and further reading:

- Blamey, M, Fitter, R and Fitter, A (2003) "The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora". A & C Black
- Preston, C D, Pearman, D A and Dines, T A (editors) (2002) "New Atlas of the British and Irish Flora". Oxford University Press
- Stace, C (1999) "Field Flora of the British Isles". Cambridge University Press

# Japanese Knotweed

## Species Description

**Scientific name:** *Fallopia japonica*

**AKA:** Japanese Bamboo, Pysen saethwr (Welsh), *Polygonum cuspidatum*, *Reynoutria japonica*

**Native to:** Japan, Taiwan, northern China

**Habitat:** Common in urban areas, particularly on waste land, railways, road sides and river banks

Tall herbaceous perennial with bamboo like stems. Often grows into dense thickets. Characteristic leaves and stems, persistence of last year's dead canes and distinctive rhizome (underground root-like stems) enables year round identification.

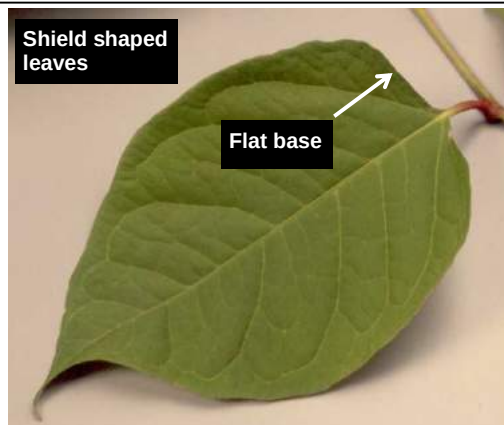
Introduced in the early 19<sup>th</sup> century as an ornamental plant. Now common and wide-spread across the UK. Spreads rapidly in the wild by natural means and as a result of spread by humans. Spread is solely by vegetative means, either fragments of rhizome or stem. Does not produce seed in the UK. Negative impacts include outcompeting native flora, contributing to river bank erosion and increasing the likelihood of flooding. Can also cause significant delays and cost to development as well as structural damage (it can grow through asphalt and some other surfaces).

Japanese Knotweed is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England, Wales and Scotland. As such it is an offence to plant or otherwise cause Japanese knotweed to grow in the wild. Under the Environmental Protection Act 1990, Japanese Knotweed is classified as controlled waste.

For details of legislation go to [www.nonnativespecies.org/legislation](http://www.nonnativespecies.org/legislation).



## Key ID Features



# Identification throughout the year

## Spring



## Summer

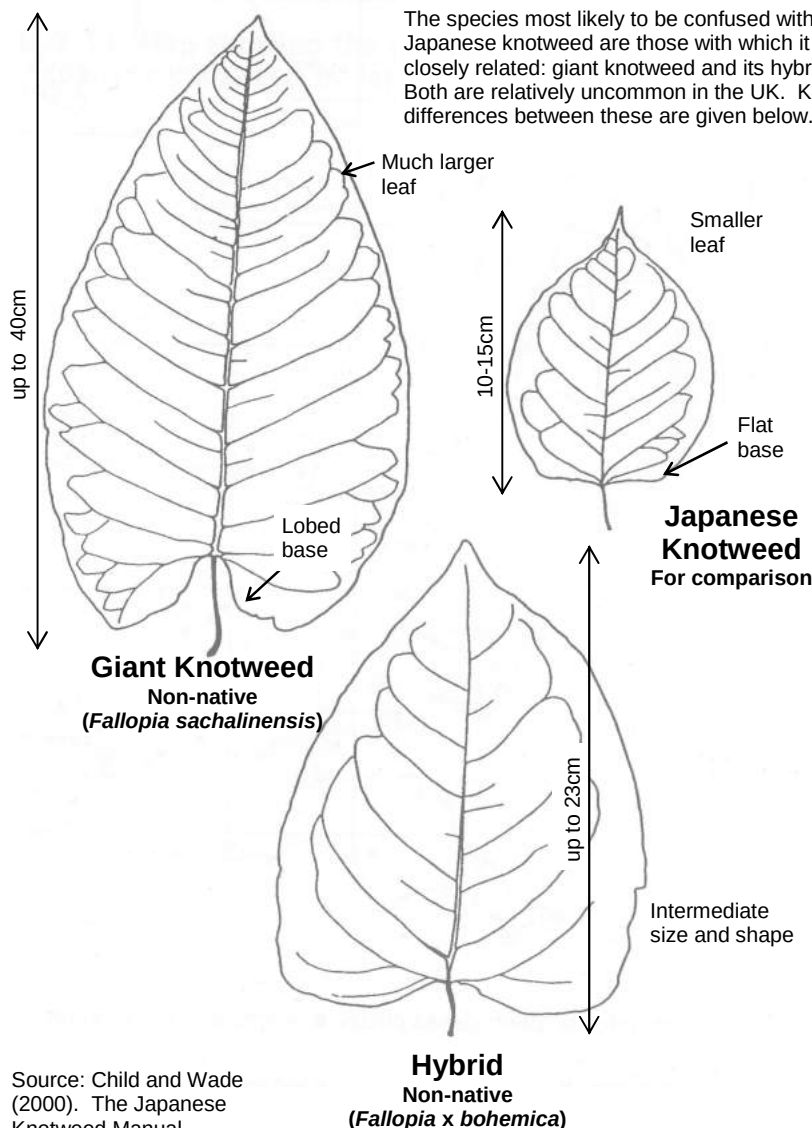


## Winter



## Similar Species

The species most likely to be confused with Japanese knotweed are those with which it is closely related: giant knotweed and its hybrid. Both are relatively uncommon in the UK. Key differences between these are given below.

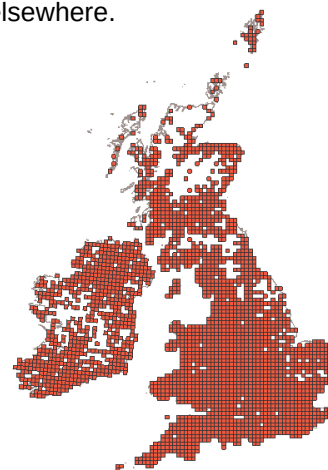


Source: Child and Wade (2000). The Japanese Knotweed Manual

## Distribution

Widespread and common across the UK. Notably extensive infestations are found in the south-west of England, south Wales and Greater London, however similarly extensive populations can also be found elsewhere.

Source: NBN Gateway. Check website for current distribution



### References and further reading:

- Blamey, M, Fitter, R and Fitter, A (2003) "The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora." A & C Black
- Child, L E and Wade, P M (2000) "The Japanese Knotweed Manual". Packard
- Environment Agency (2006) "The Japanese Knotweed Code of Practice". Environment Agency
- Preston, C D, Pearman, D A and Dines, T A (editors) (2002) "New Atlas of the British and Irish Flora". Oxford University Press
- Stace, C (1999) "Field Flora of the British Isles". Cambridge University Press

# New Zealand Pigmyweed

## Species Description

**Scientific name:** *Crassula helmsii*

**AKA:** *Tillaea aquatica*, Australian Swamp-stonecrop, Briweg Seland Newydd (Welsh), *Tillaea recurva*

**Native to:** Australia and New Zealand

**Habitat:** Aquatic up to 3m deep in still or slow flowing water bodies or terrestrial around pond or lake margins

Can be submerged, emergent and terrestrial. Readily recognisable when growing at the edges of water bodies by its fleshy leaves. Submerged leaves are less easy to see and recognise. Reproduces from very small stem fragments but does not produce viable seed in the UK.

Introduced in 1911 as an oxygenating plant for ponds and, since the 1970s, has spread rapidly. Forms dense mats and can impede drainage, causing flooding. Displaces other aquatic plant species and reduces amenity use of the waterbody.

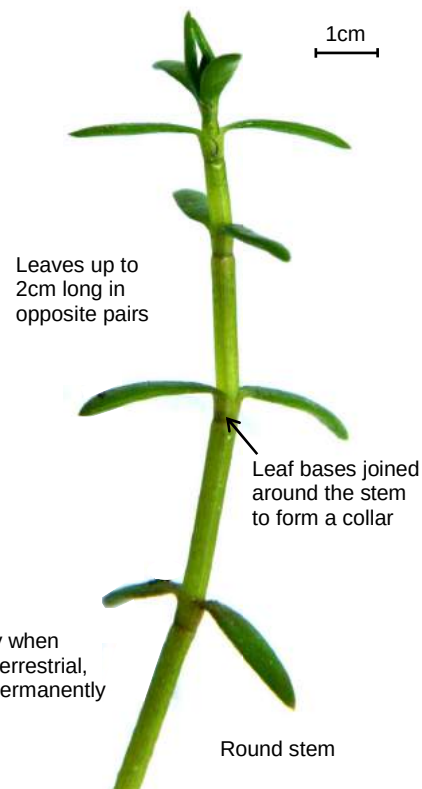
New Zealand Pigmyweed is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England, Wales and Scotland. As such, it is an offence to plant or otherwise cause this species to grow in the wild.

For details of legislation go to [www.nonnativespecies.org/legislation](http://www.nonnativespecies.org/legislation).



## Key ID Features

Forms dense mats within the water body



# Identification of terrestrial, emergent and submerged forms

**Terrestrial:** Growing away from the water's edge or left stranded as water level falls, creeping stems and aerial, fleshy leaves.



**Emergent:** Densely packed leaves in water, intermediate between terrestrial and submerged form (occurs in water <0.6m deep).



**Submerged:** Elongated stems with leaves sparse and flat, able to form extensive mats on bed of the water body.



## Similar Species

A group of species known as water-starworts are most likely to be confused with New Zealand pigmyweed. Water-starworts are distinguished from New Zealand pigmyweed by their non-fleshy leaves, which are usually notched at the tip (hold up to light or use hand lens), and lack of collar at leaf base.

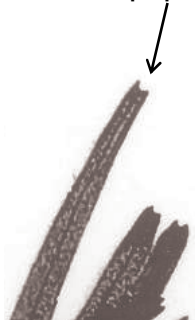
**Water-starworts**  
Native  
(*Callictriche* species)



Non-fleshy leaves

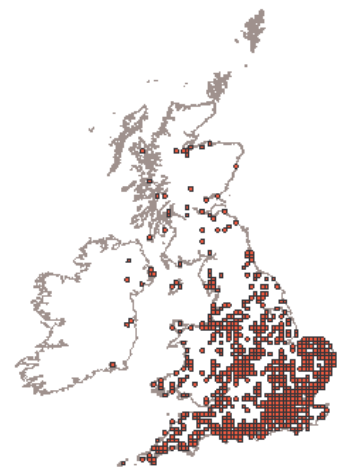
RL

Water-starwort leaf with typically notched tip, a hand lens is usually required to see this properly



## Distribution

Widespread in England and Wales. Spreading northwards, though much less common in Scotland. Very common in the south-east of England.



Source: NBN Gateway. Check website for current distribution.

**New Zealand Pigmyweed**  
For comparison



New Zealand pigmyweed collar around stem at base of leaves

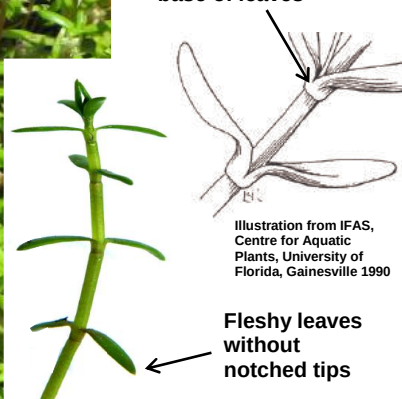


Illustration from IFAS, Centre for Aquatic Plants, University of Florida, Gainesville 1990

Fleshy leaves without notched tips

References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) "The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora." A & C Black

Preston, C D and Croft, J M (1997) "Aquatic plants in Britain and Ireland". Harley Books

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) "New Atlas of the British and Irish Flora". Oxford University Press

Stace, C (1999) "Field Flora of the British Isles". Cambridge University Press



**J.5 Ecological Compliance Audit**



**MOTT MACDONALD  
BENTLEY**

### Ecological Compliance Audit: Five Fords Wastewater Treatment Works

**Table 1: Generic Key Performance Indicators and evidence required**

| No | Performance Indicator                                                                                                                                                                                                                                                                                                                                                                                                         | Evidence Required                                                                                                                                                   | Pass<br>(Yes or<br>No) | Comments |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|
| 1  | Licence available for inspection by any police constable, employee of the Welsh Assembly Government or Natural Resources Wales or authorised persons on demand.                                                                                                                                                                                                                                                               | Licence is available for inspection on site.                                                                                                                        |                        |          |
| 2  | Before starting work the licensee will advise NRW Species Officer of the date the works will start.                                                                                                                                                                                                                                                                                                                           | Written or electronic documentation of notification of start of works.                                                                                              |                        |          |
| 3  | No agent of the licensee shall act under licence unless they are in possession of a letter signed by the licensee appointing them by name as the duly accredited agent of the licensee for the purposes of this licence, and shall carry with them the said letter and a copy of this licence and shall produce them to any police constable or employee of the Natural Resources Wales or other authorised person on demand. | All relevant accredited agents have copies of licence holder's letter of authorization. Licence holder's letter is available for inspection.                        |                        |          |
| 4  | A suitably experienced licensed ecologist will be appointed and retained during the life time of this licence to provide on-site advice.                                                                                                                                                                                                                                                                                      | Letter, contract or other document outlining the appointment of an Ecologist Log (end of project) shows that Ecologist has been retained during lifetime of licence |                        |          |
| 5  | Prior to the start of any works on site, all site workers will be inducted by the Project Ecologist. This induction will cover the legal status of the species, the method of working, and action to be taken if protected species are encountered.                                                                                                                                                                           | Copy of documents from ecological induction, showing content of induction<br>List of induction attendees                                                            |                        |          |
| 6  | Preparation and implementation of the bio-security risk assessment.                                                                                                                                                                                                                                                                                                                                                           | Bio-security risk assessment is available for inspection.                                                                                                           |                        |          |

| No | Performance Indicator                                                                                                                                                                                                                                                 | Evidence Required                                                                                                                                                                                                                                                                                     | Pass<br>(Yes or No) | Comments |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|
|    |                                                                                                                                                                                                                                                                       | Log of implementation of bio security measures is available for inspection.<br>Log shows that bio security measures have been implemented.<br>Field observation shows that physical evidence of bio security measures is available e.g. foot washes.                                                  |                     |          |
| 7  | Implementation of mitigation and compensation measures including: <ul style="list-style-type: none"> <li>Land transfer;</li> <li>Habitat creation /enhancement;</li> <li>Submission of Management Plan; and</li> <li>Implementation of the management plan</li> </ul> | Log of implementation of mitigation and compensation measures to be included in the licence return report and the compensation enhancement completion report.<br>Field observation shows that physical evidence of mitigation and compensation measures is available e.g. presence of GCN hibernacula |                     |          |

**Table 2: Great Crested Newt Compliance Audit – Key Performance Indicators and evidence required**

| No. | Performance Indicator                                                                                                                                                                                                                                                                                                                                                  | Evidence Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Pass<br>(Yes or No) | Comments |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|
| 1   | Different species of newt and other amphibians to be held and transported in separate containers.                                                                                                                                                                                                                                                                      | Log of activities, including use of containers, is available for inspection.<br>Log shows that amphibians have been transported within separate containers.<br>Containers are available for inspection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |          |
| 2   | Installation and design of amphibian fencing: <ul style="list-style-type: none"> <li>Exclusion/ drift fencing will be installed;</li> <li>The fencing layout will not contain gaps through which newts may pass. Vehicle access points can be installed using gates of heavy plastic or ACO stop-grids;</li> <li>Fencing membrane will be installed without</li> </ul> | Log and field observation show that exclusion/ drift fencing have been installed to the specifications as detailed in the Mitigation Specification. <ul style="list-style-type: none"> <li>Log and field observation show that exclusion/ drift fencing have been installed;</li> <li>Log and field observation show that the fencing layout does not contain gaps through which newts may pass. Vehicle access points have been installed using gates of heavy plastic or ACO stop-grids;</li> <li>Log and field observation show that the fencing membrane has been installed without noticeable creases or folds;</li> <li>Log and field observation show that the fencing has been installed so there is a minimum 1m access strip left for maintenance on all sides; and</li> </ul> |                     |          |

| No. | Performance Indicator                                                                                                                                                                                                                                                                                                                                                                                                                     | Evidence Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Pass<br>(Yes or No) | Comments |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|
|     | <p>noticeable creases or folds; and</p> <ul style="list-style-type: none"> <li>The fencing will be installed so there is a minimum 1m access strip left for maintenance on all sides</li> <li>Fence-posts will be located on outside of receptor area;</li> </ul> <p>Any joins in the membrane will be 'curl-joined' and well secured to a post with pads and nails. This jointing method will continue underground as well as above.</p> | <ul style="list-style-type: none"> <li>Log and field observation show that fence-posts have been located on the outside of the receptor area.</li> </ul> <p>Log and field observation show that joins in the membrane have been 'curl-joined' and well secured to a post with pads and nails. The jointing method continues underground as well as above.</p>                                                                                                                                                                                                                                                                                                     |                     |          |
| 3   | All newts found to be released within 1 hour of capture.                                                                                                                                                                                                                                                                                                                                                                                  | <p>Log of activities is available for inspection.</p> <p>Log shows that all newts found have been released within 1 hour of capture.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |          |
| 4   | A daily log of all newts found to be kept and made available to NRW at 48 working hours notice.                                                                                                                                                                                                                                                                                                                                           | A daily log of all newts found is available for inspection within 48 working hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |          |
| 5   | <p>Amphibian fencing to be inspected every 24 hours (except weekends) and any repairs completed within 12 hours. Fence specification and condition shall be as NRW Guidelines.</p> <p>A fence inspection log must be kept and made available to NRW at 48 working hours notice. Fence inspection and maintenance will be required throughout the</p>                                                                                      | <p>A suitable log has been maintained of all of inspections and all required repairs</p> <p>Log of activities, including inspections and repairs of fencing, is available for inspection within 48 working hours.</p> <p>Log shows that amphibian fencing has been inspected every 24 hours (except weekends) and any repairs completed within 12 hours</p> <ul style="list-style-type: none"> <li>Log shows that the fencing has been checked by a suitably qualified/ licensed ecologist daily during translocation; and</li> <li>Log and field observation show that all necessary repairs have been completed as per the Mitigation Specification.</li> </ul> |                     |          |

| No. | Performance Indicator                                                                                             | Evidence Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Pass<br>(Yes or<br>No) | Comments |
|-----|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|
|     | duration of construction works.                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |          |
| 6   | Works within amphibian habitats will not commence until working areas are confirmed to be clear by the ecologist. | Log shows that works within amphibian habitats did not commence until working areas were confirmed to be clear by the Ecologist.                                                                                                                                                                                                                                                                                                                                                    |                        |          |
| 7   | Design and installation of hibernacula                                                                            | <ul style="list-style-type: none"> <li>Log and field observation show that hibernacula as specified within the GCN Licence Method Statement</li> </ul>                                                                                                                                                                                                                                                                                                                              |                        |          |
| 8   | Design and creation of Great Crested Newt Ponds                                                                   | <ul style="list-style-type: none"> <li>Log and field observation show that the surface area of the new ponds are approximately between 100 and 300m<sup>2</sup>;</li> <li>Log and field observation show that the ponds have a maximum depth of 1.5m;</li> <li>In some circumstances, the log will explain why for bio-security reasons, the ponds have not been planted; and</li> <li>Log shows that the pond water was not contaminated during the construction phase.</li> </ul> |                        |          |

