



**Solar Park and Battery Storage Facility at
Land to the North of Maelor Gas Works, Marchwiel,
Wrexham, LL13 0UN**

Great Crested Newt Conservation and Management Plan

Novus Renewable Services

REPORT REF: 258_GCN_CMP

9/9/21

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Table of Contents

1	Introduction	1
1.1	Background to development	1
1.2	Status of GCN	1
2	GCN site assessment	1
2.1	Existing information on GCN at the proposed development site.....	1
2.2	Designated sites notified for GCN.....	2
2.3	Summary of GCN presence within the proximity of the proposed development site	2
3	Proposed development site description.....	2
4	Impact assessment.....	3
4.1	Pre and mid development impacts.....	3
4.2	Long term impacts	4
4.3	Fragmentation and isolation.....	4
4.4	Miscellaneous impacts.....	4
4.5	Post- development interference impacts	4
4.6	Scale of impact.....	4
5	Mitigation.....	4
5.1	GCN capture, translocation and exclusion.....	4
5.2	Hand searching	6
5.3	Tool box talk.....	6
5.4	Post construction	6
6	References	6
	Appendix A Smart Ecology EPS Development Licence Great Crested Newt Method Statement Wrexham Solar Park	8
	Appendix B Phase 1 habitat results Corylus 2021	9
	Appendix C GCN fencing details	14
	Figure C-1: Indicative GCN fencing locations	14
	Figure C-2: GCN fencing design (EN 2001)	15

1 Introduction

1.1 Background to development

Corylus Planning and Environmental Ltd were commissioned by Novus Renewable Services Ltd. to create a Great Crested Newt (*Triturus cristatus*) (GCN) conservation and management plan for a proposed solar development at Land to the North of Maelor Gas Works, Marchwiel, Wrexham, LL13 0UN. This document will form the basis of the method statement when it comes to submitting a European Protected Species licence application to Natural Resources Wales (NRW), if planning permission is granted.

The GCN conservation and management plan has been produced in response to pre-application consultation feedback received by NRW (reference CAS-138608-T5Y1).

The site was chosen for the proposed solar farm primarily as it was identified that there was import capacity available with the local grid and a nearby sub-station could be utilised.

1.2 Status of GCN

GCN and their habitat (aquatic and terrestrial) are afforded full protection by Wildlife and Countryside Act 1981 (Section 9, Schedule 5). This Act is the domestic implantation of the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) and was amended by the Countryside and Rights of Way Act 2000.

GCN are also listed on Annex II and Annex IV of the Conservation of Natural Habitats and Wild Fauna and Flora (the Habitats [and species] Directive). This is transposed into UK law by the Conservation of Habitats and Species Regulations 2010.

Specifically in relation to the locality of the development, Wrexham Industrial Estate non- statutory designated site adjacent to the proposed development area, is known to support GCN and be in unfavourable condition. Therefore, it is imperative to retain the existing GCN population and enhance the habitat for GCN subsequently.

This document was compiled with reference to Great Crested Newt Mitigation Guidelines document created by English Nature (now Natural England) 2001.

2 GCN site assessment

2.1 Existing information on GCN at the proposed development site

Mapping was viewed on the Multi Agency Geographic Information Centre (MAGIC) website (<http://magic.defra.gov.uk>; accessed April 2021) to update the location of ponds. This identified 17 ponds within 500 m of the site.

The River Clywedog acts as a barrier between the site and ponds to the north, and therefore, there are 11 ponds with connectivity to the site within 500 m observed on MAGIC, with a further three installed recently on an existing solar site to the south west, bringing the total to 14 ponds.

Pond 2 on the exiting solar site has been found to support GCN in the 2021 breeding season (NRW licence return Smart Ecology 2021) refer to Appendix A Smart Ecology 2020 for details of adjacent

site and pond layout. Previously eDNA samples analysed in 2018 have provided negative results (Smart Ecology 2020).

2.2 Designated sites notified for GCN

There are two statutory designated sites notified for GCN populations nearby, Stryt las a'r Hafod site of Special Scientific Interest (SSSI) and Johnstown newt site Special Area of Conservation (SAC), both approximately 7 km from the proposed development site. Wrexham Industrial Estate non- statutory designated site adjacent to the proposed development area to the north is known to support GCN and be in unfavourable condition.

2.3 Summary of GCN presence within the proximity of the proposed development site

It was concluded, that as the site is likely to support GCN, as habitat would not be lost and can in fact be enhanced for GCN as part of the proposed development, a medium GCN population presence should be assumed without further survey and the appropriate measures put in place. This approach was confirmed with the LPA ecologist via telephone conversation in 2020.

3 Proposed development site description

A Phase 1 survey (JNCC 2010) was undertaken in 2020, a Phase 1 habitat map is provided in Figure 1 Appendix A and the habitats are described below.

3.1.1 Improved grassland

The proposed development site comprised of improved grassland pasture dominated by perennial ryegrass (*Lolium perenne*), with frequent Yorkshire fog (*Holcus lanatus*) and cock's-foot (*Dactylus glomerata*), occasional red fescue (*Festuca rubra*), meadow foxtail (*Alopecurus pratensis*) and meadow fescue (*Festuca pratensis*). Occasional herbs/forbs including meadow buttercup (*Ranunculus acris*), sheep sorrel (*Rumex acetosella*), ribwort plantain (*Plantago lanceolata*), kidney vetch (*Anthyllis vulneraria*), dandelion (*Taraxacum officinale*), bugle (*Ajuga reptans*), cleavers (*Galium aparine*), silver weed (*Potentilla anserina*) and tormentil (*Potentilla erecta*). Occasional patches of ruderals including frequent creeping thistle (*Cirsium arvense*), common nettle (*Urdita dioica*) and broadleaved dock (*Rumex obtusifolius*). With foxglove (*Digitalis purpurea*), common ragwort (*Senecio jacobaea*) and field horsetail (*Equisetum arvense*) also occasionally present. Scattered mature pendunculate oak trees (*Quercus robur*) were present to the east, and in some cases were mature specimens (refer to TN27,TN28,TN29 and TN31).

3.1.2 Tall Ruderal

Tall ruderal vegetation was present along the river edge. Nettle, creeping thistle and broad-leaved dock were the dominant species present. With occasional brambles (*Rubus fruticosus*), hogweed (*Heracleum sphondylium*), greater burdock (*Arctium lappa*), cow parsley (*Anthriscus sylvestris*), white dead nettle (*Lamium album*), red campion (*Silene dioica*), wild mustard (*Sinapis arvensis*) and male fern (*Dryopteris filix-mas*). Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*) were also visible in patches along the riverbank, likely present throughout the length of the river.

3.1.3 Broad leaved semi-natural woodland

Also along the river corridor were areas of broad leaved semi-natural woodland, that comprised scattered crack willow (*Salix fragilis*) as the dominant species and occasional young alders (*Alnus glutinosa*), with a ground layer of common reed (*Phragmites australis*), soft rush (*Juncus effusus*)

greater willow herb (*Epilobium hirsutum*), rosebay willow herb (*Chamerion angustifolium*), water forget me not (*Myosotis scorpioides*), meadowsweet (*Filipendula ulmaria*), hemlock water dropwort (*Oenanthe crocata*), pendulous sedge (*Carex pendula*) and cuckooflower (*Cardamine pratensis*), indicating a seasonally wet area.

3.1.4 Native species rich hedgerows

To the east of the proposed development area there were a number of hedgerows, full hedgerow regulations assessment was undertaken. Hedgerow one (H1 refer to for Phase 1 habitat map) was classified as important under the hedgerow regulations assessment criteria. Within the species rich hedgerows hawthorn (*Crataegus monogyna*), was the dominant species with frequent blackthorn (*Prunus spinosa*), occasional ash (*Fraxinus excelsior*), pendunculate oak, field maple (*Acer campestre*), elder (*Sambucus nigra*) and crab apple (*Malus sylvestris*). Within several of the hedgerows (H1, H2 and H3) was occasional non-native firethorn (*Pyracantha spp*). Species poor hedgerows comprises of hawthorn, blackthorn and field maple.

3.1.5 Buildings

There were several disused single storey, red brick buildings within the proposed development area, part of an old munitions factory, refer to B1-7 and Plate 7 to 12.

3.1.6 Habitat suitability for amphibians

The proposed development area did not contain any ponds, but the area was thought highly likely to support great crested newts during their terrestrial stage, due to a population known to be present nearby. Improved grassland offers suboptimal habitat for GCN, especially when heavily grazed. Although, tussocks can provide cover and foraging habitat. Hedgerows to the east provide cover and foraging opportunities for GCN. In addition, there were a number of rubble piles and the concrete bases of buildings that may offer refugia or hibernacula for amphibians, specifically GCN.

The river Clywedog provides a barrier to the north, that prevents GCN dispersal north from the proposed development site, and from GCN located beyond the river moving south to the proposed development site.

Adjacent to the site is an existing solar farm, this contains hibernacula, and three ponds, specifically designed for GCN.

4 Impact assessment

4.1 Pre and mid development impacts

During the construction (c 16 weeks) of the proposed development, there is a risk that GCN could be present on site and therefore could be disturbed, injured or killed.

To prevent disturbance, injury or death of a GCN, the entire construction area will require fencing with one-way exclusion fencing. Pit fall traps set when the temperature is > 5°C and trapped for 60 nights of suitable conditions as a minimum. Refer to section 5.1 for more detail.

The exclusion fencing will lead to temporary fragmentation of the habitat, with a total of 9.1 ha of sub optimal (improved grassland) terrestrial habitat being excluded temporarily during construction, c 16 weeks.

4.2 Long term impacts

4.2.1 *Habitat loss*

The proposed development will not lead to significant habitat loss, the grassland will be unchanged and accessible with only small areas under inverters and the battery store, where concrete bases will be installed will no longer provide habitat for GCN (total area lost= 531 m²).

4.2.2 *Habitat modification*

The proposed works will lead to installation of a pond (94 m²)- providing additional GCN breeding habitat, hibernacula (2)- providing additional habitat for over wintering, woodland planting (876.67 m²) and wildflower seeded areas (4054 m²) -providing additional foraging habitat. It is also proposed that a conservation grazing regimen is undertaken over the entire site once it is constructed, to create more variety in the sward and make the grassland habitat more suitable than for GCN than the existing habitat.

4.3 Fragmentation and isolation

No permanent fragmentation or isolation of the GCN population will occur, as all barriers (security fences) are permeable to GCN. The habitat will be fragmented temporarily during construction, as translocation is undertaken, as discussed previously.

4.4 Miscellaneous impacts

The proposed development will create more shading of the grassland by the panels, this may create cooler damper microclimates that could be more suitable to GCN.

4.5 Post- development interference impacts

Routine maintenance could disturb GCN, specifically in the following actions: Pond management and hedgerow cutting. Both these tasks would be carried out over winter, for pond work September-December (Langton 2001) and for hedge cutting November- February, when GCN will not be active. Any vegetation removal from the pond will be undertaken by hand or using basic hand tools.

4.6 Scale of impact

The proposed works will lead to temporary loss of habitat (c16 weeks) and permanent loss of a small amount of habitat (531 m² under the battery store and inverters). The closest development (installation of a gravel track) is within approximately 60 m of Pond 2 where GCN have been confirmed. The scale of the impact was categories as low impact in terms of population viability, (EN 2001). However, there is still risk to an individual, hence the requirement for one way exclusion fencing and temporary translocation of GCN. An additional pond and more suitable habitat will be created as part of the development.

5 Mitigation

5.1 GCN capture, translocation and exclusion

All works will be undertaken under the appropriate licence and during the appropriate season when GCN are active, approximately February-October, when the night-time air temperature is > 5°C. The preference is also for periods of the year that are wetter, ideally spring.

5.1.1 Fencing

The named ecologist or an accredited agent will undertake a fingertip search for GCN prior to installation of the fence.

One- way amphibian exclusion fencing will be installed around the perimeter of the area where works will be undertaken, refer to Appendix C Figure C-1 and Figure C-2 for design, which follows the English Nature 2001 specification, (figure 4 page 12). The specification will include:

- An underlap to prevent newts passing underneath.
- Backfill to be placed turf downwards in the fence trench and compacted.
- All fence trenches filled the same day as they are dug.
- An overhang to prevent newts climbing over the fence.
- A membrane that does not become brittle in UV light (e.g. 1000 gauge transparent polythene sheeting, woven polypropylene and black polythene DPC).
- Fence posts positioned on the inside of the works area.
- The fencing membrane should be as taut as possible without noticeable creases or folds which could allow newts to climb the fence.
- Fencing to be sloped at an angle between 40 and 45 degrees, allowing newts to leave the works area but not re-enter.
- Security fence around the construction site will incorporate the newt fencing, to limit damage. The fence will require regular monitoring to ensure it remains suitable for purpose.
- Where access is required by vehicles, the gap should be as small as possible and the end of the barrier fencing turned back at 45° to deflect amphibians from the gap. Heavy duty flaps that deform under vehicles and spring back should be utilised.

5.1.2 Pit fall trapping

Once the fencing is installed pit fall trapping should be undertaken to capture all GCN within the construction area ahead of construction commencing. The fence and pitfall design shown in Figure C-2 and taken from EN 2001. The traps will also follow these specifications:

- Plastic buckets without a top lip.
- Buckets fitted flush to the barrier fencing, with tops just level with the ground.
- Checks of the buckets to ensure that these have not raised above ground level, specifically after heavy rain.
- Spacing of pitfall traps 5-10 m apart.
- Additional refuges (carpet tiles) also deployed in close proximity to the fence to add further refugia.
- Splitting the site into compartments would increase capture rates.

GCN captures will be moved to suitable receptor habitat on the existing solar farm either the terrestrial vicinity of pond 1 or pond 3 where GCN have not previously been recorded but where the habitat has been suitably designed for the species. Alternatively, other suitable habitat nearby will be identified and used for translocation.

As the population is assumed to be medium, the minimum trap density is 80 / ha and the minimum number of nights of trapping is 60 nights of suitable weather, when the night air temperature is > 5 °C and rain/or damp ground. Five nights of suitable conditions and no GCN captures would indicate that the trapping effort has been sufficient. Once this has been achieved, a statement will be given to the construction team and work can commence within the trapped area- releasing the land for

development. All pitfall traps will be removed carefully by the licenced ecologist or accredited agent. Some internal compartments of exclusion fencing will be removed, however the exclusion fencing around the periphery of the site must stay in place, be monitored and maintained while all construction activities occur to keep GCN from re-entering the site.

5.2 Hand searching

Where there are rubble piles these will be carefully deconstructed by the licenced ecologist or accredited agents. This will occur when GCN are likely to be in a state of torpor, between February and October when the night-time air temperature is $> 5^{\circ}\text{C}$. Any GCN found will be relocated to the receptor areas near pond 1 or 2 on the existing solar site or suitable habitat nearby to be identified.

5.3 Tool box talk

A tool box talk will be given to all construction site operatives, this will include:

- make contractors aware of the possible presence of GCN and their legal protection status.
- How to identify a GCN.
- Who is the licenced ecologist and agents to call if a GCN is found.
- Details of the newt fencing -how this should not be breached and should be monitored for gaps.

A written record of this toolbox talk will be made by the ecologist to confirm that it took place.

5.4 Post construction

Once construction of the solar site has occurred and creation of the pond, hibernacula and additional habitat have occurred, the newt fencing can be removed. This will need to be done under the supervision of the licenced ecologist or accredited agents. The site will then be accessible to GCN. Within the biodiversity management plan GCN should be considered in all timings of maintenance etc.

Monitoring will be required post construction, this will include:

- GCN surveys of the new pond and any pond used for translocation, if these are not already monitored as part of a licence application.
- Incorporating ponds into the Wales GCN Monitoring Scheme.
- Annual monitoring of habitats and hibernacula to ensure that these provide habitat to GCN as proposed and to inform maintenance requirements.

Monitoring should primarily be used to inform site maintenance to ensure habitats remain suitable for GCN. The results will be provided to NRW as required under licence and also to the Local Planning Authority.

6 References

Author	Date	Title/Description
Corylus	2021	Solar Park and Battery Storage Facility at Land to the North of Maelor Gas Works, Marchwiel,

		Wrexham, LL13 0UN Preliminary Ecological Appraisal
English Nature (now Natural England)	2001	Great Crested Newt Mitigation Guide
JNCC	2010	Handbook for Phase 1 habitat survey A technique for environmental audit.
Langton, T.E.S., Beckett, C.L., and Foster, J.P.	2001	Great Crested Newt Conservation Handbook, Froglife, Halesworth.
MAGIC		http://magic.defra.gov.uk ; accessed April 2021
Smart Ecology	2020	Wrexham Solar Park, Land off Tetrapak Road, Wrexham, LL13 0UW EPS Development Licence Great Crested Newt Method Statement
Smart Ecology	2021	Interim Great Crested Newt Monitoring Report Wrexham Solar Park, Land off Tetrapak Road, Wrexham, LL13 0UW

**Appendix A Smart Ecology EPS Development Licence Great Crested Newt
Method Statement Wrexham Solar Park**

 Cyfoeth Naturiol Cymru Natural Resources Wales	REPORT BY THE LICENCE HOLDER OF ACTION TAKEN UNDER LICENCE European Protected Species		Species Protection Team, National Permitting Service, Natural Resources Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor, Gwynedd, LL57 2DW specieslicence@naturalresourceswales.gov.uk Tel. 03000 653000	 Noddir gan Lywodraeth Cymru Sponsored by Welsh Government
	Name of licensee:	Russell Farnhill		
	Address of site:	Wrexham Solar Park, Land off Tetrapak Road, Wrexham, Denbighshire, LL13 0UW		
	Email Address:	russell@innovacapital.co. uk		

GUIDANCE NOTES *Please read the following notes carefully before completing the table overleaf in BLOCK CAPITALS or type. This form may be downloaded from our website and emailed to us.*

1. It is a condition of your licence that you provide Natural Resources Wales with a report detailing action taken under the licence. This report must be completed, even if no action is taken, and must be returned to Natural Resources Wales (details above) within **4 weeks** of the licence expiry date.
2. Failure to complete and submit this form is a breach of your licence and may result in any future applications being refused. It is an offence under Regulation 60(1) to breach a licence condition.
3. The report is used to provide summary information to the Department for Environment, Food and Rural Affairs (Defra) and the European Commission regarding the number and type of licences issued and the actual work carried out under the licence. The data collected from licence reports might also be used for scientific monitoring purposes and be shared with the Local Planning Authority. If you have concerns about the use of the information you are providing please contact us using the details shown at the top of this form.
4. The personal information on this licence report may be kept and used by Natural Resources Body for Wales otherwise known as Natural Resources Wales (NRW) in accordance with the Data Protection Act (1998) and in line with the provisions of the licence under which the collection of these biodiversity records was authorised.

Natural Resources Wales licence reference number	S087171/4	Period of licence From:	17/07/2020	To:	31/03/2021
Name of ecological consultant	Robert Dunn	Company	Smart Ecology Ltd.		

Declaration: To the best of my knowledge, the data is reliable and was collected with any necessary permissions.
 NRW have my permission to store, copy, use, release and publish the biodiversity records I have supplied, including my name as part of the record, in line with the provisions of the licence under which the collection of these biodiversity records was authorised.

Signed:		Name:	Robert Dunn	Date:	27/04/2021
	<i>For electronic returns please insert an electronic signature above or place an x in the box opposite to confirm agreement with the declarations above.</i>				☐

Report form contents

Section 1	Purpose for which the licence was issued
Section 2	Summary of action taken
Section 2.1	All animals except bats
Section 2.2	Bat species
Section 2.3	All plants
Section 2.4	Incidental capture or killing – all animals
Section 3.1	Licences issued for 'science and education' or 'ringing and marking or examining any ring or mark'
Section 3.2	Bats ringed or bat rings examined
Section 4	Licences issued for conserving wild animals
Section 5	Licences issued for 'other reasons of over-riding public interest'
Section 6	Licences issued for preventing the spread of disease or serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries

Section 1 – Purpose for which the licence was issued

Please state the primary purpose for which the licence was issued then go to relevant sections as indicated.

Tick one box only. The purpose for which the licence was issued is given on the front page your licence.

<i>Science or education</i>	☐	Complete <u>section 2</u> and <u>section 3</u>
<i>Ringling and marking, or examining any ring or mark</i>	☐	Complete <u>section 2</u> and <u>section 3</u>
<i>Photography</i>	☐	Complete <u>section 2</u> only
<i>Conserving wild animals/plants</i>	☐	Complete <u>section 2</u> and <u>section 4</u>
<i>Preserving public health or public safety</i>	☐	Complete <u>section 2</u> and <u>section 5</u>
<i>¹Other imperative reasons of overriding public interest</i>	☐	Interim report: complete section 5 only - To be completed in order to evidence compliance
	☒	Final report: complete <u>section 2</u> and <u>section 5</u> To be completed on expiration of the Licence
<i>Preventing the spread of disease</i>	☐	Complete <u>section 2</u> and <u>section 6</u>
<i>Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries</i>	☐	Complete <u>section 2</u> and <u>section 6</u>

¹including those of a social or economic nature and beneficial consequences of primary importance for the environment

Section 2 – Summary of action taken

2.1 All animals except bats

A) Species	B) Date/s when action taken		C) Action taken				D) If captured/taken:		E) If marked:	
Choose from: Dormouse Great crested newt (GCN) Natterjack toad Otter Sand lizard	From ¹ dd/mm/yy	To ¹ dd/mm/yy	Choose from: Captured/taken Damaged/destroyed breeding site or resting place Disturbed Killed/injured	For each action state ² : EITHER number of animals affected; OR number / area of breeding sites/resting places affected		Location where action taken Give precise grid reference, at least 6 or 8 figures	Method used Choose from: Appropriate trap, Bottle trap, Carpet/tin tiles, Egg survey, Hand, Nest box, Nest tube, Netting, Noose, Pit-fall trap, Torch survey	Where released (if applicable) Give 6 or 8 figure grid reference	Method used Choose from: Fur clip PIT tag Radio tag Ring	Number marked
				Number/ Area ³	Unit Choose from: Ha of habitat, No. of sites, No. of ponds, Adults, Juveniles, Individuals, Eggs					
Examples: Dormouse	01/12/12	13/12/12	Damage/destr oy BS or RP	10	Hectare	SH345678	Select from list		Select from list	
GCN	01/05/12	10/05/12	Captured/ taken	25	Adults	SH12345678	Bottle trap	SH124556 99	Select from list	
GCN	12/10/20	12/10/20	Disturbed	1	Adult	SJ 377 481	Hand	SJ 377 481	N/A	N/A
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	

¹ Wherever possible give an exact date for the action taken rather than a range of dates.

² Report only once for each action, eg if individuals are 'captured' it is not necessary to also report that they were 'disturbed'.

³ If exact number not known indicate approximate number with 'c.'

2.2 Bat species

A) Species	B) Date/s when action taken		C) Action taken			D) If captured/taken:		E) If marked:		
Choose from list:	From ¹ dd/mm/yy	To ¹ dd/mm/yy	Choose from: Captured/taken Damaged/ destroyed breeding site or resting place Disturbed Killed/injured	For each action state ² : EITHER <u>number</u> of animals affected; OR <u>number</u> / <u>area</u> of breeding sites/resting places affected	Unit Choose from: Adults, Juveniles, Individuals Number of sites	Location where action taken Give precise grid reference, at least 6 or 8 figures	Method used Choose from: Hand/handheld net Harp trap Harp trap with lure Mist net Mist net with lure	Where released (if applicable) Give 6 or 8 figure grid reference	Method used Choose from: Fur clip PIT tag Radiotag Ring ⁴	No. marked
Examples: Barbastelle bat	09/09/12		Captured/taken	2	Adults	SH123456 78	Harp trap	SH12345678	Radiotag	2
Select from list	01/11/12	11/11/12	Select from list	1	Sites	SH123456	Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	
Select from list			Select from list		Select from list		Select from list		Select from list	

¹ Wherever possible give an exact date for the action taken rather than a range of dates.

² Report only once for each action, eg if individuals are 'captured' it is not necessary to also report that they were 'disturbed'.

³ If exact number not known, indicate approximate number with 'c.'

⁴ NB if rings fitted or examined section 3.2 below must also be completed.

2.3 All plants

A) Species	B) Date/s when action taken		C) Action taken			D) State how plant was used:	E) State how each plant was disposed of:	
<i>Choose from:</i> Early gentian Fen orchid Floating-leaved water plantain Killarney fern Shore dock	From¹ dd/mm/yy	To¹ dd/mm/yy	<i>Choose from:</i> Collect Collect seed Cut Destroy Pick Uproot	For each action state <u>number of plants</u> affected ²	Location where action taken <i>Give precise grid reference, at least 6 or 8 figures</i>	Describe how used:	Describe how disposed of:	Where replanted (if applicable) <i>Give 6 or 8 figure grid reference</i>
Examples: Shore dock	01/09/12		Collect seed	20	SH12345678	Add to seed bank		
Float-leaved water plantain	01/09/12	10/09/12	Uproot	30	SH12345678		Translocated to new site	SH12455699
Select from list			Select from list					
Select from list			Select from list					
Select from list			Select from list					
Select from list			Select from list					
Select from list			Select from list					
Select from list			Select from list					

¹ Wherever possible give an exact date for the action taken rather than a range of dates.

² If exact number not known, indicate approximate number with 'c.'

2.4 Incidental capture or killing – all animals

NRW is required under the Habitats Directive to compile information on incidental capture or killing of animals listed on Annex IVa* i.e. capture or killing not covered under a licence. The information is for reporting purposes only and will be submitted to the European Commission in summary format.

A) Species	B) Date when incident took place	C) Nature of incident	D) Location of incident	E) Animals affected			F) Other information
<i>Choose from list:</i>	<i>dd/mm/yy</i>	<i>Choose from: Captured Killed</i>	<i>Give precise grid reference, at least 6 or 8 figures</i>	Number	Unit <i>Choose from: Adults, Juveniles, Individuals</i>	Sex (if known)	
Examples: Natterjack toad	01/06/12	Killed	SH12345678	2	Adult	Male	Found dead in pitfall trap
GCN	01/09/12	Killed	SJ12345678	5	Adult	Male	Found killed on road
<i>Select from list</i>		<i>Select from list</i>			<i>Select from list</i>	<i>Select from list</i>	
<i>Select from list</i>		<i>Select from list</i>			<i>Select from list</i>	<i>Select from list</i>	
<i>Select from list</i>		<i>Select from list</i>			<i>Select from list</i>	<i>Select from list</i>	
<i>Select from list</i>		<i>Select from list</i>			<i>Select from list</i>	<i>Select from list</i>	
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* Article 12 of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora of 21 May 1992

Section 3.1 Licences issued for ‘Science and education’, or ‘Ringing and marking, or examining any ring or mark’

Use this section to report on activities completed under licences for species surveys and research projects.

Give details of any variation from the methods described in your licence application.

Please describe the activities completed under this licence. Examples include survey work, fitting rings or radio-tags (please also complete section 3.2 to give details of bats ringed or rings examined)	
Activity	Details of activities undertaken
Reports	Provide full details of any reports, scientific papers etc that have been or will be produced as a result of the activities completed under this licence.

3.2 Bats ringed or bat rings examined

Use this section to provide further details of bats ringed or rings examined.

[illegible]

Section 4 - Licences issued for conserving wild animals/plants

Use this section to report on activities completed under licences for conserving wild animals or plants.

Please provide details of works undertaken affecting breeding sites and resting places and any associated disturbance, capture etc. Examples include improvements to bat roosts, management of woodlands for dormice or management of ponds for great crested newts. Report on the actions as described in your licence application and note any changes that were necessary to the proposed methods. Append photographs wherever possible.	
Activity	Details of activities undertaken
Reports	Provide full details of any reports that have been produced as a result of the activities completed under this licence.

Section 5 – Licences issued for ‘Other Reasons of Over-riding Public Interest’

Use this section to report on activities completed under licences for ‘*Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment*’ including developments

Note that for compliance audit purposes this section of the form may be submitted as an interim report as well as a final report.

Please state which below:

Interim report:	☐	Final report:	☒
-----------------	--------------------------	---------------	-------------------------------------

For interim reports complete only the front page of this form and section 5.

Please provide details of works undertaken affecting breeding sites and resting places damaged or destroyed.

Examples include bat roosts, bat flight lines, dormouse habitat, otter holts, great crested newt hibernacula.

Report on actions as proposed in your method statement submitted with the licence application (see ‘*Delivery Information Mitigation, compensation and monitoring*’ section E2).

Append photographs wherever possible and submit copies of GIS layers detailing compensation or mitigation sites.

Activity	Details of works undertaken
In situ retention (Method Statement Delivery Information section E.2.1)	N/A
Modification of existing (Method Statement Delivery Information section E.2.2)	• Pond 2 desilted under ecological supervision (completed October 2020). Photos appended.
Creation of new as compensation , please detail compensation sites as appropriate (Method Statement Delivery Information section E.2.3)	• Creation of Ponds 1 and 3 (completed by October 2020). Photos appended. • Scrub planting (completed by end of February 2021). Photos appended. • Underplanting of existing southern site boundary vegetation (completed by end of February 2021). Photos appended. • Creation of rough grassland areas (areas around pond fenced off from livestock with livestock proof fencing – development of rough grassland ongoing as grassland grows) (completed by end of February 2021). Photos appended.

Licence specific reporting Report here against the implementation of conditions as indicated in your licence	N/A
Post-development site safeguard Describe works to manage/maintain the population post-development	
No works to manage/maintain have been undertaken as yet.	
A Habitat Management and Maintenance Plan will be implemented for the lifetime of the Solar Park (i.e. 36 years after first operation, until 2051) to ensure maintenance of:	
• Three ponds. • Rough grassland areas around ponds. • Rough grassland along the southern site boundary. • Scrub planting. • Understorey shrub planting along the southern site boundary.	
Habitat Management and Maintenance Plan document is appended.	
Details of monitoring (include methods, timing, weather conditions, personnel, result, constraint and interpretation). To include monitoring carried out to date and monitoring planned. Append report as applicable.	
One torching monitoring survey was undertaken on the 19 th of April 2021 by Robert Dunn (Natural Resources Wales survey licence Reference: S086581/1). Weather conditions: 10% cloud cover, No precipitation, Light air (Beaufort Scale 1), Air temperature 12°C.	
GCN recorded in Pond 2 (two adult males). No GCN recorded in Ponds 1 and 2. No constraints to survey.	
One further torching monitoring survey will be carried out during May 2021.	
See appended report for further details of the survey.	

Compliance audit Please tick to indicate mechanism used to demonstrate compliance with the licence and method statement	
☒	NRW licence report form (this form) used to demonstrate completion of works in accordance with the licence
☐	Compliance audit completed by developer (give details below)
☐	Compliance audit completed by external auditor (give details below)
List and append compliance audit reports:	

Comments and further information

**Section 6 - Licences issued for ‘Preventing the spread of disease’ OR
‘Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries’**

Use this section to report on activities completed under licences for these purposes.

Provide details of works undertaken affecting breeding sites and resting places and any associated disturbance, capture etc. Report on the actions as described in your licence application and note any changes that were necessary to the proposed methods. Append photographs wherever possible.	
Activity	Details of activities undertaken
Reports	Provide full details of any reports that have been produced as a result of the activities completed under this licence.

Photographs

Modification of Existing

Pond 2 desilted under ecological supervision (completed October 2020).



Desilting in progress (06/10/21)



Immediately after desilting (06/10/21)



Desilted pond (19/04/21)

Creation of New as Compensation

Creation of Pond 1 (completed by October 2020).



Pond 1 post-excavation (06/10/21)



Pond 1 (19/04/21)

Creation of Pond 3 (completed by October 2020).



Pond 3 post-excavation (06/10/21)



Pond 3 (19/04/21)

Scrub planting (completed by end of February 2021).



Scrub planting close to Pond 1 (alongside southern boundary) (19/04/21)



Scrub planting adjacent to Pond 3 (19/04/21)



Scrub planting alongside western section of southern site boundary (19/04/21)



Scrub planting alongside western section of southern site boundary (19/04/21)

Underplanting of existing southern site boundary vegetation (completed by end of February 2021).



Understorey planting along western section of southern site boundary (19/04/21)



Understorey planting along western section of southern site boundary (19/04/21)



Understorey planting along western section of southern site boundary (19/04/21)



Understorey planting along western section of southern site boundary (19/04/21)

Creation of rough grassland areas (areas around pond fenced off from livestock with livestock proof fencing – development of rough grassland ongoing as grassland grows) (completed by end of February 2021).



Example of stock proof fencing installed around Pond 1 (19/04/21)



Example of stock proof fencing installed around Pond 2 (19/04/21)



Example of stock proof fencing installed
around Pond 3 (19/04/21)



Interim Great Crested Newt Monitoring Report

Wrexham Solar Park, Land off Tetrapak Road,
Wrexham, LL13 0UW

Client	Wrexham Solar Park Ltd.
Reference	2019-017
Version	1
Date	27/04/2021



Quality Assurance

	Name	Position	Date	Signature
Surveyors and Survey Dates	Robert Dunn BSc, MSc, ACEEIM	Director/ Senior Ecologist	19/04/2021	
Authored	Robert Dunn	Director/ Senior Ecologist	27/04/2021	
Reviewed	Rachel Barber BSc, MSc, MCIEEM	Director/ Senior Ecologist	27/04/2021	
Approved	Robert Dunn	Director/ Senior Ecologist	27/04/2021	

Document History

Version	Date	Revision
1	27/04/2021	Issued to Natural Resources Wales.

Disclaimer

This document has been prepared solely for use by the client. Smart Ecology accept no responsibility or liability for any use of this document by third parties or for purposes for which it was not originally commissioned.

The evidence in this document is based upon the field survey(s) detailed. Due to the changing nature of ecology the list of species present cannot be considered comprehensive and Smart Ecology cannot guarantee that other protected/notable species and habitats are not present. The ecology of a site is constantly changing and therefore the information provided in this document is only relevant at the time of survey.

The evidence which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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Non-Technical Summary

Purpose of Report	Smart Ecology was commissioned to undertake two great crested newt torch surveys of three ponds at Wrexham Solar Park, Land off Tetrapak Road, Wrexham, LL13 0UW. This was to comply with the monitoring requirements of mitigation licence reference S087171/4.
Methodology	One torching survey was undertaken on the 19th of April 2021 of three ponds located at Wrexham Solar Park. A second torching survey will be undertaken of the three ponds in May 2021.
Survey Results	Great crested newts were recorded in Pond 2 (two adult males). No great crested newts were recorded in Ponds 1 and 3.



Contents

Non-Technical Summary.....ii

1 Introduction1

2 Methodology.....2

2.1 Personnel.....2

2.2 Field Survey.....2

2.3 Limitations2

3 Results.....3

Appendix – Survey Data4



1 Introduction

- 1.1.1 Smart Ecology was commissioned by Wrexham Solar Park Ltd. to undertake two great crested newt torch surveys of three ponds at Wrexham Solar Park, Land off Tetrapak Road, Wrexham, LL13 0UW.
- 1.1.2 This was to comply with the monitoring requirements of mitigation licence reference S087171/4.
- 1.1.3 See Table 1-1 for the grid references of the three surveyed ponds.

Table 2-1: Pond central national grid references

Pond	Central National Grid Reference
1	SJ 38315 48288
2	SJ 38174 48314
3	SJ 37704 48124

- 1.1.4 A second torch monitoring survey will be carried out in May 2021.
- 1.1.5 This report has been prepared by Robert Dunn, director at Smart Ecology and an associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM).



2 Methodology

2.1 Personnel

- 2.1.1 The survey was undertaken by Robert Dunn (Natural Resources Wales survey licence number Reference: S086581/1).

2.2 Field Survey

Survey times and weather conditions

- 2.2.1 Refer to Table 2-1 for a summary of survey weather conditions.

Table 2-1: Survey weather conditions

Survey Date	Ponds	Weather conditions at dusk
19/04/2021	1 - 3	10% cloud cover. No precipitation. Light air (Beaufort Scale 1). Air temperature 12°C.

Survey Methodology

- 2.2.2 A high-powered torch (Clulite 1 million candle power) was used to search for great crested newts within Ponds 1, 2 and 3 after dark.
- 2.2.3 The surveyor slowly walked around the perimeter of Ponds 1, 2 and 3 and shone the torch across the water surface to look for newts. Any newts seen were identified to species level and sexed (where possible). It is not usually possible to differentiate between female smooth and palmate newts during torching surveys.

2.3 Limitations

- 2.3.1 There were no limitations to the survey.



3 Results

3.1.1 Table 3-1 provides a summary of the survey results. Refer to the Appendix for full survey data.

3.1.2 Great crested newts were found to be present in Pond 2.

3.1.3 No great crested newts were recorded in Ponds 1 and 3.

Table 3-1: Survey results summary

Waterbody	Great Crested Newt Count	Smooth Newt	Palmate Newt	Smooth or Palmate	Common Frog	Common Toad
1	0	-	-	Yes	-	-
2	2	Yes	Yes	Yes	Yes	-
3	0	-	-	Yes	-	-



Appendix – Survey Data

Pond	Survey Date	Turbidity ¹	Pond Edge Surveyed (%)	Great Crested Newt	Palmate Newt	Smooth Newt	Smooth or Palmate	Common Frog	Common Toad
1	19/04/2021	Turbid	100	0	-	-	1	0	0
2	19/04/2021	Good	100	2 adult males	2 adult males	19 adult males	25 adults (male and female)	2 adults	0
3	19/04/2021	Turbid	100	0	-	-	1	0	0

¹ Good = pond bottom visible; Intermediate = bottom visible in shallows; Turbid = bottom not visible





Habitat Management and Maintenance Plan

Wrexham Solar Park, Land off Tetrapak Road,
Wrexham, LL13 0UW

Client	Wrexham Solar Park Ltd
Reference	2019-017
Version	1
Date	27/03/2019

Quality Assurance

	Name	Position	Date	Signature
Authored	Robert Dunn BSc, MSc, ACIEEM	Director/ Principal Ecologist	25/03/2019	
Reviewed	Rachel Barber BSc, MSc, MCIEEM	Director/ Principal Ecologist	25/03/2019	
Approved	Robert Dunn	Director/ Principal Ecologist	26/03/2019	

Document History

Version	Date Issued	Revision
1	27/03/2019	Issued to client.

Disclaimer

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The evidence which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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Contents

1	Introduction and Background	1
1.1	Introduction	1
1.2	Background	1
1.3	Existing ntext	1
1.4	On-site Great Crested Newt Habitats	2
2	Aims and Objectives.....	3
3	Habitat Management & Maintenance	4
3.1	Habitat to be Managed & Maintained	4
3.2	Responsibilities	4
3.3	Management & Maintenance Operations.....	4
4	Monitoring and Review	12
4.1	Monitoring	12
4.2	Review	12
5	Maintenance Schedule	13
6	References.....	16



1 Introduction and Background

1.1 Introduction

- 1.1.1 This Habitat Management and Maintenance Plan has been produced to provide a methodology which will be followed to ensure the long-term management and maintenance of great crested newt habitats (existing and newly created) at Wrexham Solar Park.

1.2 Background

- 1.2.1 Planning permission (ref: P/2015/0463) was granted for installation of a solar park on the site in 2015 and a Natural Resources Wales (NRW) great crested newt mitigation licence was granted to permit the works (69975:OTH:EPS:2016). The requirement for the habitat management and mitigation strategy is secured by planning condition 9:

The development shall be carried out in strict accordance with the habitat mitigation, improvement, management and monitoring measures as detailed in the following approved documents: a) Habitat Management Plan compiled by Sarah Board BSc (Hons) of the Magnificent Science Company dated 10th – 14th October 2015. b) Method Statement for Great Crested Newt, Bats, European Badger and European Otter compiled by Sarah Board BSc (Hons) of the Magnificent Science Company dated 10th – 14th October 2015.

- 1.2.2 The solar park was subsequently installed without following the granted licence and implementing the habitat management and maintenance plan.
- 1.2.3 The completed solar park site has now been purchased by Wrexham Solar Park Ltd. and a new great crested newt licence is being applied for to provide retrospective compensation for great crested newts.
- 1.2.4 This Habitat Management and Maintenance Plan and the NRW licence method statement (Smart Ecology Ltd., 2019) will be provided to Wrexham County Borough Council as part of a Section 73 application to amend the conditions.

1.3 Existing Site Context

- 1.3.1 The site is approximately 12.5 ha and is located to the south-east of Wrexham Industrial Estate, approximately 2.5 km south-east of the outskirts of Wrexham.
- 1.3.2 The site comprises a solar PV array with poor semi-improved grassland beneath. The grassland is currently grazed by sheep. Although the poor semi-improved grassland only offers sub-optimal terrestrial habitat for great crested newts there are several tussocky areas which provide some potential foraging habitat.
- 1.3.3 There are several scattered broadleaved trees across the site and several derelict brick buildings in the eastern area of the site which were historically part of a munitions works from World War II. The roots of broadleaved trees and the derelict buildings provide opportunities for refuge and hibernation. There are several old mammal holes and stone piles with areas of tall ruderal on site which provide potential for refuge and hibernation for great crested newts.



Additionally, there are three hibernacula on site which were created in within the last three years (exact date unknown) and provide potential for refuge and hibernation.

- 1.3.4 A pond is located in the east of the site, which his was created in within the last three years (exact date unknown). The pond is rectangular in shape and approximately 12 x 8 m in size. It is located in a depression within the poor semi-improved grassland and surrounded by grass dominated banks.

1.4 On-site Great Crested Newt Habitats

- 1.4.1 Refer to the “Scope of Works for the Revised Newt Mitigation Scheme” document (Corylus Planning & Environmental Ltd., 2019) for full details of proposed new compensation habitats.
- 1.4.2 The compensation proposals comprise creation of the following habitats on the site to provide enhanced breeding, foraging, and refuge habitats for great crested newts:
- Creation of two new wildlife ponds surrounded by rough grassland. The ponds and surrounding rough grassland will be delimited by stock proof fencing.
 - Creation of a corridor of rough grassland along the southern site boundary.
 - Scrub planting on bunds.
 - Understorey shrub planting along the southern site boundary.
- 1.4.3 It is understood that these compensation measures will be in place by the end of November 2019.
- 1.4.4 The following existing habitats on the site with suitability for great crested newt will be retained:
- One pond.
 - Three hibernacula.
 - Hedgerows.



2 Aims and Objectives

2.1.1 The aims of this Habitat Management and Maintenance Plan are:

- To ensure successful establishment of aquatic and terrestrial great crested newt habitat.
- To manage these habitats so that they provide habitat of value to great crested newts.
- To secure long-term maintenance of these aquatic and terrestrial habitats.

2.1.2 These aims will be achieved by:

- Ensuring that ponds are managed and maintained so that they provide good quality foraging and breeding habitat for great crested newts.
- Maintaining hibernacula in a good state of repair so that they continue to provide refuge and hibernation habitat for great crested newts and creating new hibernaculum to replace any defunct hibernaculum if necessary.
- Maintaining and managing rough grassland to provide good quality foraging and dispersal habitat for great crested newts.
- Ensuring that fencing around ponds and refugia is maintained as stock proof to protect great crested newt habitat from damage and disturbance.
- Maintaining and managing scrub and shrub habitat to provide good quality foraging and dispersal habitat for great crested newts.



3 Habitat Management & Maintenance

3.1 Habitat to be Managed & Maintained

3.1.1 The management measures detailed in this Habitat Management and Maintenance Plan will be implemented to ensure maintenance of the following habitats:

- Three ponds.
- Rough grassland areas around ponds.
- Rough grassland along the southern site boundary.
- Three hibernacula.
- Scrub planting on bunds.
- Understorey shrub planting along the southern site boundary.

3.2 Responsibilities

3.2.1 The site will be managed in accordance with this Habitat Management and Maintenance Plan for its lifetime (i.e. 36 years after first operation, until 2051). Wrexham Solar Park Ltd. will be responsible for the inspection, management and maintenance costs and arranging the required management and maintenance activities.

3.2.2 As part of the NRW licence the named ecologist or accredited agent will monitor development of the new habitats and implementation of the maintenance and management regime annually for the first six years after completion and then once every three years. Reports of the implementation will be submitted to NRW and any other relevant parties. The costs of monitoring will be the responsibility of Wrexham Solar Park Ltd

3.2.3 Wrexham Solar Park Ltd. will commission a new long-term management plan for the management and maintenance of great crested newt habitats in 2050, the year before the solar park will finish operations). This may involve appointment of a managing organisation or wildlife body who would then be responsible for management of the mitigation features. The agreed new management and maintenance plan will be submitted to NRW at this time.

3.3 Management & Maintenance Operations

3.3.1 The site will be inspected by the named ecologist or accredited agent once annually between April and September for the first six years after completion and then once every three years to ensure that habitats are being managed appropriately. Additionally, fencing around ponds will be inspected monthly by the client, and plant guards around new shrub and scrub planting will be checked monthly by the client until they are no longer required.

3.3.2 This will ensure that habitats remain suitable for use by great crested newts. The requirement for any remedial action will be reported to the Wrexham Solar Park Ltd. by the ecologist, and the Wrexham Solar Park Ltd. will be responsible for commissioning contractors to carry out the necessary remedial works.



Ponds

Aims

3.3.3 The aim for the management of ponds is to:

- Maintain good quality aquatic habitat for great crested newts in the long-term, with suitability for foraging and breeding.

Objectives

- Ensure the successful establishment of pond habitats.
- Ensure that the ponds are managed and maintained to provide aquatic suitable habitat for foraging and breeding by great crested newts in the long term.

Management & Maintenance Methodology

3.3.4 Ponds will be inspected by the named ecologist or accredited agent. The ecologist will provide feedback to the client on any necessary remedial works. The ecologist or accredited agent will check:

- Coverage of vegetation on the surface of ponds.
- Water levels to identify if pond linings have failed or desilting or remedial works are required.
- Evidence of high nutrient levels (e.g. increased algal growth, discolouration).
- Evidence of fish.
- Presence of litter.

Vegetation Coverage

Objective:

3.3.5 Ponds will be managed so that they are well vegetated with native species, but with open areas where male newts can display. Ponds will therefore be managed so that approximately 70 - 80% of the surface area is vegetated.

Management:

3.3.6 Where it is identified that marginal and emergent planting has not established and coverage of the surface of ponds is below 70 - 80% of the surface area, the ecologist or accredited agent will report to the client that new planting must be undertaken. Any new planting will utilise the following species:

- *Butinus umbellatus* (Flowering Rush)
- *Caltha palustris* (Marsh Marigold)
- *Carex acutiformis* (Lesser Pond Sedge)
- *Filipendula ulmaria* (Meadowsweet)
- *Iris pseudacorus* (Yellow Flag)
- *Myosotis scorpioides* (Water Forget-me-not)



- *Sagittaria saggitifolia* (Arrowhead)
- *Schoenoplectus lacustris* (Common Club Rush)
- *Sparganium erectum* (Branched Bur-Reed)
- *Veronica beccabunga* (Brooklime)

- 3.3.7 Where it is identified that vegetation cover within ponds exceeds approximately 70 - 80% of the surface the ecologist or accredited agent will report to the client that action is needed to reduce vegetation coverage.
- 3.3.8 The client will be responsible for commissioning contractors to remove excess vegetation. Vegetation removal will be carried out by cutting or pulling vegetation by hand only. If common reed and/or reedmace (bulrush) species become dominant, these will be preferentially targeted during vegetation removal. Vegetation removal will be carried out between October and January inclusive as this is when great crested newts are most likely to be absent from ponds, and so minimises the risk of causing harm or disturbance.
- 3.3.9 Any invasive species (e.g. Himalayan balsam) will be cut or pulled from the ponds.
- 3.3.10 Cut and pulled vegetation will be left on protective membrane by the edge of ponds for 48 hours before being removed from the site.

Water Levels

Objective:

- 3.3.11 Ponds will be managed so that they retain sufficient water, thereby continuing to function as suitable great crested newt habitat.

Management:

- 3.3.12 The named ecologist or accredited agent will check water levels in the ponds during monitoring inspections. If water levels fall below half a metre at the deepest point in two consecutive years, then the ecologist or accredited agent will report to the client that pond lining repairs or desilting must be carried out. The client will be responsible for commissioning contractors to carry out the desilting works.
- 3.3.13 If monitoring of the ponds for great crested newts (see Section 4) has shown that great crested newts are absent from the pond lining repairs and desilting can be undertaken at any time of the year. Desilting will be undertaken using a long-armed mini excavator. Ground protection will be utilised to reduce damage to marginal habitats. The top third of a metre of silt will be temporarily placed around the margins of the excavated pond, onto protective membrane. After a period of 48hrs, the protective membrane will be removed, and any arising removed.
- 3.3.14 If monitoring of the ponds for great crested newts (see Section 4) has shown that great crested newts are present in the pond, then lining repairs and desilting will be undertaken between October and January inclusive to minimise the risk of causing harm or disturbance to great crested newts. The same methodology for desilting as described above will be followed.



Water Quality

Objective:

- 3.3.15 Maintain good water quality in ponds so that the ponds continue to provide suitable habitat for great crested newts.

Management:

- 3.3.16 Water quality will be visually checked by the named ecologist or accredited agent during the monitoring inspections for any signs of nutrient enrichment (e.g. excessive algal growth and discolouration). If evidence of eutrophication is noted, the named ecologist or accredited agent will report to the client that remedial action must be implemented to reduce nutrient levels in the water, and provide advice on the necessary and appropriate measures required. The client will be responsible for commissioning contactors to carry out any necessary remedial works.
- 3.3.17 No fertilisers or pesticides will be used within the rough grassland around the ponds or in grazed grassland in proximity to the ponds.

Fish

Objective:

- 3.3.18 Avoid or control the presence of fish in ponds, as fish can predate great crested newt eggs, larvae, and plants used for egg laying, thereby negatively impacting the value of ponds as breeding habitat.

Management:

- 3.3.19 The named ecologist or accredited agent will check for signs of fish in ponds during the monitoring inspections.
- 3.3.20 Fish will not be introduced into ponds, and any fish identified during pond checks or works will be removed. If large numbers of predatory fish are noted, then the ecologist will provide advice to the client on whether remedial action such as pond draining is required to eliminate the fish. A licence will be sought if necessary.

Litter

Objective:

- 3.3.21 Ensure that ponds are free from litter.

Management:

- 3.3.22 The named ecologist or accredited agent will check for litter in ponds during the monitoring inspections.
- 3.3.23 Any litter present will be removed from the site between October and January inclusive when there is no risk that litter could be used for great crested newt egg laying.



Rough Grassland

Aims

3.3.24 The aim for the management of the grassland habitat around the ponds and along the southern site boundary is to:

- Maintain good quality terrestrial habitat for great crested newts in the long-term, providing opportunities for foraging, dispersal, and refuge.

Objectives

- Manage rough grassland habitat to maintain a species rich and structurally diverse habitat to benefit great crested newts by providing habitat for prey species and providing enhanced cover and shelter opportunities.
- Ensure the long-term maintenance of rough grassland habitat by preventing colonisation by scrub and trees.

Management & Maintenance Methodology

3.3.25 Rough grassland around ponds and along the southern site boundary will be cut once every three years.

3.3.26 Cutting will be carried out in September as this will permit plants to set seed and allow less competitive species to establish in the spring, thereby helping to maintain a diverse sward.

3.3.27 To minimise the potential for harming great crested newts the following careful working methods will be implemented when the grassland is cut:

- Where practicable, cutting will be carried out during warm/hot (above 18°C) and dry weather to minimise the likelihood that great crested newts would be present and active within the grassland.
- Cutting will be carried out using brush cutters to a minimum height of 150 mm i.e. the grassland will not be cut any lower than 150 mm in order to protect from harm any great crested newts that may be present.

3.3.28 Cut grass will be removed from the site to avoid nutrient enrichment, thereby encouraging the development of a diverse sward.

3.3.29 No fertilisers will be applied to the grassland. This will help to ensure that a diverse sward is maintained.

3.3.30 No pesticides or herbicides will be applied to the grassland. Any noxious weeds will be controlled by hand pulling only.

3.3.31 Grassland within 0.5 m around the hibernacula will not be cut, to avoid potentially damaging the hibernacula and harming great crested newts.



Hibernacula

Aims

3.3.32 The aim for the management of hibernacula on the site is to:

- Provide long-term refuge and hibernation habitat for great crested newts.

Objective

- Ensure the maintenance of hibernacula so that they continue to provide suitable refuge and hibernation habitat for great crested newts in the long-term.

Management & Maintenance Methodology

- 3.3.33 Hibernacula will be checked during monitoring inspections by the named ecologist or accredited agent to ensure they are in a good condition and still fit for purpose. If any repairs or replacement of hibernacula are required then the ecologist will report this to the client. The client will be responsible for commissioning contractors to carry out repairs/construct new hibernacula.
- 3.3.34 If the named ecologist or accredited agent identifies that repairs are necessary, these will be carried out between March and May inclusive. If extensive repairs are required which could potentially harm great crested newts then these works will be supervised by the named ecologist or accredited agent. Whether ecological supervision is required would be decided by the named ecologist or accredited agent.
- 3.3.35 Access points into the hibernacula will be maintained free of blockages.
- 3.3.36 Grassland within 0.5 m around the hibernacula will not be cut, to avoid potentially damaging the hibernacula and harming great crested newts.
- 3.3.37 If the structure of a hibernaculum degrades to the extent that it is no longer functional then a replacement hibernaculum will be created close to the existing hibernaculum. The existing hibernaculum would be left in-situ.

Scrub & Understorey Shrub Planting

Aims

- 3.3.38 The aim for the management of the scrub habitat planted on bunds and shrubs planted within the understory of the southern boundary hedgerow is to:
- Maintain good quality terrestrial habitat for great crested newts in the long-term, with suitability for foraging, dispersal, and refuge.

Objectives

- Ensure the successful establishment of planted scrub and shrub habitat.
- Manage scrub and shrub habitat to maintain a species-rich and structurally diverse habitat to benefit great crested newts by providing habitat comprising a range of scrub and shrub species for prey species and providing enhanced cover and shelter.



Management & Maintenance Methodology

- 3.3.39 Scrub and shrub planting will be checked by the named ecologist or accredited agent during monitoring inspections to check that shrub and scrub has successfully established and is being managed in accordance with the measures set out in the plan.
- 3.3.40 Additionally, shrub and scrub will be inspected monthly by the client to check for any mulching, watering, weeding, and plant protection requirements for the first five years or until the scrub/shrubs are established and these measures are no longer necessary.

Establishment

- 3.3.41 New scrub and shrub planting will be managed to ensure successful establishment. Management will include the following:
- **Mulching** - mulch will be applied to the base of plants once or twice a year (as required) to minimise weeds and retain soil moisture.
 - **Watering** - planting will be watered during dry periods as required to maintain soil moisture.
 - **Weeding** - the base of the vegetation will be weeded by hand or strimmed as required to reduce competition.
 - **Plant protection** - guards and canes will be inspected monthly by the client to ensure that guards aren't too tight and identify if any guards need replacement. Any remedial work carried out will be reported back to the named ecologist or accredited agent. Plant protection will also be inspected by the named ecologist or accredited agent during monitoring inspections and the need for remedial work reported to the client. Protection will be removed once the plants are sufficiently established (to be advised by the ecologist).
- 3.3.42 This management will be undertaken for the first five years, or until the ecologist or accredited agent is satisfied that the vegetation has successfully established.
- 3.3.43 Once the vegetation has started to establish it will be lightly trimmed between December and February until sufficiently established.
- 3.3.44 Any cut material will be used to create habitat piles within the areas of shrub and scrub.

Remediation

- 3.3.45 New planting will be monitored by the ecologist or accredited agent to ensure it successfully establishes, and any requirements for remediation works will be identified and feedback provided to the client. The client will be responsible for commissioning any required remedial works. In addition, the client will be responsible for ensuring that plant protection guards are regularly checked, and replaced by the client where necessary.
- 3.3.46 If any new planting fails replacement planting will be undertaken between October to March inclusive using the same native species.
- 3.3.47 If monitoring shows that planting is being significantly affected by any mammal browsing, then new protection measures will be advised by the monitoring ecologist.



Fencing

Aims

3.3.48 The aim for the maintenance of fencing around ponds is to:

- Ensure that ponds and rough grassland around ponds are protected from damage and disturbance from livestock.

Objective

- Ensure that fencing remains stock proof.

Management & Maintenance Methodology

3.3.49 Fencing will be inspected monthly by the client to ensure that it is stock proof. Any remedial work carried out will be reported back to the named ecologist or accredited agent.

3.3.50 Fencing will also be inspected by the named ecologist or accredited agent during monitoring inspections to check that it is stock proof and any damage will be reported to the client, who will be responsible for commissioning contractors to mend the fencing..



4 Monitoring and Review

4.1 Monitoring

- 4.1.1 A monitoring report will be provided by the ecologist or accredited agent to the client annually for the first six years of monitoring and every three years thereafter which will provide the results of the monitoring inspections and recommendations for any remedial works required.
- 4.1.2 With respect to monitoring habitat creation, great crested newt surveys of the ponds will be undertaken to inform future management policies. This will comprise two torch surveys annually for the first three years and then every two years thereafter between mid-March and June to monitor the great crested newt population.

4.2 Review

- 4.2.1 The Management and Maintenance Plan will be reviewed after each monitoring inspection has been carried out by the named ecologist or accredited agent. Therefore, review of the plan will be carried out annually by Wrexham Solar Park Ltd. for the first six years and then once every three years to ensure that the plan is meeting the management aims and objectives.



5 Maintenance Schedule

Activity	Years Required	Month of Activity											
		J	F	M	A	M	J	J	A	S	O	N	D
Great crested newt torch surveys undertaken between mid-March and June by a suitably qualified and licensed ecologist.	Annually for the first three years and then every two years thereafter												
Inspection by named ecologist or accredited agent between April and September.	Once annually for first six years, then once every three years thereafter.												
Ponds													
Planting of additional pond vegetation by client, as required.	As required.												
Pulling/cutting of excess pond vegetation by client, as required.	As required.												
Pond lining repairs and silt removal by client, as necessary <u>if ecology surveys determine that great crested newts are absent.</u>	As required.												
Pond lining repairs and silt removal by client, as necessary <u>if ecology surveys determine that great crested newts are present.</u>	As required.												
Water quality remediation by client, as necessary. Remediation method to be advised by ecologist.	As required. Month(s) when activity must be carried out dependent on remediation method required (to be advised by ecologist).												
Fish removal by client, as necessary. Removal method to be advised by ecologist.	As required. Month(s) when activity must be carried out dependent on removal method required (to be advised by ecologist).												



Activity	Years Required	Month of Activity											
		J	F	M	A	M	J	J	A	S	O	N	D
Litter removal by client, as necessary.	As required.												
Rough Grassland													
Cutting of rough grassland by client.	Once every three years.												
Hibernacula													
Repairs and/or replacement of hibernacula by client as required.	As required.												
Scrub and Understorey Shrub Planting													
Mulching of planting.	Two times a year for the first five years as required or until it is no longer necessary												
Watering of planting.	As required for the first five years or until it is no longer necessary												
Weeding of planting.	As required for the first five years or until it is no longer necessary												
Repair/replace plant protection.	As required for the first five years or until it is no longer necessary												
Remedial scrub/shrub planting by client, as required.	As required.												



Activity	Years Required	Month of Activity											
		J	F	M	A	M	J	J	A	S	O	N	D
Fencing													
Inspections by the client to check that fencing is stock proof.	Monthly in all years.												
Repairs to fencing.	As required.												



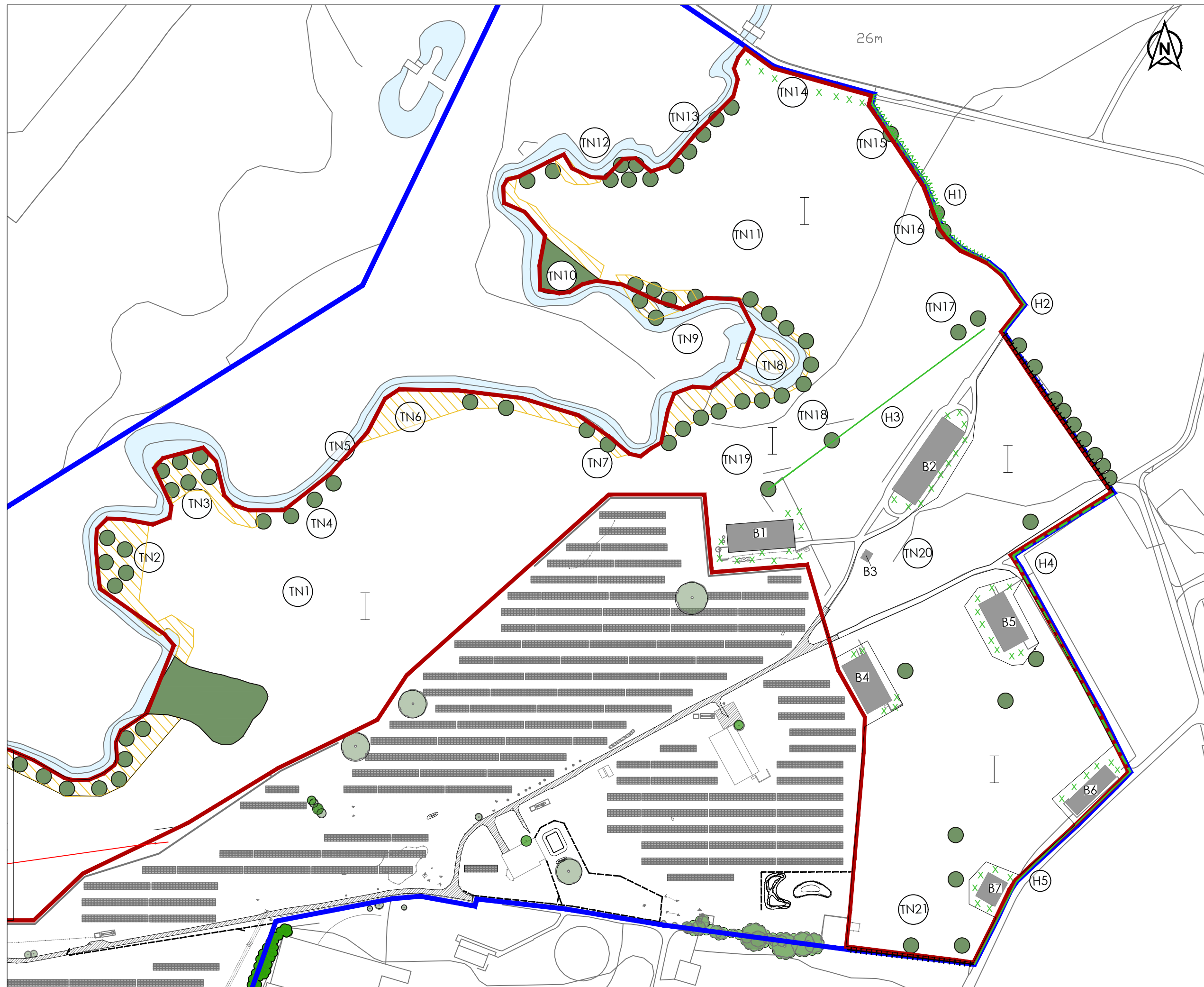
6 References

Corylus Planning & Environmental Ltd. (2019). *Scope of Works for the Revised Newt Mitigation Scheme, For the PV Array, on Land off Tetrapak Rd, off Bedwell Road, Wrexham, LL13 0UT.* Corylus Planning and Environmental Ltd, Yanworth.

Smart Ecology Ltd, (2019). *EPS Development Licence Great Crested Newt Method Statement – Wrexham Solar Park, Land off Tetrapak Road, Wrexham, LL13 0UW.* Smart Ecology, Berkeley.



Appendix B Phase 1 habitat results Corylus 2021



Key:

- Total Land Holding (33.47 HA & 82.7 acres)
- Land Ecology Survey Boundary
- Target Note
- Broad leaved Trees A3.1
- Tall Ruderal C3.1
- Improved Grassland B4
- Semi-Natural Broadleaf Woodland A1.11
- Existing Buildings J3.6
- Scattered Scrub A2.2
- Native Species Rich Hedge Intact J3.1
- Intact Species Poor Hedge J1.2
- Defunct Hedge J2.2
- Fence J3.4
- Hedge Number

B 18/08/20 SD amendments to target notes
rev: A date: 08/07/20 details: SD amendments to notation

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client:
Novus R S Ltd

project:
Wrexham PV Extension

title:
Phase 1 Habitat Survey

scale:	date:	drawn by:	checked by:	size:
1:2000	01/06/2020	SD	MR	A3
Project ref:	258		drawn no:	rev:
		WR/EX/258/05	B	

Target No.	Notes
1	Improved grassland pasture dominated by perennial ryegrass (<i>Lolium perenne</i>), with frequent Yorkshire fog (<i>Holcus lanatus</i>) and cock's-foot (<i>Dactylus glomerata</i>). Occasional herbs/forbs including meadow buttercup (<i>Ranunculus acris</i>) and tormentil (<i>Potentilla erecta</i>). Occasional patches of ruderals including creeping thistle (<i>Cirsium arvense</i>) common nettle (<i>Urdita dioica</i>) and broadleaved dock (<i>Rumex obtusifolius</i>).
2	Pocket of semi-mature crack willow (<i>Salix fragilis</i>) and ruderals beneath.
3	Pocket of semi-mature crack willow and ruderals beneath.
4	Line of semi-mature crack willow with young ash (<i>Fraxinus excelsior</i>), Sycamore (<i>Acer pseudoplatanus</i>) and goat willow.
5	Small section of open bankside habitat, with no trees, clear water and marginal areas dominated by branched bur-reed (<i>Sparganium erectum</i>).
6	Dense bed of common nettle encroaching into the grassland pasture.
7	Multi-stemmed semi-mature crack willow on riverbank.
8	Riparian zone extends ~5m into field from top of riverbank in places. Dominated by semi-mature crack willows and a dense/continuous under-storey of common nettle and Himalayan balsam (<i>Impatiens glandulifera</i>). A small stand of Japanese knotweed (<i>Fallopia japonica</i>) is present as indicated by the target note itself. Knotweed likely to be more widespread than was visible to the surveyor.
9	A small stand of Japanese knotweed on the opposite riverbank.
10	Riparian zone is still characterised by semi-mature crack willow with tall ruderal under-storey. Here the willows are more extensive and form a small woodland block, with Japanese knotweed also present in a small stand as indicated by the target note itself.
11	Improved grassland pasture; composition as per TN1. Only very rare pockets of ruderals present other than the riparian zone.
12	Small stand of knotweed located on the opposite riverbank as indicated by the target note itself.
13	Open section of watercourse with occasional young alder and goat willow (<i>Salix caprea</i>) on the riverbank.
14	Small embankment with a farm track on top, enclosed by a stock-fence on top of the bank and scattered trees pedunculate oak (<i>Quercus robur</i>) & hawthorn (<i>Crataegus monogyna</i>) and bramble scrub (<i>Rubus fruticosus</i>) on the embankment itself. There is a mammal path running up and over the bank, indicated by the target note itself. Likely to be badger, but no hair under the fence or any latrines found.
15	Semi-mature pendunculate oak (<i>Quercus robur</i>) tree located within a species-rich native hedgerow with trees. Oak tree is of Low BRP owing to a couple of small cracks/splits in minor limbs.
16	Two semi-mature ash trees within hedgerow. Both Low Bat Root Potential (BRP) owing to a couple of small cracks/splits in minor limbs.
17	Two mature pendunculate oak trees, one either side of a field access within a species-poor native hedgerow. Both of impressive size and stature, with numerous significant and high value features for bats and birds – High BRP.
18	Mature pendunculate oak within a species-poor native hedgerow. Tree is of impressive size and stature, with numerous significant and high value features for bats and birds – High BRP.
19	Mature pendunculate oak at the end of a species-poor native hedgerow. Tree is of impressive size and stature, with numerous significant and high value features for bats and birds – High BRP.

Target No.	Notes
20	Improved grassland pasture, composition as per TN1 but with a smaller proportion of herbs/forbs and a dominance of perennial ryegrass over other grasses. Ruderals are mainly found around the derelict buildings.
21	Cluster of mature oaks in southern end of the field, all with multiple Potential Roost Features (PRFs) and of High BRP. Grassland beneath the trees has a higher proportion of ruderals than in the main field.
Building 1	Derelict red brick building, all on a single storey level but comprising a long corridor along both north and south sides of the building. The central portion of the building comprises a number of rooms, each with open 'windows' allowing natural light in. Used by cattle/sheep for shelter and lots of woodpigeons present. No evidence of bats or barn owl but lots of bat potential in the form of damaged brickwork and failing mortar – Medium BRP.
B2	As per B1.
B3	A small single-storey structure covering a square footprint but actually comprising two small rectangular structures with a narrow corridor in between. Each rectangular structure is then split into two small square rooms, with a single letterbox style opening for each room. Resulting in very dark rooms that are well protected from the elements and perfect for bats, specifically lesser horseshoes (<i>Rhinolophus hipposideros</i>). One lesser horseshoe bat found in the northernmost room.
B4	As per B1.
B5	As per B1.
B6	Not accessible – large metal doorway in southern gable was locked. No other access routes into main building. Definite bat roost potential – Medium BRP.
B7	Small red brick building surrounded by hawthorn scrub. Comprised of a corridor down the middle of the building, with rooms on either side. Last room on the left as found to support a single lesser horseshoe bat – this room was the darkest and most well protected from the elements.



Plate 1: Grassland sward



Plate 2: TN18 willows and tall ruderal



Plate 3: Riparian habitat (TN20)



Plate 4: Embankment with scattered trees and scrub (TN24)

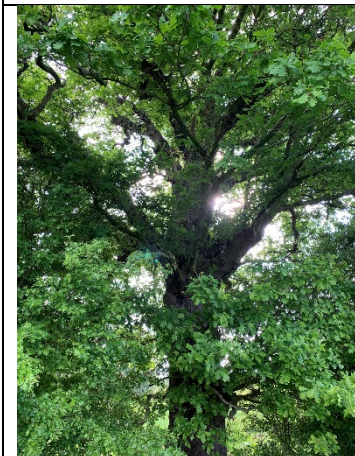


Plate 5: Mature tree in H1



Plate 6: mature oak trees TN31



Plate 7: Building B1



Plate 8: Building B2



Plate 9: Building B3



Plate 10: Building B4 and B5



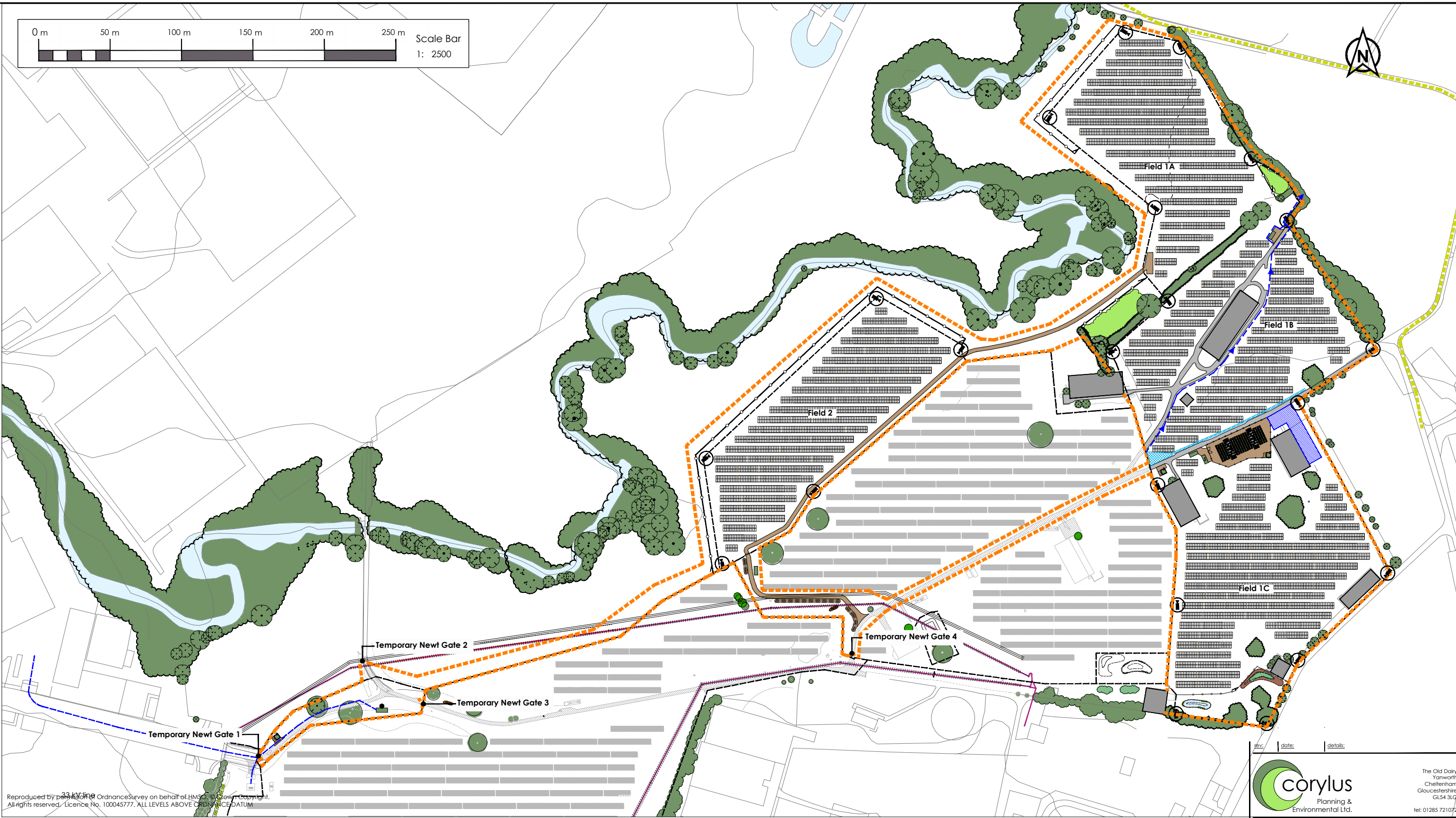
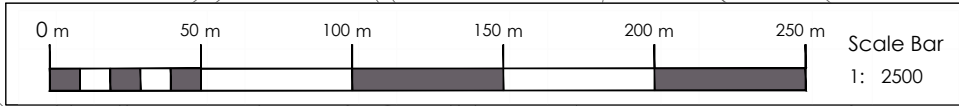
Plate 11: Building B6



Plate 12: Building B7

Appendix C GCN fencing details

Figure C-1: Indicative GCN fencing locations



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Key:

	Planning Application Boundary		Existing Hedgerow		Battery store
	Temporary Newt Fence		Proposed Planting		Proposed Access Road
	Existing Building		Public Right of Way		Existing site roads
	Cable route		Deer fencing		Soil Storage area
	Shallow ditch		CCTV		Soil Storage area
	Soil Bund		Attenuation Swale		

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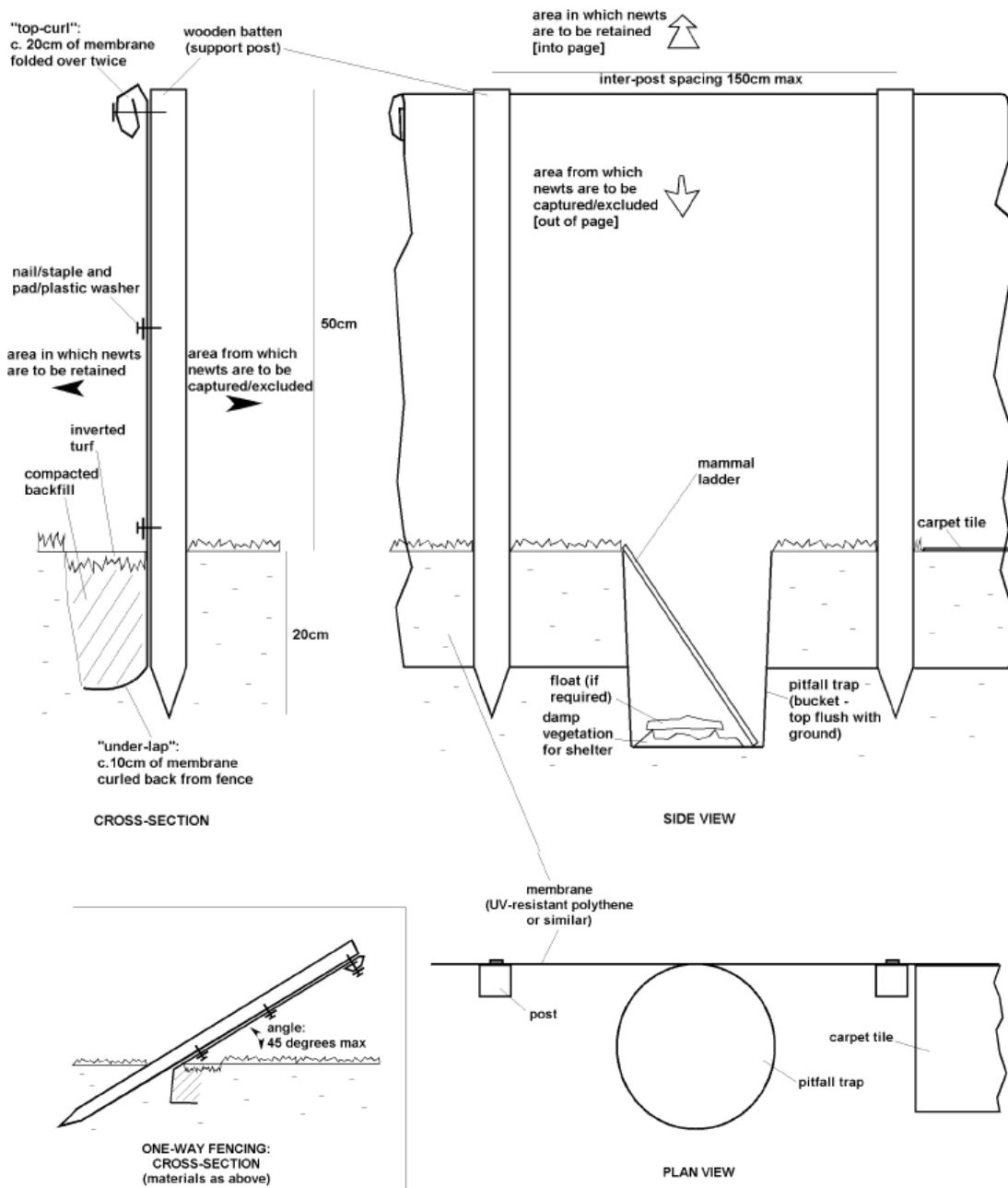
client: Novus R S Ltd

project: Solar Park to the north of Maelor Gasworks

title: Newt Protection Fencing

scale: 1:2500	date: 07/05/21	drawn by: JLB	checked by:	size: A3
project ref: 258	dwg no: WR-EX-258-16	rev:		

Figure C-2: GCN fencing design (EN 2001)





Planning

Landscape

Architecture

Hydrology

Ecology

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