Black Rock Farm, Cross Lanes, Wrexham
Intensive Poultry Farm Permit Application

Great Crested Newt Method Statement

June 2015

Control sheet

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Background and Supporting Information

A. Executive Summary

Two poultry rearing sheds are planned to be constructed at Black Rock Farm, Wrexham (SJ3735247495).

The scheme will involve construction of two poultry sheds and associated access linked from the existing road to the west of the site. The development will result in the permanent loss of approximately 0.5ha of suboptimal terrestrial great crested newt habitat and the temporary loss of a further 0.3ha of suboptimal terrestrial great crested newt habitat. No ponds will be lost as part of the development.

A single pond is currently present on the site and the wider meta-population is known to support a medium sized population of great crested newts, as part of a wider meta-population which is likely to include ponds to the north and south of the development site.

The scheme will involve an exclusion and capture scheme of the development footprint and laydown areas, with a capture period of 60 days, based on the population size.

A further two ponds/scrapes, along with hibernacula and refugia and hedge planting, which will form a receptor site adjacent to the footprint of the poultry sheds. The existing pond will be enhanced by the installation of stock fencing to reduce livestock poaching.

B. Introduction

B.1 Background to the activity / development

The proposal involves the construction of two new poultry units along with associated car parking areas and an access from the main road. No ponds will be directly impacted by works but suboptimal terrestrial habitat within close proximity to ponds will be impacted.

B.2 Full details of the works that are to be covered by the licence

The works to be covered by the licence will include:

- Fencing with amphibian exclusion fencing and clearing of the area to be affected by the construction of proposal, including development area, access routes, compensatory pond and relocation of any amphibians present within this area at the time of works to a receptor site outside of the working area.
- Excavation of a new pond at the site.

The scheme is subject to a future planning application. There are no statutory wildlife sites which may be impacted by the scheme.

B.3 Actions requiring Licencing

Activities outlined in B.2 will involve capture and translocation of terrestrial great crested newts to avoid potential injury or mortality caused by construction activities. No breeding ponds will be directly impacted by activities on site.

C. Survey and Site Assessment

C.1 Pre-existing information on great crested newts at the survey site

A search with Cofnod, the biological records holder for the area was undertaken for the site and a 1 km buffer zone. The following results for great crested newts were retrieved:

Date	Location	Count / Details
On Site		
07/07/1992	SJ37364744 Maelor abattoir	Present
27/04/2000	SJ37354745	9
1992	SJ37364747 Maelor abattoir	Present
07/07/1992	SJ37364747 Maelor abattoir	Probable presence
27/04/2000	SJ3734547470 Maelor abattoir	Eggs and Efts
Within 250 m		
28/10/2011 – 09/11/2011	SJ373475	Pit fall trap records - 4 Adult male (2), Adult female (1), juvenile
13/04/2000	SJ372473 Chetwynd Grove	4
Before 23/03/2007	SJ3716647448 The Hollies	

16/06/1992	SJ37164744	Probable presence
13/04/2000	SJ3715747434 The Hollies	Eggs
16/06/1992	SJ37154743	
07/07/1992	SJ37194758	
02/07/1992	SJ37244726	Probable presence
16/06/1992	SJ37134742	Probable presence
13/04/2000	SJ37134742 The Hollies	7
Before 29/08/2003	SJ3713247426 The Hollies	Last surveyed 2001
1992	SJ37154758 Maelor abattoir	Present
02/07/1992	SJ37444771 Maelor abattoir	18
27/04/2000	SJ37444771 Maelor abattoir	18
07/07/1992	SJ37124759 Maelor abattoir	Present
Before 29/08/2003	SJ3757947696 Maelor abattoir	4 male, 5 Female
07/07/1992	SJ36974757 Maelor abattoir	2
13/04/2000	SJ36974757 Maelor abattoir	2
Over 250 m		
1991	SJ37224723	Present
Before 23/03/2007	SJ3757447723 Maelor abattoir	
Before 27/04/2000	SJ37614772	2
Before 29/08/2003	SJ3698247527	6 male, 6 Female (2001)
02/07/1992	SJ37084717 Gwrych Teg Farm	Present
15/04/2000	SJ373470 Cross Lanes Hotel	6
07/07/1992	SJ37974779 Parkey Farm	Present
02/07/1992	SJ36974687	
15/04/2000	SJ36974687 Gwrych Teg Farm	11
13/04/2000	SJ366474	5
13/04/2000	SJ3663147401 Hollyhedge	5
15/04/2000	SJ367470	8
02/07/1992	SJ36684700 Gwrych Teg Farm	Present
07/07/1992	SJ38184743 Parkey Farm	Present
15/04/2000	SJ365472 Highfield Farm	14
12/06/1992	SJ36524715 Highfield Farm	Present
03/04/2000	SJ363472 Highfield Farm	6
12/06/1992	SJ36334714 Highfield Farm	Present
12/06/1992	SJ36314716 Highfield Farm	Present
Over 1 km		
25/02/1992	SJ38424785	
25/06/1992	SJ38424785	
25/06/1992	SJ38524789	
25/06/1992	SJ38404816 Pickhill Bridge Farm	
24/04/2002	SJ36514781 Five Fords, Sewage treatment works lagoon	Bottle trap - 5
24/04/2002	SJ362480	
12/06/1992	SJ36124717	Present
12/06/1992	SJ36274678 Highfield Farm	Present
25/06/1992	SJ38604785 Talurn Farm	Present
12/06/1992	SJ36204678	

1992	SJ36204676 Highfield Farm	Present
09/05/2005 and 11/05/2005	SJ360478 Marchwell Marsh Nature Reserve	Torch survey - 2 Male, 4 Female
07/06/2005	SJ3601047855 Marchwell Marsh Nature Reserve	20
12/06/1992	SJ35964723	Probable presence
03/06/1992	SJ38594817 Parkey Lodge	Present

Table 1. *COFNOD great crested newt records*

C.2 Statutory Sites (great crested newt) within 10 km

Johnstown Newt Sites Special Area of Conservation (SAC UK0030173) and Stryt las A'r Hafod Site of Special Scientific interest (SSSI) share the same site boundary and lie approximately 5.9 km west of the proposal.

This 69 hectare SAC and SSSI is made up of two separate post-industrial sites in and around Rhosllanerchrugog which lies south of Wrexham. The population of great crested newts present is one of the largest known in Great Britain with much conservation management over the last few years. Mining subsidence pools and natural water-filled hollows on clay are utilised as breeding ponds, whilst other ponds have been created as part of nature conservation management. Terrestrial habitat includes marshy grassland, grazed farmland, swamp, scrub and broad-leaved woodland. Good populations of other widespread amphibian species are also present.

No other statutory sites designated for great crested newts fall within 10 km of the proposal.

C.3 Objectives of the Survey

Based upon the desk study results indicating that great crested newts were present on site previously, for the purpose of this method statement continued presence is assumed. Due to the age of the records received from Cofnod and the need to establish a population size specific surveys commenced in April 2015. At the time of writing surveys were still in progress and as such final results have not been included at this stage. Full survey results would be submitted with full planning applications. An initial site survey was undertaken by Jeremy James MSc, BSc (Hons), CEcol, CEnv, MCIEEM on 26th March 201, prior to the commencement of the first presence/absence survey. The aim was to make an assessment of the existing pond and terrestrial habitats present on the site and in the locality as well as the likely usage of the site by great crested newts and other widespread amphibian species.

C.4 Scaled Plan / Map of Survey area

C.5 Site / Habitat Description

Pond 1

Pond 1 is located to the south of the development site. It comprises a circular pond in a large depression in the ground, judged to be a balancing pond for the adjacent new road and roundabout. It is approximately 15m in diameter with limited aquatic and marginal vegetation, with a stand of bulrush (*Typha latifolia*) on the western bank and flote grass (*Glyceria fluitans*) observed elsewhere. Water clarity was found to be very poor. When water levels in the pond drops, the banks are left with a bare, muddy substrate.

Plate 1. *View of pond 1 from the north west bank*

Pond 2

Pond 2 is the only pond located within the development boundary. It is a moderate sized field pond with dense scrub growth on the eastern bank and part of the western bank, comprising hawthorn (*Crataegus monogyna*) and willow (*Salix* sp.). The northern bank has sparse marginal vegetation, dominated by soft rush. The southern bank has much more marginal and aquatic vegetation cover, with a dense stand of bulrush approximately 5m out into the pond. Aquatic and marginal vegetation species include jointed rush (*Juncus articulatus*), water plantain (*Alisma plantago-aquatica*), water forget-me-not (*Myosotis scorpioides*), bittersweet (*Solanum dulcamara*), gipsywort (*Lycopus europaeus*), bur-reed (*Sparganium* sp.), sedges (*Carex nigra*) and water starwort (*Callitriche stagnalis*).

Plate 2. *Pond 2 viewed from the north-western bank*

Pond 3

Pond 3 is the most southerly of the cluster of what appear to be mitigation ponds, created as part of the mitigation scheme related to the construction of the new road, located to the north of the development site. The pond is approximately 10m wide and 20m long. Water clarity was found to be very good, with an abundance of invertebrates present. Good coverage of marginal plant species is present on all banks, with species including jointed rush and water forget-me-not, with a dense stand of bulrush on the eastern bank, stretching into the centre of the pond, as well as growth on other banks. There is also good macrophyte growth in the centre of the pond, including water starwort and milfoil (*Myriophyllum* sp.).

Plate 3. *Pond 2 viewed from the western bank*

Pond 4

Pond 2 is located approximately 10m to the north of Pond 3. It is circular in shape with a diameter of approximately 15m and a similar character to Pond 3. Good coverage of emergent and marginal vegetation is present, with species including jointed rush, water plantain, water forget-me-not, bittersweet, gipsywort, bur reed, water starwort and a number of sedge species. Water clarity is very good, with open areas towards the centre of the pond.

Plate 4. *Pond 4 viewed from the western bank*

Pond 5

Is the most northerly of the three mitigation ponds, and is located immediately east of an amphibian underpass, providing connectivity underneath the new road. The pond is approximately 4m wide by 35m long, with dense marginal and emergent vegetation. The northern bank is covered by dense scrub including bramble (*Rubus fruticosus*) and hawthorn, as well as two mature oak (*Quercus robur*) trees. Bulrush growth is dense throughout the pond, leaving less open water than is available in Ponds 3 and 4. Oher species include sharp-flowered rush, water plantain, water forget-me-not, bittersweet, starwort and milfoil.

Plate 5. *Pond 5 viewed from the southern bank*

Terrestrial Habitat

Terrestrial habitat in the field to the north of the development comprises unmanaged grassland and tall ruderal vegetation with species including common nettle (*Urtica dioica*), cocksfoot (*Dactylis glomerata*), oxeye daisy (*Leucanthemum vulgare*) and creeping thistle (*Cirsium vulgare*), surrounding Ponds 3,4 and . Young scattered scrub, including a number of tree saplings which have been recently planted between Ponds 3 and 4, are also present. An amphibian underpass is present on the western boundary of this field, connecting it with habitat on the western side of the newly constructed road. This habitat, along with the three ponds situated here, provides highly favourable habitat for breeding great crested newts, with diverse habitat structure.

Plate 6. *Terrestrial habitat looking north adjacent to Pond 3*

Plate 7. *Terrestrial habitat looking north-east adjacent to Pond 4*

Terrestrial habitat within the development area comprises three fields, two to the north of Pond 2, bisected by a fence line, and a third to the south of Pond 2. The northern fields were comprised primarily of poor semi-improved grassland habitat, with dominant species including creeping buttercup (*Ranunculus repens*), cocksfoot, Yorkshire fog (*Holcus lanatus*), creeping thistle with occasional meadow fox-tail (*Alopecurus pratensis*) and common mouse-ear (*Cerastium fontanum*). The ground feels poached in places, and so has been used for grazing livestock in the recent past, however, in its currently unmanaged state, it provides the structural diversity favoured by great crested newts. A large mound is located to the west of the fields, adjacent to the road. This appears to be an old earth pile which has since re-vegetated, primarily by ruderal species. A small patch of bramble also occurs on the fence line bisecting he fields, providing additional structural diversity. A corrugated metal shed is located on the northern boundary of the development area, with tall ruderal vegetation alongside.

Plate 8. *Terrestrial habitat in development area from gateway*

Plate 9. *Re-vegetated earth mound to west of field*

Plate 10. *Small area of scrub along timber fence line bisecting northern fields*

Plate 11. *Metal shed on northern boundary of development site with adjacent tall ruderal vegetation*

Mature scrub (outgrown hedgerows) comprising primarily hawthorn and blackthorn (*Prunus spinosa*), were present on the northern boundary of the development area, as well as the boundary which runs either side of the Pond 2. A number of mature trees, including oak and willow were also present around the pond. The boundary running north from Pond 2, bisecting the northern fields, comprises a timber fence with a single young hawthorn, and therefore provides limited value to great crested newts. The field to the south of Pond 2 is heavily dominated by graminoid species, with a much higher sward length than the previous fields, with much higher occurrence of meadow fox-tail.

Plate 12. *Outgrown hedgerow comprising mature scrub species, adjacent to Pond 2*

Plate 13. *Field to the south of Pond 2 from gate to the north*

The field to the south of the development area, where Pond 1 is situated, is comprised of steep banks down to the pond, with a well managed sort sward covering the banks whilst much taller vegetation generated higher up the banks as the growing season progressed. A line of scattered trees and outgrown hedge, as well as an access track separate this habitat and the development area.

The verges of the newly created road are comprised of rough grassland with young sapling trees. This is likely to provide an additional route of connectivity between the development area and ponds to the north and south. Connectivity between this group of ponds is primarily maintained via areas of scrub and field margins.

Plate 14. *Roadside verge and new hedge to north of development site access*

Plate 15. *Roadside verge and new hedge to south of development site access*

C.6 Field Survey

Information in the field and from map work was collected for the pond in order to complete a 'Great Crested Newt Habitat Suitability Index' (Oldham *et al.,* 2000). This involves collecting information on ten suitability indices, the geometric mean of which gives a Habitat Suitability Index on a scale of 0-1. An HSI of 1 is optimal habitat (high probability of occurrence), while an HSI of 0 is very poor habitat (minimal probability of occurrence). The HSI is calculated on a single pond basis, but takes into account surrounding terrestrial habitat and local pond density. The HSI score can be interpreted as follows:

HSI	Pond Suitability
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Good
>0.8	Excellent

Table 2. *HSI results scale*

The amphibian survey was undertaken in accordance with the methodology prescribed within the Great Crested Newt Mitigation Guidelines (English Nature, 2001) for a presence / absence survey and a population assessment. The presence / absence survey requires the completion of four survey visits to ponds and water features within the study area. These surveys should be undertaken between mid-March and mid-June. Two of the visits need to be undertaken during the peak survey period which extends from mid-April to mid-May. The surveys should be undertaken during suitable weather conditions (ideally the minimum overnight temperature should be greater than 5ºC, no rain during the survey and only a gentle breeze). During each of the visits three of the five available survey methods described below should be implemented each time.

Survey methods that can be used are as follows:

- Bottle trapping – bottle traps are spaced evenly around the margin of the pond/water in the evening and then left overnight. These are then checked and removed in the morning to see if there are any newts present within the bottle traps.
- Torching – surveyors walk the entire perimeter of the pond using high powered torches (500,000 candle power) to identify if any amphibians are present.
- Netting – a long handled dip net is used to sample within open water and vegetation.
- Egg searching – newts will lay their eggs upon vegetation. Therefore the vegetation is inspected to see if they are present and to determine if they are small newts of great crested newt eggs.
- Refugia search – natural refugia is lifted and inspected to see if newts are present terrestrially.

The population assessment survey was completed, this requires the completion of a further two survey visits (therefore six survey visits in total). As stated above the survey period extends from mid-March to mid-June and for a population assessment three survey visits should be undertaken during

the peak survey period between mid-April and mid-May. As above three survey methods are used on each visit.

C.7 Survey Results

The habitat suitability index for the only pond within the development site, Pond 2, found it to be excellent with a score of 0.82. Ponds to the north of the site, Ponds 3, 4 and 5, were all found to be excellent with respective scores of 0.8, 0.81 ad 0.94. Pond 1 to the south of the site was found to have a habitat suitability index score of 0.69, giving it average suitability for great crested newts.

Pond Ref	Pond 1	Pond 2	Pond 3	Pond 4	Pond 5
SI1 - Location	1	1	1	1	1
SI2 - Pond area	0.5	1	0.6	0.6	1
SI3 - Pond desiccation	0.5	0.9	1	0.9	0.9
SI4 - Water quality	0.67	0.67	1	0.67	1
SI5 - Shade	1	1	1	1	1
SI6 - Fowl	0.67	0.67	0.67	0.67	0.67
SI7 - Fish	0.67	1	1	1	1
SI8 - Ponds	1	1	1	1	1
SI9 - Terr'l habitat	0.67	0.67	1	1	1
SI10 - Macrophytes	0.5	0.5	0.7	0.5	0.9
Total	0.69	0.82	0.8	0.81	0.94

Table 3. *Habitat suitability index results for the existing ponds*

Presence/absence surveys were undertaken by Kate Statham MSc, BSc (Hons) (KS), ACIEEM, Matt Clifford MSc, BSc (MC) and Sarah Birtley MBiolSci (Hons) (SB), with assistance from Sophie Barrell MEcol (SBA) and Jody Ginley BSc (Hons) (JG). Surveys were undertaken on the following dates:

Date	Surveyors
14/04/2015	KS, JG
28/04/2015	MC, JG
06/05/2015	MC, JG
20/05/2015	MC, SBA
01/06/2001	SB, SBA
15/06/2015	KS, SBA

Table 4. *Habitat suitability index results for the existing ponds*

Date	Peak Count			Presence/Absense	
	Triturus cristatus	***Lissotriton vulgaris***	***L. helvetica***	***Bufo bufo***	***Rana temporaria***
14/04/2015	**40**	**24**	**2**	O	X
28/04/2015	21	8	0	O	O
06/05/2015	20	11	0	O	O
20/05/2015	27	18	0	O	X
01/06/2015	13	2	0	X	X
15/06/2015	13	1	0	O	X

Table 5. *Peak count values for each species on each survey date (see Appendix J.1 for full results)*

C.8 Interpretation / Evaluation of Survey Results

Cofnod records indicate that the site is situated within an area where great crested newts are common, utilising the numerous ponds scattered throughout the area. In addition, one of the largest known populations of great crested newts (Johnstown SAC) lies 5.9 km west of the site.

The 0.82 score for the Habitat Suitability Index indicated that Pond 2, within the development site has excellent suitability for great crested newts. In addition, Ponds 3, 4 and 5 immediately north of the development site also recorded a status of excellent for great crested newts under the Habitat Suitability Index. The 2015 presence / absence survey results to date indicate that all of the ponds surveys support great crested newts. The results of the surveys indicate a medium sized meta-population utilising the 5 ponds, with reference to Section 5.8 of the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001).

D. Impact Assessment

D.1 Short-term Impacts: Disturbance

Short-term impacts, in the absence of mitigation the following impacts could occur to great crested newts:

- permanent loss of optimal terrestrial habitat where the poultry units, car parking and access track are to be located.
- Killing or injury to great crested newts present in terrestrial habitats on the site at the time of works.
- Killing, injury or disturbance to amphibians present in the existing ponds if damaged by construction activities.
- Potential for pollution of the adjacent ponds during construction works
- Restricted access across the site whilst the works are being undertaken, which could hinder movement across terrestrial habitats to and from the existing ponds.
- Introduction of potential amphibian pathogens, e.g. *Batrachochytrium dendrobatidis*

D.2 Long-term Impacts: Site Modification

Potential long-term impacts in terms of site modification, in the absence of mitigation are as follows:

- Localised loss of optimal terrestrial habitat, where the proposal is to be located.
- Localised loss of sub-optimal terrestrial habitat to accommodate new aquatic habitat.
- Potential damage to existing ponds due to construction activity.
- Change in terrestrial habitat type (i.e. grassland to poultry unit) may alter movement across terrestrial habitats to and from the existing ponds.
- Introduction of potential amphibian pathogens, e.g. *Batrachochytrium dendrobatidis*

D.3 Long-term Impacts: Site Loss

There are not considered to be any long-term adverse impacts on the sub populations within the wider landscape (up to 10 km) as no ponds will be lost and only a small area, approximately 0.8ha, will be lost. A further small area, approximately 0.2ha, of suboptimal habitat will be lost to accommodate the provision of new aquatic and terrestrial receptor habitat at the site.

D.4 Long-term Impacts: Fragmentation and Isolation

The majority of linear features (hedges) around the site will be retained and are unaffected by the proposal, the entrance to the main road will require widening and therefore a small length of very young hedgerow, approximately 10m, will be removed. No ponds will be removed or altered as part of the proposal. New aquatic habitat to be created at site will be fenced from livestock, therefore increasing the availability of high quality terrestrial habitat

at the site. Additionally, existing boundary features will be re-enforced where necessary, e.g. replanting of gaps in hedgerows. As such it is unlikely that fragmentation and isolation of the pond will occur as a result of the proposed works.

D.5 Post-development Interference Impacts

Post-development interference impacts may include the risk of great crested newts being run over on the access road to the poultry units. Pollution and run off from the poultry units may also negatively affect the adjacent pond and immediate terrestrial habitat, if not adequately mitigated for. Human interference is considered to be minimal at present and is likely to decrease as a result of the scheme because the new aquatic habitat will be fenced with stock fencing to prevent access to the ponds by livestock, further reducing disturbance.

D.6 Predicted Scale of Impact

The predicted scale of impact on species status at the site, 2km, 10km, local, county, regional and country levels is as follows:

Geographic level	**Predicted scale of impact**
2km	Minor positive impact with increase in available aquatic habitat and improvement of some existing terrestrial habitat
10km	No impact
Local	Minor positive impact with increase in available aquatic habitat and improvement of some existing terrestrial habitat
County	No impact
Regional	No impact

Table 6. *Scale of Impact*

Delivery Information

E. Works to be undertaken

E.1 Great Crested Newt Capture and Exclusions

An amphibian exclusion area will be created around the proposed footprint and associated laydown areas prior to the commencement of works. The exclusion will include amphibian fencing around the perimeter and drift fencing within the area. All fencing will have associated pitfall traps set at intervals as recommended in the Great Crested Newt Mitigation Guidelines (2001). In addition, carpet tiles will be utilised to undertake refugia searches within the exclusion area. These will be located around the perimeter and drift fences as well as in areas where terrestrial habitat is judged to be most favourable for great crested newts. See Appendix J.2 for plan of exclusion scheme and Appendix J.4 for a plan of the receptor site.

The presence of a medium great crested newt population on site requires a minimum trapping effort of 60 days with appropriate weather conditions, in accordance with the GCN Mitigation Guidelines.

Protection measures during construction include:

- Toolbox talks to be given to all contractors and others working on site, prior to the commencement of works. Toolbox talks to include GCN identification, legislation, the importance of biosecurity and explanation of the exclusion scheme.
- Implementation of biosecurity, e.g. spraying wheels of vehicles and machines with Virkon prior to accessing site.
- Hand search of terrestrial habitat prior to installation of exclusion fencing and supervision of fence installation.
- Hand search prior to hedge removal and supervision of hedge removal
- Daily checks of the pitfall traps will be undertaken in accordance with the GCN Mitigation Guidelines, which will also include inspection of the perimeter fence to ensure it remains intact throughout the capture period.
- Destructive hand search, by suitably qualified ecologist, of all log/rock piles and other potential refugia at the end of the capture period
- If a GCN is found within the construction area during the construction period, all works must cease immediately and the project ecologists contacted for further advice.
- If a GCN is found and is in imminent danger, move GCN to a safe location and contact project ecologist

E.2 Great Crested Newt Habitat

An area of new aquatic habitat will be created immediately to the west of the exclusion area, including two new receptor ponds/scrapes (see Appendix J.5 for design specification). Livestock will be excluded from this area by a post and wire fence, with a new hedgerow planted along the fence line. The fencing will therefore provide undisturbed terrestrial habitat for great crested newts. Two refugia (e.g. log piles) and a single hibernacula (see Appendix J.6 for design specification) will be constructed within this area. New aquatic habitat and associated fencing will be completed prior to commencement of construction works, allowing adequate time for it to establish, allowing for its use as a receptor site for the exclusion scheme.

Additional planting will be undertaken along the boundary to the north of the exclusion area to reinforce the hedgerow as a commuting route between the existing ponds to the north and the receptor ponds. Further planting will be undertaken along the field boundary to the west of the exclusion area, enhancing the habitat corridor already present along the embankment of the new road, which currently comprises grassland and a young hedgerow. Planting will be undertaken during the winter months, the hedgerow planting season, to ensure a good survival rate or shrubs/hedgerow plants. Supplementary planting of native herbaceous hedgerow species is also recommended.

Species used within the planting scheme with be native species, of local provenance where possible, and will include:

Woody hedgerow species:

- Hawthorn (*Crataegus monogyna*)
- Blackthorn (*Prunus spinosa*)
- Elder (*Sambucus nigra*)
- Field maple (*Acer campestre*)
- Dogwood (*Cornus sanguinea*)
- Hazel (*Corylus avellana*)

The existing pond, Pond 2, will be fenced from livestock along its western and northern boundaries. As well as reducing poaching of the ponds, a geotextile (e.g. Terram or other suitable barrier) will be fitted to the lower portion of the fencing to prevent any run off from the poultry sheds from entering the ponds. This work will be completed prior to the commencement of construction works.

The area of terrestrial habitat surrounding the new ponds should be sown with yellow rattle (*Rhinanthus minor*), to reduce the vigour of grass growth and therefore encourage greater botanical and structural diversity. Ideally, yellow rattle should be sown in autumn.

Ground to the west of the poultry sheds which lies within the exclusion area, but is not occupied by the footprint of the buildings, will be allowed to re-vegetate naturally.

Please see Appendix J.3 for plan full plan of mitigation and compensation measures.

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

An appropriate audit log will be kept, logging all visits made to site by site ecologists.

An audit will be made to ensure the completion of the two new ponds and new hedgerow, to an acceptable standard, prior to the commencement of amphibian fence installation. An audit visit will also be made to ensure the amphibian fencing is installed correctly, prior to the commencement of the exclusion period.

A full log of all great crested newts, and other widespread amphibians, will be kept for each day of the exclusion period. This will include the number and sex of each individual and which pond they were translocated to.

All site logs, photographs and data will be kept on file.

Regular updates will be provided by the site ecologists to the relevant staff at NRW, as well as the planning authority, to ensure the scheme is implemented as planned. Any issues which result in unforeseen changes to the methods detailed in this document will be dealt with immediately via the appropriate body.

Newt-friendly features will be incorporated into the design of the development. This will include:

- Any perimeter/visual barrier fencing, to maintain a gap of 15mm between the ground and the base of the fence to ensure the porosity of the site to amphibians.

- Any gully pots to be installed as part of the scheme will be offset from the kerb by 10cm, and will not abutt them, as recommended by Muir (2012).

E.4 Mitigation Contingencies

The six survey visits have provided an estimate of a medium sized population of great crested newts within the metapopulation present across the five ponds surveyed.

Following commencement of the exclusion period, if the capture rate of great crested newts is found to be significantly higher than anticipated, further contingency mitigation and compensation measures will be employed.

This will include the provision of a new scrape adjacent to Pond 2, on its southern side, increasing the available aquatic habitat and therefore the carrying capacity of the site for great crested newts. In addition, a stock fence will be installed excluding livestock from a buffer of terrestrial habitat around the new scrape as well as the southern banks of Pond 2. This will increase the provision of terrestrial habitat on site which is not accessible to livestock and therefore more structurally diverse and with reduced disturbance.

E.5 Biosecurity Risk Assessment

A Biosecurity Risk Assessment has been prepared for the proposed development. Please see Appendix J.7.

F. Post-development Site Safeguard

F.1 Habitat/Site Management

Post-development, the site will be managed and maintained by N & K Elliott. Management and maintenance will include:

- Maintenance of stock fencing to ensure livestock are unable to enter receptor area
- Maintenance of geotextile/pollution barrier on fencing around Pond 2. Any damage areas should be repaired or replaced to maintain the barrier to run off
- Monitoring of woody species in hedgerow planting – any which fail should be replaced on a like for like basis
- Low intensity management of the terrestrial habitat associated with the new ponds – cutting annually in late summer, with arising's removed and no grazing permitted.
- Removal of any scrub saplings within the receptor area every 5 years to ensure that the receptor ponds do not become shaded.

F.2 Population Monitoring

Population monitoring of the site will be undertaken between March and June 2017 and 2018. Monitoring will be undertaken over six visits, with two in the peak period of mid-April to mid-May, utilising four of the standard methods as defined in the GCN Mitigation Guidelines.

Monitoring will focus on the receptor ponds as well as Pond 2.

F.3 Post Development Mitigation Contingencies

If ongoing monitoring results are unfavourable, an assessment as to why the area has not been occupied by great crested newts will be undertaken. During monitoring visits, the quality of the aquatic and terrestrial habitats created as part of the mitigation and compensation, will be assessed. If the terrestrial habitat has become unfavourable, management will be undertaken to improve it, in consultation with the landowner. This may include scrub management and additional sowing of yellow rattle to reduce the vigour of grass species in order to maintain the structural diversity of the sward within the mitigation areas. If aquatic habitat becomes unfavourable, management may be undertaken in consultation with the landowner, including additional planting of margins.

F.4 Mechanisms for ensuring delivery

All further monitoring will be undertaken by appropriately licensed and experience Bowland Ecology staff, and their accredited agents. All reporting will be provided to both NRW and he council. Any matters which may arise

during the course of the monitoring will be discussed immeadiatly with the appropriate body.

G. Timetable of works

The proposed developmet does not yet have planning permission, and therefore the estimation of timescales for the project is not possible. However, once a working schedule is drafted, all mitigation and compensaion works will be programmed in, taking into account the most appropriate time of year/season for each element of the works to ensure the efficacy of the mitigation.

H. Land Ownership

H.1 Mitigation site ownership

The receptor ponds are owned by N & K Elliott, the owner of the proposed development site.

Hedgerows to the north and west of the site, which are to be re-enforced as part of the compensation measures, are outside of N & K Elliott's ownership. However, as these are boundary features, additional planting will take place on the side of the boundary within the ownership of N & K Elliott.

H.2 Mitigation site ownership post development

The mitigation site will remain within the ownership of N & K Elliott for the foreseeable future, following development.

I. References, Credits for Sources of Information

Langton, T., Beckett, C., Foster, J. (2001) *Great Crested Newt Conservation Handbook.* Froglife: Suffolk

Natural England, (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough

Muir, D (2012) Amphibians in drains project summary. *Biodiversity News*, 59: 16-18

J. Annexes

J.1 Raw Survey Data

Site: Black Rock Farm **Pond 1**

Method	GCN			Smooth newt		Palmate newt		Palmate/smooth ♀ indet.	Other species present (specify)	Notes - Number of bottles etc…
	♂	♀	indet.	♂	♀	♂	♀			
Visit 1 - 14/04/15										
Temp: 14°C / Weather: dry and bright / Turbidity: 3 / Veg Cover: 1										
Torch	0	1	0	0	0	0	0	0	Diving beetle	
Net	0	0	0	0	0	0	0	0		
Eggs	None			None						
Visit 2 - 28/04/15										
Temp: 8°C / Weather: breezy, dry / Turbidity: 4 / Veg Cover: 2										
Torch	0	0	0	0	0	0	0	0	snails, diving beetles	
Net	0	0	0	0	0	0	0	0		
Eggs										
Visit 3 - 06/05/15										
Temp: 9°C / Weather: rain clearing, cool / Turbidity: 4 / Veg Cover: 2										
Torch	0	0	0	0	0	0	0	0	Diving beetle larvae	
Net	0	0	0	0	0	0	0	0	diving beetle larvae	
Eggs										
Visit 4 - 20/05/15										
Temp: 10°C / Weather: still, dry, clear / Turbidity: 5 / Veg Cover: 2										
Torch	0	1	0	0	0	0	0	0		
Net	0	0	0	0	0	0	0	0	Various invertebrates	
Eggs										
Visit 5 - 01/06/15										
Temp: 9°C / Weather: Rain / Turbidity: 5 / Veg Cover: 1										
Torch	0	0	0	0	0	0	0	0		
Net	0	0	0	0	0	0	0	0	Water boatmen, damselfly larvae	
Eggs	Present									
Visit 6 - 15/06/15										
Temp: 17°C / Weather: Dry, clear / Turbidity: 2 / Veg Cover: 3										
Torch	0	1	0	0	0	0	0	efts	water boatmen	
Net	0	0	0	0	0	0	0	0		
Eggs	None			None						

Site: Black Rock Farm	Pond 2									
Method	**GCN**			**Smooth newt**		**Palmate newt**		**Palmate/smooth ♀ indet.**	**Other species present (specify)**	**Notes - Number of bottles etc…**
	♂	♀	**indet.**	♂	♀	♂	♀			
Visit 1 - 14/04/15										
Temp: 14°C / Weather: dry and bright / Turbidity: 2 / Veg Cover: 3										
Torch	3	1	0	5	0	0	0	2		
Bottle	1	2	0	6	1	0	1	0		
Net	0	0	0	1	0	0	0	0	Water hoglouse, diving beetle	
Visit 2 - 28/04/15										
Temp: 8°C / Weather: breezy, dry / Turbidity: 4 / Veg Cover: 2										
Torch	0	0	0	0	0	0	0	0		
Bottle	0	0	0	1	0	0	0	0		
Net	0	0	0	0	0	0	0	0		
Visit 3 - 06/05/15										
Temp: 9°C / Weather: rain clearing, cool / Turbidity: 4 / Veg Cover: 2										
Torch	0	0	0	0	0	0	0	0	Diving beetle larvae	
Net	0	0	0	0	0	0	0	0	diving beetle larvae	
Eggs	Present									
Visit 4 - 20/05/15										
Temp: 10°C / Weather: still, dry, clear / Turbidity: 5 / Veg Cover: 2										
Torch	0	0	0	3	0	0	0	4		
Bottle	0	3	0	0	0	0	0	0	Various invertebrates	
Eggs	0	0	0	0	0	0	0	0		
Visit 5 - 01/06/15										
Temp: 9°C / Weather: Rain / Turbidity: 2 / Veg Cover: 3										
Torch	0	0	0	0	0	0	0	0	2 common frog, 2 common toad	
Bottle	0	1	0	0	0	0	0	0	diving beetle	
Eggs	0			0				0		
Visit 6 - 15/06/15										
Temp: 17°C / Weather: dry, clear / Turbidity: 4 / Veg Cover: 4										
Torch	0	0	0	0	0	0	0	0	Water boatmen, greater diving beetle	
Bottle	0	0	0	0	0	0	0	efts	greater diving beetle larvae	
Eggs	none			none						

Site: Black Rock Farm	Pond 3

Method	GCN			Smooth newt		Palmate newt		Palmate/smooth ♀ indet.	Other species present (specify)	Notes - Number of bottles etc…
	♂	♀	indet.	♂	♀	♂	♀			
Visit 1 - 14/04/15										
Temp: 14°C / Weather: dry and bright / Turbidity: 3 / Veg Cover: 1										
Torch	13	1	0	4	0	0	0	3	water boatmen, diving beetles	
Bottle	2	0	0	2	0	0	1	0		
Net	0	0	0	0	0	0	0	0	Daphnia	
Visit 2 - 28/04/15										
Temp: 8°C / Weather: breezy, dry / Turbidity: 4 / Veg Cover: 2										
Torch	6	2	0	4	0	0	0	5		
Bottle	0	0	0	2	0	0	0	0		
Eggs										
Visit 3 - 06/05/15										
Temp: 9°C / Weather: rain clearing, cool / Turbidity: 4 / Veg Cover: 2										
Torch	11	3	0	4	2	0	0	2		
Bottle	0	0	0	0	2	0	0	0		
Eggs										
Visit 4 - 20/05/15										
Temp: 10°C / Weather: still, dry, clear / Turbidity: 5 / Veg Cover: 2										
Torch	7	3	0	5	4	0	0	3	1 x common frog	
Bottle	2	0	0	0	0	0	0	0		
Eggs										
Visit 5 - 01/06/15										
Temp: 9°C / Weather: Rain / Turbidity: 1 / Veg Cover: 2										
Torch	4	2	0	1	0	0	0	2		
Bottle	1	0	0	1	0	0	0	0	greater diving beetle	
Net	0	0	0	0	0	0	0	0	Water boatmen	
Visit 6 - 15/06/15										
Temp: 17°C / Weather: dry, clear / Turbidity: 2 / Veg Cover: 3										
Torch	0	2	0	0	0	0	0	0	common frog	
Bottle	0	1	0	0	0	0	0	0	common frog, dragonfly larvae, water boatmen	
Net	0	0	0	0	0	0	0	0	Dragonfly larvae, water boatmen	

Site: Black Rock Farm				Pond 4						
Method	**GCN**			**Smooth newt**		**Palmate newt**		**Palmate/smooth ♀ indet.**	**Other species present (specify)**	**Notes - Number of bottles etc…**
	♂	♀	**indet.**	♂	♀	♂	♀			
Visit 1 - 14/04/15										
Temp: 14°C / Weather: dry and bright / Turbidity: 3 / Veg Cover: 1										
Torch	7	3	1	1	0	0	0	0	1 x Common frog	
Bottle	5	3	0	1	1	0	0	0		
Net	0	0	0	0	0	0	0	0	Daphnia	
Visit 2 - 28/04/15										
Temp: 8°C / Weather: breezy, dry / Turbidity: 4 / Veg Cover: 2										
Torch	9	4	0	1	0	0	0	2		
Bottle	0	0	0	0	0	0	0	0		
Eggs								0		
Visit 3 - 06/05/15										
Temp: 9°C / Weather: rain clearing, cool / Turbidity: 4 / Veg Cover: 2										
Torch	2	2	0	2	1	0	0	0		
Bottle	0	0	0	0	0	0	0	0		
Eggs										
Visit 4 - 20/05/15										
Temp: 10°C / Weather: still, dry, clear / Turbidity: 5 / Veg Cover: 2										
Torch	6	4	0	4	2	0	0	0	2 x common frog	
Bottle	0	0	0	0	0	0	0	0	Various invertebrates	
Eggs										
Visit 5 - 01/06/15										
Temp: 9°C / Weather: Rain / Turbidity: 1 / Veg Cover: 2										
Torch	0	3	1	0	0	0	0	1		
Bottle	1	0	0	0	0	0	0	0		
Net									Water boatmen, tadpole, damselfly larvae	
Visit 6 - 15/06/15										
Temp: 17°C / Weather: dry, clear / Turbidity: 2 / Veg Cover: 3										
Torch	1	7	0	1	0	0	0	0	common frog, water boatmen	
Bottle	0	0	1	0	0	0	0	0	GCN eft	
Eggs	none			none						

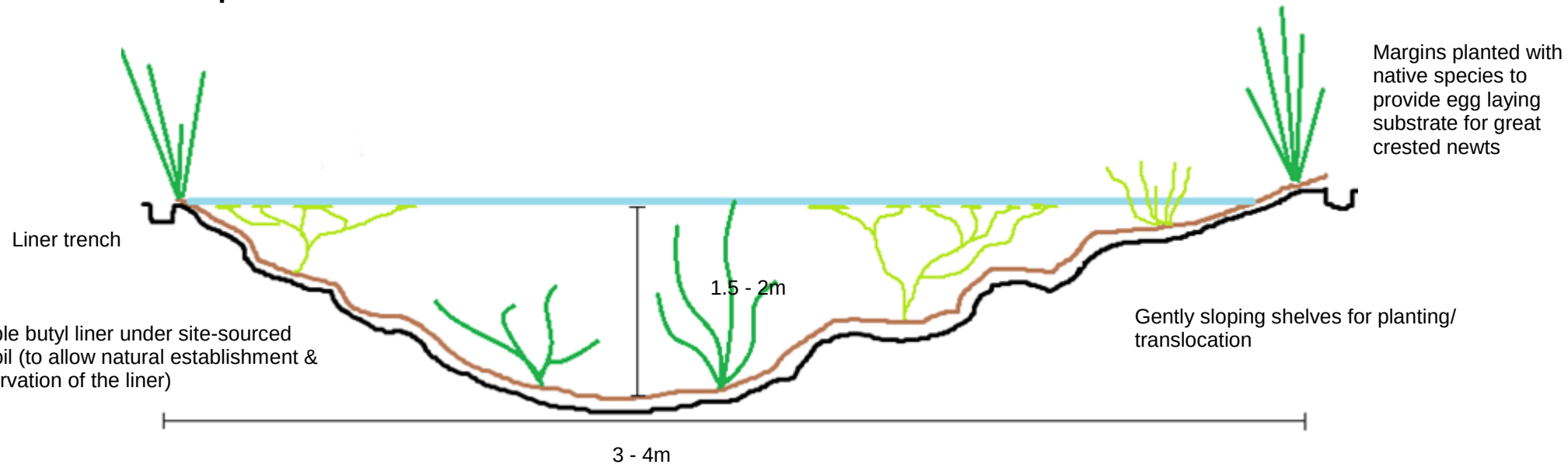
Site: Black Rock Farm	Pond 5									
Method	**GCN**			**Smooth newt**		**Palmate newt**		**Palmate/smooth ♀ indet.**	**Other species present (specify)**	**Notes - Number of bottles etc…**
	♂	♀	**indet.**	♂	♀	♂	♀			
Visit 1 - 14/04/15										
Temp: 14°C / Weather: dry and bright / Turbidity: 3 / Veg Cover: 1										
Torch	0	0	0	2	0	0	0	0	Diving beetle	
Bottle	0	0	0	0	0	0	0	0		
Eggs										
Visit 2 - 28/04/15										
Temp: 8°C / Weather: breezy, dry / Turbidity: 4 / Veg Cover: 2										
Torch	0	0	0	0	0	0	0	0	Diving beetles	
Bottle	0	0	0	0	0	0	0	0		
Eggs										
Visit 3 - 06/05/15										
Temp: 9°C / Weather: rain clearing, cool / Turbidity: 4 / Veg Cover: 2										
Torch	1	0	0	0	0	0	0	1		
Bottle	0	1	0	0	0	0	0	0		
Eggs										
Visit 4 - 20/05/15										
Temp: 10°C / Weather: still, dry, clear / Turbidity: 5 / Veg Cover: 2										
Torch	1	0	0	0	0	0	0	1		
Bottle	0	0	0	0	0	0	0	0	Various invertebrates	
Eggs										
Visit 5 - 01/06/15										
Temp: 9°C / Weather: Rain / Turbidity: 2 / Veg Cover: 4										
Torch	0	0	0	0	0	0	0	0	common frog, greater diving beetle	
Bottle	0	0	0	0	0	0	0	0	diving beetle larvae	
Net	0	0	0	0	0	0	0	0	diving beetle, Gammarus, water boatmen	
Visit 6 - 15/06/15										
Temp: 17°C / Weather: clear, dry / Turbidity: 2 / Veg Cover: 4										
Torch	0	0	0	0	0	0	0	0	common frog, diving beetle	
Bottle	0	0	0	0	0	0	0	0	greater diving beetle larvae	
Net	0	0	0	0	0	0	0	0	diving beetle, water boatmen	

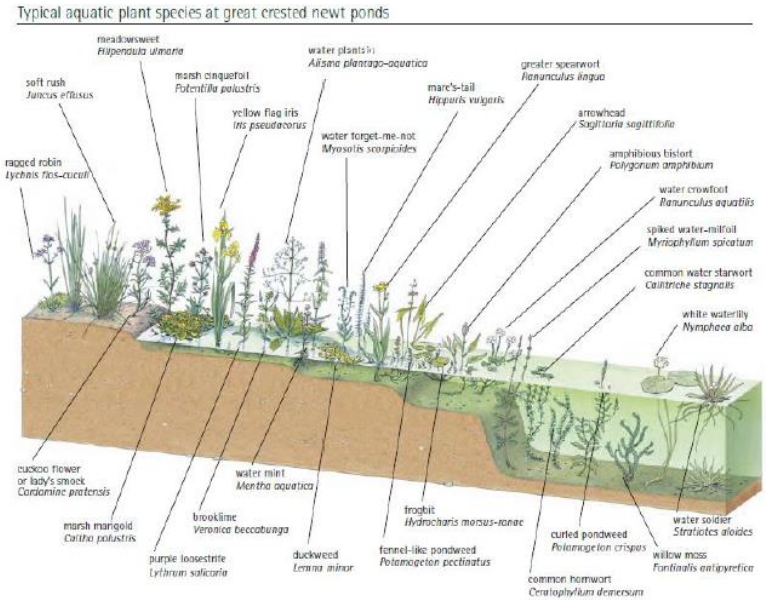
J.2 Exclusion scheme

J.3 Mitigation and compensation

J.4 Receptor site

J.5 Pond specification

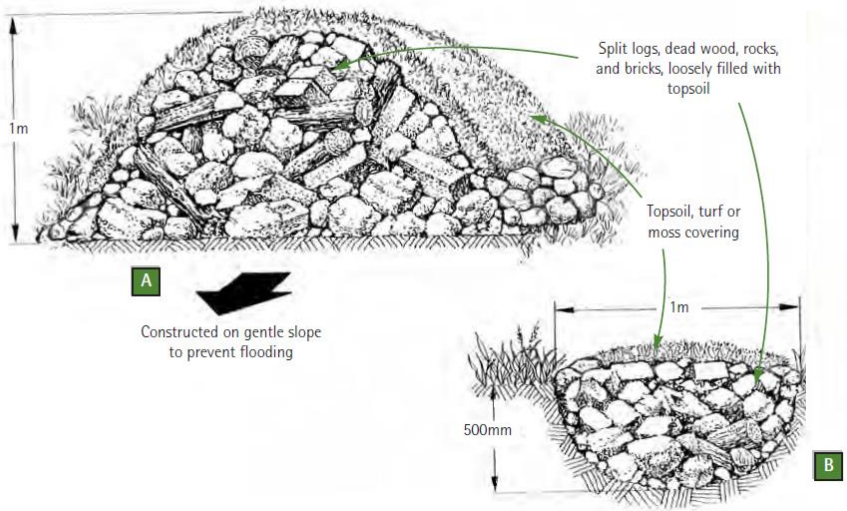




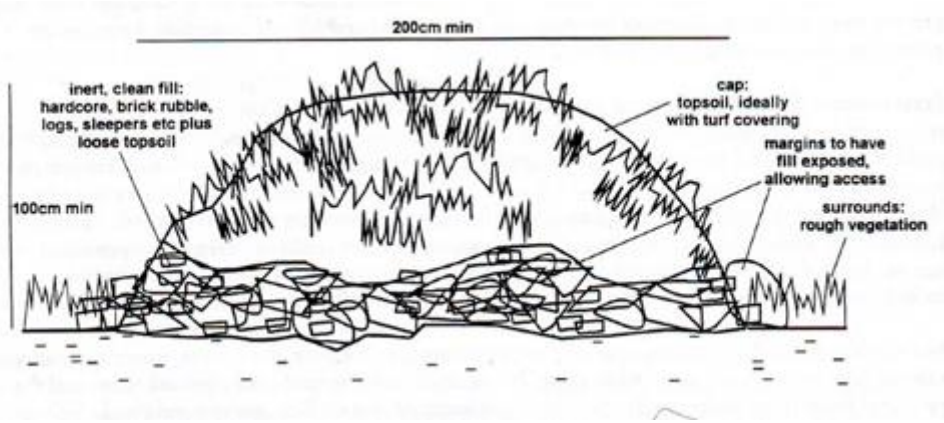
Species appropriate for planning/translocation (Source: Langton, Becket & Foster, 2001)

An alternative to planting the pond would be to translocate marginal and aquatic vegetation from Pond 2 and allowing the new ponds to establish more naturally

J.6 Hibernacula specification



Hibernacula design on free draining and non-free draining soils (Source: Langton, Becket & Foster, 2001)



Hibernacula design (Source: English Nature, 2001)

Photographs of artificial hibernacula constructed for amphibians

J.7 Biosecurity Risk Assessment

Company: Bowland Ecology Ltd	Ref: Bowland/ BSRA/BRF	Date issued: 23/06/15

Activity:	Areas of work:
Construction of poultry sheds and associated access & mitigation, including pond creation, stock fencing and amphibian exclusion fencing	Black Rock Farm, Cross Lanes, Wrexham

Parties at risk	Amphibian population, aquatic & terrestrial habitats	Risk rating before control measures			Control measures	Risk rating after control measures		
Activity	Hazard description	Risk rating				Risk rating		
		S	L	R		S	L	R
Staff/contractors/machinery driving between site	Vehicles spreading pathogens such as Chytrid	4	3	12	• Where possible, minimise number of vehicles on site • Keep to established tracks and park on hardstanding where possible • Keep vehicles free of accumulated mud, particularly on tyres, wheel arches and undercarriage • Sterilise wheels vehicle wheels prior to accessing site	4	1	4
	Vehicles spreading invasive species such as Japanese knotweed and Himalayan balsam fragments/seeds	2	3	6		2	1	2
Staff/contractors moving between site	Vehicles spreading pathogens such as Chytrid	4	3	12	• Keep boots and equipment free of accumulated mud • Sterilise boots/wellies prior to accessing site	4	1	4
New establishment of invasive plant species on site	Not immediately identified therefore risk of inadvertent spread by works	2	3	6	• Ecologist to check site for newly occurring invasive species during each site visit	2	1	2
Works on site resulting in run off	Run off entering existing ponds on site causing pollution event, potentially affecting amphibians	3	4	12	• Temporary bunds e.g. sandbags, to be placed along the southern and eastern boundaries of the working area to prevent silty run-off entering pond • Monitor level of run-off, and adjust number of sandbags accordingly	2	2	4
Oil/fuel leak from machinery/equipment	Pollutants entering ponds, potentially affecting amphibians	3	4	12	• Re-fuel off site where possible • Where this is no possible, refuel on hardstanding • Spill kits to be kept on site • If an fuel/oil spill/leak occurs use spill kits, prevent spill from entering any water bodies • Inform ecologist as soon as possible following any spills/leaks	2	2	4

Please use the table below to decide on the likelihood and overall risk for each hazard.

Severity of Impact						
	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	**2**	**3**	**4**	**5**
	Likelihood of Spread					

0-4: Risks are likely to be acceptable
4-12: Consider further options for reducing risk; if not available consider proceeding with caution
12+: Risk is too high; do not proceed until further consideration of control options has been taken into account