Rockingham 1 Ecological Survey and Assessment Summary – December 2014

Rockingham, Hoyland, Barnsley

Harworth Estates

AES-LTD

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Field Investigations and Data

Where field investigations have been carried out these have been restricted to a level of detail required to achieving the stated objectives of the work. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by AES - Ltd for inaccuracies in the data supplied by any other party.

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ROCKINGHAM 1 - ECOLOGY SURVEY AND ASSESSMENT SUMMARY DECEMBER 2014

SITE DESCRIPTION AND BRIEF DESCRIPTION OF THE DEVELOPMENT

1 Rockingham 1, located at grid reference SE 350 008 (approximate central point) is situated in the north west of the former Rockingham Surface Mine Site and extends to 6.1 hectares in area. The "Rockingham 1" development is intended to form the first phase of the wider Rockingham employment development on land owned by Harworth Estates, subject to future planning application(s). In recognition of this area-wide development aspiration and its potential ecological impacts, Harworth Estates commissioned comprehensive habitat and protected species surveys for the full area of the Rockingham sites. This document presents a site-specific ecological summary within the context of a wider site appraisal.

2 For the purpose of clarity within this report the Rockingham 1 site is further divided into two areas Rockingham 1a and Rockingham 1b. At the time of submission of the planning application, the full nature and extent of the surface water drainage attenuation was not known. Subsequent investigation and design work has indicated that a sustainable drainage system (SUDS) can accommodate the majority of the attenuation capacity required, with any further capacity provided in an engineered solution beneath the development site. The use of a SUDS system conforms to planning policy and may itself provide ecological benefits. The SUDS system comprises an extended pond located around the existing pond within the northeast part of the site, beyond the proposed development area where ground conditions and gradients allow. The pond will be served by pipe from beneath the development site. Rockingham 1a is therefore the development platform and Rockingham 1b is the area to the east of the site that has been identified to support the water attenuation facilities.

3 It is proposed that the water attenuation pond will be created by 'scraping up' of existing soil material within the pond area to form an elevated rim around its perimeter This will require the removal of some existing vegetation including scrub/shrubs and grass in the area of Rockingham 1b. The works will be undertaken in a manner which does not impact upon the existing pond in this location. In

operation, water flowing into the new pond will breach the existing pond and be held to control outflow rates.

4 A sries of ecological surveys have been undertaken at the Rockingham 1a and 1b (the site) and the wider Rockingham Site throughout 2013 and 2014, these areas are collectively referred to as the *study area* (see Phase 1 Habitat Plan, attached). The following text presents a summary of those habitats and species recorded with the site which are taken from those surveys.

5 The study area is located to the north west of the town of Hoyland and to the south east of the village of Birdwell in the Metropolitan Borough of Barnsley, South Yorkshire. The site is situated to the west of Shortwood Industrial Park immediately to the north of the Dearne Valley Parkway (A6195) dual carriageway and is bordered by existing housing immediately to the west (please see the Site Location Attached). The site is used informally and unofficially by members of the public for recreational purposes including dog walking, grazing of horses.

SUMMARY OF METHODS USED

6 Methods used in the suit of surveys undertaken in the study area are detailed in full within the Ecological Appraisal Report (AES – LTD 2013). All surveys where undertaken using standardised methodologies for undertaking Extended Phase 1 Habitat Survey and resulting dedicated species surveys. Species surveys complied with all current legislation, licensing and animal welfare requirements. A data / records search was undertaken in April 2013 with Barnsley Biological Records Centre (BRC). In addition to the records search undertaken by Barnsley BRC additional searches were also undertaken using www. Magic.gov.uk and the NBN Gateway - National Biodiversity Network, www.nbn.org.uk and pre-existing reports were also reviewed. Results from the searches of the Magic and NBN gateway databases are presented in full in the Rockingham Sites Ecological Appraisal (AES – LTD, 2013).

RESULTS

DATA SEARCH

7 The records search undertaken with Barnsley BRC returned over 15,000 records for a 2Km search radius from the survey area boundary (See Search Area Plan). Most of the records were in relation to birds. There were 192 records of species highlighted as being protected under the Wildlife & Countryside Act (1981, as amended (W&C Act)) and Badgers Act, of which 91 were birds, 62 amphibians, 35 terrestrial mammals and four reptiles. In addition to these records there were 14 records of Local Biodiversity Action Plan species. There were 51 records of European Protected Species (EPS), of which 20 were great crested newts *Triturus cristatus* recorded between 1.4 - 2.2km to the south west of the site near to the village of Tankersley. There were 31 records of bats *Chiropteran sp*. which have predominately been recorded to the north and northwest of the site. There were no other records of EPS post-2000. A confidential record of badgers *Meles meles* was provided by Barnsley BRC, from along the edge of Short Wood approximately 400m northeast of Rockingham 1a.

RECORDS POST 2000 WITHIN 200M OF THE STUDY AREA BOUNDARY

8 A noctule bat *Nyctalus noctula* and a common pipistrelle *Pipistrellus pipistrellus* were recorded on Shortwood Way, to the northeast of the study area. There were no other records of European Protected Species (EPS) near the site.

9 There were no bird species listed under the W&C Act (1981, as amended). However, there were 16 species on the Red and Amber Birds of Conservation Concern (BCC) list, of which four are also Biodiversity Action Plan (BAP) species including cuckoo *Cuculus canorus*, yellowhammer *Emberiza citrinella* and lapwing *Vanellus vanellus*. Common toad *Bufo bufo*, common frog *Rana temporaria* and smooth newt *Triturus vulgaris* have been recorded in the study area and common frog was recorded in Pond 3 located to the east of Rockingham 1 (See Search Area Plan).

10 A number of ancient woodland indicator species recorded by Barnsley BRC were mainly found in association with the Short Wood and Hay Green LWS. Species recorded included bitter vetch *Lathyrus linifolius*, bluebell *Hyacinthoides non-scripta*

and yellow archangel *Lysimachia vulgaris*. Dyer's Greenwood *Genista tinctoria*, a typical component of unimproved meadows, was recorded in the study area but not in the site. No additional species were recorded by Doar, (2013)[1].

CONTROLLED INVASIVE SPECIES

11 Controlled invasive species were recorded in the study area but not in the Rockingham 1 Site. Species present included: Himalayan balsam *Impatiens glandulifera* recorded in Short Wood & Hay Green LWS and New Zealand pygmy weed *Crassula helmsii* that was recorded in Ponds 1, 2 and 3 in the Study Area.

HABITATS AND SPECIES PRESENT AT ROCKINGHAM 1A AND 1B

12 The Phase 1 Habitat Plan identifies the locations of those habitats present in the study area and in Rockingham 1a and Rockingham 1b site and they are summarised below. Habitats located within Rockingham 1a were heavily grazed semi improved grassland with sparse ephemeral and ruderal vegetation present in those areas not as heavily affected by horse grazing. Four seasonal very shallow (<10cm deep) wet areas / pools and a single hedgerow located along the northern edge of the site. The hedgerow was recently planted and was comprised predominantly of hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, elder *Sambucus nigra*, hazel (*Corylus Avella,* and dog rose *Rosa canina*. Hedgerow ground flora was limited to tall ruderal species cow parsley *Anthriscus sylvestris,* stinging nettle *Urtica dioica,* cleavers *Galium aparine* and a variety of grasses associated with the adjacent grassland. Seasonal wet areas located in Rockingham 1a supported no additional vegetation than the surrounding grassland and in places these were quite poached by horses and therefore limited in their use to ground nesting birds. A strip of land located along the west edge of Rockingham 1a supported rougher / rank grassland than did the adjacent horse grazed field.

13 Habitats located in Rockingham 1b were immature plantation woodland supporting alder *Alnus glutinosa,* hazel, hawthorn, ash *Fraxinus excelsior,* Pendunculate oak *Quercus robur,* goat willow *Salix capraea,* rowan *Sorbus aucuparia,* Scots pine *Pinius sylvestris* silver birch Betula *pendula* and poplar *Populus tremula* and other

[1] Doar, C. 2013. Summary report to Barnsley Council on H3, Shortwood Extension. Widlscapes.

salix species. Grassland in Rockingham 1b was semi – improved neutral grassland varying in species diversity roughly from south to north across the area. Grasses present were Yorkshire fog *Holcus lanatus,* perennial rye – grass *Lolium perenne,* Crested dogs-tail *Cynosurus cristatus,* cocksfoot *Dactylis glomerata,* annual meadow grass *Poa annua,* red fescue *Festuca rubra*, creeping bent *Agrostis stolonifera* and Sheeps fescue *Festuca ovina*. The herb layer was variable across the location with some small areas of bare ground found in the site. Meadow vetchling *Lathyrus pratensis,* cow parsley, coltsfoot *Tussilago farfara,* red clover *Trifolium pratense,* white clover *Trifolium repens,* hard rush *Juncus inflexus,* dandelion *Taraxacum officinale agg.*, daisy *Bellis perennis,* Ox-eye daisy *Leucanthemum vulgare,* creeping buttercup *Ranunculus repens,*

14 Pond 3 was located in a central location within the Rockingham 1b area. Pond 3 was Located at SE 352 010 and was a large well established pond situated close to the A6195, measuring 40m x 14m. The ponds depth was over 1 metre in the centre and has well established reedmace (*Typha latifolia)* and Common reed *Phragmites australis* forming a swamp type habitat beds on each side of the pond and marshy grassland was located on the east edge of the pond. New Zealand Pygmy Weed *Crassula helmsii* an invasive species was recorded. Pond 3 was found to support one individual great crested newt in 2014. Other amphibian species present were smooth newt. In relation to its entire area Pond 3 had a limited open water area located centrally in the pond.

15 The Rockingham 1b area had greater species and habitat diversity than surrounding land including Rockingham 1a. Species diversity in Rockingham 1b is described by Doar, 2014 as significant, although they were referring to a larger area than is the case here and that comment does need to be considered in a localised context and in relation to a restored surface mine site. The area supporting Rockingham 1b is recognised locally as a part of a larger wildlife corridor extending from the M1 in the west to the Dearne Valley in the east.

16 The only mammal species recorded at Rockingham 1a and Rockingham 1b was rabbit *Oryctolagus cuniculus.* This species was most abundant in edge habitat near to grassland forming Rockingham 1a. Birds species collectively recorded within

Rockingham 1a during the Breeding Bird Survey (BBS) 2013[2] were: Skylark, Blue tit, Blackbird, Swallow, Mistle thrush, Carrion Crow, Rook, Jackdaw, Starling and Magpie. Bird species collectively recorded in Rockingham 1b were: Whitethroat, Moorhen, Willow warbler, Reed bunting, Great tit and Robin. Two bird species Skylark and Blackbird were confirmed as breeding in Rockingham 1a and three species Robin, Whitethroat and Moorhen were confirmed as breeding at Rockingham 1b (see BBS 2013).

17 No important invertebrate species were observed during the course of the survey period. In addition to those species recorded in the site a single great crested newt (GCN) was recorded in Pond 3 in 2013 and in 2014 (See Survey and Assessment for Great Crested Newts and Other Amphibian Species 2014).

18 Surveys undertaken for badger *Meles meles* and water vole *Arvicola amphibius* (see Protected / Notable Species Surveys, 2014) produced negative results for land forming Rockingham 1a and Rockingham 1b and in the remainder of the study area.

SUMMARY OF THE SURVEY RESULTS

19 Rockingham 1a supported a very limited number of habitat types which is reflected in its low species diversity. Species recorded in the site were typical of those generally used in surface mining restoration schemes. Plant species diversity within marginal areas around the site and particularly in those areas not affected by grazing horses was higher when compared to those heavily grazed by horses heavily grazed areas. Species and habitat diversity was higher in Rockingham 1b when compared to the results from Rockingham 1a and elsewhere in the study area.

20 Bird species diversity was low within Rockingham 1a and 1b, but typical of the remainder of the study area as a whole. Skylark and Starling are red listed by the RSPB this shows that they species of nature conservation concern in the UK.

21 No significant mammals and / or invertebrate species were recorded in the Rockingham 1a and or Rockingham 1b.

22 In relation to the single GCN located in Pond 3 it is suggested that development could commence on a *Risk Assessment Basis.* Such a Risk Assessment approach

[2] Breeding Bird Survey, AES – LTD (2013)

would need to be discussed with the LPA, but it would adopt a minimum intervention approach using reasonable avoidance measures and suitable mitigation.

SUMMARY OF POTENTIAL EFFECTS AND MITIGATION

23 The proposal for Rockingham 1a is the development of employment facilities and associated infrastructure, the area comprising Rockingham 1b is not required or proposed for development but it is proposed to construct a surface water attenuation feature in this area.

24 The development of the Rockingham 1a area will result in the removal of the majority of the grassland habitat situated in the site although peripheral habitats including hedgerows situated to the north will be retained. The main effects of this area of development will be the loss of poor semi – improved grassland and the removal of sub optimal habitat used by small numbers of ground nesting bird species. A method statement is proposed to manage the development in relation to breeding birds, see Appendix 1.

25 The proposal is to construct a surface water attenuation feature in the area of Rockingham 1b which currently supports rough semi – improved grassland, plantation woodland, scrub and a pond, identified as Pond 3 in the Rockingham Sites Ecological Appraisal (2013). Pond 3 will be retained *in situ* and the works to form the Water attenuation feature will mainly take place in the semi – improved grassland area, the water attenuation proposal facilitates the retention of approximately 85% of the plantation woodland / scrub located on the higher embankments of Rockingham 1b.

26 The water attenuation feature will not form a permanent pond but will instead be periodically inundated thereby creating a marshy / damp grassland / woodland area that will have a higher biodiversity value than the grassland which the area supports at the present time.

27 Restoration of the grassland will be undertaken to create an enhanced habitat for a range of species including amphibians, birds, invertebrates, bats and other mammals. Hibernacula will be created from deadwood cut in the site and other materials and the new water attenuation feature will be stripped of topsoil thereby

allowing regeneration of neutral type grassland in areas that will be less wet. Any trees / shrubs that are removed to facilitate the creation of the water attenuation feature will be replaced elsewhere in the site.

28 It is our opinion that the creation of the water attenuation feature in this area can be undertaken on a risk assessment basis using Reasonable Avoidance Measures in relation to all amphibian species. Reasonable Avoidance Measures and offsite mitigation are proposed for managing the amphibian species that are resident near to the site. The Risk Assessment will be implemented through the drafting of a Method Statement. The objective of the Method Statement will to affect a strategy to safeguard great crested newt and all other amphibian species that might be present in peripheral habitats without causing harm or disturbance to any species.

29 We propose that a condition be imposed on the planning permission along the lines of: "*Before the commencement of the development a comprehensive Method Statement giving full details, including a timetable for completion, of the Reasonable Avoidance Measures to be taken to avoid any possible harm or disturbance to great crested newts shall be submitted and approved in writing by the Local Planning Authority and it shall be implemented in full in accordance with the timetable contained therein*".

29 A method statement outlining a risk assessment is located at Appendix 2.

PROPOSED DEVELOPMENT

Dearne Valley Parkway, Barnsley,(Junction 36 M1)

OVERALL SITE AREA (Edged in red)
20.65 acre (8.36 hectare)

Note:
Assumed site boundary and site constraints subject to confirmation.
All Legal easements and extent of existing underground services locations are subject to confirmation.

0 25 50 75 100 125 m
SCALE 1:2500

Rev	Date	Description	Rev By	Chk'd By
B	26.08.14	Site boundary updated	NBB	JMR
A	10.07.14	Site boundary updated	NBB	JMR

Project Title	PROPOSED DEVELOPMENT ROCKINGHAM 1 Dearne Valley Parkway Barnsley				
Client	Harworth Estates				
Status	FOR PLANNING				
Scale	1:2500		Drawing Size	A3	
Drawn By	NBB	Checked By	JMR	Date	07/2014
Drawing Title	LOCATION PLAN				
Job-Dwg No	11462-100		Rev	B	

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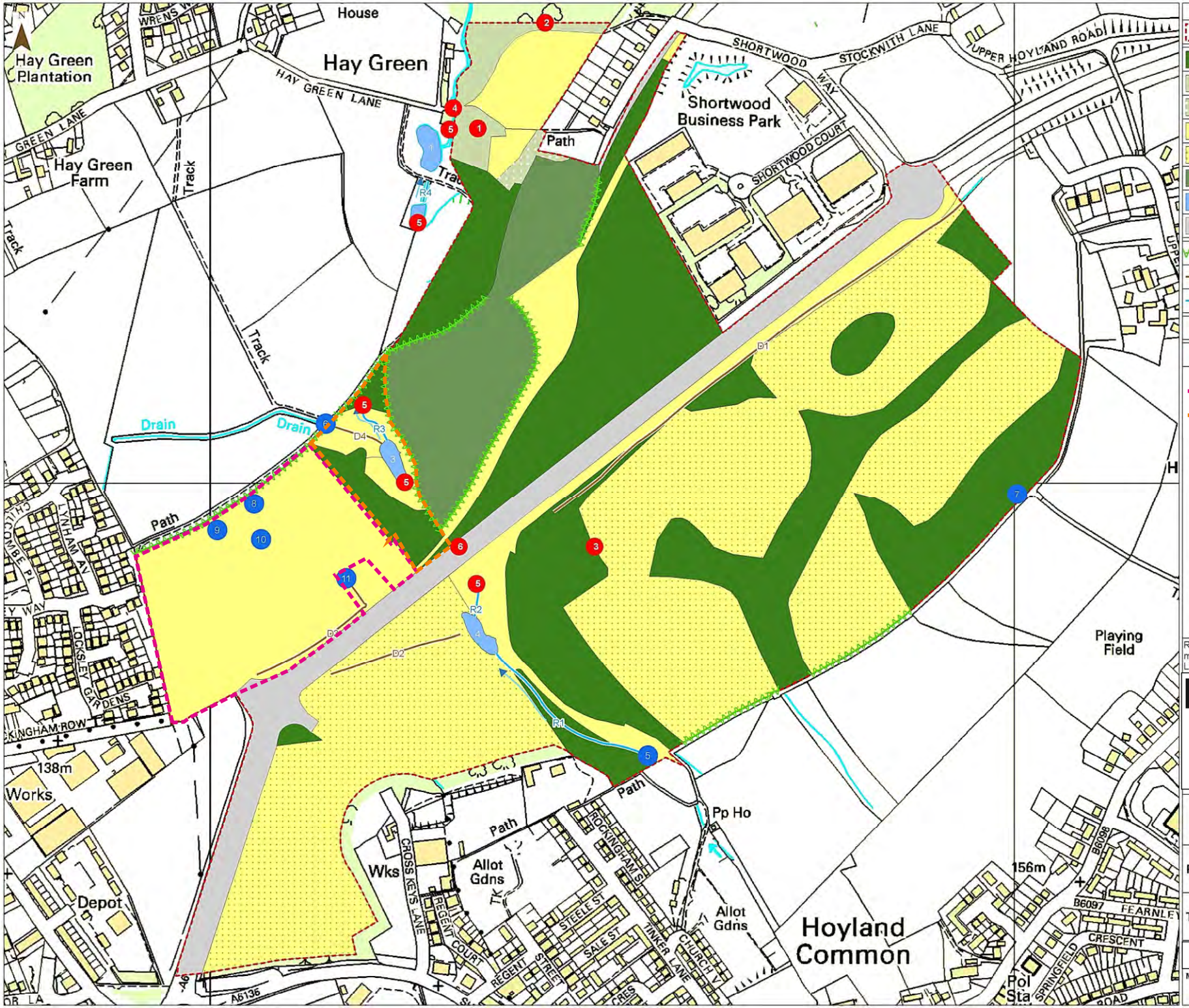
LOCATION PLAN



Legend

- Survey area boundary
- Plantation broadleaved woodland
- Semi-natural broadleaved woodland (1)
- Semi-natural broadleaved woodland (2)
- Semi-improved grassland (1)
- Semi-improved grassland (2)
- Improved grassland
- Pond
- Hardstanding
- Hedgerow - intact
- Ditch
- Running water
- Seasonal wet area / water body
- Target note
- Rockingham 1a
- Rockingham 1b

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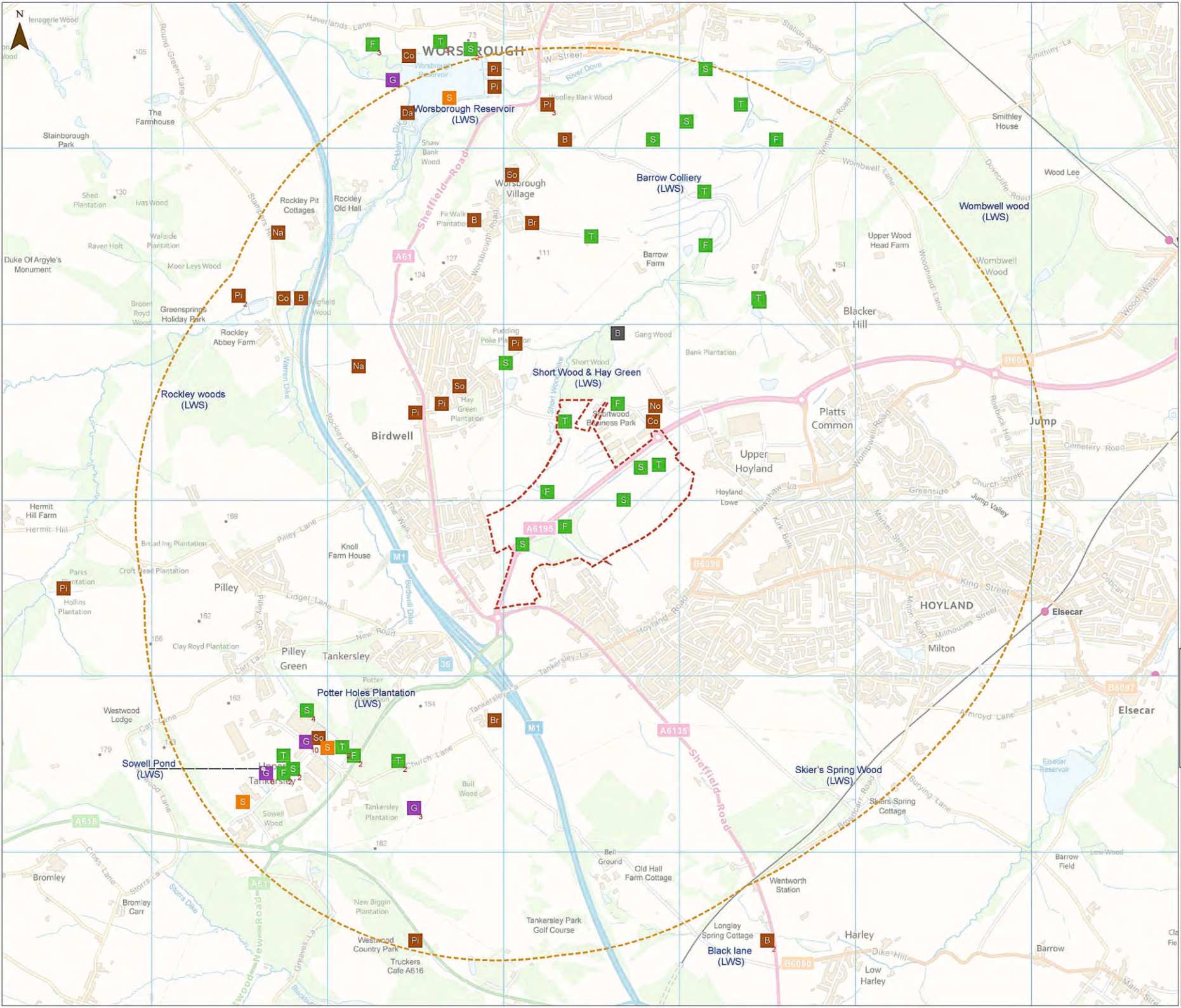
AES-LTD

Rockingham

0 50 100 200 m

Project	0404 Rockingham
Title	Figure 2. Phase 1 Habitat Survey Plan
	Applied Ecological Services

Map date	Version	Reviewer	Size
30/07/13	1.4	MP	A3



Legend

	Site - boundary
	Site - 2km buffer
	Amphibian
	Badger
	Bat
	Great crested newt
	Reptile

Additional Info:
Text codes within each square refer to the specific species and red text refers to the number of records, see species codes below.

Blue text refers to the centroid of Local Wildlife Sites (LWS).

Please note that the map does not contain any mapped bird records (Red and Amber species), but the species recorded within the 2km search buffer are listed below:

Barn Owl	Kingfisher
Black Tern	Merlin
Brambling	Pintail
Cetti's Warbler	Quail
Fieldfare	Red Kite
Goldeneye	Redwing
Greenshank	Ruff
Greylag Goose	Whooper Swan
Hobby	

Species Codes

Amphibian:	Brown Long-Eared Bat - Br
Common Frog - F	Daubenton's Bat - Da
Common Toad - T	Natterer's Bat - Na
Smooth Newt - S	Noctule - No
	Pipistrelle - Pi
Badger:	
Badger - B	**Great crested newt:**
	Great Crested Newt - G
Bat:	
Common Pipistrelle - Co	**Reptile:**
Soprano Pipistrelle - So	Grass Snake - S
Bat species - B	

Rockingham

0 250 500 1,000 m

Title 2Km Search Area

Applied Ecological Services

Map date	Version	Reviewer	Size
29/07/13	1.1	MP	A3

APPENDIX 1: OUTLINE BREEDING BIRD MITIGATION SCHEME DRAFT DOCUMENT

The company is aware that under the Wildlife and Countryside Act 1981 (as amended) all wild birds, their nests and eggs are protected by law. It is an offence to intentionally or recklessly:

- kill, injure or take any wild bird (with certain exceptions for recognised game or pest species);
- take, damage or destroy the nest of any wild bird whilst it is in use or being built;
- take or destroy the egg of any wild bird.

In order to comply with the above legislative requirements in relation to breeding birds, it is proposed to undertake vegetation clearance, wherever possible, outside the bird breeding season. This includes all ground level vegetation as well as woodland, scrub, hedgerows and standard trees. The bird breeding season generally runs from March until around the end of July but this period may be extended for certain species and / or due to poor weather conditions. Where vegetation is removed during the winter months no additional breeding bird survey by an ecologist prior to clearance is likely to be necessary. Where vegetation clearance cannot be undertaken outside the bird breeding season, it is confirmed that all such areas would be subject to a thorough walkover survey by a suitably qualified ecologist prior to any clearance or disturbance work being undertaken. It is proposed that such vegetation clearance would be carried out in sections and only further to the ecologist having undertaken a survey of the relevant area and confirmed that such works can proceed. Where no nests or any other bird matters are identified, a post survey period of 48 hours will stand within which time clearance of that section may proceed. A further survey would be required if the vegetation surveyed was not removed within this time.

Where nests are located within a proposed vegetation clearance area, no vegetation removal would be carried out within a 10m radius of the nest unless a

different stand-off distance is specified by the ecologist. This buffer zone distance would also be subject to the level of exposure and dependency that the breeding bird had on the surrounding vegetation. Only once the young have hatched and have fledged the nest should clearance works proceed in the safeguarded area. The nest therefore would need to be monitored by an ecologist to confirm this. For most common passerine species this period of time ranges from around 14 to 24 days approximately.

Trees present in the site would be subjected to further inspection for the presence of breeding birds and / or nests 24 hours before felling or lopping. If nests are present in any such structure or if individual birds are vigorously defending that structure then the tree will not be felled the following day. Any such trees will be marked on a plan and retained in situ until breeding is complete, young have hatched and fledged. Further survey would be required to determine when it is safe to fell such trees.

Where birds of high conservation concern i.e. Schedule 1, red or amber list species have been identified, more specific measures would be reviewed by the ecologist in order to ensure that nesting seasons and habitat specific to these species are taken into account.

Transects will be established in areas of rough vegetation to search for the presence of ground nesting birds. In the unlikely events that any of these species are observed as nesting in these areas ground works will be halted until such time that the young have fledged. The area around any ground nests will be visited and monitored every 24hrs until the nests are no longer in use. Only when such ground nests have been vacated will machinery and other plant be allowed into the area.

APPENDIX 2: GCN METHOD STATEMENT WATER ATTENUATION PHASE 1

1.0 INTRODUCTION

1.1 This document provides details of the method statement required to avoid harm and / or disturbance to great crested newt (*Triturus cristatus*) whilst providing a feature to attenuate surface water runoff from Phase 1 of the Rockingham Development.

1.2 This document is prepared and submitted to demonstrate compliance with all relevant legislation (see previous appraisal documents) in relation to the proposed development.

2.0 THE EXISTING SITUATION

2.1 This area proposed to support the water attenuation feature is located outwith the actual development site boundary immediately to the east of the site in an area supporting rough semi – improved grassland and a waterbody identified as Pond 3. All plant species recorded in the grassland sward were common and widespread in the site and the local area. Exisiting embankments currently surrounding the proposed attenuation feature area support recently planted trees and scrub comprising of hawthorn, backthorn, alder, sycamore and occasional oak. The water attenuation scheme is designed to retain most of these trees and shrubs.

2.2 Pond 3 is a large pond well established pond located close to the A6195 at grid reference SE 352 010, measuring 40m x 14m. The ponds depth was over one metre and has well established reedmace (*Typha latifolia)* and Common reed beds on each side of the pond. Pond 3 was found to support one individual great crested newt in 2014. Other amphibian species present were smooth newt.

OBJECTIVES OF THE METHOD STATEMENT

2.3 The objective of the method statement is to affect a strategy to safeguard great crested newt and all other amphibian species that might be present in peripheral areas of the site without causing harm or disturbance to any species.

3.0 METHOD STATEMENT

3.1 The following lists of actions are mandatory requirements to be implemented to safeguard local amphibian populations:

PRIOR TO CONSTRUCTION

- In the year prior to the commencement of development a dedicated amphibian survey will be repeated in suitable habitats located adjacent to the site.
- All land within the development site that will support the attenuation feature (including the site and related access routes) will be subjected to daily walkover surveys prior to the commencement of the development.
- Weekly walkover surveys within the site and along access roads will continue throughout the active amphibian season in 2015 and during the construction period.
- Prior to any vegetation removal tall areas of grass / scrub / woody vegetation / hedgerow will be hand searched at their base and when declared free of animal species they will be strimmed prior to being mechanically removed.
- The ground below wooded areas, scrub habitat, hedgerow and any stored piles of dead and / or cut wood will be searched by hand and when declared free of animals any vegetation located within or around them will be strimmed prior to mechanical removal.
- Dead / cut timber will be retained on site and used to create hibernacula.
- Vegetation stand checks will remain valid for 24 hours after which time if the vegetation has not been removed further hand searches will be required.
- Temporary refugia in the form of carpet tiles and / or bitumen tiles will be placed along the boundaries of Pond 3 at intervals not exceeding three metres.
- The grassland located in the area to support the attenuation feature will be strimmed manually in 20 – 30m strips, moving south to north, temporary refugia will be placed along the south edge of the strimmed grassland and they will be checked by the ecological clerk of works. The purpose of this is to give any animals located in that area a chance of vacating the area prior to its removal.

- Temporary refugia will be checked twice daily for the presence of animals.
- All construction / site staff will be briefed about on and off site issues through the provision of a Toolbox Talk.

DURING CONSTRUCTION

- Materials will be stored off the ground on pallets to prevent attracting amphibian species and other animals.
- No trenches, footings or other construction related voids will be left open overnight.
- Where a trench / void or hole cannot be in filled overnight then a plank or other length of timber will be placed at each end of the structure to create an escape structure for any animals that could fall in during the night.
- All site rubbish especially plastic wraps, polythene, polystyrene and full and / or parts of insulation sheets will be placed into suitable receptors and removed from the site immediately and not stockpiled in the site.
- Fuel, oil and any other potentially harmful or polluting fluids / chemicals will be stored in suitable containers and not within 15m of any watercourse.
- All fuel, oil or chemical spillages however minor will be reported and appropriate action taken immediately.
- If any animals are discovered in the site the site ecologist will be contacted immediately.

4.0 REFERENCES

Baker, JMR & Halliday, TR (1999) Amphibian colonisation of new ponds in an agricultural landscape. Herpetological Journal 9: 55-64

British herpetological society (1996) Surveying for amphibians. London: BHS

Cooke, AS & Frazer, JFD (1976) Characteristics of newt breeding sites. Journal of Zoology, London. 178:223-236

Cresswell, W & Whitworth, R. (2004). An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt *Triturus cristatus*. English Nature Research Report: Number 576

Department of the Environment, Transport and the Regions and English Nature (2000) European protected species: Guidance note.

Edgar, P. & Griffiths, RA (2004). An evaluation of the effectiveness of great crested newt *Triturus cristatus* mitigation projects in England, 1990 – 2001. English Nature Research Report 575

English Nature (2001) Great crested newt mitigation guidelines

Foster, J (1997) The ecology, conservation and management of the great crested newt (*Triturus cristatus*). Information and advisory note no. 92. Edinburgh: Scottish Natural Heritage

Gent, AH & Gibson, SD (eds.) (1998) Herpetofauna Worker's Manual. Peterborough: Joint Nature Conservation Committee

Green, D (2001) Identification – egg laying and larval development of great crested newts. British Wildlife 12(4) 252-255

Kupfer, A & Kneitz, S (2000) Population ecology of the great crested newt (*Triturus cristatus*) in an agricultural landscape: dynamics, pond fidelity and dispersal. Herpetological Journal: 10(4): 165-171

NCC (1990) Handbook for Phase 1 habitat survey: a technique for environmental audit. Nature Conservancy Council, Peterborough.

Oldham, RS & Humphries, RN (2000) Evaluating the success of great crested newt (*Triturus cristatus*) translocation. Herpetological Journal: 10(4): 183-190

Swan, MJS & Oldham, RS (1993) Herptile sites volume 1: national amphibian survey final report. English Nature Research Report No. 38. Peterborough, English Nature.