

LAND EAST OF BRYN LANE, WREXHAM

Extended Phase 1 Habitat Survey

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Prepared by

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1 INTRODUCTION

1.1 Background

- 1.1.1 Submission of a Planning Application for the development of land to the east of Bryn Lane, Wrexham Industrial Estate, requires an extended Phase 1 Habitat Survey. MRB Ecology and Environment was commissioned to undertake the Phase 1 Habitat Survey.
- 1.1.2 A visit to carry out the survey took place on the 7th / 8th of August 2008.
- 1.1.3 This Report presents the results of a data search, details of the site survey, a description of the habitats found and an assessment of the nature conservation value of the site based on the current survey information.

2 SURVEY METHODOLOGY

2.1 Extended Phase 1 Survey

- 2.1.1 In addition to an Extended Phase 1 Habitat survey, a search of available species records was undertaken by commissioning a search of records from COFNOD – the North Wales Environmental Information Service.
- 2.1.2 A Phase 1 Habitat survey was carried out, the habitats being classified according to Phase 1 Habitat types (Nature Conservancy Council 1990). A coloured map has been drawn up to show the extent of each type of habitat. The frequency of occurrence of each plant species was recorded using the DAFOR scale - Dominant, Abundant, Frequent, Occasional and Rare. The dominant species in each habitat was noted. The habitat map is presented in Figure 1. Photographs were taken, to illustrate the types of habitat present on the site. These are presented in Figure 2. Full species lists of all the plants seen during the site visit are included in Appendix 1. Plant species were identified by reference to Stace (1991). Phase 1 Target Notes are provided in Appendix 2.

2.2 General Faunal Survey

- 2.2.1 During the Phase 1 Habitat Survey any signs or sightings of fauna were noted. Details are provided in Appendix 2.

2.3 Survey Constraints

- 2.3.1 Botanical survey - Surveys of grassland are best undertaken in early summer in order to record the full diversity of plants within the sward. This means that the survey undertaken in August may be somewhat limited in the range of early-flowering herbaceous plants recorded. It is also likely that the survey will have under-recorded the range of spring-flowering herbs species present in the woodland and hedgerow habitats in particular.

2.4 Specialist Faunal Surveys

- 2.4.1 Derek A Whitcher Ltd has previously undertaken four Great Crested Newt surveys of the ponds within the proposed development site during 2005 and in connection with earlier developments to the south of Plot 3. Therefore, the presence of Great Crested Newts (*Triturus cristatus*) (a European Protected Species) was known at the beginning of pre-application discussions between the applicant and the Local Authority ecologist and it was also known that further surveys of this species would be necessary. These earlier ecological investigations also highlighted the presence of habitats within the development area which were considered to be

suitable for birds and bats and, accordingly, surveys of bird and bat activity have been undertaken. Information provided by the Council's Ecologist indicated the presence of a Badger (*Meles meles*) sett on the opposite side of Bryn Lane. Walkover Badger surveys were carried out by Derek A. Whitcher Ltd during site visits in 2005 and in 2008 during site surveys for other protected species. No Badger field signs or Badger setts were identified on site during any of the surveys. Surveys for Water Vole (*Arvicola terrestris*) were also carried out by Derek A. Whitcher Ltd during site visits in 2005 and in 2008 for other protected species. No water vole field signs of burrows were identified anywhere along the stream or in the banks of any of the ponds on the site. No records of Water Vole came to light as a result of the data search. The surveys for Great Crested Newts, bats and birds have all been completed by Derek A Whitcher Ltd and reference should be made to the following separate reports for further details:

- 080261/GCN/Mitigation Bryn Lane , Wrexham. Great Crested Newt Survey and Mitigation Strategy. 25th August 2008. DAW Ltd.
- 080261/BAT Bryn Lane , Wrexham. Bat Survey and Mitigation Strategy. 18th August 2008. DAW Ltd.
- 080261/Birds Bryn Lane , Wrexham. Bird Census and Mitigation Strategy. 22nd August 2008. DAW Ltd.

2.4.2 Pre-application discussions between the applicant and the Countryside Council for Wales (CCW) also highlighted the potential for the site to support notable invertebrates. Surveys were required to determine the presence/ absence of Lesser Silver Water Beetle (*Hydrochara caraboides*) and to assess the habitat quality for two species of butterfly; Grizzled Skipper (*Pyrgus malvae*) and Dingy Skipper (*Erynnis tages*). These specialist invertebrate surveys have been undertaken by Marches Ecology and reference should be made to the following separate report for further details:

- C070/Draft Kingmoor Park, Bryn Lane, Wrexham. Industrial Estate - Ecological Surveys. August 2008. Marches Ecology.

2.4.3 For completeness, a brief summary of the survey methodologies for the specialist faunal surveys is given here:

Great Crested Newt Survey

2.4.4 A further two surveys in 2008 on the 15th /16th May and 26th / 27th of May of those ponds where a population of Great Crested Newts was identified during the original 2005 surveys were undertaken in order to bring the survey information up to date and, at the same time, increase the number of surveys to six in each of these ponds.

2.4.5 The survey area was thoroughly searched for evidence of Great Crested Newt activity by carrying out the following survey techniques:

Searching aquatic habitats by:

- Examining vegetation in ponds and areas of static water for newt eggs.
- Looking for newts in ponds and areas of static water with a high-powered torch during hours of darkness.
- Setting bottle traps, leaving them overnight and returning the next morning to inspect and record all animals trapped, before immediate release.

Bat Survey

2.4.6 Two surveys were carried out, one on 7th and 8th August and one on 13th and 14th August 2008. The site was checked for potential bat roosting sites by looking for the following signs:

- Holes, cracks or crevices.
- Bat droppings.
- Prey remains.

2.4.7 This was followed on each occasion by a dusk emergence survey using Batbox Duet detectors and by overnight recording of bat activity using static Anabat detectors.

Bird Census

- 2.4.8 Two surveys were carried out, one on 7th and 8th August and one on 13th and 14th August 2008. The purpose of the survey was to identify the range of species present on the site, to assess the impact of the proposed works and to ensure that there is sufficient mitigation put in place to ensure continuity of habitat on the site.
- The survey area was thoroughly searched for evidence of birds present on the site. Birds were identified by observation with field binoculars and by listening and identifying bird calls.
 - Two surveyors patrolled the site during early morning and late afternoon on each of two occasions and collated the overall results.

N.B. The surveys were carried out late in the season after most birds had completed nesting. However, the birds seen is expected to be representative of the list of species that would be expected on the site.

Lesser Silver Water Beetle Survey

- 2.4.9 A single visit was undertaken to each of the four ponds within Plot 3 and the adjacent Plot 1. The survey was undertaken on 13 August 2008 by Andy Harmer. This work was carried out under CCW licence OTH:SA:353:2008. The presence/ absence survey included the following elements (Harmer 2008):
- Inspection of the waterbody for floating egg cocoons, initially from the pond perimeter, and then more thoroughly by wading into the water, carefully inspecting areas between vegetation;
 - Sweep-netting of the ponds for adults, cocoons, and larvae. Netting was undertaken for approximately 45 minutes at each pond, with the option of extending the search for breeding evidence if an adult beetle were located;
 - Identification of all aquatic macro-invertebrates encountered, to species level where possible, in order to assess the assemblage for breeding pool indicator species.

Grizzled Skipper and Dingy Skipper Habitat Assessment

- 2.4.10 The main flight period for the Grizzled Skipper in North Wales is usually from late April/ early May up to mid-June. The main flight period of the Dingy Skipper in North Wales is usually from the first or second week of May up to the start of July. Survey of the proposed development site was commissioned in late July, and therefore concentrated on assessing the *potential* quality of the habitat for these two species. The survey was carried out on 4th of August 2008 by Tom Knight and Max Ellson of Marches Ecology.
- 2.4.10 A simple qualitative scale was used to categorise habitat value so that this can be mapped. As a subjective survey tool it is entirely reliant on surveyor experience. Although the Grizzled Skipper and Dingy Skipper often inhabit broadly similar habitat patches within brownfield sites (and can be found in the same area) there are certain habitat parameters that are preferential for each species. Such parameters include the Dingy Skipper's preference for shorter vegetation especially at egg-laying plants and more obviously the different larval host-plants. It was therefore felt that a separate assessment scale was required for each species.

3 NATURE CONSERVATION EVALUATION METHOD

3.1 *Habitats*

- 3.1.1 The Phase 1 Habitat survey findings were examined to establish whether any habitats or species of particular nature conservation value were present on the site. The habitats and species on the site were evaluated by reference to the primary criteria established by Ratcliffe (1977). These criteria are: rarity, diversity, size, naturalness, fragility and typicalness. Reference was also made to the Wrexham Biodiversity Action Plan.

3.2 *Plant Species*

- 3.2.1 The plant species which were recorded were evaluated with reference to UK and Local Biodiversity Action Priority Species lists, The New Atlas of the British Flora, and Vascular Plant Red Data Lists for Great Britain and Wales.

4 DATA SEARCH

4.1 *Designated Sites and Notable Species*

First Tier sites

- 4.1.1 There are no 'first tier' statutory nature conservation sites (Sites of Special Scientific Interest, Special Protection Areas, Special Areas of Conservation etc), within 1km of the site. The nearest such site is the River Dee, a long linear site encompassing the river Dee and its floodplain to the east of Wrexham. This Site of Special Scientific Interest lies between 1.2 and 1.4 km from the eastern boundary of the site at Bryn Lane, Wrexham. The SSSI forms part of the River Dee and Bala Lake Special Area of Conservation.

Second Tier sites

- 4.1.2 There is one Adopted Wildlife Site within 1km, located to the south west of the Study Area on the opposite side of Bryn Lane. A further two sites are located between 1km and 2km from the site, both to the south-west of the site, in or on the edge of Wrexham Industrial Estate.

Notable Species

- 4.1.3 COFNOD provided a report on the Protected or Notable species within 1km radius of the centre of the site. The publicly available information is provided in Appendix 5.

Habitat Inventory and Previous Phase 1 Habitat Survey

- 4.1.4 Data provided by COFNOD lists the following habitat types within a 1000m radius of the centre of the site: Amenity Grassland, Arable, Buildings, Dense Scrub, Ephemeral/Short Perennial, Gardens, Improved Grassland, Not Accessed Land, Semi-improved Neutral Grassland, Standing Water.

4.2 *'Landmap' Landscape Character*

- 4.2.1 The Landscape Character Area description for Wrexham Industrial Estate is a Local Planning Guidance Note based on Wrexham LANDMAP. Adopted in March 2007 it describes the ecological character of the area as follows:

- Small watercourses, ditches, and ponds are frequent, providing good habitats for water voles, great crested newts and other aquatic species. Wetlands with rushes and reed mace swamp are found, important in filtering polluted runoff from the

- estate.
- The River Clywedog is an important aquatic habitat but its quality is compromised by runoff from industrial areas.
- Large but declining areas of species rich neutral grassland of high biodiversity value on unused land Includes area of semi-natural broadleaved woodland (Erlas Black Wood).

4.3 Biodiversity Action Plans

- 4.3.1 Signing of the Convention on Biological Diversity at the Rio Earth Summit placed an obligation on the UK to produce national and local Biodiversity Action Plans. These Plans draw up actions by which the conservation of a targeted list of species and habitats can be secured.

UK BAP List of Habitats

- 4.3.2 The revised list of Habitats of Principal Importance for Conservation of Biological Diversity in Wales includes over 50 Priority habitats some of which have relevance to the site off Bryn Lane.

UK BAP List of Species found in Wales

- 4.3.3 A revised list of Species of Principal Importance for Conservation of Biological Diversity in Wales has been produced. This lists a range of Mammals, Birds, Fish, Reptiles and Amphibians, Invertebrates, Vascular Plants, Lichens, Mosses and Liverworts, Fungi, Stoneworts and Marine species.

Wrexham Biodiversity Action Plan

- 4.3.4 To conserve and enhance the local biodiversity, the Wrexham Biodiversity Action Plan was published in March 2002.

Habitat Action Plans*

- Derelict and Industrial Land (2003)
 - Yellow bartsia Locally Important
 - Dryer's greenweed Locally Important
 - Bee orchid Locally Important
 - Grass vetchling Locally Important
 - Spiny restharrow Locally Important
 - Peltigera didactyla (lichen) Locally Important
 - Sarcosagium campestre (lichen) Locally Important
- Garden (2002)
- Lowland Bog (2002)
- Pond (2002)
 - Soft hornwort
 - Rigid hornwort
 - Cowbane
 - Frogbit
 - Tasteless waterpepper
 - Water violet
 - Fennel pondweed
 - Greater duckweed
 - Fat duckweed
 - Least duckweed
 - Lesser water plantain
- River, Stream and Canal (2002)
 - Floating water plantain Nationally important
 - Ptilidium pulcherrimum Locally important
 - Campylium calcareum Locally important
- Upland Moorland (2003)

- Veteran Tree and Wood-Pasture (2002)
- Woodland (2002)
Herb paris - Ancient woods Locally important

*Key plant species associated with these habitats are provided for those Habitats most relevant to the Bryn Lane site.

Species Action Plans

- Badger (2003)
- Barn Owl (2004)
- Black Poplar
- Great Crested Newt (2003)
- Lesser Horseshoe Bat (2003)
- Otter (2002)
- Song Thrush (2002)

5 BASELINE ECOLOGICAL CONDITIONS

5.1 *Site Location and Boundary*

- 5.1.1 The Study Area lies to the east of the re-aligned Bryn Lane and south of Ridley Wood Lane on the eastern edge of Wrexham Industrial Estate centred at National Grid Reference SJ 393505, at a height of 25 metres A.O.D. The land slopes gently down towards the central section of the site where a stream runs from west to east in a belt of scrub and mature tree. The site boundary to the north is formed by the roadside hedge of Ridley Wood Road and to the west the boundary is the realigned route of Bryn Lane. The eastern boundary follows a water-filled ditch and field hedgerows. The southern boundary lies along the perimeter of the existing TDG buildings and hardstanding area. The old route of Bryn Lane runs diagonally across the south-western quadrant of the site.

5.2 *Habitat Types*

- 5.2.1 The survey area included a variety of Phase 1 Habitat Types (Refer to Figure 1, Phase 1 Habitat Map and Target Notes in Appendix 2 for full details):

- Scattered Scrub
- Continuous Scrub
- Scattered Broadleaved Trees
- Unimproved Natural Grassland
- Semi-improved/Poor Semi-improved Neutral Grassland
- Improved Grassland
- Marshy Grassland
- Amenity Grassland
- Tall Ruderals
- Ephemeral/Short Perennial
- Standing Water
- Swamp
- Water-filled Ditch
- Dry Ditch
- Flowing Stream
- Species-poor Hedges (some with trees)
- Bare Ground
- Spoil
- Hardstanding and Roadways
- Buildings

- 5.2.2 The adjacent land uses are predominantly improved grasslands, or industrial development.

- 5.2.3 Detailed descriptions of the various habitats are presented below. Photographs are presented in Figure 2.

5.3 *Habitats*

Scrub and Trees

- 5.3.1 Areas of low continuous scrub of bramble, blackthorn and hawthorn occur along the open section of the stream course (Target Note 15), which enters the site in the south-western corner. More mature scrub, dominated by blackthorn, with hawthorn, willows and scattered birch and poplar also grows alongside the mid section of the stream, covering both banks. A crack willow stands on the stream bank just upstream of Old Bryn Lane. Downstream of the Old Bryn Lane is a wide band of scrub and mature trees (Target Note 35). The more-mature trees (predominantly oak but with occasional ash and crack willow are located on the northern and southern edges, along the field boundaries. The southern bank of the stream has scattered mature trees. Understorey and woodland edge species include hawthorn, blackthorn, hazel,

field maple and holly, with locally frequent elder scrub alongside the stream and honeysuckle in the northern edge. The herb layer beneath the scrub is dominated by ivy with scattered hairy brome, hedge woundwort, red campion, hedge garlic, nettle and cuckoo pint.

- 5.3.2 Scattered scrub (predominantly hawthorn) occurs alongside the water-filled ditch on the eastern edge of the site. To the east of this ditch is a wide belt of hawthorn, blackthorn, willow and bramble scrub (Target Note 32).
- 5.3.3 A mixture of bramble and blackthorn scrub is also invading the edges of the less-intensively managed grass pastures to the south of the stream (Target Note 27), and also the semi-improved remnants of neutral grassland located between the old and new routes of Bryn Lane (Target Note 21).
- 5.3.4 Willow, blackthorn and bramble scrub is abundant around the fishing ponds (Target Note 9) and on the eastern-side small wetland (Target note 4) and there is a wide band of hawthorn and blackthorn scrub running along the fence-line between the TDG land and the open grasslands.
- 5.3.5 A small copse of young birch and willow scrub is located to the north-east of an old car park area next to the fishing pond (Target Note 11) and there is scattered scrub along the boundary fence between the fishing lake and visitor car park of TDG (Target Note 1).
- 5.3.6 There are scattered mature oak and ash trees in the grassland beside Bryn Lane. Two large oak trees also stand beside one of the fishing ponds (near Target Note 9).

Grasslands and Arable

- 5.3.7 Unimproved grasslands occur as narrow strips of grassland to the east of the site (Target Notes 8 and 32) and also as a herb-rich sward which has developed on the rubble and made-up ground at the southern end of the site (Target Note 3). This relatively-recently created habitat on free-draining substrate supports an abundance of black knapweed, ox-eye daisy, bird's-foot trefoil, ribwort plantain, white clover, lady's bedstraw, creeping cinquefoil and yarrow in a sparse sward of Yorkshire fog, false oat-grass and scattered tufted hairgrass.
- 5.3.8 Several relict areas of former meadow or pasture are located between the old and new routes of Bryn Lane. These and apparently unmanaged grasslands support a range of grasses including common and creeping bents, Yorkshire fog, sweet vernal grass, timothy, meadow foxtail as well as coarse species such as couch, cock's foot and false oat grass. Glaucous sedge, false fox sedge and compact and hard rushes are also locally frequent in some areas. Flowering herbs include black knapweed, meadow vetchling, yarrow, tufted vetch, ragwort, creeping cinquefoil, bird's-foot trefoil and, cowslip. Reed canary grass occurs in an isolated clump in a damp part of one of the meadows. A tall unmanaged sward of false oat-grass covers the mounded areas around the large unused car park in the south-western corner of the site. Pepper saxifrage also occurs in one of the fields (Target note 19). The fields may have been grazed by cattle at some point in the recent past as some parts are fenced off with barbed wire.
- 5.3.9 The majority of the remaining grasslands are predominantly improved grasslands, with a limited range of grasses dominated by perennial ryegrass with Yorkshire fog, crested dog's tail sweet vernal grass, creeping and common bent. The sward in these fields has a limited range of flowering herbs such as creeping and meadow buttercup, white clover, common mouse-ear, common sorrel and self heal. One of the improved grasslands (Target note 29) appears to have been used as sports pitches in the past, although it is now occasionally grazed by cattle. Another field (Target Note 26), closest to the fishing pond, had a very limited range of grass species in the sward, predominantly sweet vernal grass, Yorkshire fog, creeping bent, common bent, and scattered areas of false oat grass. The sward is apparently unmanaged. Slight ridge and furrow effect is visible in the field. Herbs are infrequent and include common sorrel and, rarely, meadow vetchling and self heal. Ridge and furrow is also evident in the field immediately to the south of the stream (Target Note 33). The fields to the north of the stream are even more improved than those to the south, evidently managed as silage and permanent pasture for grazing cattle. The field in the north-western corner of the site (Target Note 44) is a

perennial ryegrass ley with very few other grass or herb species and has therefore been classed as arable.

- 5.3.10 Relict areas of less-improved grass sward are found along the hedgerows which separate the northern pasture fields. A strip of grassland on the western side of one hedge (Target Note 40) has an abundance of black knapweed, and meadow sweet. Pepper saxifrage, a relict of unimproved pasture, also grows beside the hedge at the eastern edge of the site (Target Note 37).
- 5.3.11 Several areas of damp grassland occur within the fields. One notable example is to be found in the field immediately south of the stream (near Target Note 33) where a damp hollow supports an abundance of plicate sweetgrass. A further example occurs as a small circular depression in one of the fields bordering Ridley Wood Road (Target note 38) where plicate sweet grass, marsh foxtail, creeping bent and hard and jointed rushes dominate the sward.
- 5.3.12 An extensive area of marshy grassland occurs to the west of the shallow wetland on made-up ground at the southern end of the site (Target Note 4). This area has a sward dominated by creeping bent with abundant compact and hard rushes, glaucous sedge and false fax sedge. Herbs include creeping buttercup, hoary ragwort, silverweed, greater bird's foot trefoil, ragged robin, smooth tare, tufted vetch, curled dock and greater willowherb. Hairy St John's-wort is also recorded in this area of marshy grassland.

Ruderals/short perennials

- 5.3.13 Tall ruderals such as creeping thistle, nettle, docks and bristly oxtongue dominate the unmanaged areas of the site, notably around the edge of the fishing pond (Target Note 10), around the small visitor car park (Target Note 1) and alongside the open stream section between the disused carpark and the top of the stream bank. Extensive stands of creeping thistle, prickly sowthistle nettle and false oat grass also dominate some areas of made-up ground at the southern end of the site (near Target note 3) and around the small lagoon in the south-eastern corner of the site (Target Note 7). Teasel is locally-frequent in some areas. Elsewhere, the free-draining made-ground of the southern end of the site is covered by ephemeral/short perennials including yellow-wort, common centaury, common fleabane, weld, prickly sow thistle, ragwort, creeping cinquefoil, smooth hawk's-beard, bird's-foot trefoil, opium poppy, bristly oxtongue and rosettes of ox-eye daisy. The area appears to be heavily grazed by rabbits. Dwarf spurge and vipers bugloss have also been recorded in this area. Damp wheel ruts and areas of impeded drainage support glaucous sedge, hard rush and greater willowherb.

Swamp and open water

- 5.3.14 There are several areas of open water within the site. The largest water body is a lined triangular fishing pond (Target Note 10) which has a wide area of open water. The water appears turbid, presumably stirred up by the fish that the pond had been stocked with. The open water supports spiked water milfoil and some small patches of broad-leaved pondweed. The perimeter of the pond has a narrow belt of swamp vegetation dominated by bulrush, with scattered hairy willowherb, hard rush, soft rush, compact rush, water plantain, bittersweet and false fox sedge. Marsh woundwort grows on the grassy bank between the pond and the old roadway which runs alongside.
- 5.3.15 The second-largest pond is a linear pond (also evidently previously used as a fishing pond). This pond is quite heavily-shaded along the southern bank, by young ash and willow which grows into the water in places. The eastern end also has blackthorn and hawthorn growing near to the edge and mature oaks shade the banks at the western end. Fish were seen in the water. The open water areas support some extensive areas of spiked water milfoil and scattered water lily. A small submerged island supports a dense bed of bulrush swamp. The northern edge supports a narrow strip of cypress sedge swamp. Bittersweet scrambles over the bramble and nettle which overhang the banks in the more-open sections.
- 5.3.16 Two smaller field ponds are located within the grazed pastures. The larger of the two lies to the

south of the stream (Target note 34). This pond is created by a series of square ponds separated by short clay berms, most of which have been trampled down by the cattle which graze the fields. This pond is quite heavily-shaded by willow scrub; however, there are some patches of diverse swamp vegetation around the outside of the scrub and in areas kept open by the cattle. The water surface is covered by least duckweed and the bottom of the pond appears to be covered by a dense layer of rotting leaves. Swamp vegetation around the pond includes branched bur-reed, plicate sweetgrass, glaucous sedge, false fox sedge, cypress sedge, marsh horsetail and lesser water parsnip. The muddy and poached margins of the pond support scattered water plantain and marsh bedstraw, tufted forget-me-not, gipsywort, mud water starwort, wild angelica, hoary willowherb, celery-leaved buttercup and square-stemmed St John's-wort. Poached areas of the adjacent pasture include marsh cudweed, with self heal and colt's-foot.

- 5.3.17 The smaller of the field ponds is located in the middle of one of the silage fields to the north of the stream, (Target Note 43). This pond is actually two pools separated by a shallow submerged baulk of clayey soil. The western-most pool is predominantly open water with a fringe of swamp and marshy vegetation around the edge. Water plantain, compact, soft and hard rushes, gipsywort, fine-leaved water dropwort, celery-leaved buttercup, water crowfoot, cypress sedge, and common spikerush grow in the muddy margin. The water has submerged plants of water plantain, ivy-leaved duckweed and water starwort. The eastern pond is filled with swamp and has willow, hawthorn and bramble scrub growing on its northern edge. The swamp is dominated by bulrush with greater willowherb, marsh pennywort, common duckweed, water forget-me-not also present. Greater bird's-foot trefoil, tufted vetch, meadow vetchling and common centaury also occur in the grassland near the pond.
- 5.3.18 A very shallow pool, choked by an extensive area of bulrush swamp is located to the west of the former factory site (Target Note 4). There is common duckweed on the water surface whilst greater willowherb, common fleabane and lesser water parsnip occur frequently throughout the outer edge of the swamp. This wetland grades into the rush and sedge-rich marshy grassland described above.
- 5.3.19 A small diamond-shaped artificial lagoon located in the souther-eastern corner of the site holds a shallow pond with a fringe of emergent vegetation including bulrush, common spikerush, hard rush, compact rush and false fox sedge. Aquatic plants include stonewort and some large rafts of blanket-weed (algae).

Flowing water

- 5.3.20 A stream enters the south-western corner of the site from a pipe culvert which runs beneath the entrance road into the TDG site. This stream runs in a northerly direction in an open trapezoidal channel; the sides are covered by bramble and bittersweet. The wetted channel supports bulrush, lesser water plantain, and common fleabane. The stream takes a right-angled bend to the east and flows through the remainder of the site in a heavy deeply-incised channel in the shade of dense and continuous scrub and mature trees. A series of small waterfalls occur along its length. The banks are covered with ivy, with occasional areas of bare ground. Male ferns occur in this damp shaded habitat.
- 5.3.21 A water-filled ditch runs down the eastern side of the site (Target Note 32). There is a slight flow from south to north, discharging to the stream at the point where the stream exits the site boundary. The channel supports an abundance of emergent plants including bulrush, hard rush, soft rush, lesser water parsnip and some water cress. Lesser pondweed and ivy-leaved duckweed grow as submerged plants in a ponded section just downstream of a penstock located approximately midway along the ditch, near the security fencing. Sneezewort, gipsywort, tufted hairgrass, square-stemmed St-John's-wort, hoary ragwort, common fleabane and greater willowherb grow in the damp mud at the margins. Where the ditch runs alongside cattle pasture the heavily trampled banks have a high proportion of bare soil. This habitat supports an abundance of self-heal, daisy, common centaury, crested dog's-tail, smooth hawks-beard and colt's-foot. Shallow dry ditches link to the water-filled ditch and stream at various points around the site. These are generally dominated by coarse grasses but there are

occasional clumps of rushes and scattered plants of lesser water parsnip, meadowsweet and bulrush.

- 5.3.22 A field drain in the meadows between the old and new Bryn Lane supports an abundance of meadow sweet and tufted hairgrass.

Hedgerows

- 5.3.23 The old route of Bryn Lane is a green lane bordered by mature trees and largely-unmanaged blackthorn-and hawthorn-dominated hedgerows on either side. Very large, mature old oak trees occur quite frequently along its length together with occasional ash and crack willow. The verges and lane are grassy with bare ground only along the wheel ruts. Ivy and black bryony scramble over the hedgerow shrubs and ivy smothers the ground beneath. Cuckoo pint occurs in the shaded hedge bottom.
- 5.3.24 Intact closely-trimmed species-poor blackthorn-dominated hedgerows (with scattered large mature hedgerow oak trees) occur around the silage fields to the north of the stream. Large oaks also form the main component of the relict field boundaries in the old meadows bordering Bryn Lane on the western side of the site. A clipped blackthorn-dominated hedge also forms the main boundary between the grasslands south of the stream. Many of the hedges are reinforced by wooden post and rail fencing.

Other 'habitats'

- 5.3.25 The remainder of the site is occupied by areas of hardstanding, (former car parks and the floor and hardstanding of a former factory site), old roadways and bare ground churned up by vehicle wheels. There are several small disused buildings, bike sheds and derelict 'portacabins' associated with the car park, fishing ponds and former sports pitches of the old factory site.

6 NATURE CONSERVATION EVALUATION

6.1 *Habitats*

Size

- 6.1.1 The proposed development site covers a large site and as a consequence includes a diversity of land use types and habitats. Approximately two thirds of the site is improved agricultural grassland. Amenity grassland and bare concrete/tarmac hardstanding and roadways occupy the majority of the remainder of the site. Zones of free-draining made-up ground occur across the remaining areas and in parts have developed an open plant community with ruderals and wetlands. Small fragments of semi-improved neutral grasslands survive as relict field corners bordering the stream habitat. Scrub woodland, hedgerows and scattered mature trees are of localised and limited distribution across the site, being associated with the old lane and the stream. There are scattered ponds, ranging in size from a moderately-sized fishing lake to smaller field ponds and also a water filled ditch runs along half of the length of the eastern boundary.

Diversity

- 6.1.2 The areas of greatest habitat diversity are associated with the stream course (and adjacent field fragments), the old lane, the mosaic of wetlands, ponds, and open plant communities associated with the made-ground, and the water-filled ditch corridor which runs along part of the eastern edge of the site. The most diverse grassland habitats are located in the field fragments on the western edge of the site, bordering the stream. The greatest diversity of scrub and woodland species is associated with the old lane and the stream corridor. The woodland is also likely to have a greater diversity of spring-flowering herbs that has been found in the survey. The greatest diversity of wetland and aquatic species is found in the two field ponds both of which have a diverse swamp communities. The other wetlands do have a reasonable diversity of wetland plant species but bulrush tends to dominate large areas of the swamp habitats around these other waterbodies. A good diversity of wetland species is also found in the water-filled ditch on the eastern boundary.

Rarity

- 6.1.3 Semi-improved grasslands and pond habitats are a declining habitat type and on a national scale are considered to be in decline due to agricultural improvements. The site includes representative areas of these increasingly-rare habitats. The made-ground habitat in the southern part of the site has developed semi-natural plant communities. The old lane and edge of the stream corridor is also notable for the number and age of the mature trees (predominantly oaks) which grow there.

UK Biodiversity Action Plan priority habitats and Habitats of principal importance for the conservation of biological diversity in Wales which occur on the site are:

- Hedgerows
- Lowland meadows
- Ponds
- Eutrophic standing waters
- Open mosaic habitats on previously developed land

The following Local Wrexham BAP priority habitats are considered to occur within the site

- Derelict and Industrial Land
- Pond
- River, Stream and Canal
- Veteran Tree and Wood-Pasture

Naturalness

- 6.1.4 The most 'natural' habitat feature on the site is the lower stream course and its associated scrub habitat. The other habitats on the site have been created through historic traditional agricultural practices or other human interventions in relatively recent times. The ponds (probably all of man-made origin, as they appear as square-cornered pits on old O.S. Maps) and the ditch have developed natural aquatic and plant communities. The less intensively managed and semi-improved grasslands field fragments on the western side of the site include a diversity of grasses and herbs typical of semi-natural habitats. The nature of the substrate and lack of recent disturbance of the land at the southern end of the site provide conditions suitable for the natural establishment of an open mosaic habitat, often rich in flowering herbs and ephemeral plant species. Many of the large trees which occur along the old lane and boundary of the stream corridor are of considerable age and girth. The fissured trunks, rot holes, dead limbs and canopy provide a 'natural' habitat comparable to the canopy habitat of veteran oak trees in broadleaved woodlands.

Fragility

- 6.1.5 The grasslands would be likely to revert to scrub and eventually to broadleaved woodland, if grazing and mowing management ceased (scrub is already invading some of the fields next to Bryn Lane). Improved drainage of semi-improved grasslands would alter the species composition of the sward. These semi-improved grassland habitats would also be affected by changes in management, such as re-seeding, increased fertiliser input, or changes in grazing intensity and frequency. Lack of management of the ponds and open water areas would lead to gradual infilling and terrestrialisation as silt and plant material built up. Ultimately, if there is no management intervention these habitats would develop to wet carr woodland and, perhaps, eventually to broadleaved woodland. Waterbodies and watercourses would also be vulnerable to changes such as chemical pollution, increased siltation or water level fluctuations.

6.2 Species

- 6.2.1 The disturbed soils of the made-up ground at the southern edge of the site support a number of less common species, as do the grasslands and wetland habitats. A number of plant species recorded from the site are considered to be of limited occurrence in the Vice County*:

Grasslands

Silaum silaus (Pepper saxifrage): of Least Concern in Great Britain but Locally Scarce in Denbighshire. Occurs in two locations within the site. (See Target Notes 19 and 37 on Figure 1, Phase 1 Habitat Map).

Wetlands

Oenanthe aquatica (Fine-leaved water dropwort); of Least Concern in Great Britain but Locally Scarce in Denbighshire. Occurs around one field pond on the site (Target Note 43).

Carex pseudocyperus (Cypress sedge) Least Concern in Great Britain but Locally-Scarce and Nationally-Threatened in Wales. Occurs in three of the ponds on the site (Target Notes 9, 34 and 43).

Disturbed ground

Picris echioides (Bristley ox-tongue); of Least Concern in Great Britain but Locally-Scarce in Denbighshire. Occurs on disturbed soils across many parts of the southern end of the site.

Lactuca serriola (Prickly lettuce); of Least Concern in Great Britain but Locally-Scarce in Denbighshire. Occurs on disturbed soils at the southern end of the site.

Hypericum hirsutum (Hairy St John's-wort); of Least Concern in Great Britain but Locally - Scarce in Denbighshire. Occurs in marshy wetland in the southern part of the site (Target Note 4).

Echium vulgare (Vipers bugloss); of Least Concern in Great Britain but Locally-Scarce in Denbighshire. Occurs on disturbed soils at the southern end of the site.

Euphorbia exigua (Dwarf spurge); Nationally-Threatened in both Great Britain Red Data List and the Red Data List for Wales. Occurs on disturbed soils at the southern end of the site (Target Note 2).

*Recorded in 4-15 10 km squares in Watsonian Vice County 50 (Green, J.A. (2006). *The Flowering Plants of Denbighshire – A Botanical Checklist for VC50*. Powlsons Ltd, Colwyn Bay).

6.3 *Important Habitats*

6.3.1 The important *habitat* features of the site, as defined through the above assessment (i.e. those considered to be natural habitat features, rare, declining or diverse habitats, or habitat which support rare or locally scarce-plant species) have been marked in Figure 3.

6.3.2 The important habitats include those areas of habitat identified as of significant actual or potential value to the range of protected or notable fauna, namely Great Crested Newt, bats and bird species, Grizzled and Dingy Skippers and the Lesser Silver Water Beetle:

- The Great Crested Newt Survey highlighted the importance of the ponds as breeding habitats and the surrounding habitats as important terrestrial foraging and hibernation sites. In total 7 ponds have been highlighted to contain a medium – small population of GCNs. Several ponds to the south of Plot 3 had been classed as containing a small population of great crested newts when in fact all great crested newts found at these ponds were all terrestrial. Of the ponds *within* Plot 3, the artificial lagoon (Target Note 7 – Pond 'H') and a second pond within the fenced off land south of the fishing Lake (near Target Note 2 – Pond 'U') were found to contain significant numbers of newts during the early surveys but had dried to such an extent, by the last two surveys in 2005, that no newts were observed or trapped. During the 2008 surveys there was far more water in the small lagoon (Pond H) than three years ago but no great crested newts were found. Pond U now no longer exists, having completely dried up. No newts were recorded in either of the two fishing ponds (Target Note 9 and 10 – Ponds 'K' and 'L' respectively). In conclusion, the 2008 survey confirmed that there is a very significant population of Great Crested Newt present on, and close to, the site.
- Bird species recorded during the survey were found in the hedgerow and trees. No activity was seen over the fields, except for swallows feeding on flying insects. It is highly likely that the hedges mature trees and wooded stream corridor, and cover provided by the swamp vegetation around the ponds are the main nesting habitats for birds.
- The bat survey highlighted the importance of the hedgerows and ponds as foraging habitat for bats. Three species of bat were seen and recorded over the site. These were Pipistrelle 45 kHz, Pipistrelle 55 kHz and Noctule bats. Whilst the pattern of activity over the site did not identify any concentration of any one species that would indicate the presence of a roost there is still a high potential for roosting bats in the mature oak trees on the site.
- The invertebrate survey identified the areas of ephemeral/short perennials in the southern parts of Plot 3 as important for both Grizzled and Dingy Skipper. Selected areas of unimproved and semi-improved neutral grasslands associated with the eastern boundary drain, and relict meadows on the western side of the site are also considered to be valuable habitats. Key areas of potential habitat will also require further survey at an appropriate time of year (May/June) to determine presence/absence.
- The pond in the improved grasslands alongside Ridley Wood Lane (Target note 43) is the only pond on the site considered potentially suitable for the Lesser Silver Water Beetle. It has not been possible to determine presence/ likely absence of this species during the present survey. As it is considered likely that the habitat conditions may be more favourable earlier in the year further survey is required in May/June 2009.

7 NATURE OF THE PROPOSED DEVELOPMENT

- 7.1 The proposed development is described in the Supporting Statement and illustrated on the plan entitled Proposed Site Layout Plan. This plan is provided as part of an outline planning application for B2 and B8 uses. The plan depicts a commercial unit with a floor area of 400,000 square feet located in the northern part of the site, beside Ridley Wood Lane, with associated infrastructure including car parks and access road off Bryn Lane. To the south of the stream there is a second commercial unit with a floor area of 250,000 square feet with associated infrastructure including car parks and an access road off Bryn Lane. This southern part of the proposed development also provides for an expansion of the buildings (by a further 250,000 square feet).
- 7.2 The Plot 1 development will consist of a 75,000sq ft development, located to the west of the existing TDG building.

8 BRIEF IMPACT ASSESSMENT

- 8.1 Detailed consideration of the impacts on the habitats of protected or notable fauna are provided in relevant survey reports.
- 8.2 The development layout and details have been adjusted in light of the ecological surveys in order to accommodate the most significant and important ecological features of the site; however, some habitat loss is inevitable given the nature and scale of the landuses designated for this site within the Wrexham UDP.
- The majority of the habitat types directly affected by habitat loss are predominantly grass ley crops or grazed improved grassland with species-poor clipped hedgerows.
 - A short length of the southern end of Old Bryn Lane, and scattered mature trees associated within the lane hedgerows, would also be lost. This would have an impact on the availability of both bird nesting habitat and bat foraging routes. The mature oaks also provide potential bat roost locations.
 - Some areas of the ephemeral and short-perennial habitat on the made-up ground at the south end of the site will be affected by the proposals. However, the majority will be retained.
 - One field pond which does support Great Crested Newts, could potentially support the a Lesser Silver Water Beetle and which also has a locally-scarce plant species would be lost.
 - The two former fishing ponds would be lost. These ponds did not support great crested newt breeding newts and are thought not suitable for the Lesser Silver Water Beetle. However, they do support water fowl, and some locally-notable swamp and aquatic vegetation.
- 8.3 There will also be indirect effects, such as changes to the surface water and drainage patterns, lighting and level of noise and human disturbance, affecting the habitats which are to remain.
- 8.4 Those habitats which will be retained will form part of a network of land managed specifically for nature conservation:
- The stream course has been retained as a wildlife corridor through the site, as have the majority of the relict areas of semi-improved neutral grassland which lie on the western edge of the site.
 - Areas of hardstanding and old factory foundations will not be affected but these areas are available for modification to enhance the areas for protected and notable fauna.
 - Significant areas of the pastures and drain along the eastern edge of the site would remain unaffected and would also provide an opportunity for the creation of new wetlands and associated swamp and terrestrial wildlife habitat.
- 8.5 Further details are provided in the Ecological and Landscape Management Framework.

9 MITIGATION

- 9.1 Detailed consideration of the mitigation required for protected or notable fauna are provided in relevant survey reports. The following mitigation measures are required to lessen the impacts on the habitats and botanical interests of the site:
- Those features marked as important in Figure 3 should be incorporated into the layout of the development in such a way that allows the habitat to remain intact and linked via undeveloped land to the surrounding landscape and adjacent semi-natural habitats.
 - Where any element of these important habitats is affected by the proposals, any losses should be mitigated by creation of a similar area of new habitat.
 - Replacement of the mature tree 'habitats' such as are provided by the large oaks along old Bryn Lane is not possible in any planting scheme since these trees are of considerable age (likely to be in excess of 150 years). Wherever possible, these trees should be retained within landscaped areas of the development. Should felling be unavoidable, the dead wood from the trees should be placed in adjacent retained habitat to provide habitat for deadwood invertebrates.
 - Oak tree saplings, grown from locally-sourced seed, should be planted in those boundary hedges which are to remain intact.
 - Lighting should be positioned and orientated so as to avoid illumination of trees, scrub and woodland edge, hedgerow or stream habitats. For this reason, parking/loading areas should be positioned away from areas adjacent to these habitats, wherever possible.
 - Where catchment areas for surface-water-fed ponds are to be reduced by development, then CLEAN surface water (possibly roof drainage) should be directed to these ponds.
 - Additional ponds should be created within the remaining areas of improved grassland, specifically for the purpose of providing replacement wildlife habitats i.e. separate from the surface water attenuation ponds. This is in order to provide ponds with a relatively static water level which will allow natural zonation of aquatic plant communities to develop. (Attenuation ponds tend to fluctuate widely and this can lead to semi-terrestrial and inundation habitats – with limited potential for the submerged or purely aquatic species to become established). The attenuation ponds have been designed to provide habitats suitable for great crested newt.
 - Attenuation ponds should be designed to provide at least some shallow open water habitat at times of low rainfall by deepening areas of the 'basin' below the outlet level.
 - The current layout would lead to the loss of the field pond in one of the fields to the north of the stream (Target Note 43). This pond has a good diversity of emergent vegetation, including some locally-scarce species. Plant material and silts from this pond should be translocated to a new wildlife pond within the adjacent unaffected pasture.
 - Some tree planting adjacent to the open section of the stream is appropriate, in order to provide a continuity of tree canopy for species such as bat; however, care will need to be taken not to cause excessive shading of the stream and not to hinder future maintenance of the stream channel. Locally-native trees grown from local provenance seeds, should be planted within the hedgerow along Bryn Lane on the western edge of the site.
 - Areas of previously-developed land in the southern part of the site comprise hardstanding, roadways and rubble from the foundations and floors of old factory buildings. These lie between the marshy wetland (Target Note 4) and the ditch, rough grassland and scrub habitat on the eastern edge of the site. The link between these two areas should be improved by creating new areas of herb-rich grasslands, and open habitat similar that which has already colonised the made-ground to the west of the wetland (Target Notes 3 and 2). Crushed rubble, spread over the concrete and roadways, would provide similar habitats, and any areas of impeded drainage would allow the development of new pools and marshy habitats. Natural colonisation should

be allowed to establish vegetation in such areas.

- 9.2 A plan for the future management of the retained and enhanced wildlife habitats will be developed following discussions with the local Wildlife Trust and Local Authority Ecologist. However, the following issues will need to be considered:

Grasslands

- A combination of mowing (for hay) and grazing would be appropriate grassland management, although grazing intensity of the more species-rich grasslands would need to be restricted to prevent excessive enrichment. The ability to graze the grasslands will be limited, due to the small and fragmented nature of the grassland areas which will remain, therefore annual mowing management may be the only feasible option. Funding of this management is likely to be necessary since the hay is unlikely to be of sufficient quantity or quality to be saleable.
- It may also be important to retain some unmanaged areas close to amphibian populations. However, grazing management around field ponds is needed, in order to provide field ponds habitats suited to certain aquatic invertebrate, such as water beetles.
- There may be the potential to create a small pond in one of the grasslands beside Bryn Lane. The vegetation in some areas suggests that localised water-logging does occur.
- Grassland areas included within the landscaping of the development should be a grass mix suitable for low-fertility open sward (dominated by bents and fescues). Hay from the semi-improved grasslands beside Bryn Lane could be used to provide a seed source for these grass areas. A 'low fertility' mix would require less maintenance (limited to strimming 2/3 times annually).
- The old route of Bryn Lane could also be lightly grazed overwinter-until early in the year, to reduce scrub invasion and preserve a grassy verge.

Hedgerows and scrub

- Hedgerows and scrub along the old Bryn lane and the middle section of the stream (Target Note 16) require some management. Blackthorn is invading the adjacent pasture and is shading the stream. Ideally this should be cut back and the hedge kept trimmed at least on the sides (in order to prevent loss of the more diverse grassland habitats in the adjacent field, preserve the grassy verges of the old lane and to allow light to reach the stream habitats). Grazing by cattle would help to control scrub invasion of the grasslands.
- Landscaping within the development area should use a high proportion of locally-native trees and scrubs.

Ponds, ditches and wetland areas

- The pond and ditch management regime should be guided by the habitat requirements of great crested newt. However, periodic maintenance of open water within the farm ponds, and clearance of channels will be necessary. This may involve periodic removal of willow scrub and clearing of excessive growth of emergent vegetation. Such work should be carried out on a rotational basis – allowing some habitat to remain undisturbed in any year.

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