

Appendix E.1

Section 42 NERC Act 2006

Habitats and Species List

**List of Species and Habitats of Principal Importance for Conservation of
Biological Diversity in Wales, December 2007.**

Table 1 Species

Mammals/Mamaliaid 17 species	
<i>Arvicola terrestris</i>	Water Vole
<i>Barbastella barbastellus</i>	Barbastelle Bat
<i>Erinaceus europaeus</i>	West European Hedgehog
<i>Lepus europaeus</i>	Brown Hare
<i>Lutra lutra</i>	Otter
<i>Martes martes</i>	Pine Marten
<i>Micromys minutus</i>	Harvest Mouse
<i>Muscardinus avellanarius</i>	Dormouse
<i>Mustela putorius</i>	Polecat
<i>Myotis bechsteinii</i>	Bechstein's Bat
<i>Nyctalus noctula</i>	Noctule
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle
<i>Plecotus auritus</i>	Brown long-eared Bat
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat
<i>Sciurus vulgaris</i>	Red Squirrel

Birds/Adar 51 species	
<i>Acrocephalus paludicola</i>	Aquatic Warbler
<i>Alauda arvensis subsp. Arvensis/scotica</i>	Skylark
<i>Anser albifrons subsp. Flavirostris</i>	Greenland Greater White-fronted Goose
<i>Anthus trivialis</i>	Tree Pipit
<i>Botaurus stellaris</i>	Great Bittern
<i>Branta bernicula subsp. bernicula</i>	Dark-bellied Brent Goose
<i>Caprimulgus europaeus</i>	European Nightjar
<i>Carduelis cabaret</i>	Lesser Redpoll
<i>Carduelis cannabina subsp. Autochthona/cannabina</i>	Common Linnet
<i>Carduelis flavirostris subsp. Bensonorum/pipilans</i>	Twite
<i>Charadrius hiaticula</i>	Ringed Plover
<i>Circus cyaneus</i>	Hen Harrier
<i>Coccothraustes coccothraustes</i>	Hawfinch
<i>Crex crex</i>	Corncrake
<i>Cuculus canorus</i>	Common Cuckoo

<i>Cygnus columbianus subsp. bewickii</i>	Tundra Swan
<i>Dendrocopus minor subsp. comminutus</i>	Lesser Spotted Woodpecker
<i>Emberiza calandra subsp. calandra/clanceyi</i>	Corn Bunting
<i>Emberiza citrinella</i>	Yellowhammer
<i>Emberiza schoeniclus</i>	Reed Bunting
<i>Falco tinnunculus</i>	Kestrel
<i>Ficedula hypoleuca</i>	Pied Flycatcher
<i>Lagopus lagopus subsp. scotica</i>	Red Grouse
<i>Lanius collurio</i>	Red-backed Shrike
<i>Larus argentatus subsp. argenteus</i>	Herring Gull
<i>Larus ridibundus</i>	Black-headed Gull
<i>Limosa lapponica</i>	Bar-tailed Godwit
<i>Locustella naevia</i>	Common Grasshopper Warbler
<i>Lullula arborea</i>	Woodlark
<i>Melanitta nigra</i>	Common Scoter
<i>Motacilla flava subsp. flavissima</i>	Yellow Wagtail
<i>Muscicapa striata</i>	Spotted Flycatcher
<i>Numenius arquata</i>	Eurasian Curlew
<i>Parus montanus subsp. kleinschmidtii</i>	Willow Tit
<i>Parus palustris subsp. palustris/dresseri</i>	Marsh Tit
<i>Passer domesticus</i>	House Sparrow
<i>Passer montanus</i>	Eurasian Tree Sparrow
<i>Perdix perdix</i>	Grey Partridge
<i>Phylloscopus sibilatrix</i>	Wood Warbler
<i>Pluvialis apricaria</i>	Golden Plover
<i>Prunella modularis subsp. occidentalis</i>	Hedge Accentor
<i>Puffinus mauretanicus</i>	Balearic Shearwater
<i>Pyrrhocorax pyrrhocorax</i>	Chough
<i>Pyrrhula pyrrhula subsp. pileata</i>	Common Bullfinch
<i>Sterna dougallii</i>	Roseate Tern
<i>Streptopelia turtur</i>	European Turtle Dove
<i>Sturnus vulgaris subsp. vulgaris</i>	Common Starling
<i>Tetrao tetrix subsp. britannicus</i>	Black Grouse
<i>Turdus philomelos subsp. clarkei</i>	Song Thrush
<i>Turdus torquatus</i>	Ring Ousel
<i>Vanellus vanellus</i>	Northern Lapwing
Fish/Pysgod 10 species	
<i>Alosa alosa</i>	Allis Shad
<i>Alosa fallax</i>	Twaite Shad
<i>Anguilla anguilla</i>	European Eel

<i>Coregonus lavaretus</i>	Whitefish (Powan, Gwyniad, or Schelly)
<i>Lampetra fluviatilis</i>	River Lamprey
<i>Osmerus eperlanus</i>	Smelt (Sparling)
<i>Petromyzon marinus</i>	Sea Lamprey
<i>Salmo salar</i>	Atlantic Salmon
<i>Salmo trutta</i>	Brown/Sea Trout
<i>Salvelinus alpinus</i>	Arctic Charr

Reptiles and amphibians/ Ymlusgiaid ac Amffibiaid 8 species	
<i>Anguis fragilis</i>	Slow-worm
<i>Bufo bufo</i>	Common Toad
<i>Bufo calamita</i>	Natterjack Toad
<i>Lacerta agilis</i>	Sand Lizard
<i>Zootoca vivipara</i>	Common Lizard
<i>Natrix natrix</i>	Grass Snake
<i>Triturus cristatus</i>	Great-crested Newt
<i>Vipera berus</i>	Adder

Invertebrates/ Anifeiliaid Di-asgwrn-cefn 187 species	
<i>Acronicta psi</i>	Grey Dagger
<i>Acronicta rumicis</i>	Knot Grass
<i>Adscita statices</i>	The Forester
<i>Agonopterix atomella</i>	A Micro-moth
<i>Agonum scitulum</i>	A Ground Beetle
<i>Agrochola helvola</i>	Flounced Chestnut
<i>Agrochola litura</i>	Brown-spot Pinion
<i>Agrochola lychnidis</i>	Beaded Chestnut
<i>Allophyes oxyacanthae</i>	Green Brindled Chestnut
<i>Amphipoea oculea</i>	Ear Moth
<i>Amphipyra tragopoginis</i>	Mouse Moth
<i>Anania funebris</i>	A Pyralid Moth
<i>Andrena tarsata</i>	A Mining Bee
<i>Apamea anceps</i>	Large Nutmeg
<i>Apamea remissa</i>	Dusky Brocade
<i>Aporophyla lutulenta</i>	Deep-brown Dart
<i>Arctia caja</i>	Garden Tiger
<i>Argynnis adippe</i>	High Brown Fritillary
<i>Asilus crabroniformis</i>	Hornet Robber Fly
<i>Asteroscopus sphinx</i>	The Sprawler
<i>Atethmia centrugo</i>	Centre-barred Sallow
<i>Austropotamobius pallipes</i>	White-clawed Freshwater Crayfish
<i>Bembidion quadripustulatum</i>	A Ground Beetle

<i>Bembidion testaceum</i>	A Ground Beetle
<i>Bidessus minutissimus</i>	A Diving Beetle
<i>Blepharita adusta</i>	Dark Brocade
<i>Boloria euphrosyne</i>	Pearl-bordered Fritillary
<i>Boloria selene</i>	Small Pearl-bordered Fritillary
<i>Bombus humilis</i>	Brown-banded Carder-bee
<i>Bombus muscorum</i>	Moss Carder-bee
<i>Bombus ruderarius</i>	Red-shanked Carder-bee
<i>Bombus ruderatus</i>	Large Garden Bumblebee
<i>Bombus sylvarum</i>	Shrill Carder-bee
<i>Brachylomia viminalis</i>	Minor Shoulder-knot
<i>Brachyptera putata</i>	Northern February Red
<i>Calosoma inquisitor</i>	A Ground Beetle
<i>Carabus monilis</i>	A Ground Beetle
<i>Caradrina morpheus</i>	Mottled Rustic
<i>Celaena haworthii</i>	Haworth's Minor
<i>Celaena leucostigma</i>	The Crescent
<i>Chesias legatella</i>	The Streak
<i>Chesias rufata</i>	Broom-tip
<i>Chiasmia clathrata</i>	Latticed Heath
<i>Chlaenius tristis</i>	A Ground Beetle
<i>Chrysis fulgida</i>	A Ruby-tailed Wasp
<i>Cicindela germanica</i>	A Tiger Beetle
<i>Cicindela hybrida</i>	A Tiger Beetle
<i>Clorismia rustica</i>	A Stiletto -fly
<i>Coenagrion mercuriale</i>	Southern Damselfly
<i>Coenonympha pamphilus</i>	Small Heath
<i>Coenonympha tullia</i>	Large Heath
<i>Cosmia diffinis</i>	White-spotted Pinion
<i>Cossus cossus</i>	Goat Moth
<i>Cryptocephalus decemmaculatus</i>	A Leaf Beetle
<i>Cupido minimus</i>	Small Blue
<i>Cyclophora pendularia</i>	Dingy Mocha
<i>Cymatophorima diluta</i>	Oak Lutestring
<i>Dasypolia templi</i>	Brindled Ochre
<i>Diarsia rubi</i>	Small Square-spot
<i>Diloba caeruleocephala</i>	Figure of Eight
<i>Dipoena inornata</i>	A Comb-footed Spider
<i>Dolomedes plantarius</i>	Fen Raft Spider
<i>Donacia aquatica</i>	A Reed Beetle
<i>Donacia bicolora</i>	A Reed Beetle
<i>Ecliptopera silaceata</i>	Small Phoenix
<i>Empis limata</i>	A Dance Fly

<i>Ennomos erosaria</i>	September Thorn
<i>Ennomos fuscantaria</i>	Dusky Thorn
<i>Ennomos quercinaria</i>	August Thorn
<i>Entephria caesiata</i>	Grey Mountain Carpet
<i>Epirrhoe galiata</i>	Galium Carpet
<i>Erigone welchi</i>	A Money-spider
<i>Eriopygodes imbecilia</i>	The Silurian
<i>Erynnis tages</i>	Dingy Skipper
<i>Eucera longicornis</i>	Long-horned Bee
<i>Eugnorisma glareosa</i>	Autumnal Rustic
<i>Eulithis mellinata</i>	The Spinach
<i>Eurodryas aurinia</i>	Marsh Fritillary
<i>Eustroma reticulata</i>	Netted Carpet Moth
<i>Euxoa nigricans</i>	Garden Dart
<i>Formicoxenus nitidulus</i>	Shining Guest Ant
<i>Graphiphora augur</i>	Double Dart
<i>Gryllotalpa gryllotalpa</i>	Mole Cricket
<i>Hagenella clathrata</i>	A Caddis Fly
<i>Haplodrassus dalmatensis</i>	A Spider
<i>Harpalus melancholicus</i>	A Ground Beetle
<i>Heliophobus reticulata</i>	Bordered Gothic
<i>Hemaris tityus</i>	Narrow-bordered Bee Hawk-moth
<i>Hemistola chrysoprasaria</i>	Small Emerald
<i>Hepialus humuli</i>	Ghost Moth
<i>Hipparchia semele</i>	Grayling
<i>Hoplodrina blanda</i>	The Rustic
<i>Hydraecia micacea</i>	Rosy Rustic
<i>Hydrochara caraboides</i>	Lesser Silver Water Beetle
<i>Hydroporus rufifrons</i>	A Diving Beetle
<i>Idaea continguarua</i>	Weaver's Wave
<i>Idaea dilutaria</i>	Silky Wave
<i>Idiocera sexguttata</i>	A Crane fly
<i>Isogenus nubecula</i>	A Stonefly
<i>Jodia croceago</i>	Orange Upperwing
<i>Lampronia capitella</i>	Currant Shoot-borer
<i>Lasiommata megera</i>	Wall
<i>Leptidea sinapis</i>	Wood White
<i>Limenitis camilla</i>	White Admiral
<i>Lipsothrix errans</i>	A Crane fly
<i>Lipsothrix nervosa</i>	A Crane fly
<i>Lipsothrix nigristigma</i>	A Crane fly
<i>Lophopus crystallinus</i>	A Freshwater Bryozoan
<i>Lucanus cervus</i>	Stag Beetle
<i>Luperina nickerlii subsp. gueneei</i>	Sandhill Rustic

<i>Lycia hirtaria</i>	Brindled Beauty
<i>Lycia zonaria subsp. britannica</i>	Belted Beauty
<i>Macaria wauaria</i>	V Moth
<i>Malacosoma neustria</i>	The Lackey
<i>Margaritifera margaritifera</i>	Freshwater Pearl Mussel
<i>Mecopisthes peusi</i>	A Money Spider
<i>Meioneta mollis</i>	A Money Spider
<i>Melanchra persicariae</i>	Dot Moth
<i>Melanchra pisi</i>	Broom Moth
<i>Melanthia procellata</i>	Pretty Chalk Carpet
<i>Meloe proscarabaeus</i>	An Oil-beetle
<i>Meloe rugosus</i>	An Oil-beetle
<i>Meloe violaceus</i>	An Oil-beetle
<i>Meotica anglica</i>	A Rove Beetle
<i>Mesoligia literosa</i>	Rosy Minor
<i>Minoa murinata</i>	Drab Looper
<i>Monocephalus castaneipes</i>	A Money Spider
<i>Mythimna comma</i>	Shoulder-striped Wainscot
<i>Myxas glutinosa</i>	Glutinous Snail
<i>Nemapogon picarella</i>	A Micro-moth
<i>Nematopogon magna</i>	A Micro-moth
<i>Nigrobaetis niger</i>	Iron Blue Mayfly
<i>Noctua orbona</i>	Lunar Yellow Underwing
<i>Notioscopus sarcinatus</i>	A Money Spider
<i>Ochthebius poweri</i>	A Water Beetle
<i>Odontomyia hydroleon</i>	A Soldier Fly
<i>Odynerus melanocephalus</i>	A Mason-wasp
<i>Omphiscola glabra</i>	Mud Snail
<i>Orthonama vittata</i>	Oblique Carpet
<i>Orthosia gracilis</i>	Powdered Quaker
<i>Osmia parietina</i>	A Mason Bee
<i>Osmia xanthomelana</i>	A Mason Bee
<i>Panagaeus cruxmajor</i>	A Ground Beetle
<i>Pelurga comitata</i>	Dark Spinach
<i>Perizoma albulata subsp. albulata</i>	Grass Rivulet
<i>Philodromus fallax</i>	A Running Crab-spider
<i>Phyllonorycter sagitella</i>	A Micro-moth
<i>Pisidium tenuilineatum</i>	Fine-lined Pea Mussel
<i>Plebejus argus</i>	Silver-studded Blue
<i>Polia bombycina</i>	Pale Shining Brown
<i>Potamanthus luteus</i>	A Mayfly
<i>Pseudanodonta complanata</i>	Depressed River Mussel
<i>Pyrausta sanguinalis</i>	A Pyralid Moth

<i>Pyrgus malvae</i>	Grizzled Skipper
<i>Rhabdomastix japonica</i>	A Crane fly
<i>Rheumaptera hastata</i>	Argent and Sable
<i>Saariotoa firma</i>	A Money Spider
<i>Sabra harpagula</i>	Scarce Hook Tip
<i>Satyrium w-album</i>	White Letter Hairstreak
<i>Scopula marginepunctata</i>	Mullein Wave
<i>Scotopteryx bipunctaria</i>	Chalk Carpet
<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar
<i>Sitticus caricis</i>	A Jumping Spider
<i>Spilosoma lubricipeda</i>	White Ermine
<i>Spilosoma luteum</i>	Buff Ermine
<i>Stilbia anomala</i>	The Anomalous
<i>Synanthedon scoliaeformis</i>	Welsh Clearwing
<i>Synaptus filiformis</i>	Hairy Click Beetle
<i>Thecla betulae</i>	Brown Hairstreak
<i>Thinobius newberyi</i>	A Rove Beetle
<i>Tholera cespitis</i>	Hedge Rustic
<i>Tholera decimalis</i>	Feathered Gothic
<i>Timandra comae</i>	Blood-vein
<i>Trichiura crataegi</i>	Pale Eggar
<i>Tyria jacobaeae</i>	The Cinnabar
<i>Vertigo angustior</i>	Narrow-mouthed Whorl Snail
<i>Vertigo geyeri</i>	Geyer's Whorl Snail
<i>Vertigo moulinsiana</i>	Desmoulin's Whorl Snail
<i>Watsonalla binaria</i>	Oak Hook-tip
<i>Xanthia gilvago</i>	Dusky-lemon Sallow
<i>Xanthia ictertia</i>	The Sallow
<i>Xanthorhoe decoloraria</i>	Red Carpet
<i>Xanthorhoe ferrugata</i>	Dark-barred Twin-spot Carpet
<i>Xestia agathina</i>	Heath Rustic
<i>Xestia ashworthii</i>	Ashworth's Rustic
<i>Xestia castanea</i>	Neglected Rustic
<i>Xylota exsoleta</i>	Sword-grass

Vascular plants/ Planhigion fasgwlaidd	
78 species and 1 Hieracium sp. group	
<i>Artemisia maritima</i>	Field Wormwood
<i>Asparagus prostratus</i>	Wild Asparagus
<i>Asplenium trichomanes subsp. pachyrachis</i>	A Maidenhair Spleenwort
<i>Blysmus compressus</i>	Flat-sedge
<i>Bupleurum tenuissimum</i>	Slender Hare`s-ear
<i>Campanula patula</i>	Spreading Bellflower

<i>Carex divisa</i>	Divided Sedge
<i>Centaurea cyanus</i>	Cornflower
<i>Centaureum scilloides</i>	Perennial Centaury
<i>Cephalanthera longifolia</i>	Narrow-leaved Helleborine
<i>Cerastium arcticum</i>	Arctic Mouse-ear
<i>Chamaemelum nobile</i>	Chamomile
<i>Cicendia filiformis</i>	Yellow Centaury
<i>Clinopodium acinos</i>	Basil Thyme
<i>Cotoneaster cambricus</i>	Wild Cotoneaster
<i>Dactylorhiza purpurella subsp. cambrensis</i>	A Marsh orchid
<i>Dactylorhiza viridis</i>	Frog Orchid
<i>Dianthus armeria</i>	Deptford Pink
<i>Euphrasia anglica</i>	Glandular Eyebright
<i>Euphrasia cambrica</i>	An Eyebright
<i>Euphrasia ostenfeldii</i>	An Eyebright
<i>Euphrasia pseudokernerii</i>	Chalk Eyebright
<i>Euphrasia rivularis</i>	An Eyebright
<i>Euphrasia rostkoviana subsp. montana</i>	An Eyebright
<i>Fumaria purpurea</i>	Purple Ramping - fumitory
<i>Galeopsis angustifolia</i>	Red Hemp-nettle
<i>Galeopsis segetum</i>	Downy Hemp-nettle
<i>Galeopsis speciosa</i>	Large-flowered Hemp-nettle
<i>Gentianella anglica</i>	Early Gentian
<i>Gentianella campestris</i>	Field Gentian
<i>Gentianella uliginosa</i>	Dune Gentian
<i>Gymnadenia borealis</i>	Northern Fragrant Orchid
<i>Gymnadenia conopsea</i>	Fragrant Orchid
<i>Gymnadenia densiflora</i>	Marsh Fragrant Orchid
<i>Hammerbya paludosa</i>	Bog Orchid
<i>Hieracium spp.</i>	6 Threatened Endemic species
<i>Hordeum marinum</i>	Sea Barley
<i>Juniperus communis</i>	Juniper
<i>Juniperus communis subsp. hemisphaerica</i>	A Juniper
<i>Liparis loeselii</i>	Fen Orchid
<i>Luronium natans</i>	Floating Water Plantain
<i>Lycopodiella inundata</i>	Marsh Clubmoss
<i>Lycopodium clavatum</i>	Stag's – horn Clubmoss
<i>Matthiola sinuata</i>	Sea Stock
<i>Melittis melissophyllum</i>	Bastard Balm
<i>Mentha pulegium</i>	Pennyroyal
<i>Monotropa hypopitys</i>	Yellow Bird's-nest
<i>Monotropa hypopitys subsp. hypophegea</i>	A Bird's-nest

<i>Monotropa hypopitys</i> subsp. <i>hypopitys</i>	A Bird`s-nest
<i>Neotinea ustulata</i>	Burnt Orchid
<i>Oenanthe fistulosa</i>	Tubular Water-dropwort
<i>Ophrys insectifera</i>	Fly Orchid
<i>Pilularia globulifera</i>	Pillwort
<i>Platanthera bifolia</i>	Lesser Butterfly-orchid
<i>Poa glauca</i>	Glaucous Meadow-grass
<i>Polystichum lonchitis</i>	Holly-fern
<i>Potamogeton compressus</i>	Grass-wrack Pondweed
<i>Potentilla rupestris</i>	Rock Cinquefoil
<i>Pseudorchis albida</i>	Small-white Orchid
<i>Pulicaria vulgaris</i>	Small Fleabane
<i>Ranunculus arvensis</i>	Corn Buttercup
<i>Ranunculus tripartitus</i>	Three-lobed Water-crowfoot
<i>Rumex rupestris</i>	Shore Dock
<i>Salsola kali</i> subsp. <i>kali</i>	Prickly Saltwort
<i>Saxifraga cespitosa</i>	Tufted Saxifrage
<i>Scandix pecten-veneris</i>	Shepherd's Needle
<i>Scleranthus annuus</i>	Annual Knawel
<i>Scleranthus annuus</i> subsp. <i>annuus</i>	Annual Knawel
<i>Silene gallica</i>	Small - flowered Catchfly
<i>Sorbus eminens</i>	A Whitebeam
<i>Sorbus leptophylla</i>	A Whitebeam
<i>Sorbus leyana</i>	Ley's Whitebeam
<i>Sorbus minima</i>	A Whitebeam
<i>Stellaria palustris</i>	Marsh Stitchwort
<i>Trollius europaeus</i>	Globe-flower
<i>Valerianella rimosa</i>	Broad-fruited Cornsalad
<i>Vicia orobus</i>	Wood Bitter-vetch
<i>Viola lactea</i>	Pale Dog-Violet
<i>Woodsia ilvensis</i>	Oblong Woodsia

Lichens/Cen 67 species and 2 communities	
<i>Anaptychia ciliaris</i> subsp. <i>ciliaris</i>	A Lichen
<i>Arthonia atlantica</i>	A Lichen
<i>Arthothelium dictyosporum</i>	A Lichen
<i>Bacidia circumspecta</i>	A Lichen
<i>Bacidia incompta</i>	A Lichen
<i>Biatoridium monasteriense</i>	A Lichen
<i>Blarneya hibernica</i>	A Lichen
<i>Bryoria smithii</i>	A Lichen
<i>Buellia hyperbolica</i>	A Lichen

<i>Calicium adspersum</i>	A Lichen
<i>Caloplaca atroflava</i>	A Lichen
<i>Caloplaca flavorubescens</i>	A Lichen
<i>Caloplaca herbidella</i>	A Lichen
<i>Caloplaca lucifuga</i>	A Lichen
<i>Caloplaca luteoalba</i>	Orange-fruited Elm Lichen
<i>Chaenotheca phaeocephala</i>	A Lichen
<i>Cladonia peziziformis</i>	A Lichen
<i>Collema dichotomum</i>	River-jelly Lichen
<i>Collema fasciculare</i>	A Lichen
<i>Collema fragile</i>	A Lichen
<i>Collema fragrans</i>	A Lichen
<i>Endocarpon adscendens</i>	A Lichen
<i>Fulgensia fulgens</i>	A Lichen
<i>Fuscopannaria sampaiana</i>	A Lichen
<i>Gomphillus calycioides</i>	A Lichen
<i>Graphina pauciloculata</i>	A Lichen
<i>Gyalecta flotowii</i>	A Lichen
<i>Heterodermia leucomela</i>	Ciliate Strap-lichen
<i>Lecania chlorotiza</i>	A Lichen
<i>Lecanographa amylacea</i>	A Lichen
<i>Lecanora achariana</i>	Tarn Lecanora
<i>Lecanora quercicola</i>	A Lichen
<i>Lecanora sublivescens</i>	A Lichen
<i>Leptogium brebissonii</i>	A Lichen
<i>Leptogium cochleatum</i>	A Lichen
<i>Lobarion</i> community	A Lichen Community
<i>Megalospora tuberculosa</i>	A Lichen
<i>Melaspilea lentiginosa</i>	A Lichenicolous Fungus
Mine site community	A Lichen Community
<i>Opegrapha prosodea</i>	A Lichen
<i>Parmeliella testacea</i>	A Lichen
<i>Parmelina quercina</i>	A Lichen
<i>Parmelinopsis horrescens</i>	A Lichen
<i>Parmotrema robustum</i>	A Lichen
<i>Peltigera venosa</i>	A Lichen
<i>Pertusaria velata</i>	A Lichen
<i>Physcia tribacioides</i>	Southern Grey Physcia
<i>Porina effilata</i>	A Lichen
<i>Porina hibernica</i>	A Lichen
<i>Pseudocyphellaria intricata</i>	A Lichen
<i>Pseudocyphellaria lacerata</i>	Ragged Pseudocyphellaria
<i>Pseudocyphellaria norvegica</i>	A Lichen
<i>Pyrenula hibernica</i>	A Lichen

<i>Pyrenula nitida</i>	A Lichen
<i>Ramonia chrysophaea</i>	A Lichen
<i>Ramonia dictyospora</i>	A Lichen
<i>Rinodina isidioides</i>	A Lichen
<i>Schismatomma graphidioides</i>	A Lichen
<i>Stereocaulon delisei</i>	A Lichen
<i>Stereocaulon symphycheilum</i>	A Lichen
<i>Sticta canariensis</i>	A Lichen
<i>Strangospora microhaema</i>	A Lichen
<i>Strigula stigmatella</i> var. <i>stigmatella</i>	A Lichen
<i>Synalissa symphorea</i>	A Lichen
<i>Teloschistes flavicans</i>	Golden Hair-lichen
<i>Toninia sedifolia</i>	A Lichen
<i>Usnea articulata</i>	A Lichen
<i>Usnea florida</i>	A Lichen
<i>Wadeana dendrographa</i>	A Lichen

Mosses and liverworts/ Mwsoglau a Llysiau'r Afu 33 species	
<i>Anomodon longifolius</i>	Long-leaved Tail-moss
<i>Atrichum angustatum</i>	Lesser Smoothcap
<i>Barbilophozia kunzeana</i>	Bog Paw-wort
<i>Bartramia stricta</i>	Rigid Apple-moss
<i>Bryum calophyllum</i>	Matted Bryum
<i>Bryum gemmiparum</i>	Welsh Thread-moss
<i>Bryum knowltonii</i>	Knowlton's Thread-moss
<i>Bryum marratii</i>	Baltic Bryum
<i>Bryum warneum</i>	Sea Bryum
<i>Cephaloziella calyculata</i>	Entire Threadwort
<i>Cephaloziella nicholsonii</i>	Greater Copperwort
<i>Cryphaea lamyana</i>	Multi-fruited River Moss
<i>Dicranum bergeri</i>	Waved Fork-moss
<i>Didymodon tomaculosus</i>	Sausage Beard-moss
<i>Ditrichum plumbicola</i>	Lead -moss
<i>Ditrichum subulatum</i>	Awl-leaved Ditrichum
<i>Fissidens curvatus</i>	Portuguese Pocket- moss
<i>Fissidens serrulatus</i>	Large Atlantic Pocket- moss
<i>Fossombronina foveolata</i>	Pitted Frillwort
<i>Funaria pulchella</i>	Pretty Cord-moss
<i>Grimmia elongata</i>	Brown Grimmia
<i>Habrodon perpusillus</i>	Lesser Squirrel-tail Moss
<i>Leptodon smithii</i>	A Moss
<i>Pallavicinia lyellii</i>	Veilwort

<i>Petalophyllum ralfsii</i>	Petalwort
<i>Rhytidiadelphus subpinnatus</i>	Scarce Turf-moss
<i>Riccia canaliculata</i>	Channelled Crystalwort
<i>Riccia nigrella</i>	Black Crystalwort
<i>Scopelophila cataractae</i>	Tongue-leaved Copper-moss
<i>Tortula cuneifolia</i>	Wedge-leaved Screw-moss
<i>Tortula wilsonii</i>	Wilson's Pottia
<i>Weissia levieri</i>	Levier's Beardless-moss
<i>Weissia squarrosa</i>	Spreading-leaved Beardless-moss

Fungi/Ffyngau 26 species	
<i>Amanita friabilis</i>	Fragile Amanita
<i>Armillaria ectypa</i>	Agaric
<i>Chrysomyxa pirolata</i>	Wintergreen Rust
<i>Clavaria zollingeri</i>	A Fairy Club
<i>Cotylidia pannosa</i>	Wooly Rosette
<i>Entoloma bloxamii</i>	Big Blue Pinkgill
<i>Geastrum elegans</i>	Elegant Earthstar
<i>Geoglossum atropurpureum</i>	Dark-purple Earthtongue
<i>Hericium erinaceum</i>	Bearded Tooth
<i>Hohenbuehelia culmicola</i>	Marram Oyster
<i>Hydnellum conrescens</i>	A Tooth Fungus
<i>Hydnellum scrobiculatum</i>	A Tooth Fungus
<i>Hydnellum spongiosipes</i>	Velvet Tooth
<i>Hygrocybe spadicea</i>	Date - coloured Waxcap
<i>Hypocreopsis lichenoides</i>	Willow Gloves
<i>Microglossum olivaceum</i>	An Earth-tongue
<i>Phellodon confluens</i>	A Tooth Fungus
<i>Phellodon melaleucus</i>	A Tooth Fungus
<i>Phellodon tomentosus</i>	A Tooth Fungus
<i>Phylloporus pelletieri</i>	Golden Gilled Bolete
<i>Piptoporus quercinus</i>	Oak Polypore
<i>Poronia punctata</i>	Nail Fungus
<i>Puccinia scorzonerae</i>	Scorzonera Rust
<i>Tremellodendropsis tuberosa</i>	Ashen Coral
<i>Tulostoma melanocyclum</i>	Scaly Storkball
<i>Urocystis colchici</i>	Colchicum Smut

Stoneworts/ Rhawn yr ebol 5 species	
<i>Chara baltica</i>	Baltic Stonewort
<i>Chara curta</i>	Lesser Bearded Stonewort

<i>Nitella gracilis</i>	Slender Stonewort
<i>Nitella tenuissima</i>	Dwarf Stonewort
<i>Nitellopsis obtusa</i>	Starry Stonewort

Marine/Morol 55 species	
<i>Alkmaria romijni</i>	Tentacled Lagoon Worm
<i>Ammodytes marinus</i>	Sandeel
<i>Anotrichium barbatum</i>	Bearded Red Seaweed
<i>Arctica islandica</i>	Icelandic Cyprine or Ocean Quahog
<i>Atrina fragilis</i>	Fan Mussel
<i>Balaenoptera acutorostrata</i>	Minke Whale
<i>Balaenoptera physalus</i>	Fin Whale
<i>Caretta caretta</i>	Loggerhead Turtle
<i>Cetorhinus maximus</i>	Basking Shark
<i>Clupea harengus</i>	Herring
<i>Cruoria cruoriaeformis</i>	A Red Seaweed
<i>Delphinus delphis</i>	Common Dolphin
<i>Dermochelys coriacea</i>	Leatherback Turtle
<i>Dermocorynus montagnei</i>	A Red Seaweed
<i>Dipturus batis</i>	Common Skate
<i>Edwardsia timida</i>	Burrowing Anemone
<i>Eunicella verrucosa</i>	Pink Sea -fan
<i>Gadus morhua</i>	Cod
<i>Galeorhinus galeus</i>	Tope Shark
<i>Globicephala melas</i>	Long-finned Pilot Whale
<i>Grampus griseus</i>	Risso's Dolphin
<i>Haliclystus auricula</i>	A Stalked Jellyfish
<i>Hippocampus guttulatus</i>	Long Snouted Seahorse
<i>Hyperodon ampullatus</i>	Northern Bottlenose Whale
<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin
<i>Lagenorhynchus albirostris</i>	White-Beaked Dolphin
<i>Lamna nasus</i>	Porbeagle Shark
<i>Lithothamnion coralloides</i>	Coral Maerl
<i>Lophius piscatorius</i>	Sea Monkfish
<i>Lucernariopsis campanulata</i>	A Stalked Jellyfish
<i>Megaptera novaeangliae</i>	Humpback Whale
<i>Merlangius merlangus</i>	Whiting
<i>Merluccius merluccius</i>	European Hake
<i>Molva molva</i>	Ling
<i>Orcinus orca</i>	Killer Whale
<i>Ostrea edulis</i>	Native Oyster
<i>Padina pavonica</i>	Peacock's Tail

<i>Palinurus elephas</i>	Crayfish, Crawfish or Spiny Lobster
<i>Phocoena phocoena</i>	Harbour Porpoise
<i>Phymatolithon calcareum</i>	Common Maerl
<i>Pleuronectes platessa</i>	Plaice
<i>Prionace glauca</i>	Blue Shark
<i>Raja brachyura</i>	Blonde Ray
<i>Raja clavata</i>	Thornback Ray
<i>Raja undulata</i>	Undulate Ray
<i>Rostroraja alba</i>	White or Bottlenosed Skate
<i>Scomber scombrus</i>	Mackerel
<i>Solea vulgaris</i>	Sole
<i>Squalus acanthias</i>	Spiny Dogfish
<i>Squatina squatina</i>	Angel Shark
<i>Stenella coeruleoalba</i>	Striped Dolphin
<i>Tenellia adspersa</i>	Lagoon Sea Slug
<i>Trachurus trachurus</i>	Horse Mackerel
<i>Tursiops truncatus</i>	Bottlenose Dolphin
<i>Ziphius cavirostris</i>	Cuvier's Beaked Whale

Table 2 Habitats

Habitats/Cynefin	Priority Habitats/Cynefin sy'n Flaenoriaeth
Terrestrial/Tirol	
Broadleaved, mixed and yew woodland	Traditional orchards
	Wood pasture & parkland
	Upland oak woodland
	Lowland beech and yew woodland
	Upland mixed ash woodland
	Wet woodland
	Lowland mixed deciduous woodland
Boundary and linear features	Hedgerows
Arable and horticultural	Arable field margins
Improved grassland	Coastal and floodplain grazing marsh
Neutral grassland	Lowland meadows
Calcareous grassland	Lowland calcareous grassland
	Upland calcareous grassland
Acid grassland	Lowland dry acid grassland
Dwarf shrub heath	Lowland heathland
	Upland heathland
Fen, marsh and swamp	Upland flushes, fens and swamps
	Lowland fens
	Purple moorgrass and rush pastures
	Reedbeds
Bogs	Lowland raised bog
	Blanket bog
Montane Habitats	Mountain heaths and willow scrub
Rivers and Streams	Rivers
Standing open waters and canals	Oligotrophic and dystrophic lakes
	Ponds
	Mesotrophic lakes
	Eutrophic standing waters
	Aquifer-fed naturally fluctuating water bodies
Inland rock	Inland rock outcrop and scree habitats
	Calaminarian grasslands
	Open mosaic habitats on previously developed land
	Limestone pavements
Supralittoral rock	Maritime cliff and slope
Supralittoral sediment	Coastal sand dunes
	Coastal vegetated shingle
Marine/Morol	
Littoral Rock	Intertidal boulder communities

	<i>Sabellaria alveolata</i> reefs
	Estuarine rocky habitats
Littoral sediment	Coastal saltmarsh
	Intertidal mudflats
	Seagrass beds
	Sheltered muddy gravels
	Peat and clay exposures
Sublittoral rock	Tidal swept channels
	Fragile sponge & anthozoan communities on subtidal rocky habitats
	Carbonate reefs
Sublittoral sediment	Subtidal sands and gravels
	Subtidal mixed muddy sediments
	Mud habitats in deep water
	<i>Musculus discors</i> beds
	Blue mussel beds
	Horse mussel beds
	Maerl beds
	Saline lagoons

Appendix E.2
Montgomery Canal
SAC SIAA 2014



Llywodraeth Cymru
Welsh Government



A483/A489 NEWTOWN BYPASS

Assessment of Implications on European Sites

Statement to Inform an Appropriate Assessment under the
Conservation of Habitats and Species Regulations 2010

September 2014



Llywodraeth Cymru
Welsh Government

A483 / A489 Newtown Bypass

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Transport

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Figure 2.0 Montgomery Canal SAC in relation to the Scheme



Glossary and Abbreviations

AADT – Average Annual Daily Traffic

AGC – Alun Griffiths (Contractors) Ltd.

AIES – Assessment of Impacts on European Sites

BAP – Biodiversity Action Plan

BS – British Standard

CCW – Countryside Council for Wales (now part of Natural Resources Wales)

CIEEM – Chartered Institute of Ecology and Environmental Management

CO₂ – Carbon Dioxide

DMRB – Design Manual for Roads and Bridges

EA / EAW – Environment Agency / Environment Agency Wales (now part of Natural Resources Wales)

ECI – Early Contractor Involvement (for of contract under which the Scheme is being delivered)

EIA – Environmental Impact Assessment

EQS – Environmental Quality Standard

ES – Environmental Statement

FRA – Flood Risk Assessment

HAWRAT – Highways Agency Water Risk Assessment Tool

HRA – Habitats Regulations Assessment

IAN – Interim Advice Note

IAQM – Institute of Air Quality Management

IEEM – Institute of Ecology and Environmental Management (now CIEEM)

JNCC – Joint Nature Conservation Committee

KS2 – Key Stage 2 (refers to the study of transportation options undertaken in 2009 on behalf of the Welsh Government)

NMWTRA – North and Mid Wales Trunk Road Agent

NO – Nitric Oxide

NO_x – Oxides of Nitrogen

NO₂ – Nitrogen Dioxide



A483 / A489 Newtown Bypass

NRW – Natural Resources Wales

PCC – Powys County Council

PM₁₀ – Particulate Matter with a small size range (between 1 and 10µm)

RBD – River Basin District

RST – Run-off Specific Threshold

SAC – Special Area of Conservation

SEA – Strategic Environmental Assessment

SIAA – Statement to Inform an Appropriate Assessment

SPA – Special Protection Area

SSSI – Site of Special Scientific Interest

TPO – Transport Planning Objectives

TREBAP – Trunk Road Estates Biodiversity Action Plan

TR111 – The planned route of a road protected for planning purposes

UDP – Unitary Development Plan

WeITAG – Welsh Transport Planning and Appraisal Guidance

WFD – Water Framework Directive 2000/60/EC

WG – Welsh Government

µm – Micro Metre (= to 1x10⁻⁶ of a metre)



1. Introduction

1.1. Purpose of the Report

This report has been prepared to provide information to the Welsh Minister for Natural Resources (“the competent authority”) on the implications of the A483/A489 Newtown Bypass Scheme on European Sites (namely the Montgomery Canal Special Area of Conservation (SAC)).

The European Community Habitats Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) provides legal protection for habitats and species of European importance. The Directive is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (the ‘Habitats Regulations’) [1].

1.2. Description of the Project

1.2.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.2.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the associated Environmental Statement (ES).

1.3. Background

The Welsh Government commissioned a Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WeITAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.

The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.



In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.4. The Project Objectives

1.4.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

The Welsh Government's mission is to:

"Promote the vision and transport strategy described in the Welsh Government's 'One Wales: Connecting the Nation', the Wales Transport Strategy, and the National and Regional Transport Plans".

1.4.2. Scheme / Planning Objectives

Seven specific Transport Planning Objectives (TPOs) have been identified for the Scheme. These were developed during the KS2 study. The TPOs would be achieved through the Scheme (Objectives 2, 3, 6 and 7) and by several other stakeholders, namely PCC/TraCC (Objectives 1, 4 and 5). The objectives are detailed below:

Objective 1 – Maintain economic base

- Maintain economic base of Newtown measured by levels of local employment by the date in the local development plan (2025).

Objective 2 – Meeting relevant environmental targets

- Within Newtown settlement boundary limit and within 200m of the Scheme;
- Meet targets and comply with appropriate environmental legislation and policies by 2018;
- Reduce greenhouse gas emissions along Pool Road and New Road by 3% from 2008 levels, by 2018 (in accordance with Wales Transport Strategy).

Objective 3 – Removing through traffic from local roads

- Reduce through traffic on Heol Treowen, Plantation Lane and Milford Road by 50% over 2008 levels by 2018;
- Reduce HGVs on Heol Treowen, Plantation Lane by 90% from 2008 levels, by 2018.

Objective 4 – Increasing level of usage for non-car forms of transport

- For travel with origin and destination within Newtown, achieve modal shift of 10% from car to non-car forms of transport (cycling, walking and public transport), over 2008 levels, by 2018;
- For travel with origin or destination within Newtown, achieve modal shift of 2% from car to public transport, over 2008 levels, by 2018.

Objective 5 – Integration of public transport

- Within Newtown limit interchange penalty linking bus services and train services to 20 minutes, by 2018;



- Within Newtown, during morning and evening peak hours (0700-0900 and 1600-1800) limit interchange penalty between bus services to 10 minutes, by 2018.

Objective 6 – Improve journey time consistency (North-South, East-West)

- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A470/A489 junction (Caersws) and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle, and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A470/A489 junction (Caersws) by 10% by 2018.

Objective 7 – Reduction in accidents

- Within Newtown settlement boundary limit, reduce road traffic accidents on A483 (T), A489 (T), Heol Treowen, Plantation Lane and Milford Road by 25% by 2018.

1.5. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.

Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.

The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.

The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.



The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this roundabout into the Mochdre Industrial Estate along Heol Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Lane Overbridge. A westbound lay-by would be provided east of Wern Ddu Overbridge.

An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.

The Scheme's general arrangement plans are shown in Figure 1.0.

1.6. Initial consideration of alternative alignments / solutions

The current route option for the Scheme, initial design and other associated transport measures have been formulated following consideration of a number of transportation options during the KS2 study commissioned in 2006. The KS2 study was undertaken using the Welsh Transport Planning and Appraisal Guidance (WelTAG) [2].

A number of options were considered during the KS2 Study including:

- Northern Bypass Option
- Three Southern Bypass Options (south of Mochdre Ind. Est, through Mochdre Ind. Est. and passing between Maesyrrhandir and Mochdre Ind. Est.).
- Two Offline improvements (new highway link to B4568 at Llanllwchaiarn via a new river bridge and a new highway link to B4568 at Aberbechan via an existing river bridge)
- Online improvements (raising railway bridges at Nantoer and Dolfor Road and a number of highway/traffic improvements)
- Local transport improvements

The study recommended that the southern bypass option, south of Mochdre Industrial Estate combined with online improvements and local transport measures be taken forward.

As part of the ECI contract the AGC Team has reviewed the conceptual scheme design through a detailed options appraisal process. This has provided improvements to junctions in the following locations:

- Western tie-in of the bypass with the existing A489
- Bypass alignment in the Dolfor road area and link to Mochdre Estate



- Kerry Road junction
- Bypass crossing the railway and the eastern tie-in with the existing A483
- Alignment to the south of Glandulas Holiday Home Park

1.7. Guidance used in preparing the report

This report has been prepared in accordance with The Conservation of Habitats and Species Regulations 2010 [1] and Highways Directive HD 44/09 [3]. The document reports the Assessment of Implications on European Sites (AIES) Screening Process as outlined in Figure 4.1 of HD 44/09 and includes information as required within Annex C ('*Screening Matrix*') and Annex D ('*Finding of no Significant Effects Report Matrix (Screening)*') of HD 44/09.

The AIES process consists of five steps, these are as follows:

- Stage 1: Screening
- Stage 2: Appropriate assessment
- Stage 3: Assessment of alternative solutions
- Stage 4: Assessment of imperative reasons of overriding public interest where no alternative solutions exist and adverse impacts remain
- Stage 5: Development of compensatory measures where adverse impacts remain

The AIES process can be concluded at the end of Stage 1, Stage 2 or Stage 5 dependent on the findings of the study.

This document reports the conclusion of the AIES process at the end of Stage 1 – the Screening Stage.

1.8. Scope of the assessment

An Appropriate Assessment Scoping Report (Ref: 5105742/ENV/AIES/RT204/A1), which was an Appendix to the main Environmental Scoping report (Ref: 5105742/ENV/SR/RT203 /A1) was issued to Natural Resources Wales (NRW) in June 2013.

The report considered Natura 2000 sites within a 30km radius of the proposed Scheme. It concluded that the Montgomery Canal SAC was the only site that warranted further consideration through the Assessment of Implications on European Sites (AIES) process. This was confirmed by Natural Resources Wales in their response on 20th July 2013.

1.9. Information used in the assessment

The main sources of information used are as follows:

- HD 44/09 Assessment of Implications (of Highway and /or Road Projects) on European Sites (Including Appropriate Assessment).
- Natura 2000 Standard Data Form for the Montgomery Canal SAC
- The Core Management Plan Including Conservation Objectives for the Montgomery Canal SAC (& SSSI)
- Severn River Basin Management Plan (Annex B Severn River Basin District)
- Natural Resources Wales Data Sets regarding (but not limited to): abstractions, discharges, environmental permits, location of any routine water quality monitoring points within 1km of the Scheme
- Flood Estimate Handbook CD ROM Version 3.0 (Rainfall data obtained for Method C Tests in HD45/09)
- Metoffice.gov (overview of annual rainfall volume in Newtown, Powys)
- Low Flows version 2.0 (to enable river flows to be estimated for ungauged catchments in the UK).
- HD 45/09 Road Drainage and the Water Environment.



- Air Pollution Information System website
- IAQM Construction Dust Guidance
- A483/A489 Newtown Bypass Environmental Statement, Volume 1 – Section 5 Air Quality
- A483/A489 Newtown Bypass Environmental Statement, Volume 1 – Section 8 Nature Conservation
- A483/A489 Newtown Bypass Environmental Statement, Volume 1 – Section 10 Materials
- A483/A489 Newtown Bypass Environmental Statement, Volume 1 – Section 14 Road Drainage and the Water Environment
- A483/A489 Newtown Bypass Environmental Statement, Volume 3, Appendix K.2 – Water Frameworks Directive Assessment

1.10. Name of author and verifier

This report has been produced by Max Burrell BSc MSc MIEEMA. Max has over nine years' experience working with projects that can potentially affect Natura 2000 Sites.

In 2012 he produced the Supplement to the Statement to Inform an Appropriate Assessment in relation to the Usk Bat Sites SAC and the Supplement to the Appropriate Assessment Screening Report for the Cwm Clydach Woodlands SAC for the A465 Section 3 (Brynmawr to Tredegar) Scheme.

In 2013, Max produced an Ecological Impact Assessment for the proposed Pembroke Learning Campus development. The finding shall inform Pembrokeshire County Council's Habitats Regulations Assessments in relation to the Pembrokeshire Marine and Bosherton Lakes and Bat Sites SACs associated with the project.

Max has also organised and undertaken the monitoring and reporting of mitigation and compensatory measures associated with effects of the A465 Section 1 (Abergavenny to Gilwern) Scheme on the Usk Bat Sites SAC between 2005 and 2013.

In 2007 he produced a report to inform Newport City Council's Habitats Regulations Assessment in relation to effects of the Newport City Centre Campus on the River Usk SAC. He also undertook a footpaths study relating to the All Wales Coastal Path for Flintshire County Council in 2007. This provided information to Flintshire County Council to undertake Habitats Regulations Assessments in relation to the Dee Estuary SAC and SPA.

This report has been verified by David Wells BSc CEnv MCIEEM. David has over thirteen years' experience as an ecological consultant, including work to inform Habitats Regulations Assessments for the A470 Maes yr Helmau to Cross Foxes Improvements, and sections of the Wales Coast Path affecting the Severn Estuary, and Rivers Usk and Wye. David prepared the Nature Conservation Chapter of the Environmental Statement for the A483/A489 Newtown Bypass Scheme.



2. Scheme Description

2.1.1. Distance from Natura 2000 Site

The Scheme lies at its closest point 840m to the west of the Montgomery Canal SAC (refer to Figure 2.0). There are no mobile species that are qualifying interests of the SAC that could be at a closer proximity to the proposals.

2.1.2. Physical land-take of the project

The Scheme (including land acquired for mitigation) would cover an area of approximately 56ha. A further area of approximately 27ha would be required temporarily during the construction phase.

There would not be any land-take from within the Montgomery Canal SAC. Therefore there would be no direct impact in terms of land lost from the SAC.

2.1.3. Key stages of the Project

2.1.3.1. Construction

The start date for the construction phase is not yet agreed, but it is anticipated that the construction activities for the Scheme would commence in autumn 2015. It is also anticipated that it would be completed in two and a half years (30 months) with an anticipated completion date of Winter 2017/2018.

On possession of the site the site boundary would be fenced off and site clearance of the enclosed area would commence as detailed in the Construction Environmental Management Plan (CEMP). Works on the majority of structures would commence with a view to completing them sufficiently to allow the mass earthworks to commence in spring 2016.

In areas where existing topsoil is to be removed for future use, topsoil would be stripped and where possible form a bund along the edge of the Scheme. This reduces the requirement to haul topsoil to, and from a storage area, ensures the topsoil is returned to its natural area, and also provides a bund to assist with the control of run-off from the Scheme.

Two properties and a barn will need to be demolished for two bridges on the Scheme to be constructed, and these are on Middle Dolfor Road and Pool Road. The demolition of these buildings will take place in the autumn 2015, to allow construction of the bridges to commence.

The anticipated phasing of key construction activities are summarised in Table 1.0 below: Note Phase 1 commences on start of construction and durations of phasing are taken from this date.

Table 1.0 Summary of Key Construction Activities

Phase	Approximate Duration	Key Activities
1	9 months	Fencing and site clearance Demolition of existing structures Construction of main structures (e.g. bridges and underpasses) Commence construction of culverts and temporary attenuation
2	12 months	Commence earthworks Commence drainage and flood compensation Service diversions Backfill around structures Complete culverts and permanent attenuation



		Construct roundabout and carriageway links to existing trunk road and to the by-pass
3	9 months	Complete tie-ins and divert traffic on to roundabout Complete earthworks/drainage/road construction to existing c/way area Landscaping and planting

2.1.3.2. Operation

The duration of operation cannot be accurately stated but the design life of the carriageway pavement is 40 years, surface course is 15 years and earthworks and structures are 120 years. There would be ongoing maintenance during the operational use as follows:

On opening of the Scheme, the Contractor would correct any highway defects within 12 months and maintain the landscape/ecological works for five years. At the completion of this five year monitoring and aftercare period, the management of the environmental mitigation measures would be passed over to the North and Mid Wales Trunk Road Agency (NMWTRA). The AGC Team would prepare a ten year Maintenance Environmental Management Plan (MEMP), which would set out ongoing management and monitoring actions.

Standard highway operation and maintenance procedures would be carried out during the lifetime of the new road on a suitably regular basis as required by NMWTRA. Typical activities would be likely to include, but are not limited to:

- Winter maintenance, such as de-icing/gritting;
- Line painting;
- Resurfacing;
- Repairs to damage;
- Dealing with traffic accidents;
- Maintenance of the highway drainage network;
- Management and maintenance of roadside grass areas and vegetation trimming to comply with the environmental objectives, and;
- Management of nature conservation (habitat and protected species) measures.

2.1.4. Resources required throughout the lifetime of the project

There is no requirement to take any resources from the Montgomery Canal SAC.

2.1.5. Waste products arising during construction and operation

The following text is taken from the A483/A489 Newtown Bypass Environmental Statement Volume 1, Section 10 – Materials:

A variety of different materials would be required for the proposed works. The Scheme would be designed to prevent where possible the volumes of both the waste materials generated and the imported construction materials by reusing or recycling the available existing materials along the Scheme.

Table 2.0 shows the estimated material quantities needed for the construction of the proposed alignment, giving details on the material quantities required, estimates of material that can be won on site and additional quantities of material that would need to be imported for the Scheme.



Table 2.0 - Material Quantities required for the Scheme

Type of Material	Approximate Quantity Required (m ³)	Approximate Quantity Won on Site (m ³)	Approximate Quantity Imported (m ³)
Road Pavement Construction			
Capping	10,000	10,000	
Sub-base	25,000		25,000
Base	23,000		23,000
Binder	6,000		6,000
Surface	4,000		4,000
Earthworks			
General Fill	850,000	910,000	40,500 ^a
Landscaping Material	111,500 ^c	100,500 ^b	
Topsoil	57,500	68,500	
Structures			
Structural Steelwork	1095 T		1095 T
Reinforcement	2446 T		2446 T
Concrete	10,600 m ³		10,600 m ³
Drainage	Approximate Quantity Required (m ³)		Approximate Quantity Imported (m ³)
Granular materials	14,000		14,000

Note a - this is required for earthworks at the eastern end to prevent fill material to be taken over the railway

Note b – this is the surplus from general fill

Note c – this includes general fill and 10 000cum of topsoil suitable for regrading etc.

Note d - It is anticipated that all earthworks materials won from the site will be reused and therefore no material will be removed from site. This is considered to be achievable provided that the excavated materials are suitably excavated, processed and stockpiled taking into account likely weather conditions during the earthworks operations.

The potential materials sources required for the Scheme are summarised in Table 3.0.

Table 3.0 - Material Sources/Origin required for the Scheme

Type of Material	Material Source
Road Pavement Construction	
Capping	Site won, sourced from a local supplier
Sub-base	Sourced from a local supplier
Base	Sourced from a local supplier
Binder	Sourced from a local supplier
Surface	Sourced from a local supplier
Earthworks	
General Fill	Site won and sourced from a local supplier
Landscaping Material	Site won
Topsoil	Topsoil strip would be re-used on site
Structures	
Structural Steelwork	Sourced from a local supplier
Reinforcement	Sourced from a local supplier



Concrete	Sourced from a local supplier
Drainage	
Granular Materials	Sourced from a local supplier

Whilst the earthworks over the majority of the Scheme should be neutral and no site material would be taken off site, a net import of construction materials is required for the Scheme in order to construct the carriageway and proposed structures. Materials would be imported from local suppliers. Given that the Scheme has been developed to achieve a balance of cutting and filling and so minimise the export of site-won materials from the works areas, import of materials would be minimised. Furthermore, given that the sources of material would be existing suppliers of materials, the sensitivity of the source is considered to be low. The magnitude of impact on the material source is considered moderate. The significance of effect is assessed to be slight adverse.

During construction, it is proposed that all materials/arising from construction would be re-used on site in accordance with the waste hierarchy defined within the Waste Framework Directive.

There may be some waste associated with the works which cannot be re-used on site but the volumes would be negligible.

Any excess materials would be taken to the nearest or most economical disposal facility. The sensitivity of the receptor (disposal site) is considered to be low. Given the very small quantities of materials that are likely to require disposal offsite, the magnitude of the impact is considered minor. The significance of the environmental impact on the disposal site is considered to be slight adverse.

2.1.6. Emissions

The following text is taken from A483/A489 Newtown Bypass Environmental Statement Volume 1, Section 5 – Air Quality:

Total emissions from all roads included in the traffic model have been estimated for, NO_x, PM₁₀, and CO₂ in 2012 (base year), and with and without the Scheme in 2017 (opening year) and 2032 (design year). The results are presented in Table 4.0. Emissions are shown for the base year 2012 and the without Scheme and with Scheme scenarios in 2017 and 2032. In addition the number of vehicle km travelled is given for each scenario.

In 2017, emissions of all pollutants with the exception of NO_x are expected to increase as a result of the Scheme. Emissions of PM₁₀ and CO₂ are expected to increase by 4% and 1% respectively in both 2017 and 2032. In 2017 emissions of NO_x are expected to decrease by 2%. In the future year 2032, there are expected to be a decrease of 1% for NO_x. Although there is an increase in vehicle km travelled with the Scheme in both 2017 and 2032, results are in line with the expected reduction in congestion in Newtown town centre and the free flow conditions expected on the bypass.

Overall, reductions in emissions of NO_x, PM₁₀ and CO₂ of 71% and 14%, and 4% respectively are estimated by 2032 when compared with 2012 emissions. This is due to expected improvements in vehicle technologies becoming more prevalent within the vehicle fleet over time as older, more polluting technologies are replaced.

The Scheme specific TPO 2 aims to reduce greenhouse gas emissions along Pool Road and New Road by 3% from 2008 levels, by 2018 (in accordance with Wales Transport Strategy). Available traffic data does not allow us to calculate the change in emissions between 2008 and 2018; however, as presented in Table 4.0 total emissions of CO₂ are expected to reduce by 5% between 2012 and 2017 across the modelled road network. Total CO₂ emissions on Pool Road and New Road in isolation are expected to reduce by over 50% between 2012 and 2017. The TPO set for the Scheme in terms of CO₂ reduction within Newtown is therefore expected to be comfortably achieved.



Table 4.0 Results of the Calculation of Emissions

Year	Scenario	NO _x (kg/yr)	PM ₁₀ (kg/yr)	CO ₂ (t/yr)	Veh kms travelled / year
2012	Base	61,509	5,096	19,855	105,832,232
2017	Do-Minimum	38,448	4,366	18,704	108,181,999
	Do-Something	37,698	4,534	18,952	113,063,025
	Change with Do-Something	-750	168	248	4,881,026
	%Change from Do-Minimum	-2%	4%	1%	5%
	% Change from Base	-39%	-11%	-5%	7%
2032	Do-Minimum	17,755	4,203	18,854	116,521,078
	Do-Something	17,543	4,387	19,088	122,057,997
	Change with Do-Something	-212	183	234	5,536,920
	%Change from Do-Minimum	-1%	4%	1%	5%
	% Change from Base	-71%	-14%	-4%	15%

2.1.7. Excavation requirements

Excavations would be required at a number of points along the length of the proposals. There would be no excavation within the Montgomery Canal SAC.

2.1.8. Transportation requirements

The main transport routes for delivery of material to the site would be along the A483 and A489 Trunk Roads, which are regularly used by HGV to transport materials to and from the industrial and commercial developments in the Newtown area and other areas in Mid-Wales and West Wales.

An estimate has been made of the number of HGV movements on the existing A483 and A489 trunk roads, which is shown in Table 5.0 below:

Table 5.0 A483-A489 Traffic Model Data (2013 Base data)

Location Description	Direction	AADT (Annual Average Daily Traffic)	% HGV	Estimated Number of HGVs per Day
A489 West of Newtown	Two-way	8,056	5%	403
A483 North-East of Newtown	Two-way	11,281	8%	902
A483 South of Newtown	Two-way	3,695	9%	333

An estimate has been made of the number of HGV movements per day on public roads during construction (Table 6.0). The estimates assume that all paving works would be undertaken by one team.



Table 6.0 Estimated Traffic generated by Material Deliveries

Construction Activity (Time Period)	Average HDV per Day during 24 month construction period	Average LDV	A483/A489 AADT
Workforce	NIL	30	3,695 to 11,281
Drainage (18 months)	5	6	3,695 to 11,281
Structures (18 months)	4	6	3,695 to 11,281
Roadworks (12 months)	12	6	3,695 to 11,281
Plant (12 months)	1	6	3,695 to 11,281
Total	22	54	3,695 to 11,281

2.1.9. Any other services

The Scheme has been designed to avoid a number of high pressure and very high pressure gas mains. There would be a number of service diversions required and the provision of protective slabs over some of the diverted services.

The proposed lighting would be restricted to the following:

- A489 Llanidloes Roundabout
- A483 Dolfor Road Roundabout
- Lower Dolfor Roundabout and the links into the existing Dolfor Road and Heol Ashley
- Kerry Road Roundabout
- A489 Pool Road Roundabout and link to the western limits of Pool Road Underbridge

Full cut off energy saving lighting units are proposed.

The Scheme would have standard trunk road signage with a limited number of brand signs.

The above would have no negative impact on the Montgomery Canal SAC.



3. Description of Avoidance / Mitigation Measures

3.1. Introduction

This section provides a brief description of assumed (plainly established and uncontroversial) measures that will be provided as part of the Scheme.

The Scheme is located to the south of the River Severn and would cross the Mochdre and Dolfor Brooks, which are tributaries of the Severn along with a number of other minor watercourses which are all within the River Severn Basin District. The Scheme must therefore ensure that the quality of these water bodies along with underlying groundwater is not adversely affected during the construction and operational phases.

Measures to avoid impacts of airborne dust during the construction phase must also be carried out to avoid impacts on human and ecological receptors; although as demonstrated in Section 4.5.3.2 the Scheme is a sufficient distance from the Montgomery Canal SAC not to be affected by dust settlement.

3.2. Prevention of pollution to surface and groundwater during construction

The Environmental Statement Volume 1, Section 14 (Road Drainage and the Water Environment) has undertaken an assessment of potential impacts to surface and ground water during the construction phase. As part of this assessment a number of measures have been proposed in order to avoid / mitigate potential impacts on surface and ground water.

The ES Volume 1, Section 14 states the following in terms of construction phase mitigation in relation to surface and ground water pollution:

The risk of pollution during construction can be reduced by the adoption of good working practices and strict adherence to the Environment Agency Pollution Prevention Guidelines (PPGs). The key guidelines are:

- *PPG 1 Understanding your environmental responsibilities – good environmental practice;*
- *PPG 2 Above ground oil storage tanks;*
- *PPG 3 Use and design of oil separators in surface water drainage systems;*
- *PPG 4 Treatment and disposal of sewage where no foul sewer is available;*
- *PPG 5 Works and maintenance in or near water;*
- *PPG 6 Working at Demolition and Construction Sites; and*
- *PPG 22 Dealing with spills.*

Additional good working practice has been collated from DMRB Volume 11 Section 3 Part 10, the Construction Industry Research and Information Association. Generic mitigation measures that would be applied prior to and during construction include the following:

- *Provision of adequate temporary storage to contain surface run-off during the construction period, particularly when there are large areas of exposed earthworks or cutting as these lead to substantial increases in surface flows during intense rainstorms and can carry silt through to receiving watercourses;*
- *On-site availability of oil spill clean-up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak;*
- *Use of drip trays under mobile plant;*



- *Sediment-trapping matting installed downstream of any construction activities adjacent to or over watercourses;*
- *Preparation of incident response plans, prior to construction, and present on site throughout construction to inform sub-contractors of required actions in the event of a pollution incident;*
- *Timing of works close to watercourses so that they do not interfere with spawning fish;*
- *The use of construction materials on site free from contaminated material, so as to avoid any potential contamination of the watercourse;*
- *Ensuring that wet cement does not come into contact with river or groundwater; and*
- *Testing of made soils and soils that be reworked to identify any soil contamination.*

During construction an incident response plan will be in place to deal with any issues as soon as they occur for a particular site and to ensure that works are undertaken with the utmost care where they have potential to lead to contamination of any watercourse. Emergency action planning will include measures to be taken to prevent pollution caused by severe weather.

Water management will be an important part of the earthworks operation. During wet periods, storage of surface run-off will be undertaken to assist in dust suppression during dry periods. Prior to the commencement of any major soil stripping activities, initial water management systems will be installed.

Temporary site drainage will be designed where practicable to retain surface run-off within the site boundary. Where possible the permanent drainage arrangements will be utilised in the temporary management system. Prior to starting the main earthworks, the permanent cut-off ditches will be constructed at the tops of batters and toes of embankments. These ditches will be used to direct the surface water to the storage lagoons and hence prevent the run-off from entering the earthworks areas. Where required, additional settling areas will be constructed to allow for settling of sediment before discharge of water to watercourses.

Wherever practicable, grey water systems will be used at site compounds to reduce run-off from site, improve water efficiency and lessen the potential for polluting discharges to surface watercourses.

Uses that could generate contaminated water, such as refuelling areas, will themselves be bunded and will drain to lagoons that will have oil interception facilities. The water will be discharged to ditches or streams through balancing ponds that will also have oil retention measures. Any oils or contaminants retained will be pumped into tankers at regular intervals for disposal off site.

Foul water drainage will be piped to an on-site wastewater treatment plant, or contained within the facilities for removal during regular maintenance.

No controlled discharges will be made to ground or groundwater during construction without NRW consent and the permission of landowners. Measures to prevent and mitigate accidental pollution of groundwater will be the same as those already described under surface water above.

Where any excavation is to be undertaken below the water table identified during construction, the cuttings, installation of headwalls or other structures, consultation with the NRW will determine if an abstraction licence for dewatering will be required.

3.3. Prevention of airborne dust during construction

The ES Volume 1, Section 5 (Air Quality) states the following in terms of construction phase mitigation in relation to airborne dust:

Mitigation measures given in the IAQM Dust Guidance that are applicable to the Scheme are described for those activities identified as low, medium and high risk as detailed in the



construction assessment. These measures should be included within a dust management plan (DMP) to form part of the construction environmental management plan. Examples of measures would include:

- Plan site layout so that dust causing activities are located as far from receptors as possible.
- Erect solid screens or barriers around the site boundary that are at least as high as the stockpiles on site.
- Avoid site run off of water and mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials with the potential to produce dust from site as soon as possible.
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- All dusty activities should be damped down during dry weather.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out.
- Use enclosed chutes, conveyors, and covered skips, where practicable.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- Make sure that any stockpiles exist for the shortest possible time.
- Do not build steep sided stockpiles or mounds or those that have sharp changes in shape.
- Whenever possible keep stockpiles or mounds away from the site boundary, sensitive receptors, watercourses and surface drains.
- Wherever possible, enclose stockpiles or keep them securely sheeted.
- Take into account the predominant wind direction when locating stockpiles to reduce the likelihood of affecting sensitive receptors.
- Seed, re-vegetate or turf long term stockpiles to stabilise surfaces. Where re-vegetation is not possible, use hessian, mulches or trackifiers or cover with topsoil as soon as possible.
- Impose an appropriate onsite speed limit.
- Vehicles carrying dusty material should be securely covered before leaving the site.
- Use water- assisted dust sweepers on the access and local roads to remove material tracked out from site.
- Liaison with PCC regarding dust deposition monitoring to begin at least 3 months before work commences.

Stakeholder communication should be implemented through community engagement both before and during work on site and the clear display of contact details for those responsible for dust issues on site. Any complaints and exceptional incidents should be logged along with the appropriate measures taken to reduce emissions.

Daily site management of emission control measures should be undertaken, with visual inspections of activities and control measures carried out every day during dry conditions. Visual inspections should include recording of activities, controls, weather and ground conditions, and observations of surface dust deposits at and beyond the site boundary in the vicinity of receptors.

3.4. Prevention of pollution to surface and groundwater during operation

The Montgomery Canal is approximately 840 m north east of the eastern tie-in of the Scheme. There is potential to be a moderate adverse impact during construction without mitigation due to silt or pollutant loading providing poor conditions for flora and fauna.



The ES Volume 1, Section 14 states the following in terms of operational phase mitigation in relation to surface water pollution.

Surface water mitigation measures

Mitigation measures for drainage and the water environment during operation are required for several reasons:

- *To treat contaminants in normal road run-off*
- *To deal with any accidental spillages occurring on the carriageway*
- *To attenuate flows from additional impermeable areas of road*
- *To prevent any increase to flood risk in the area*
- *To protect and enhance wildlife corridors near watercourses*

The preferred approach for the Scheme is to provide mitigation in the form of sustainable drainage.

With the exception of catchment 2B where a dry detention basin is proposed, wet drainage ponds have been selected as mitigation for all other catchments to control the volume and quality of the run-off from the Scheme. Wet drainage ponds would provide soluble metal removal through plant uptake as well as providing some sediment removal.

Ponds provide surface attenuation of storm water run-off to aid in the control of surface water discharge. Ponds also allow for some water quality treatment, primarily settlement of solids, and uptake of heavy metals through plants. These are proposed for catchments 1A West, 1A East, 2A, 3, 4, 5 and 6, and would meet the water quality and attenuation criteria. In order to intercept hydrocarbons all the drainage ponds with the exception of the detention basin in catchment 2B (due to design constraints) would be hybrid ponds, which feature permanently wet areas. The detention basin in catchment 2B would still allow some removal of hydrocarbons through retention in the detention basin.

In terms of spillage risk, method D tests undertaken show that all discharges have a lower serious spillage risk than the threshold of 1 in 200 years. Separate oil interceptors are not proposed. However, the proposed hybrid ponds would be equipped with skim plates and flow controls (as shown in Figure 2.5, HA 103/06 ^{14,18}) which would operate on the same principles as oil separators. This approach is subject to agreement with NRW. Emergency shut-off valves and bypasses would be provided upstream of critical discharge locations to enable the ponds to be isolated from receiving watercourses in the event of an accidental spillage.

Flood risk

The drainage design outlined in the Drainage Strategy Report requires proposed flow rates from the Scheme to meet existing Greenfield Run-off Rates. Relative to the flow in the River Severn upstream of the Montgomery Canal the change in flow rates and resultant water level due to the Scheme will be insignificant.

WFD compliance mitigation

No mitigation was necessary in relation to the Montgomery Canal, as the water body was screened out at detailed assessment.

3.5. Effectiveness of mitigation

Mitigation provided for surface water discharges would ensure a negligible adverse impact and a neutral significance of effects on the Montgomery Canal.

The mitigation measures described above are based on industry best practice guidance such as the Environment Agency's Pollution Prevention Guidelines (PPGs 1 to 6 and 22) and measures outlined in the Design Manual for Roads and Bridges (DMRB, November 2010). Therefore,



measures are tried and tested standard best practices that have been developed by statutory environmental bodies.

The effectiveness is largely driven by the mechanisms by which these measures are delivered. In relation to the Scheme, there are stringent delivery mechanisms, which the AGC Team are contractually obliged to follow. These are described below.

Following mitigation, water quality tests show that all discharges would comply with the EQS for both copper and zinc and would meet and pass the RST for both copper and zinc. Tests also show that discharge from all catchments following mitigation would pass the Tier 1 suspended sediment test. Spillage risk tests undertaken show there would be no serious spillage risk for any catchment.

Tests also show the combined discharge from aggregated catchments 2A + 2B would meet and pass the RST for both copper and zinc and would comply with the EQS for both copper and zinc. Tests also show that the combined discharge following mitigation would pass the Tier 1 suspended sediment test.

3.6. Mechanisms for delivery

Under the terms of the contract, the AGC Team are required to operate an Environmental Management System (EMS) in compliance with ISO:14001, ISO:14004 and the requirements of DMRB Volume 10 [4].

As part of the AGC Teams EMS, they are also contractually obliged to produce and implement a Construction Environmental Management Plan (CEMP) [4] throughout the construction phase of the Scheme. Central to this is the Register of Commitments (ROC), which lists the obligations made in the Environmental Statement, such as the mitigation and avoidance measures list above. The ROC also lists commitments made under relevant licences and consents and those given in the Strategic Habitats Regulation Assessment (SHRA) and Strategic Environmental Assessment (SEA) for the National Transport Plan. The AGC Team's Environmental Coordinator and Environmental Clerk of Works will be responsible for the implementation and monitoring of the CEMP.

A series of other specific Environmental Action Plans (EAPs) will be produced as part of the CEMP and will detail measures required to reduce the potential impacts on sensitive environmental features and will provide control procedures to all staff on dealing with environmental issues during the construction phase. These include the following:

- Site Waste and Materials Management Plan
- Pollution Control and Contingency Plan
- Environmental Landscape and Ecology Aftercare and Management Plan
- Cultural Heritage Management Plan
- Noise and Vibration Management Plan
- Maintenance Environmental Management Plan (MEMP)
- Sediment Erosion Management Plan

The AGC Team would monitor, measure and review the environmental performance against the commitments, objectives and targets/key performance indicators identified in the CEMP (contained in the ROC). The CEMP shall contain procedures for checking, auditing and corrective action. These shall include regular meetings, internal and external audits to review the operation and effectiveness of the CEMP. The results shall be reported to the Project Manager by the Environmental Co-ordinator at the monthly progress meetings.

In the event of any non-compliance the Contractor shall immediately, on its detection, inform the Project Manager of the occurrence and his proposals for corrective action. The Contractor shall review and amend his procedures to minimise the risk of further non compliances and re-submit



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them to the Project Manager and others as required prior to carrying out any further affected works.

At the beginning of the maintenance period or before completion and handover for use, the Contractor should confirm with the Employer that all commitments listed in the ROC, other than those relating to maintenance, have been actioned or, if not, reasons submitted with a proposal for implementation for approval by the Employer.



4. Characteristics of European Site

4.1. General

This document refers to the Montgomery Canal SAC. Other Natura 2000 sites have been considered previously in the Appropriate Assessment Scoping Report (Report Ref: 5105742/ENV/AIES/RT204/A1). This established that the Montgomery Canal SAC was the only Natura 2000 site that warranted further consideration in the AIES process.

The Montgomery Canal SAC covers an area of 55.89ha and the citation is included in Appendix A.

4.2. Qualifying interests of the Montgomery Canal SAC

The primary reason for the selection of the Montgomery Canal SAC is the presence of the 'Annex II Species' – Floating water plantain (*Luronium natans*).

The following description of Floating water-plantain in the Montgomery Canal is taken from the Joint Nature Conservation Committee (JNCC) website [3].

*'This is the largest and the most extensive population of **Floating water-plantain Luronium natans** in Britain and is a highly significant lowland population. In favourable management conditions the species can be dominant over kilometre lengths of canal, carpeting the shallow bed and flowering and setting seed in abundance. This is a semi-natural population, having colonised from drift material or seed but needing periodic human disturbance for continued growth; in this respect the canal is a substitute for the species' former slow-moving, mesotrophic river niche, which has been largely destroyed in lowland Britain'.*

There are no 'Annex I' habitats that are primary reasons for selection of this site and no other habitats or species that are present as qualifying features of the site.

Floating water plantain is also a qualifying feature of the Montgomery Canal original designation as a Site of Special Scientific Interest (SSSI) along with open water (canal) habitat, Assemblage of rare and scarce aquatic plants, Grass-wrack pondweed (*Potamogeton compressus*), Autumnal water-starwort (*Callitriche hermaphrodita*), Flat-stalked pondweed (*Potamogeton friesii*), Perfoliate pondweed (*Potamogeton perfoliatus*), Long-stalked pondweed (*Potamogeton praelongus*), Greater duckweed (*Lemna polyrrhiza*) and Assemblage of aquatic invertebrates.

There is one conservation objective for the SSSI which relates to the open water (canal) habitat feature. This assessment is carried out against the qualifying feature and conservation objectives relating to the SAC designation.

4.3. Conservation objective of the Montgomery Canal SAC

The conservation objectives for the Montgomery Canal SAC are set out in the Core Management Plan for the site [6] as follows:

Floating water-plantain (*Luronium natans*)

*The vision for this feature is to maintain the extent and distribution of *L. natans* within the Montgomery Canal at favourable conservation status, where all of the following conditions are satisfied:*

- The *L. natans* population in favourable condition will reflect the natural carrying capacity of the canal habitat and will be limited principally by species ability to spread or be relocated (vegetative or otherwise), the suitability of the rooting medium and competition between species as part of habitat succession.*



- *Recreation pressure, principally through boat movements and fisheries management, will not significantly affect the maintenance of the species, or its ability to disperse throughout the canal network and any associated off-line reserves.*
- *The ecological status of the water environment, including elements of water quality and physical habitat quality, will be sufficient to support the population of L. natans in favourable condition.*
- *All factors affecting the achievement of the above conditions are under control.*

Performance Indicators

The following table outlines the performance indicators for each feature or attribute.

Table 7.0 - Performance Indicator for feature condition

Performance indicator for feature condition		
Attribute	Attribute rational and other comments	Specified limits
A1. Extent of L. Natans	<i>The base-line area (measured from 2001 survey for mapped continuous stands only) is 1.5 hectares. The lower limit is set to allow for up to a 25% decline to allow for natural fluctuations or management activity (like dredging) necessary to restore open water conditions. In reality this is too time-consuming to measure, so will usually be covered by monitoring distribution (A2), unless a new comprehensive mapping survey is completed.</i>	<i>Upper limit: Not required. Lower limit: 1.1ha</i>
A2. Distribution of L. Natans	<i>This has been set to ensure the size of the population is safeguarded. It also provides a means of ensuring that the species can recognise areas subject to dredging and weed cutting to maintain open water and water flow. Note that some units are composed of a number of contiguous km lengths. There are no recent records for this species in Unit 4, 12 or 13, but at low density this species is very difficult to find. Each off-line reserve has also been treated as a separate unit. The performance indicator limits are over and above the minimum standards set by JNCC because the plant is so widespread along the canal.</i>	<i>Upper limit: present along whole length of canal. Lower limit: Present in all non-navigable channel kms where it was found in 2001; AND present in 75% of samples and 75% of the mapped area in 2001 in Vynwy aqueduct. Also present in offline reserves at Wern, Guilsfield Arm, Whitehouse and Brithdir Pools. Also requires evidence of spreading by runners, and spreading around site by fragments.</i>



Table 8.0 - Performance Indicator for factors affecting feature condition

Performance indicator for factors affecting feature		
Attribute	Factor rational and other comments	Specified limits
<i>F1. Water Quality</i>	<i>The water determines the quality of the habitat and plant community in which this species grows. These standards are higher than may be required for this species to safeguard the SSSI feature.</i> <i>It is recognised that these standard may be replaced by better standards more specific to canals as and when they become available.</i> <i>The standard will only be failed if failure is sustained and is for criteria wider than biochemical oxygen demand and dissolved oxygen.</i> <i>There should be no deterioration from existing levels.</i> <i>These targets should be replaced by existing data available from the Environment Agency or emerging Water Framework Directive targets over the coming years.</i>	<i>Upper limit: As an interim guide the total phosphorus target for the whole canal is <40µg L⁻¹ TP. None required for other elements.</i> <i>Lower limit: The current target is to seek to attain General Quality Assessment Grade A or B for biological water quality, and General Quality Assessment Grade B for water chemical quality.</i>
<i>F2. Water Clarity</i>	<i>It is considered essential to use a Secchi disk because observation alone cannot be a reliable measure of light penetration.</i> <i>This should not be measured during or after periods of heavy rain.</i>	<i>Upper limit: not required.</i> <i>Lower limit: Secchi disk should be visible at depth of 1m in 90% of observations.</i>

4.4. Use of conservation objectives in this assessment

The conservation objective for the Montgomery Canal SAC described in 4.3 above consists of two elements, these being the vision for the feature and performance indicators. The performance indicators are what makes the conservation objectives measureable.

Attributes, as set out in the core management plan [6] in relation to performance indicators, have been used as a 'shorthand' for the full performance indicators in the process. When carrying out the assessment, consideration has been given to the vision and performance indicators behind the attribute.

The assessment of impacts in Section 6 have been carried out against each of the attributes.



4.5. Baseline conditions and survey work undertaken to inform the assessment

4.5.1. Vulnerability of site identified on data form

The Natura 2000 Standard Data Form (refer to Appendix A) identifies under Section 4.3 activities that the site is vulnerable to. These include:

- Nutrient enrichment through agricultural and domestic activities
- Lack of management and poor management practices (e.g. herbicidal runoff from tow-path)
- Effects of boat traffic (e.g. propeller / wash detaching floating leaves and creating turbidity, which will reduce light transfer to submerged leaves).
- Colonisation of aggressive plant species causing blanket coverage and increased nutrient input.
- Introduction of certain fish species.

4.5.2. Conservation status and management requirements for Floating water-plantain (*Luronium natans*)

With regards to the conservation and management requirements of Floating water-plantain, the Montgomery Canal Core Management Plan [6] states the following:

Results of the most comprehensive survey in 2001 [7] showed that this species is widespread along the length of the canal, although there are some lengths where there are no records because of its very low density, recent dredging activity or its local absence. This information had led CCW to conclude that the population was healthy and that this should warrant an assessment of favourable condition.

However, there are concerns about water quality that may account for the current lack of species-richness in some parts of the canal. Whilst this may be of lesser concern for this feature the status of this feature has been currently assessed as unfavourable (2007), pending further discussion and investigation with the Environment Agency (February 2006). This assessment has not been done for each management unit.

*Some areas are dominated by *Elodea* spp, which can out compete the more sensitive species (including *L. natans*).*

It can be stated with certainty (November 2007) that the population of this feature is currently large and abundant in management units 2 (Vyrnwy Aqueduct to Pentrehelin) and 15 (Red House to Glanhafren).

With regards to the management requirements of Floating water-plantain the Core Management Plan [6] states the following:

Dredging – *Silting up means that shallow water and competing marginal species restrict the availability of open water and early successional conditions that this species requires to thrive.*

British Waterways are mindful of their responsibilities on this site and work in partnership with CCW to ensure that existing populations are safeguarded during any works that are necessary to maintain water flows and physical structure of the canal.

New funding sources for proper dredging are continually being sought, and it is hoped that a focussed and sustainable restoration to a controlled but navigated waterway would provide the means to safeguard the future of the site and this feature.



Water quality – There concerns about the quality of the water that feeds into the canal. This is currently being investigated by the Environment Agency as part of their review of consents process.

It is possible that once proper dredging can occur that this may improve water flow and help to improve quality by removing a nutrient source.

4.5.3. Assessments undertaken as part of the Scheme

4.5.3.1. Road Drainage and the Water Environment

A detailed assessment of the potential effects of the Scheme on the water environment has been carried out in accordance with the Design Manual for Roads and Bridges (DMRB) HD 45/09 [8]. This is reported in the ES Volume 1, Section 14 for the Scheme. A Water Frameworks Directive (WFD) Assessment has also been carried out and is reported in the ES Volume 3 for the Scheme.

Data sets used in the assessments of water quality (as reported in ES Volume 1, Section 14) are shown in Section 1.9 'Information Used in the Assessment'.

Prediction and evaluation of the effects of the Scheme (as reported in ES Volume 1, Section 14) follows the requirements and detailed assessment methods as set out in HD 45/09 [8]. The methods are outlined in Table 9.0. In addition to the methods outlined below, groundwater vulnerability and Source Protection Zone (SPZ) maps have been reviewed to determine vulnerability of the groundwater in the local area.

The DMRB methodology starts with identification of the importance of the environmental attributes within the Scheme area. The magnitude of impact of the Scheme on the attribute is then determined using historical records, calculations and tests from the DMRB, taking into consideration the influence of mitigation measures. The combination of the importance of an attribute and the magnitude of impact on that attribute gives a significance of potential effect on the water environment.

Table 9.0 – Methods used within the water quality assessment

Method	Description
Method A	This method focuses on the dilution of routine runoff and pollutants. The method is a simple assessment and includes the use of Highways Agency Water Risk Assessment Tool (HAWRAT) considering dilution of indicator metals (dissolved zinc and dissolved copper). The HAWRAT tool is designed to make an assessment of the short-term risks related to the intermittent nature of road run-off as well as the long-term risks. All discharges have been tested using HAWRAT. The methodology for routine runoff involves tests to predict future concentrations of zinc and copper in receiving watercourses with addition of discharge from the Scheme. This is based on Annual Average Daily Traffic (AADT) flows, catchment size for the road, dilution flows (Q95) and current water quality (hardness) for each receiving watercourse.
Method B	In the event that, following the assessment using method A, application of mitigation still fails against Environmental Quality Standards (EQS), method B should be applied. This is a rare occurrence. Method B assesses the bioavailability of the soluble fraction of pollutants (dissolved zinc and dissolved copper).
Method C	This method focuses on groundwater effects. This is the standard method for assessing the impact of a Scheme on groundwater quality. Typically this considers the risk of pollution to groundwater of discharges from a Scheme.



Method	Description
Method D	This method focuses on the probability of a serious spillage risk occurring that would affect the water environment. The method provides the return period of a serious accident based on road length, road characteristics (e.g. presence of junctions, roundabouts, and crossroads) AADT, percentage of Heavy Good Vehicles (HGVs), spillage risk factors and emergency services response time (based on site environment – e.g. urban/rural). An assessment has been undertaken for each outfall to test whether the probability of an accidental spillage causing a pollution incident represents an unacceptable risk.
Method E	Hydrological Assessment of Design Floods. This gives generic guidance to estimation of flood events for catchments.
Method F	Hydraulic Assessment - This gives direction as to what is required in a flood consequences assessment and the process of hydraulic modelling to determine flood risk.

Through consultation with NRW it has been established that there is hydrological connectivity between the Scheme and the Montgomery Canal SAC. The Scheme will drain into the River Severn via a number of water courses, some of which are tributaries of the River Severn. There is a feeder stream to the Montgomery Canal at Penarth Weir near the sewage works. This feeder stream is approximately 600m downstream of outfall 6 of the Scheme which would discharge to a Tributary of the River Severn (refer to Figure 2.0).

4.5.3.2. Assessment of impacts from construction dust

An assessment of potential impact from dust generated from construction activities on ecological receptors (which include sites with statutory designations such as SSSI, SAC and SPA) has been carried out and reported in the ES Volume 1, Section 5 Air Quality.

The assessment has been carried out in accordance with the methodology provided in the IAQM Construction Dust Guidance. The method used is deliberately conservative in order to require a further assessment for most schemes. For ecological receptors, the four step assessment process is as follows:

Step 1 (screening) - Identify the number of ecological receptors within 50m of either the boundary of the site and/or of the route(s) used by construction vehicles on the public highway up to 500 m from the site entrance. No further assessment is required if there are no receptors.

'Ecological' receptors include sites with statutory designations e.g. 'Ramsar' sites, SPA, SAC and SSSI as well as non-statutory sites such as local wildlife sites and/or locations with very specific sensitivities e.g. horticultural operations.

Step 2 - Assess the risk of dust effects by considering the area around the site in the context of potential dust impacts and distances to nearby receptors in relation to proposed activities in terms of demolition, earthworks, trackout (mud deposits on the road from road vehicles leaving the site) and construction.

Step 2A - Dust emission classes of 'large', 'medium' and 'small' are used to define the level of risk arising from each site depending on nature and scale of operation.

Step 2B - The sensitivity of the area is defined as 'high', 'medium' and 'low' for dust soiling effects, human health impacts and ecological impacts separately taking into account the sensitivity of receptors, distance of receptors from dust generating activities, background PM₁₀ concentrations and other site specific factors.

Step 3 - Describe site specific mitigation in terms of the identified risks.

Step 4 - Assess the significance of the dust effects, after site specific mitigation.



4.5.3.3. Assessment of impacts from operational air quality

A detailed assessment of the potential effects of the Scheme on air quality has been carried out in accordance with the Design Manual for Roads and Bridges (DMRB) HA207/07 [9]. This is reported in the ES Volume 1, Section 5 for the Scheme.

The DMRB methodology considers impacts on ecological receptors with national or international designation. Designated ecological sites need only be considered where they fall within 200 m of the Scheme or affected road network (ARN) and as such Montgomery Canal SAC and SSSI has not been included as a discrete receptor in the model.

The APIS website provides modelled estimates of background NO_x and nitrogen deposition across the whole of the UK at 5 km resolution, and site specific data for SSSIs, SACs and SPAs. Critical load ranges for specific habitats are also reported on the website. The site specific background NO_x concentration and nitrogen deposition for the Montgomery Canal SAC and SSSI are reported as 7.2 µg/m³ and 45.92 kg/N/ha/yr respectively. The background NO_x concentration at the site represents less than a third of the AQS objective for the protection of vegetation of 30 µg/m³.

The critical load range for nitrogen deposition, for the relevant habitat type at Montgomery Canal of floating water-plantain is reported as 3 – 10 kg/N/ha/yr. The reported background nitrogen deposition of 45.92 kg/N/ha/yr is currently more than four times the upper critical load for the relevant habitat. In relation to the existing background concentrations and the site location, over 200m from an affected road, any change in NO_x concentrations and nitrogen deposition rates as a result of the Scheme, would be negligible.



5. Assessment Methodologies and Assumption

5.1. Assessment Methodology

There is no nationally agreed system for the categorisation of impacts on qualifying features within AIES. The approach has been undertaken as follows:

The nature of the potential impacts are described in terms of the list within Annex F of HD44/09 [3].

Additionally, in accordance with the IEEM Guidelines on ecological impact assessment [10], impacts have been characterised in detail, in terms of the following parameters:

- Positive or negative.
- Magnitude - refers to the 'size' or 'amount' of an impact, and has been quantified wherever possible (e.g. the area of habitat to be lost etc.).
- Extent - refers to the area over which the impact occurs.
- Duration - refers to the time for which the impact is expected to last prior to recovery or replacement of the resource or feature (which may be longer than the impact-causing activity).
- Reversibility - this is addressed by identifying whether an impact is ecologically reversible, either spontaneously or through specific action, and whether such an outcome is intended.
- Timing and frequency - the timing of impacts in relation to important seasonal and/or life cycle constraints has also been evaluated.

As per the IEEM Guidelines [10], for the purposes of this assessment impact significance, in general terms, has been defined as follows: *"an ecologically significant impact is one which is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area"*.

In addition to the assessment of impacts, the IEEM Guidelines [10] require the probability of each impact occurring to be considered in accordance with the following scale:

- Certain/near-Certain: probability estimated at 95% chance or higher.
- Probable: probability estimated above 50% but below 95%.
- Unlikely: probability estimated above 5% but less than 50%.
- Extremely Unlikely: probability estimated at less than 5%.

5.2. Precautionary principle

In assessing impacts the 'precautionary principle' as described in the HD 44/09 [3] has been adopted. The precautionary principle as set out in HD 44/09 [3] is as follows:

'It is important to recognise that in undertaking assessment of the implications of plans and projects, there is a need to apply the precautionary principle that is the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary. The basis of this is the Communication from the Commission on the precautionary principle, which indicates that the Treaty does not define this term but that it prescribes it only once in that its purpose is to protect the environment. This communication goes further in providing detailed advice on when recourse to this principle is relevant, recourse to this principle should occur when there is':



- *Identification of potentially negative effects resulting from a phenomenon, product or procedure;*
- *A scientific evaluation of risks which, because of the insufficiency of the data, their inconclusive or imprecise nature, makes it impossible to determine with sufficient certainty the risk in question.*

5.3. Consideration of other plans or projects

HD44/09 [3] requires that potential cumulative impacts from other plans or projects (in combination effects) are considered. A number of seemingly small impacts upon different parts of the SAC may have no significant effect when viewed in isolation, but in combination with one another the cumulative impact may be significant, either for the European site as a whole or for one or more of its qualifying interests.

Other plans that have been considered in the assessment are as follows:

- Powys County Council Adopted Unitary Development Plan
- Powys Deposit Local Development Plan
- National Transport Plan
- Mid-Wales Wind Farms Strategic Transport Plan

Other projects that have been considered in the assessment are as follows:

- Llandinam Windfarm Repowering
- Llandinam Windfarm Grid Connection
- Neuadd-goch Wind Farm
- Residential development and access – land at Heol Treowen
- Hope Community Church redevelopment
- Newtown Welsh Medium Primary School
- New Windfarm Access Road
- Severnside Yard Residential Development
- Single turbine developments in the vicinity of Dolfor and Mochdre



6. Potential impacts on Montgomery Canal SAC

6.1. Introduction

The assessment seeks to identify potential impacts of the Scheme on the following qualifying interest of the Montgomery Canal SAC.

- Floating water plantain (*Luronium natans*)

The impacts in this section have been considered without specific mitigation for those impacts other than mitigation which may occur due to the design of the proposal itself, standard industry practices for other environmental topics and plainly established and uncontroversial (PEU) mitigation measures as outlined in Section 3.

6.2. Potential impact on qualifying interest

6.2.1. Habitat loss

There would not be any anticipated direct habitat loss as a result of the proposed Scheme.

The loss of habitat is considered to be of **neutral** magnitude with **neutral** significance. The probability of this impact is considered **certain/near certain**.

6.2.2. Habitat loss / degradation through pollution

As outlined in Table 8.0 in Section 4.3, the water determines the quality of the habitat and plant community in which Floating water plantain grows and is therefore sensitive to reductions in water quality and clarity.

6.2.2.1. Water borne pollution during construction

As outlined in Section 3, a number of 'plainly established and uncontroversial' measures would be provided as part of the Scheme to ensure there were no adverse effects to surface and ground water, in particular the River Severn catchment including the Mochdre and Dolfor Brook Tributaries. The ES Volume 1, Section 14 (Road Drainage and the Water Environment) reports that the magnitude of impact to surface water and groundwater (and also the Montgomery Canal SAC) during construction would be negligible with neutral significance provided that there was strict adherence to these measures. The Canal feeder stream which takes water from the Severn is approximately 600m downstream of the Scheme's nearest outfall, which is discharged to a tributary of the Severn. The western end of the SAC is then approximately an additional 340m downstream. DMRB Guidance [8] states that for soluble water quality impacts, impacts from sediment should only be considered within 100m downstream of the source, after which suspended sediment would become diluted and settle out.

With the implementation of these measures and given distance of the Montgomery Canal SAC from the Scheme (approximately 840m as the crow flies and approximately 940m from the nearest discharge via the River Severn and via the feeder stream) the magnitude of impact is considered **neutral** with **neutral** significance. The probability of this impact is considered **certain/near certain**.

6.2.2.2. Airborne dust during construction

As outlined in Section 6 of the IAQM Construction Dust Guidance [11] ecological receptors with a statutory designation such as SACs should only be considered in the assessment if they are within 50m of either the boundary of the site and/or of the route(s) used by construction vehicles on the public highway up to 500 m from the site entrance. The Montgomery Canal is



approximately 840m from the eastern end of the Scheme and approximately 630m to the northwest of a point that is 500m east along the A483 from the Scheme's eastern end. Given that the Montgomery Canal SAC is located outside of the distance given within the IAQM screening criteria, no assessment is required of the impact of construction dust on the site.

The magnitude of impact of construction dust on the Montgomery Canal SAC is therefore considered to be **neutral** with and **neutral** significance. The probability of this impact is considered **certain/near certain**.

6.2.2.3. Waterborne pollution during operation

As outlined in Section 3, a number of 'plainly established and uncontroversial' measures would be provided as part of the Scheme to ensure there were no adverse effects to surface water from the drainage discharge during the operational phase. These measures would include the provision of drainage ponds and detention basins which have a dual function of retaining water to prevent flooding and treatment to prevent pollution downstream. The ES Volume 1, Section 14 (Road Drainage and the Water Environment) reports that the magnitude of impact to receiving watercourses during operation would be negligible with neutral significance provided that the drainage ponds and detention basins are implemented.

The results of the tests undertaken show that all discharges would comply with the EQS for both copper and zinc and would meet and pass the RST for both copper and zinc. Tests also show that discharge from all catchments following mitigation would pass the Tier 1 suspended sediment test. Spillage risk tests undertaken show there would be no serious spillage risk for any catchment.

Following mitigation, tests also show the combined discharge from aggregated catchments 2A + 2B would meet and pass the RST for both copper and zinc and would comply with the EQS for both copper and zinc. Tests also show that the combined discharge following mitigation would pass the Tier 1 suspended sediment test.

With the implementation of these measures and given distance of the Montgomery Canal SAC from the Scheme (approximately 840m as the crow flies and approximately 940m from the nearest discharge via the River Severn and via the feeder stream) the magnitude of impact is considered **neutral** with **neutral** significance. The probability of this impact is considered **certain/near certain**.

6.2.2.4. Effects of airborne nutrients (NO₂ & NO_x)

Section 3 of the DMRB Guidance (HA 207/07) [9] states that ecological receptors such as SACs should only be considered as discrete receptors where they fall within 200m of the Scheme or affected road network (ARN). As the Montgomery Canal SAC is approximately 350m from the eastern end of the ARN, it has not been considered within the assessment.

The magnitude of impact of airborne nutrients (NO₂ & NO_x) on the Montgomery Canal SAC is considered to be **neutral** with and **neutral** significance. The probability of this impact is considered **certain/near certain**.

6.2.3. Potential in combination effects with other plans or projects

With regards to the other plans and projects outlined in Section 5.3, it is not considered that any of these proposals will have an in combination effect with the Scheme to have an adverse effect on the qualifying interest and conservation objectives of the Montgomery Canal SAC.

The large windfarm projects identified are at such a distance they are unlikely to have a combined effect with the Scheme on the Montgomery Canal SAC. Other developments proposed in Newtown are at too smaller scale and also too far from the SAC to have an in combination effect with the Scheme.



With regards to the Powys Adopted UDP, this has been subject to a Habitats Regulations Assessment [12], which concluded that *'the policies and proposals within the plan are not likely to give rise to any significant effects on any European site in Powys'*.

A HRA has also been completed for the National Transport Plan [13], in which other trunk road Schemes in Wales are proposed. No other major protects considered under the plan are in the vicinity of Newtown or the Montgomery Canal SAC, and therefore there would be no in combination effects.

6.2.4. The use of professional judgement

Professional judgement has been used in the interpretation of results in relation to assessment of potential impacts, the significance of impacts, and consequences for conservation objectives. The reliability of professional judgement can be quantified to some extent by reference to the experience of the professionals concerned (refer to Section 1.9).

The approach has been to identify risks on the basis of the precautionary principle. The precautionary principle has been applied to ensure that any assessment errs on the side of caution, without being overly cautious. This principle means that the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary. A high standard of proof is required at all stages of the assessment. Objective evidence is required to justify the assessment. It will be important to provide sufficient evidence to support conclusions "beyond any reasonable scientific doubt".

6.2.5. Summary of Impacts

Table 10.0 below provides a summary of the potential impacts on the Montgomery Canal SAC's qualifying interest and Table 11.0 provides a summary of the potential impacts on the SAC's conservation objectives prior to mitigation.

Table 10.0 – Summary of Potential Impacts on qualifying interest

SAC Qualifying interest	Potential impact	Magnitude of impact	Significance of impact	Likelihood or risk
Floating water plantain (<i>Luronium natans</i>)	Habitat loss (direct)	Neutral	Neutral	Certain
	Habitat loss/degradation through pollution	Neutral	Neutral	Certain

Table 11.0 – Summary of likely impacts on conservation objectives

SAC Qualifying interest	Potential impact	Attribute of the Performance Indicator	Likelihood of significant effects
Floating water plantain (<i>Luronium natans</i>)	Habitat loss (direct)	A1. Extent of <i>L. natans</i> <i>The base-line area (measured from 2001 survey for mapped continuous stands only) is 1.5 hectares. The lower limit is set to allow for up to a 25% decline to allow for natural fluctuations or management activity</i>	Nil



		<i>(like dredging) necessary to restore open water conditions. In reality this is too time-consuming to measure, so will usually be covered by monitoring distribution (A2), unless a new comprehensive mapping survey is completed.</i> <i>A.2. Distribution of L. Natans</i> <i>This has been set to ensure the size of the population is safeguarded. It also provides a means of ensuring that the species can recognise areas subject to dredging and weed cutting to maintain open water and water flow. Note that some units are composed of a number of contiguous km lengths. There are no recent records for this species in Unit 4, 12 or 13, but at low density this species is very difficult to find.</i> <i>Each off-line reserve has also been treated as a separate unit.</i> <i>The performance indicator limits are over and above the minimum standards set by JNCC because the plant is so widespread along the canal.</i>	
	Habitat loss/degradation through pollution	As above	Extremely unlikely



7. Conclusion

- a) *Is the proposal directly connected with or necessary to site management for nature conservation?*

The proposals in question relate to a road improvement scheme and are neither connected with nor necessary to the management of Montgomery Canal SAC for nature conservation.

- b) *Is the proposal likely to have a significant effect on the features of the site of European Importance, alone or in combination with other plans and projects?*

It has been concluded that, even in the absence of mitigation (other than PEU mitigation outline in Section 3), the proposals would not be likely to have a significant effect on the qualifying feature/interest of the Montgomery Canal SAC, whether alone or in combination with other plans and projects.

Therefore, for the purposes of Regulation 61 of the Conservation of Habitats and Species Regulations 2010, it is concluded that it is not likely that there would be a significant effect on the Montgomery Canal SAC.



8. References

- [1] The Conservation of Habitats and Species Regulations 2010
- [2] Welsh Government (2008). Welsh Transport Planning and Appraisal Guidance (WelTAG). Welsh Government.
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Appendices

Appendix A.

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type 1.2 Site code

1.3 Compilation date 1.4 Update

1.5 Relationship with other Natura 2000 sites

☐	☐	☐	☐	☐	☐	☐	☐
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1.6 Respondent(s)

1.7 Site name

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	200101
date confirmed as SCI	200412
date site classified as SPA	
date site designated as SAC	200412

2. Site location:

2.1 Site centre location

longitude	latitude
03 06 56 W	52 40 57 N

2.2 Site area (ha) 2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK914	Powys	100.00%

2.6 Biogeographic region

☐
Alpine

☒
Atlantic

☐
Boreal

☐
Continental

☐
Macaronesia

☐
Mediterranean

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex II species

Species name	Population				Site assessment			
	Resident	Migratory			Population	Conservation	Isolation	Global
		Breed	Winter	Stage				
<i>Lutra lutra</i>	Present	-	-	-	D			
<i>Luronium natans</i>	100000	-	-	-	C	B	C	B

4. Site description

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	73.6
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	2.4
Dry grassland. Steppes	21.6
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Scree. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	2.4
Total habitat cover	100%

4.1 Other site characteristics

Soil & geology:

Alluvium, Clay, Neutral, Nutrient-rich, Sedimentary

Geomorphology & landscape:

Floodplain, Lowland, Valley

4.2 Quality and importance

Luronium natans

- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

Enrichment through agricultural or domestic nutrient inputs is a likely threat as this could affect the populations of floating water-plantain.

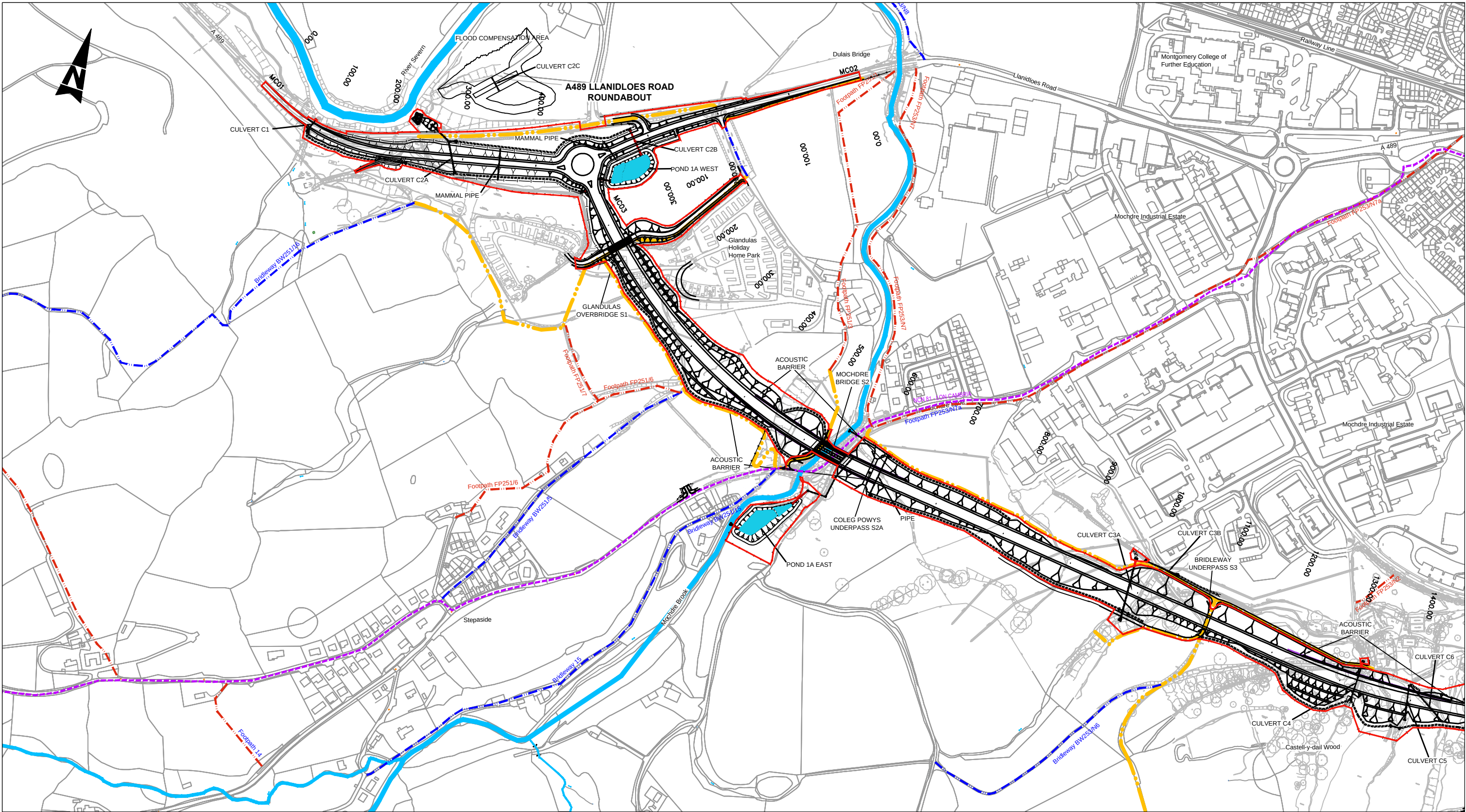
Several sections of canal currently suffer from lack of management. CCW will liaise with owners and occupiers to achieve an appropriately scaled and timed management. To ensure that bank protection and other engineering works are undertaken in a sensitive manner, CCW will liaise with competent and relevant authorities to agree on appropriate methods and practices. For example, the mowing of terrestrial and marginal vegetation would not harm aquatic plants but herbicide run-off from the towpath could be a problem. The effects of boat traffic on populations of floating water-plantain are uncertain and are being investigated by British Waterways. It is certain that the species will be detrimentally affected above a certain point as the actions of propeller/wash will detach floating leaves and create turbidity which will reduce light transfer to submerged leaves.

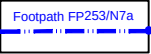
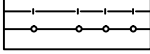
The population of floating water-plantain is vulnerable to colonisation by aggressive species which can have an impact on the canal's ecology, through blanket coverage of the canal channel and increased nutrient input because of a large leaf biomass. The introduction of certain fish species could also damage aquatic plant populations.

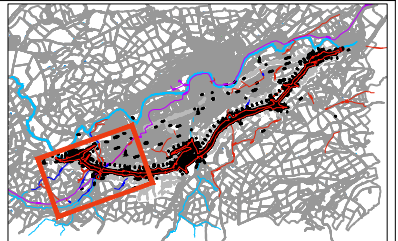
5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

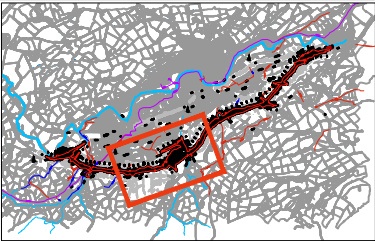
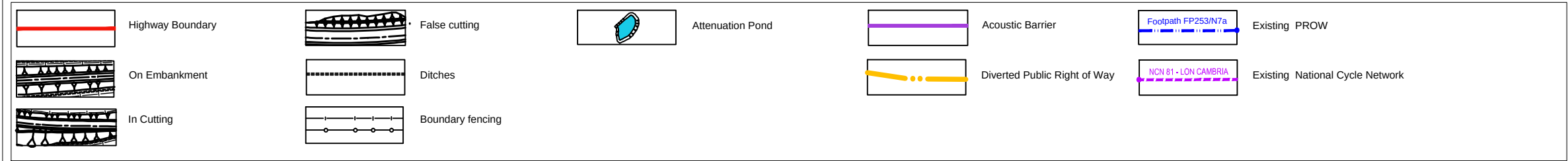
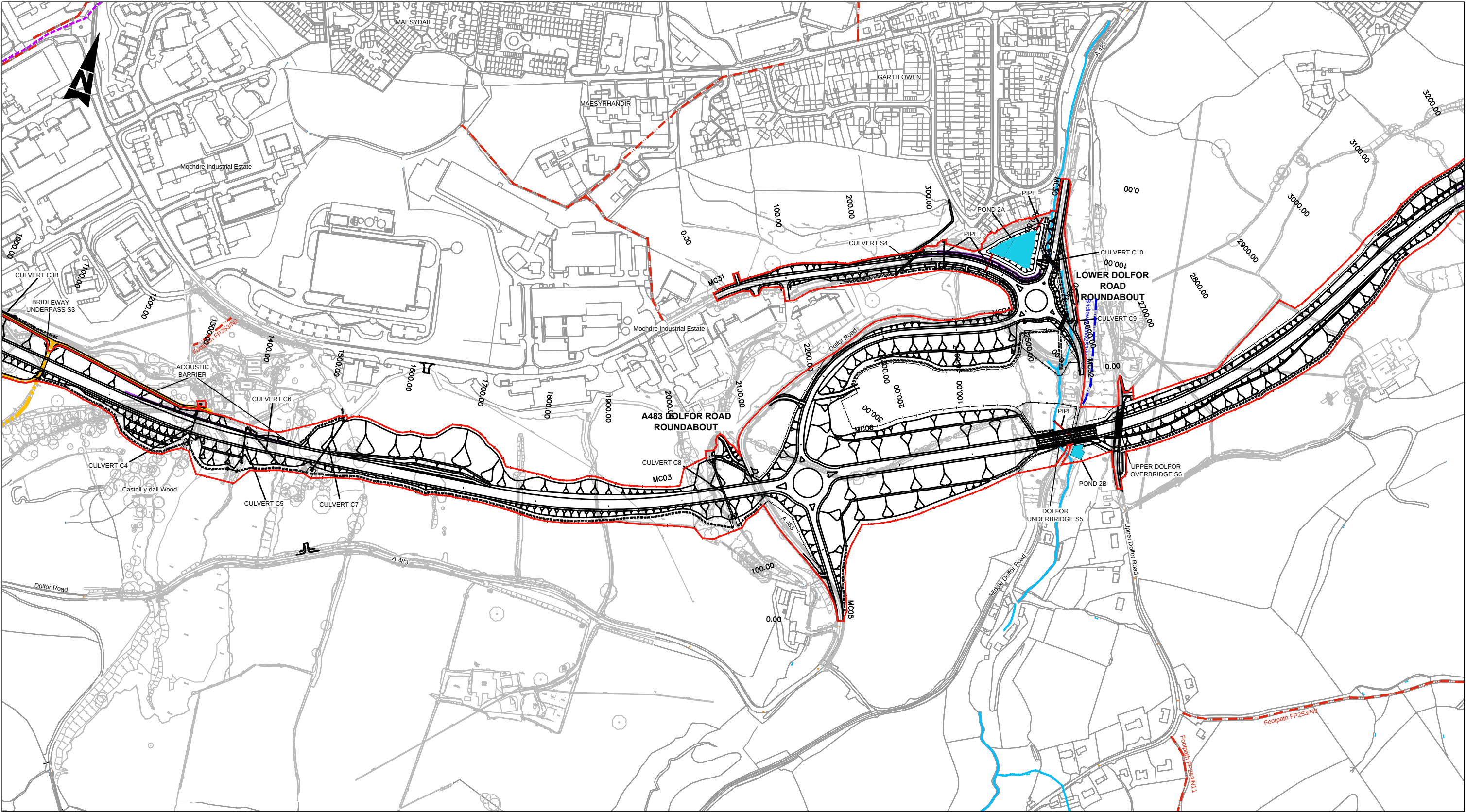
Code	% cover
UK04 (SSSI/ASSI)	100.0

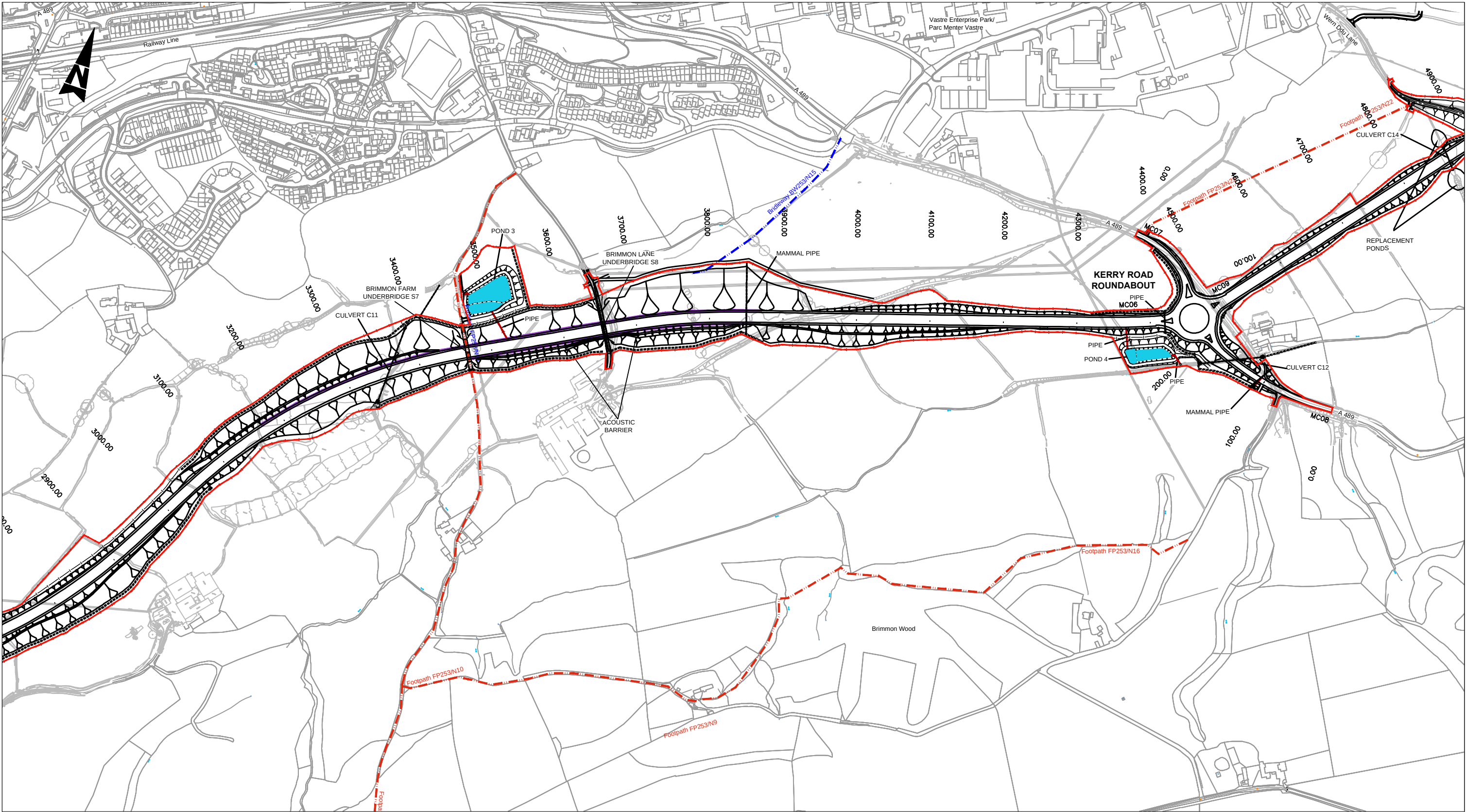


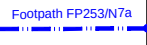
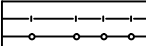
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	On Embankment		Ditches		Diverted Public Right of Way		Existing National Cycle Network		
	In Cutting		Boundary fencing						

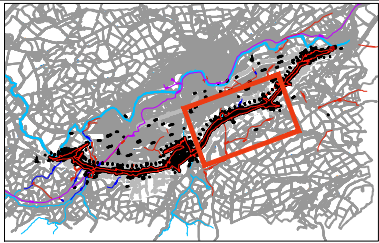


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	 Llywodraeth Cymru Welsh Government		A483/A489 Newtown Bypass		Statement to Inform an Appropriate Assessment General Arrangement Sheet 1 of 4		Scale at A3 1:5,000	Scale at A1 1:2,500	Checked	MB	
							Drawing Status		Approved		JW
							Job No	Figure No	Issue		
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	Highway Boundary		False cutting		Attenuation Pond		Acoustic Barrier		Existing PROW
	On Embankment		Ditches		Diverted Public Right of Way		Existing National Cycle Network		
	In Cutting		Boundary fencing						



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Client/Team



Llywodraeth Cymru
Welsh Government



Job Title

A483/A489
Newtown Bypass

Drawing Title

Statement to Inform an Appropriate Assessment
General Arrangement
Sheet 3 of 4

Date

Sept 2014

Drawn by

FS

Scale at A3

1:5,000

Scale at A1

1:2,500

Checked

MB

Drawing Status

FINAL

Approved

JW

Job No

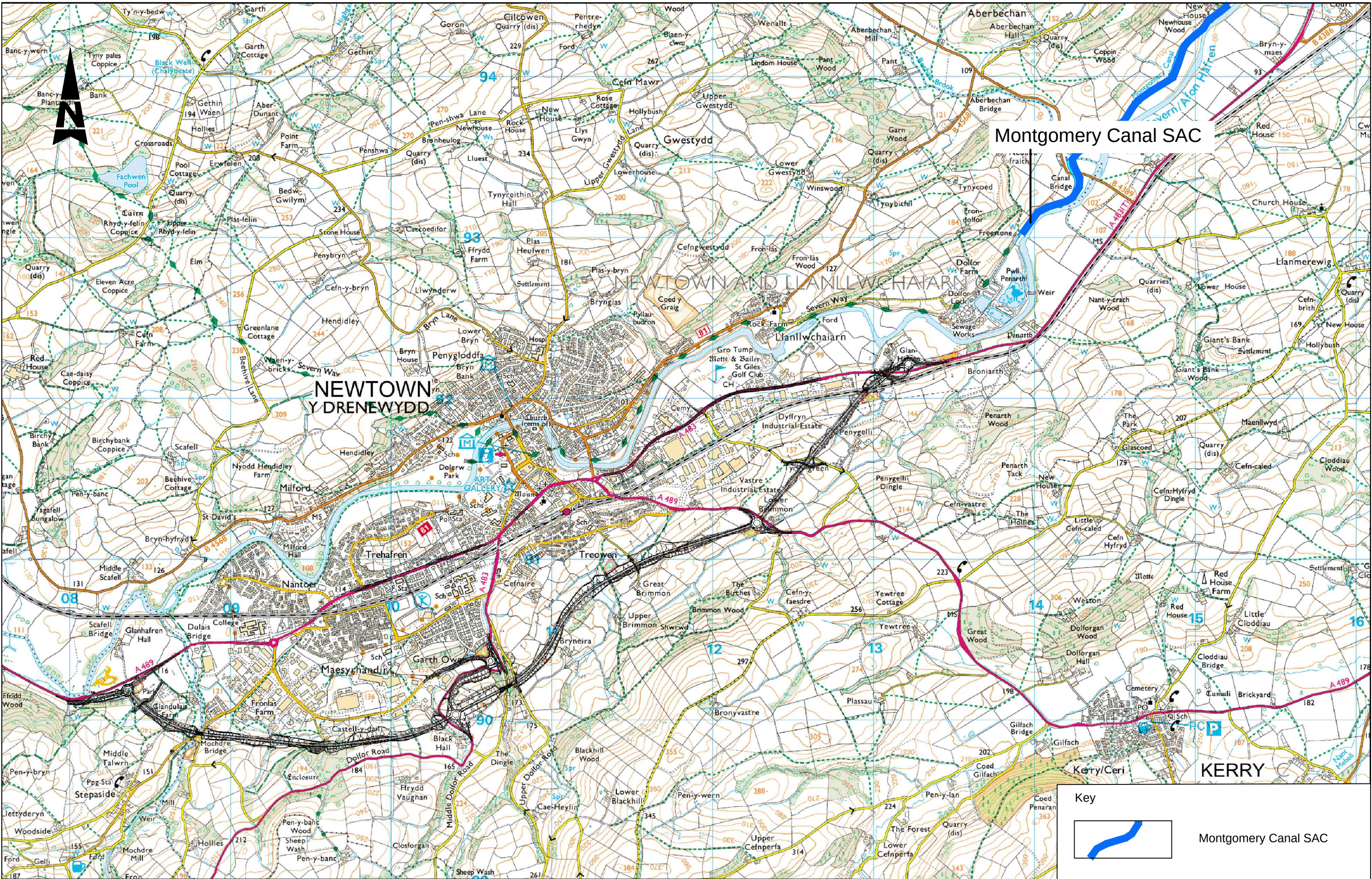
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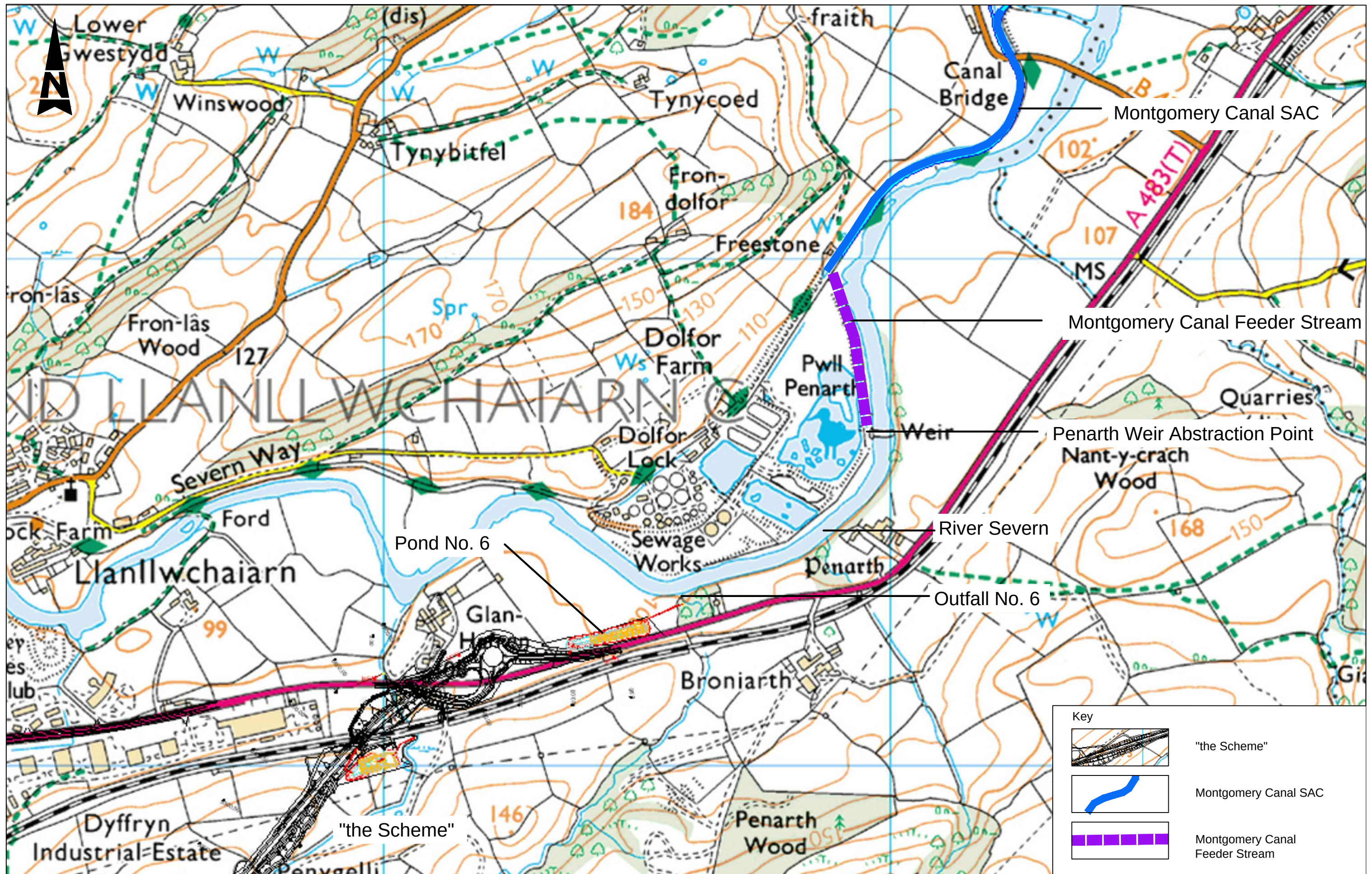
Figure No

1c

Issue

-





Appendix E.3

Lichen Survey

A Lichen Survey of a Proposed Bypass at Newtown, Powys



Alan Orange

2014

Orange, A. (2014) *A Lichen Survey of a Proposed Bypass at Newtown, Powys*. Unpublished report to TACP.

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1. Introduction

A proposed bypass for the town of Newtown, in Powys, will create a new road through agricultural land south of the town. The route contains a significant number of mature and over-mature trees in non-woodland situations. A lichen survey was carried out to assess the potential value of these and other features.

2. Methods

The proposed route of the bypass for Newtown, Powys, runs south of the town from approximately 32/130.921 to 080.900. The route runs predominantly through pasture and meadow, with some small woodlands. All records are from one of the two hectads 32/09 and 32/19. All parts of the site are within the botanical vice-county of Montgomeryshire (V.C. 47). The site was visited on two days, 23-24 June 2014, in warm, dry weather. All substrates were potentially examined for lichens, with particular attention paid to mature trees. The selection of areas to visit was guided by aerial photographs and a tree report by Jerry Ross Arboricultural Consultancy; some parts of the route apparently without mature trees were not visited as these are unlikely to have significant value.

A number of specimens were collected for identification in the laboratory. Taxonomy and nomenclature of lichens follows Smith *et al.* (2009) unless stated. Location was recorded using a hand-held GPS receiver.

Species were regarded as 'notable' and potentially of conservation interest if they met one of the following criteria:

- Graded as Critically Endangered, Endangered, Vulnerable, or Near Threatened in the Welsh red data list (Woods 2010)
- Indicated as Nationally Rare (recorded in 1-15 hectads in Great Britain) or Nationally Scarce (in 16-100 hectads in Great Britain) in Woods & Coppins (2012).
- Indicated as International Responsibility (British populations considered to be of international importance due to their abundance in Britain compared to the rest of the world) in Woods & Coppins (2012).
- Used in the calculation of the New Index of Ecological Continuity (NIEC) (Coppins & Coppins 2002). Sites containing a high number of species from a list of indicator species are considered to have a high likelihood of ancient origin, but individual NIEC species are not necessarily of conservation interest.

3. Results

A total of 94 lichen species and one lichenicolous fungus was recorded (Table 1). Target notes (including localities of common species) are shown in Table 3.

Oak (nearly all *Quercus robur*) was the most frequent mature tree. Here, lichen communities suggested rather dry, mostly acidic but nutrient-enriched conditions. Frequent species included *Lecanora expallens*, *Parmelia ernstiae*, *P. sulcata*, *Phlyctis argena*, *Pyrrhospora quernea* and *Ramalina farinacea*. Dry, rain-sheltered bark of mature oaks rarely carried a specialised flora with *Calicium viride*, *Chaenotheca trichialis* and *Schismatomma decolorans*

(Fig. 3). Ash carried a flora indicative of slightly higher pH. Nearly all the lichen communities were seen strongly influenced by nutrient-enrichment from agriculture, with nutrients probably delivered to the bark by such processes as dust deposition, fertiliser spreading, and release of gaseous ammonia. Species indicating nutrient-enrichment were found on most trees, except those in woodland, and included *Amandinea punctata*, *Arthonia impolita*, *Candelariella* spp., *Physcia* spp., *Physconia* spp. and *Xanthoria* spp. On mature trunks these were only rarely dominant, for instance beside sheep lying-up places (Fig. 4), and were more typically mixed with species including *Parmelia ernstiae*, *P. sulcata*, *Pertusaria* spp. and *Pyrrospora quernea*. Branches and twigs, however, usually bore a community dominated by species of nutrient-rich conditions, including abundant *Physcia tenella* and *Xanthoria parietina*. Naturally acid-barked trees, such as larch, had a very poor flora, and may still be influenced by acid deposition. However, *Chaenotheca stemonea* occurred on the rain-sheltered bases of old larch in a woodland. Most areas of woodland were very shady and lichen-poor. Rock was a rare substrate at the site, represented only by a small mudstone exposure and a few stones at field margins.

Very few notable species (as defined above) were recorded (Table 2, Figs. 1-2). *Chaenotheca stemonea* is regarded as Vulnerable in Wales (Woods 2010) due to the small number of known populations. This species occurred on the dry, rain-sheltered bases of three mature larch at 0826.9011 in planted woodland on a slope which would not be directly affected by construction, according to the current bypass route. *Strigula jamesii* is regarded as Vulnerable in Wales, and occurred on hazel at the margin of otherwise unremarkable woodland (grid ref. 0965.8987, Castell y Dail Wood). This is shortly north of the proposed route. It is possible that more of this species occurs nearby, but few trees were searched.

Three additional species were Nationally Scarce. *Cladonia cyathomorpha* occurred on occasionally flushed rocks on a small mudstone outcrop at approximately 1029.8996; this species is occasional in much of North Wales and may be a little under-recorded in Britain. *Lecanora compallens* is a recently recognised and probably under-recorded species of field and wayside trees. *Porina byssophila* was formerly considered to be Nationally Rare and confined to shaded rock, but it has been overlooked as a species of shady bark, often in unremarkable habitats.

Very few species from the list of those considered to be indicative of old woodland and ecological continuity were found, namely *Cladonia caespiticia*, *Chaenotheca trichialis* and *C. stemonea*. The whole site thus has a score of 3 on the NIEC, suggesting a low likelihood of ancient origin and ecological continuity. It is likely that there has been little ecological continuity here, as large trees are scattered and possibly planted, and woodlands are small and much disturbed. In addition, old-woodland species would have suffered from acid deposition and eutrophication.

4. Discussion

With the few exceptions above, the lichen flora is not of special interest. The main interest lies in the mature trees, especially oak, which have some species (which do not achieve a conservation grading, however) typical of trees in agricultural landscapes which are not too heavily eutrophicated, including *Calicium viride*, *Pertusaria coccodes*, *P. flavida*, and *Schismatomma decolorans*. These species are not found here on young or heavily shaded

trees. Thus any loss of mature trees is regrettable, as their lichen communities are not duplicated on younger trees.

It is not possible to offer true mitigation for the loss of old trees. However, some planting of oaks could be carried out, preferably using local stock. If trees are to be destroyed during road construction, the ideal would be for the intact tree to be winched over, dragged aside and retained, either in pasture or preferably in light shade, but where it will not become smothered by scrub growth. This, at least in the case of oak, would create a long-lasting dead wood habitat for lichens.

5. References

Coppins, A.M. & Coppins, B.J. (2002) *Indices of Ecological Continuity for Woodland Epiphytic Habitats in the British Isles*. British Lichen Society.

Smith, C.W., Aptroot, A., Coppins, B.J., Fletcher, A., Gilbert, O.L., James, P.W. & Wolseley, P.A. (2009) *The Lichens of Great Britain and Ireland*. London: The British Lichen Society.

Woods, R.G. (2010) *A Lichen Red Data List for Wales*. Salisbury: Plantlife.

Woods, R.G. & Coppins, B.J. (2012) *A Conservation Evaluation of British Lichens and Lichenicolous Fungi*. Plantlife. http://jncc.defra.gov.uk/pdf/Lichens_Web.pdf

Table 1. Lichen species recorded.

Species	Notes
<i>Amandinea punctata</i>	Frequent on trunks. 2/1Qr, 2/4Qr, 4/1 Qr, 4/3 Qr, , 6/1 Ug, 6/2 Qr, 6/4 Qr, 8/4 Qr, 8/5 Qr, 9 Cs.
<i>Arthonia didyma</i>	Rare on shaded smooth bark of hazel, 6/10.
<i>Arthonia impolita</i>	Rare on dry sides of large oak trunks. 4/3 Qr small quantity, 8/5 Qr.
<i>Arthonia radiata</i>	Rare on smooth bark of hazel. 6/10 Ca, 11 Ca, 13/1 Ca.
<i>Buellia griseovirens</i>	Oak gate post, 6/7.
<i>Calicium viride</i>	Rare, in crevices on dry underside of large oak trunk, 4/3 Qr.
<i>Caloplaca cerina</i>	Very rare, elm twig. 6/1 Ug.
<i>Caloplaca cerinella</i>	Occasional on bark. 6/3 Ps twigs, 8/1 Fe.
<i>Caloplaca oasis</i>	Concrete post, 10/1.
<i>Caloplaca obscurella</i>	Rare, on ash trunk, 8/1 Fe.
<i>Caloplaca saxicola</i>	Concrete posts, 10/1, 10/4.
<i>Candelaria vitellina</i>	Occasional on trunks and fence posts. 2/1Qr, 2/4Q, 2/5 Fe, 6/1 Ug, 6/5 Qr, 8/1 Fe, 8/2 wood, 8/3 wood, 11 Qr.
<i>Candelariella aurella</i>	Concrete posts, 10/1, 10/4.
<i>Candelariella reflexa</i>	Rare, in small amounts. 10/3 Ca, 11 Cm twig, 12 Qr br, 13/1 Ca.
<i>Chaenotheca ferruginea</i>	Rare on mature oak and larch. 7/2 Qr, 13 Ld.
<i>Chaenotheca stemonea</i>	Rare, in fissures of rain-sheltered mature larch, 13/3 Ld, and sterile on two more nearby. Fig. 6.
<i>Chaenotheca trichialis</i>	Rare in crevices on dry underside of large oak trunks. 4/3 Qr, 5/1 Qr, 7/2 Qr.
<i>Chrysothrix candelaris</i>	Rare, on dry sides of oak trunks. 11/2 Qr, 11/4 Fe, 11/6 Qr.
<i>Cladonia caespiticia</i>	Rare, mature larch, 13 Ld.
<i>Cladonia cyathomorpha</i>	Shaly mudstone of small exposure near stream, 5/2.
<i>Cladonia digitata</i>	Rare, wood of larch stump, 11.
<i>Cladonia polydactyla</i>	On wood, 8/2.
<i>Cladonia subulata</i>	Rare, on wood, 8/2.
<i>Cliostomum griffithii</i>	Dry sides of trunks. 6/2 Qr, 7/1 Qr
<i>Diploicia canescens</i>	Very rare, small quantity on dry, nutrient-enriched oak trunk, 6/5 Qr.
<i>Evernia prunastri</i>	Occasional on oak trunks. 6/2 Qr, 10/3 Ca
<i>Flavoparmelia caperata</i>	Very rare, 6/8 Qr.
<i>Fuscidea lightfootii</i>	Leaning oak trunk, 6/3 Qr.
<i>Graphis scripta</i>	Rare, on shaded hazel, 13/1 Ca.
<i>Hyperphyscia adglutinata</i>	Occasional on trunks. 2/5 Fe, 6/5 Qr, by 6/9 Qr, 11 Ca
<i>Hypogymnia physodes</i>	Rare, hazel branch, 10/3.
<i>Ionaspis lacustris</i>	Shaly mudstone on small exposure near stream, 5/2.
<i>Lecanactis abietina</i>	Rare, on oak trunk at woodland margin, 11/5.
<i>Lecania cyrtella</i>	Occasional on bark. 6/4 Qr, 8/1 Fe, 12 Qr br
<i>Lecania naegelii</i>	On hazel, 6/10 Ca.
<i>Lecanora carpinea</i>	Occasional on branches. 4 Qr, 4/2 Fe br, 6/1 Ug, 8/1 Fe, 11/1 Qr br

<i>Lecanora chlarotera</i>	Frequent on trunks and branches. 2/1Qr, 2/3Qr br, 2/4Q, 4/1 Qr branch, , 6/3 Qr, 8/1 Fe br, 9 Cs, 10/2 Ap, 11 Cm twig, 11 Qr, 13/1 Ca.
<i>Lecanora compallens</i>	Probably occasional on oak and ash trunks. 2/1, 8/1 Fe.
<i>Lecanora conizaeoides</i>	Rare on wood and larch bark. 6/7 oak gate post, 10/3 wood, 11 Ld.
<i>Lecanora dispersa</i>	Concrete posts, 10/1, 10/4.
<i>Lecanora expallens</i>	Frequent on dry sides of trunks. 2/1 Qr, 4/1 Qr, , 4/3 Qr, 6/2 Qr, 8/2 wood.
<i>Lecanora hagenii</i>	6/3 Ps twigs.
<i>Lecanora pulicaris</i>	Rare on hard wood. 6/7 oak gate post, 10/3 wood.
<i>Lecanora semipallida</i>	Concrete post, 10/1.
<i>Lecanora symmicta</i>	6/7 oak gate post.
<i>Lecidella elaeochroma</i>	Occasional on trunks and twigs, in small quantities. 2/4Qr, 4/1 Qr twig, , 6/3 Qr, 6/10 Ca, 8/1 Fe br
<i>Lecidella scabra</i>	Occasional on root buttresses of large trees, also on stones. By 6/3, 6/4 Qr, 6/5 Qr.
<i>Lepraria incana</i>	Occasional on rain-sheltered bark and on rock. 4/3 Qr, 5/2, 6/2 Qr, 6/3 Qr , 6/8 Qr, 9 Cs, 11 Ld, 13 Ld.
<i>Lepraria lobificans</i>	Dry bark and rock. 5/2, 6/9 Fe.
<i>Melanelixia glabratula</i>	Occasional on oak trunks. 2/4Qr, 4/3 Qr, 6/2 Qr, 11/4 Fe.
<i>Melanohalea exasperata</i>	Occasional on branches. 4/1 Qr twig, 4/2 Fe br, , 6/3 Qr br, 8/1 Fe br, 11/1 Qr br, 12 Qr br
<i>Melanohalea exasperatula</i>	Rare, on oak trunk, 6/5 Qr.
<i>Melanohalea subaurifera</i>	Occasional on trunks and twigs. 2/1Qr, 6/2 Qr, 6/7 oak gate post, 11 Cm twig, 12 Qr br.
<i>Ochrolechia androgyna</i>	Rare, on oak trunks. 2/4, 11/1 Qr
<i>Ochrolechia subviridis</i>	Occasional on oak trunks. 2/4Qr, 6/2 Qr, 11/1 Qr.
<i>Opegrapha niveoatra</i>	4 Qr, 11 Ca.
<i>Opegrapha varia</i>	Base of oak in shady woodland, 6/9 Qr.
<i>Opegrapha vermicellifera</i>	6/9 Qp.
<i>Parmelia ernstiae</i>	Locally frequent on oak and ash trunks. 2/4Qr, 4/3 Qr, 6/2 Qr, 11/1 Qr, 11/4 Fe. A recently recognised and apparently common segregate of <i>P. saxatilis</i> .
<i>Parmelia saxatilis</i>	6/7 oak gate post.
<i>Parmelia sulcata</i>	Frequent on trunks and twigs. 2/1Qr, 2/4Qr, 4/1 Qr, 4/3 Qr, 6/2 Qr, 6/3 Qr, 6/4 Qr, 8/1 Fe, 8/4 Qr, 11/1 Qr, 11/4 Fe, 12 Qr br. The recently recognised cryptic species <i>P. encyprata</i> was not distinguished.
<i>Pertusaria albescens</i>	Occasional on oak trunks. 2/4Qr, 4/3 Qr, 11/1 Qr, 11/4 Fe.
<i>Pertusaria coccodes</i>	Rare, on mature oak trunk. 4/3 Qr.
<i>Pertusaria flavida</i>	Rare on mature oak trunks. 4/3 Qr, 11/1 Qr.
<i>Pertusaria hymenea</i>	2/5 Fe.
<i>Pertusaria pertusa</i>	11/3 Fe, 11/4 Fe.
<i>Phaeophyscia orbicularis</i>	Occasional on bark and concrete. 2/5 Fe, 6/1 Ug, 10/1 concrete, 10/2 Ap.
<i>Phlyctis argena</i>	Frequent on trunks. 2/1Qr, 6/2 Qr, 6/4 Qr, 6/8 Qr, 8/4 Qr, 11/4 Fe

<i>Physcia adscendens</i>	Trunks and twigs, occasional. 6/1 Ug, 6/5 Qr, 8/1 Fe br, 10/1 concrete
<i>Physcia caesia</i>	Rare, on base of one oak, 2/1.
<i>Physcia dubia</i>	On oak. 2/1.
<i>Physcia stellaris</i>	Occasional on branches and twigs. 4 Qr, 6/1 Ug, 6/3 Qp, 8/1 Fe br, 11/1 Qr br, 12 Qr br.
<i>Physcia tenella</i>	Occasional on trunks, abundant on twigs. 2/3Qr br, 2/4Qr, 4/3 Qr, 6/3 Qr, 6/5 Qr, 8/1 Fe, 8/1 Fe br, 10/2 Ap, 11/4 Fe, 12 Qr br
<i>Physconia distorta</i>	On nutrient-enriched oak trunk, 6/5 Qr.
<i>Physconia enteroxantha</i>	Occasional on oak and ash trunks. 2, 4/3 Qr, 8/1 Fe, 11/1 Qr.
<i>Placynthiella dasaea</i>	Wood of gate post, 8/3.
<i>Porina aenea</i>	Shaded smooth bark of hazel. 6/10 Ca.
<i>Porina byssophila</i>	11/8 Ca.
<i>Porpidia tuberculosa</i>	Shaly mudstone of small exposure near stream, 5/2; stone by 6/3.
<i>Punctelia subrudecta</i>	Rare on branches. 6/3 Qr br, 10/3 Ca.
<i>Pyrrhospora quercea</i>	Frequent on trunks, especially oak. 2/4Qr, 4/3 Qr, 6/2 Qr, 6/4 Qr, 6/8 Qr, 7/1 Qr, 8/4 Qr, 9 Cs, 11 Ca, 11 Ld, 11/1 Qr, 11/3 Fe.
<i>Ramalina farinacea</i>	Locally frequent on trunks. 2/1Qr, 2/4Q, 4/3 Qr, 6/2 Qr, 6/2 Qr, 6/4 Qr, 6/5 Qr, 10/2 Ap.
<i>Rhizocarpon reductum</i>	Stone on bank by hedge. By 6/3.
<i>Rinodina oleae</i>	Oak trunk 6/5 Qr; concrete posts, 10/1, 10/4.
<i>Schismatomma decolorans</i>	Rare on dry sides of large oak trunks. 4/3 Qr, 11/2 Qr.
<i>Scoliosporum chlorococcum</i>	6/3 Ps twigs.
<i>Strigula jamesii</i>	Rare, on hazel at woodland edge, 11/8 Ca.
<i>Trapeliopsis flexuosa</i>	Occasional on hard dry wood. 6/7 oak gate post, 8/2 wood.
<i>Verrucaria elaeina</i>	Shaly mudstone in small exposure near stream, 5/2.
<i>Xanthoria calcicola</i>	Concrete posts, 10/1, 10/4.
<i>Xanthoria elegans</i>	Concrete post, 10/1.
<i>Xanthoria parietina</i>	Occasional on trunks, generally in small quantities, frequent on twigs, also on concrete posts. 2/1Qr, 2/3Qr br, 6/1 Ug, 6/5 Qr, 8/1 Fe, 8/1 Fe br, 10/1 concrete, 10/2 Ap, 12 Qr br.
<i>Xanthoria polycarpa</i>	Occasional on trunks and twigs in small quantities. 2/1Qr, 6/1 Ug twig, 6/2 Qr, 6/7 oak gate post, 8/1 Fe, 11 Cm twig, 11 Qr
<i>Xanthoria ucrainica</i>	Occasional on tree trunks in small quantities. 2/1 Qr, 6/5 Qr, 8/1 Fe, 8/4 Qr, 11/6 Qr.
<i>Xanthoriicola physiicola</i> [LF]	On <i>Xanthoria parietina</i> . 4/2.

Ap = *Acer pseudoplatanus*, Ca = *Corylus avellana*, Cm = *Crataegus monogyna*, Fe = *Fraxinus excelsior*,
Ld = *Larix decidua*, Ps = *Prunus spinosa*, Qp = *Quercus petraea*, Qr = *Quercus robur*, Ug = *Ulmus glabra*.

[LF] = lichenicolous fungus.

Numbers refer to target notes, see table 3.

Table 2. Notable species recorded				
	Woods (2010) Wales	Woods & Coppins (2012) GB	NR/NS	NIEC (Coppins & Coppins 2002)
Chaenotheca stemonea	VU		NS	NIEC
Chaenotheca trichialis				NIEC
Cladonia caespiticia				NIEC
Cladonia cyathomorpha			NS	
Lecanora compallens	DD		NS	
Porina byssophila	[LC]	DD	[NS]	
Strigula jamesii	VU		NS	
VU = Vulnerable, DD = Data Deficient.				
[LC] = should be considered Least Concern, in the opinion of the writer.				
NR = Nationally Rare (Great Britain), NS = Nationally Scarce,				
[NS] = Nationally Scarce in the opinion of the writer.				

Table 3. Target notes

Number	GPS reference	GPS stated accuracy (m)	Notes	Number in tree survey report (when identified)
1	11525.90989	5	Shaded oaks and ash with very poor flora.	11
2	11608.91051	6	Six oaks and 2 ash in pasture.	10
4/1	10601.90474	6	Oak.	19
4/2	10496.90380	4	Very shaded ash.	20
4/3	10404.90303	9	Large oak in meadow, with <i>Chaenotheca trichialis</i> (Fig. 3).	22
5/1	10292.89968	9	Mature oak with <i>Chaenotheca trichialis</i> .	24
5/2	10270.89999	9	Mudstone exposure/small quarry, with <i>Cladonia cyathomorpha</i> .	
6/1	10316.90071	5	Elm in old hedgerow.	
6/2	10327.90067	6	Large pollard oak.	23
6/3	10361.90066	9	Prostrate oak (<i>Q. petraea</i>) in old hedgerow.	
6/4	10463.90069	5	Mature oak.	25
6/5	10479.90083	4	Mature oak (Fig. 4).	25a
6/7	10568.90162	5	Oak gate post.	
6/8	10613.90197	9	Mature oak.	
6/9	10667.90198	5	Very shady woodland with no notable trees.	
6/10	10663.90203	9	Shaded hazel.	
7/1	10641.90299	9	Large oak, shady.	
7/2	10641.90299	9	Oak with <i>Chaenotheca trichialis</i> .	
8/1	12298.91293	9	Mature ash	9
8/2	12379.91371	6	Wood of old farm machinery.	
8/3	12427.91462	5	Fence post.	
8/4	12448.91513	5	Large oak.	
8/5	12363.91300	4	Ancient oak in pasture, lichens poor (Fig. 5).	8
9	13096.92181	7	Large chestnut in ley, very poor.	
10/1	12893.91945	4	Concrete gate post.	
10/2	12804.91813	5	Mature sycamore.	5
10/3	12793.91806	5	Fence post.	
11	09941.89863	9	Larch and others	28
11/1	09906.89869	7	Mature oak.	28
11/2	09834.89813	9	Old oak.	
11/3			Ash.	
11/4	09774.89862	6	Large ash in pasture.	
11/5	09728.89855	8	Mature oak.	
11/6	09399.89827	9	Oak.	
11/7	09322.89840	6	Three oaks in pasture.	34
11/8	09652.89873	8	Hazel at edge of poor woodland, with <i>Strigula jamesii</i> , <i>Porina byssophila</i> .	32
12	08576.89941	7	Shaded ash and oak, very poor.	39, 40

13/1	08173.90114	8	Hazels in overgrown hedge.	
13/2	08259.90113	10	Shady woodland.	41
13/3	08266.90119	7	Mature larch with <i>Chaenotheca stemonea</i> (Fig. 6).	41

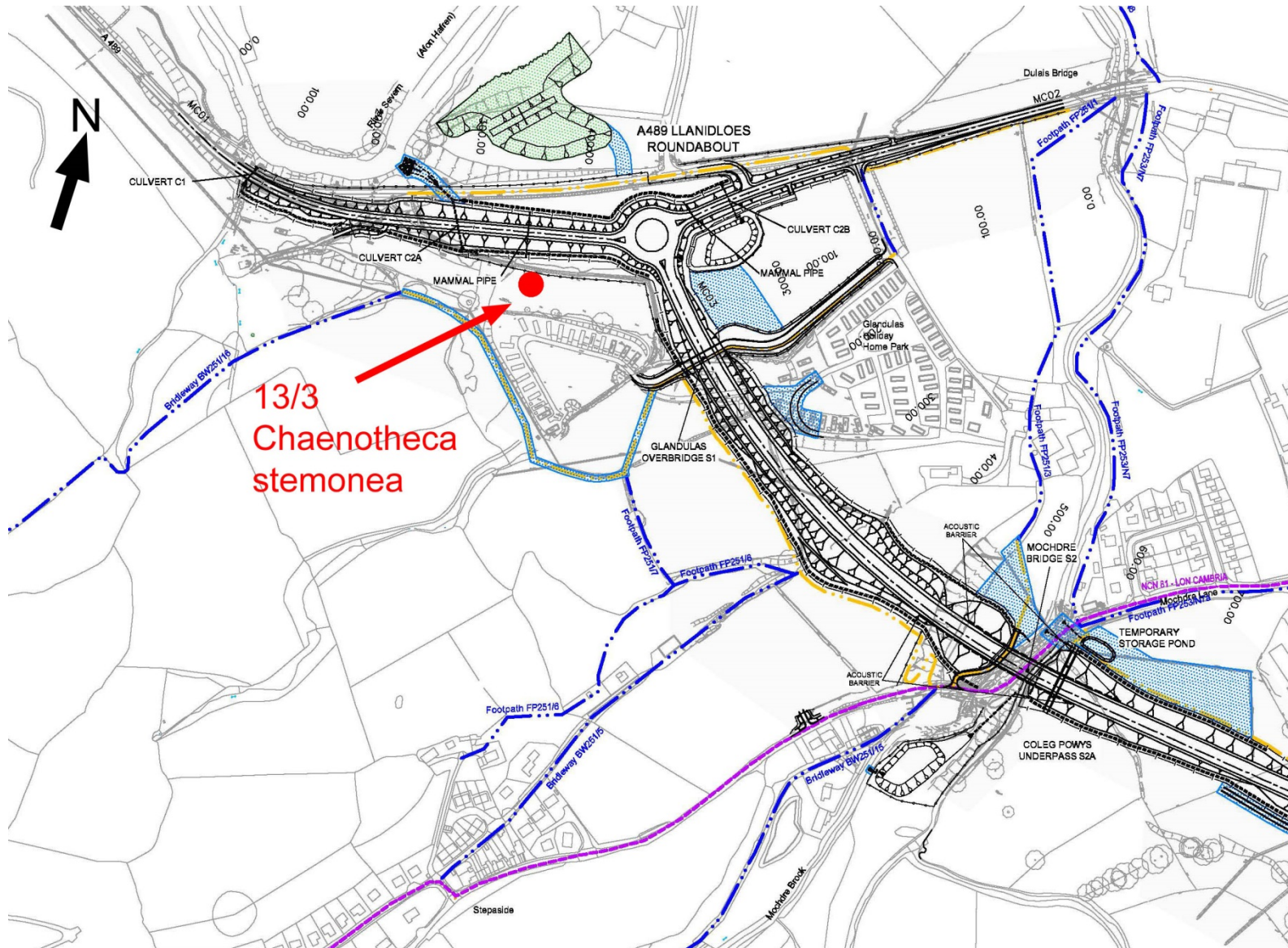


Fig. 1. Location of notable species, west end of site.

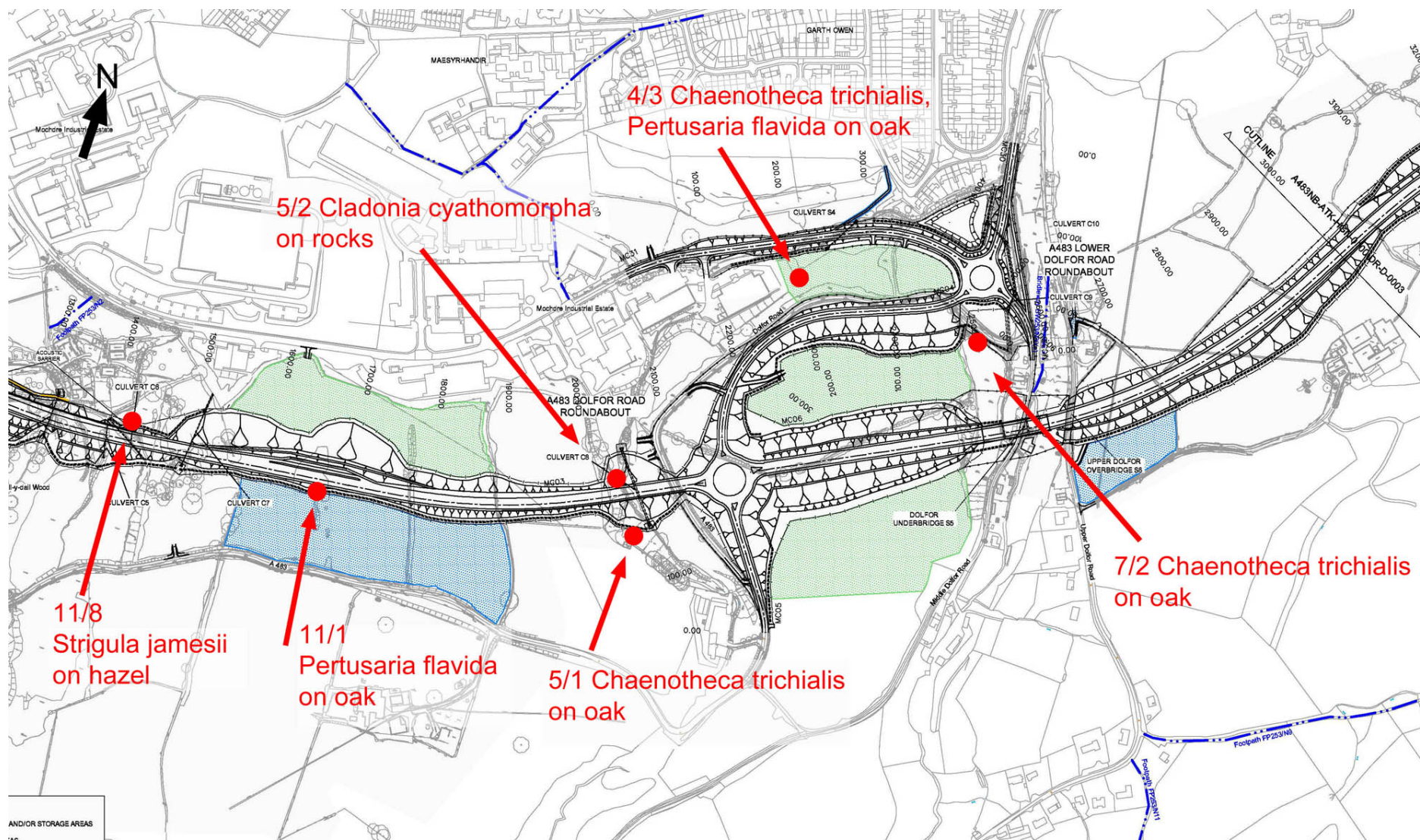


Fig. 2. Location of notable and other (*Pertusaria flavida*) species, western part of site.



Fig. 3. Large oak (379 cm circumference at breast height) in pasture (target note 4/3) with *Calicium viride*, *Chaenotheca trichialis* and *Schismatomma decolorans* on the dry side on the right, and *Pertusaria coccodes* and *P. flavida* on the other side.



Fig. 4. A mature oak with nutrient-enriched bark, in pasture (target note 6/5), this side with *Parmelia sulcata*, *Physcia tenella* and *Ramalina farinacea* and the other side, beside a sheep lying-up area, with much *Physconia distorta*. The root buttresses have the normally saxicolous *Lecidella scabra*, and an unidentified *Caloplaca* sp., also found on stones nearby.



Fig. 5. An ancient pollard oak in pasture (target note 8/5), much used by sheep for shelter. The burred trunk has a very poor lichen flora, with a little *Amandinea punctata* and *Arthonia impolita*.



Fig. 6. *Chaenotheca stemonea*, graded Vulnerable in Wales, from the dry, rain-sheltered base of a mature larch (target note 13/3). The thallus is pale green and very finely powdery; the fruiting bodies are stalked and bear a mass of dry brown spores at the apex. This group of 'pin lichens' with stalked fruiting bodies are more frequent in the drier eastern parts of Wales than in the west.

Appendix E.4
Fish Survey Report



Newtown bypass electric fishing surveys

Client: TACP

APEM Ref 413502

July 2014

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Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by

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1. Introduction

This report outlines the results of electric fishing surveys in association with the proposed A483/A489 Newtown bypass. Installation of new culverts in the various watercourses throughout the route of the bypass could potentially impact fish populations via loss of habitat and connectivity. Evidence from this report will help to support any ecological impact assessment associated with the proposed works.

1.1 Fish populations in the upper River Severn

The River Severn comprises a mixed fishery, including both salmonid and coarse fish species. It is characterised by two main zones; the upper river (upstream of Shrewsbury) is designated as a salmonid fishery, whilst the lower river between Shrewsbury and the tidal limit just north of Gloucester is designated as a coarse fishery.

Salmon, brown trout and grayling are all found throughout the reaches within the vicinity of Newtown, with the principal salmon spawning habitat being found upstream of Welshpool and as far upstream as Llanidloes. In addition, other species of conservation interest, such as bullhead and European eel are also recorded within the upper catchment, where suitable habitat exists.

1.2 Overview of scheme and proposed culvert locations

The proposed scheme comprises a 5.6km bypass to the south of Newtown to alleviate the high volumes of traffic passing through the town. As part of the proposed scheme, a total of 11 new culverts and four culvert extensions are required within various tributaries of the River Severn, which flows through Newtown (Figure 1). In addition, three new bridges are also proposed to span Mochdre Brook, the Dolfor watercourse and Green Brook. The reaches in question are located within the upper catchment, approximately 190 km upstream of the tidal limit and 70 km upstream of Shrewsbury.

In relation to potential impacts upon fish populations, Natural Resources Wales and TACP have identified three sites where further investigation was considered necessary; culvert C3a (Unnamed watercourse), Bridge S5 (Dolfor Brook) and culvert C11 (Unnamed watercourse). Electric fishing surveys were, therefore, conducted to assess the current (and potential) fish populations present within the three watercourses in question.

Electric fishing sites are highlighted in Figure 1. In all cases, sites were located just upstream of the proposed works. However, site C11 was located at the upstream end of an existing culvert (approximately 12" diameter pipe running through field), therefore, an additional site was surveyed downstream of this pipe.

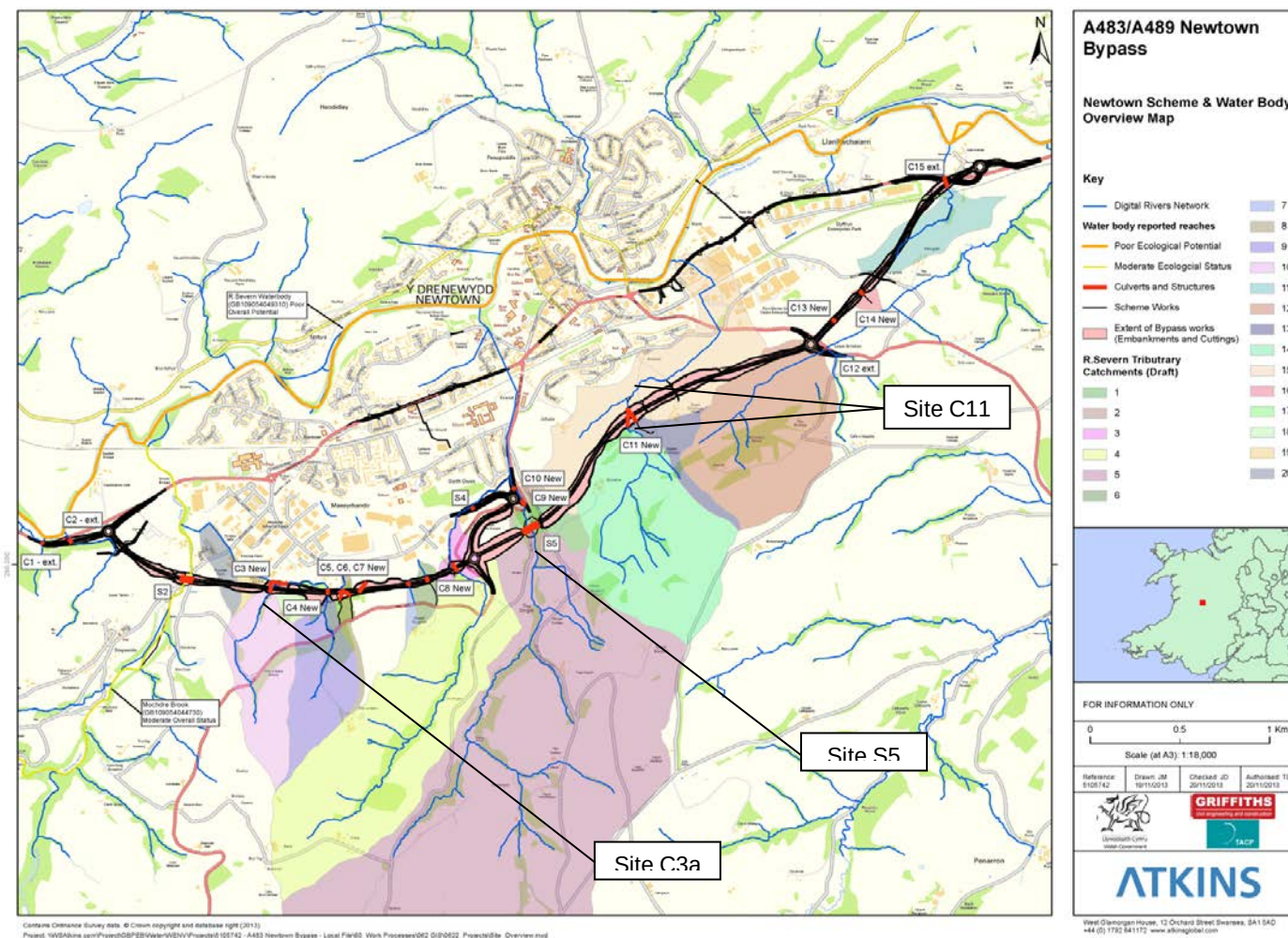


Figure 1 Location of proposed culverts (from WFD compliance assessment report) and electric fishing sites.

2. Methodology

At each location, the upstream and downstream extent of the electric fishing site was delineated with stop nets to aid in the capture of any fish present. A single run electric fishing survey was conducted using backpack electric fishing equipment, with a view to establishing the presence of any fish species, with a particular emphasis on brown trout and bullhead.

3. Results

No fish were captured at any of the sites surveyed.

4. Discussion

4.1 Site C3a

The unnamed watercourse at site C3a is a tributary of Mochdre Brook. Flow was relatively low during the time of the survey, with a maximum water depth of 14 cm and an average depth of ~4 cm (Figure 2). A total river length of 133 m was surveyed.



Figure 2 Typical stretch at site C3a.

The mixed substrate of cobble (40%), pebble (40%), gravel (10%) and sand/silt (10%) appears potentially suitable for both brown trout and bullhead, although shallow water depths and minimal low flow refuge areas (e.g. deep pools) would likely compromise survival of fish during low flows. In addition, an existing lack of connectivity to the downstream Mochdre Brook is likely limiting fish populations in this watercourse. The extent of existing culverts is unclear; however, there appears to be substantial culverting associated with the industrial premises at the south-western edge of Mochdre which would likely inhibit upstream migration.

During low flows, fish populations may seek to move downstream to deeper water refuge areas, moving back upstream when flows increase and habitat becomes available. However, the lack of connectivity precludes this from happening in this reach, likely contributing to the absence of any sustainable fish populations.

4.2 Site S5

Site S5 is located on the Dolfor Brook. Flow was relatively low during the time of the survey, with a maximum water depth of 19 cm and an average depth of ~7 cm (Figure 3). The average width of the brook was 1.0 m and a total length of 50 m was surveyed.



Figure 3 Heavily shaded stretch at site S5.

The mixed substrate of gravel (40%), pebble (35%), cobble (15%) and sand/silt (5%), and heterogeneity of habitat and depths, appears potentially suitable for both brown trout and

bullhead, although heavy shading in parts would likely limit productivity. However, an existing lack of connectivity to the River Severn downstream is likely limiting fish populations in this watercourse. The extent of existing culverts is unclear; however, there appears to be extensive culverting from where the brook meets the Dolfor Road (A483) through Newtown to the confluence with the River Severn which would likely inhibit upstream migration.

4.3 Site C11

The unnamed watercourse at site C11 is a tributary of the River Severn. Flow was relatively low during the time of the survey, with a maximum water depth of 7 cm and an average depth of ~3 cm upstream of the existing culvert/pipe. The average width of the brook at this location was 0.85 m and a total length of 91 m was surveyed. Downstream of the existing culvert/pipe the average width was 1.0 m and a total of 81 m was surveyed. The maximum water depth at this location was 13 cm and the average depth was ~3 cm.

The substrate at this site was heavily silted, with evidence of extensive cattle poaching and bank erosion, and the shallow nature of the watercourse would likely make it susceptible to complete de-watering under very dry conditions (Figure 4).



Figure 4 Heavily poached, silted and shallow habitat at site C11.

Habitat both upstream and downstream of the existing culvert/pipe at the survey site does not appear suitable for brown trout or bullhead; furthermore, the existing culvert/pipe is likely to act as a total barrier to fish migration. In addition, although the full extent of culverting is

unknown, there appears to be extensive culverting further downstream through Newtown to the confluence with the River Severn which would likely inhibit upstream migration.

5. Summary

Fish survey data indicate that, under the existing baseline scenario, fish are absent from the affected reaches, most likely as a result of both the extensive culverting downstream of the survey sites, and a lack of suitable habitat (particularly sites C3a and C11). Shallow water depths and a lack of flow permanence may preclude the establishment of sustainable fish populations at all sites.

Although there appears to be suitable habitat at site S5, no fish were captured at this site. Brown trout populations within these small streams would likely require a spawning stock of adults migrating upstream from the main River Severn (i.e. with the channel at this location being unsuitable for adult trout, juveniles would need to move downstream to grow). However, connectivity issues associated with existing culverts downstream appear to be currently restricting access to these tributaries.

Although bullhead could potentially survive and reproduce within some of the survey reaches, upstream migration would be limited due to the existing culverts downstream. This would result in fish populations within the upper tributaries being susceptible to impacts of high flow events that could displace individuals (particularly juveniles) downstream, with no subsequent access back upstream. Long-term maintenance of populations would, therefore, likely be compromised under the existing scenario.

Given the current lack of fish recorded within the affected reaches, installation of new culverts is unlikely to affect fish populations within the water bodies, particularly upstream. However, as mentioned in the 'WFD review and response to NRW comments' report (June 2014), it is considered good practice to incorporate practical environmental measures now that could benefit a wider restoration strategy at some point in the future. With this in mind, culverts should be designed following EA best practice guidance for fish passage. It is understood that all practical measures to enhance the ecological functioning of the culverts will be incorporated into the design, including a natural substrate, slope and low flow channel. In addition, steps should be taken to avoid sudden transition from bright to dark conditions at the entrance to the culverts, as this may act as a behavioural deterrent to fish entry. This can be achieved to some extent by strategically planting the banksides at the entrance to the culvert to provide adequate shading.

Appendix E.8
Bat Activity Surveys
2013 Report



Llywodraeth Cymru
Welsh Government



A483/A489 NEWTOWN BYPASS

Bat Activity Surveys 2013

July 2014



Llywodraeth Cymru
Welsh Government

A483 / A489 Newtown Bypass

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Glossary and Abbreviations

BAP – Biodiversity Action Plan

CCW – Countryside Council for Wales (now part of Natural Resources Wales)

CIEEM – Chartered Institute of Ecology and Environmental Management

CRoW Act – Countryside Rights of Way Act 2000

DMRB – Design Manual for Roads and Bridges

EA / EAW – Environment Agency / Environment Agency Wales (now part of Natural Resources Wales)

EIA – Environmental Impact Assessment

ES – Environmental Statement

JNCC – Joint Nature Conservation Committee

LBAP – Local Biodiversity Action

NERC Act – Natural Environment and Rural Communities Act 2006

NRW – Natural Resources Wales

PCC – Powys County Council

SAC – Special Area of Conservation

SINC – Site of Importance for Nature Conservation (termed Wildlife Sites in Powys)

SSSI – Site of Special Scientific Interest

TREBAP – Trunk Road Estates Biodiversity Action Plan



1. Introduction

1.1. Purpose

TACP were commissioned to undertake a number of ecological surveys in 2013 including update surveys for bat activity surveys along the route of the Proposed Newtown Bypass Scheme.

The purpose of these surveys was to update and expand on survey information gained in previous years. Specifically, these surveys aimed to identify any commuting routes for bats across the route of the Scheme and to understand the importance of the Scheme for two species, lesser horseshoe (*Rhinolophus hipposideros*) and barbastelle bats (*Barbastella barbastellus*), which are known to be present as rare species in the Newtown area.

In addition to the activity surveys, roost surveys of several buildings were undertaken in order to confirm the locations and statuses of roosts close to the route of the Scheme.

The purpose of this document is to report this updated and extended survey information for the proposed Scheme and surrounding area, in order to inform bat mitigation proposals and assist in the preparation of the Environmental Statement (ES) for the Scheme.

1.2. Description of the Project

1.2.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.2.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the ES.

1.3. Background

The Welsh Government commissioned Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WelTAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.



The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.

In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.4. The Project Objectives

1.4.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

1.5. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.

Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.

The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.

The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.



The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this roundabout into the Mochdre Industrial Estate along Heol Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Lane Overbridge. A westbound lay-by would be provided east of Wern Ddu Overbridge.

An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.

1.6. Summary of existing data

Initial surveys for bats in 2008 comprised a review of existing records of bats within 10km of the centre of Newtown, and activity transect surveys. The desk based assessment revealed a number of species including lesser horseshoe (*Rhinolophus hipposideros*) and barbastelle (*Barbastella barbastellus*) bats in the vicinity of Newtown. Five activity transects were surveyed, in areas likely to have the highest value for foraging bats, and were surveyed on two occasions in May/June and August 2008. On each occasion surveys were undertaken for two hours following sunset and for two hours before dawn, on the same night. Heterodyne and frequency division (Anabat) detectors were used, and calls from the latter recorded for subsequent identification. These surveys identified common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*), brown long-eared bat (*Plecotus auritus*), Natterer's bat (*Myotis nattereri*), whiskered or Brandt's (*Myotis mystacinus/brandtii*) and possibly other *Myotis* species along the route of the Scheme, though no lesser horseshoe or barbastelle bats were recorded.

Eight bat activity transects were surveyed once (though some transects partially overlapped), between May and August 2012. On some occasions several transects were surveyed on the same night, by different teams. The transects comprised linear or circular walking routes along the majority of the route of the Scheme. Surveys commenced half an hour before sunset and continued until two hours after sunset. Heterodyne and frequency division (Batbox Duet) detectors were used, and calls from the latter recorded for subsequent identification. These surveys found common and soprano pipistrelle bats to be the commonest bat species recorded during the surveys, with small numbers of *Myotis* and noctule passes, particularly towards the western end of the Scheme. Visual inspections of trees and buildings on the route of the Scheme in 2012 identified that a number of these were potentially suitable for use by roosting bats, though no roosts were confirmed during these inspections. A possible noctule roost located within a walnut tree was identified during the activity survey conducted on the 1st August 2012, close to Castell-y-Dail.



2. Bat Ecology and Legislation

Bats are the only flying mammals, and all UK species are nocturnal and insectivorous, either catching insects on the wing or (for some species) plucking insects from vegetation or from the ground. As in temperate climates there is insufficient insect food during the winter months, all UK bats hibernate during the winter months.

Bats hibernate in features which provide stable low temperatures and high humidity, such as underground sites or well-insulated holes in trees. In contrast, summer roost sites typically receive warmth from the sun or man-made sources, and maternity roosts in particular tend to retain heat well once they are warmed up (this benefits the pups, which cannot thermoregulate for several days following birth). Bats give birth to a single pup in June or July; some of the larger species may only breed every other year, and some species may not start breeding until they are three years old.

Bats navigate around the landscape surrounding their roosts primarily by echolocation: interpreting the echoes produced by nearby objects when high frequency calls are produced. The attenuation of sound in air places an upper limit on how far ahead bats can perceive objects, which for some species may be less than ten metres. Consequently, bats can find it difficult to cross open areas or gaps created in hedgerows, or do so very close to ground level.

Bats are therefore typically found in areas providing a combination of roost sites (in buildings or trees), foraging habitats providing good insect biomass, and a network of linear habitat features, such as hedgerows or ditches which allow bats to commute between roosts and foraging areas. Some species have specific foraging preferences, such as Daubenton's bats (*Myotis daubentonii*) foraging over water, whilst others are able to exploit a wider range of foraging habitats.

All bats are European Protected Species listed under Annex IV of the Habitats Directive (Council Directive 92/43/EEC), which is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (as amended). Four species: lesser horseshoe, greater horseshoe (*Rhinolophus ferrumequinum*), Bechstein's (*Myotis bechsteinii*) and barbastelle bats; are also listed on Annex II of the Directive and are therefore species for which Special Areas of Conservation can be designated. Bats also receive limited protection under the Wildlife and Countryside Act 1981 (as amended).

Seven bat species are currently listed as Species of Principal Importance for nature conservation under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006: soprano pipistrelle, greater horseshoe, lesser horseshoe, Bechstein's, barbastelle, noctule and brown long-eared bats. Lesser horseshoe and pipistrelles (all species) are also Powys Local BAP priority species, and all bats are TREBAP priority species.



3. Survey Methodology

3.1. Survey locations

Surveys in 2013 aimed to identify commuting routes across the proposed route of the Scheme, rather than general activity surveys as carried out in previous years. Consequently, aerial photos and existing habitat data was reviewed to identify features crossed by the Scheme which were potentially suitable for use as commuting routes by bats. Although the majority of the route was considered to offer limited suitability for commuting and foraging bats, being sheep-grazed pastures bordered by regularly-flailed hedgerows, 15 features were identified, comprising mature hedgerows and watercourses. Following consultation with Natural Resources Wales (NRW) a further four features were also included in the survey programme. The locations of the 19 features surveyed is shown on Figure 1.0.

3.2. Survey methodology

Bat activity surveys were undertaken at each transect on three occasions in 2013: in May, July and September.

On each occasion, the transect was surveyed by two people, using handheld broadband bat detectors and recording devices. Each survey team monitored activity at one transect per night, monitoring commuting activity along the feature continuously as well as walking up and down the feature to identify foraging behaviour by bats. Wherever possible the behaviour of bats observed was recorded (such as direction of flight) to allow identification of commuting routes. Each survey comprised two hours of monitoring after dusk and two hours before dawn on the following morning.

Survey teams carried at least three bat detectors, in order to maximise chances of recording lesser horseshoe and barbastelle bats. Two detectors were used in heterodyne mode, tuned to approximately 110kHz and 35kHz, and a third detector was used in time expansion/frequency division mode to record other bat activity, with any recordings made analysed later using Batsound and AnalookW software, and identified by reference to Russ (2012).

The level of survey effort employed corresponds with that recommended in Hundt (2012) for activity surveys of low value habitats. Automatic detectors were not used during these surveys as their primary aim was to confirm presence or absence of commuting routes from the Scheme, using surveyor observations to identify direction of flight for bats recorded.



4. Results

4.1. Survey constraints

On some occasions surveys were affected by poor weather conditions; where this could be predicted in advance, surveys were rescheduled and completed in more suitable weather conditions later in the same month. A small number of May surveys took place in early June as a result of postponement due to poor weather conditions.

Recordings made on seven occasions were lost due to a computer failure. Consequently data are not available for: Transect 1 in May, Transect 4 in May, Transect 5 in July, Transect 6 in May, Transect 13 in July, Transect 15 in September and Transect 17 in July. Data is available for all transects on at least two occasions.

By agreement with NRW, one transect (number 7) was not surveyed in September 2013 for safety reasons, as the volume of traffic on the A483 at the time the survey commenced would be dangerous for surveyors walking this transect on foot.

4.2. Species recorded

At least eight bat species were recorded during the activity surveys. The commonest species throughout the Scheme were common and soprano pipistrelle bats, which made up the majority of activity at all transects on all occasions. Smaller numbers of noctule bats were recorded on most of the transects. *Myotis* species were recorded occasionally in most survey locations; these species cannot always be reliably distinguished from their echolocation calls, but Daubenton's bat was recorded at the Mochdre Brook, the Dolfor valley and adjacent to the A489 Kerry Road, and Natterer's bats were recorded in the Dolfor valley and woodland north-west of Upper Brimmon Farm. Long-eared bats, presumably brown long-eared bats as the proposed Scheme is outside the known range for grey long-eared bats (*Plecotus austriacus*) were recorded rarely at some survey locations in the central part of the proposed Scheme, between the Dolfor valley and the Kerry Road.

A lesser horseshoe bat was recorded on two occasions during one survey, at a transect adjacent to the Mochdre Brook, but this was the only location where this species was recorded on the Scheme. Other species encountered very rarely were serotine (*Eptesicus serotinus*), recorded once in the Dolfor valley and once close to Brimmon Farm, and possible Nathusius' pipistrelle (*Pipistrellus nathusii*) calls, recorded in the Mochdre and Dolfor valleys. Barbastelle bats were not recorded during any of the 49 transect surveys for which data are available.

4.3. Commuting routes identified

The majority of features crossed by the proposed Scheme did not supporting significant commuting routes for bats. However bats were recorded commuting in larger numbers (peak counts of ten or more bats recorded commuting during one survey) in six locations. These are shown in Table 1.



Table 1: Bat commuting routes identified

Transect number	Location description	Species	Peak number of commuting bats recorded
5	northern edge of Castell-y-Dail	common pipistrelle	10
8	western side of the A483 at the northern end of the Dolfor valley	common pipistrelle	21
17	along the Middle Dolfor road, on the floor of the Dolfor valley	common pipistrelle	11
18	on the Upper Dolfor road immediately to the east of the Dolfor valley	common pipistrelle	22
10	along Brimmon Lane	common pipistrelle	51
12	along the Kerry Road	common pipistrelle	20
12	along the Kerry Road	soprano pipistrelle	22

No other bat species were recorded commuting in significant numbers, on any survey visit, no commuting routes were identified at other transects. The locations of identified commuting routes are shown on Figure 2.0.



5. Assessment and conclusions

5.1. Species recorded

These surveys confirm findings in previous years that lesser horseshoe and barbastelle bats are very rarely recorded on the route of the proposed Scheme. Barbastelle bats were not recorded on any of the 49 survey nights for which data are available, and lesser horseshoe bats were recorded on only one transect on one occasion (Transect 3, September 2013). It is likely, though impossible to confirm, that the two passes recorded during the survey indicate foraging activity along the Mochdre Valley by one individual.

Common and soprano pipistrelles were recorded at all of the transects, and were by far the most commonly encountered species. Other species such as noctule and *Myotis* were only recorded occasionally, but again at the majority of transects. *Myotis* bats were recorded at 17 of the 19 transects (numbers 1 and 5 being the only ones where *Myotis* were not recorded), and noctule bats were recorded at 18 transects (number 1 being the only one where this species was not recorded). Brown long-eared bats were recorded on five transects, from the Dolfor valley eastwards, and serotine bats only recorded on the Dolfor valley and Brimmon Lane transects. Possible Nathusius' pipistrelle calls were recorded on the Dolfor valley and Mochdre valley transects.

5.2. Commuting routes identified

Given the predominance of common and soprano pipistrelle passes during the surveys, it is not surprising that these were the only species for which clear commuting routes could be identified. It is possible that some of the species recorded more rarely, such as *Myotis* bats, were also commuting; however if only a few commuting bats passed the surveyors their direction of flight may not have been seen and they are less readily distinguished from foraging behaviour. In any case, it is less likely that commuting routes used by only small numbers of bats would represent a critical resource for these species in population terms.

For most of the identified commuting routes, the surveys indicate the presence of roosts close to the edge of Newtown, from which bats commute out across the route of the Scheme at dusk, and return before dawn. This is certainly the case on Brimmon Lane, the Kerry Road and at Castell-y-Dail, but in the Dolfor valley there is some indication that a roost may be present south of the proposed Scheme. A roost site for soprano pipistrelle bats was identified in 'Kinsale' a dwelling house in the Dolfor valley and on the route of the Scheme, during other surveys in 2013, but surveys of this building did not indicate a roost of the size indicated by the number of bats recorded commuting. Consequently it is considered likely that the Kinsale roost is a small roost of males or non-breeding females associated with a maternity colony further south within the valley.



6. References

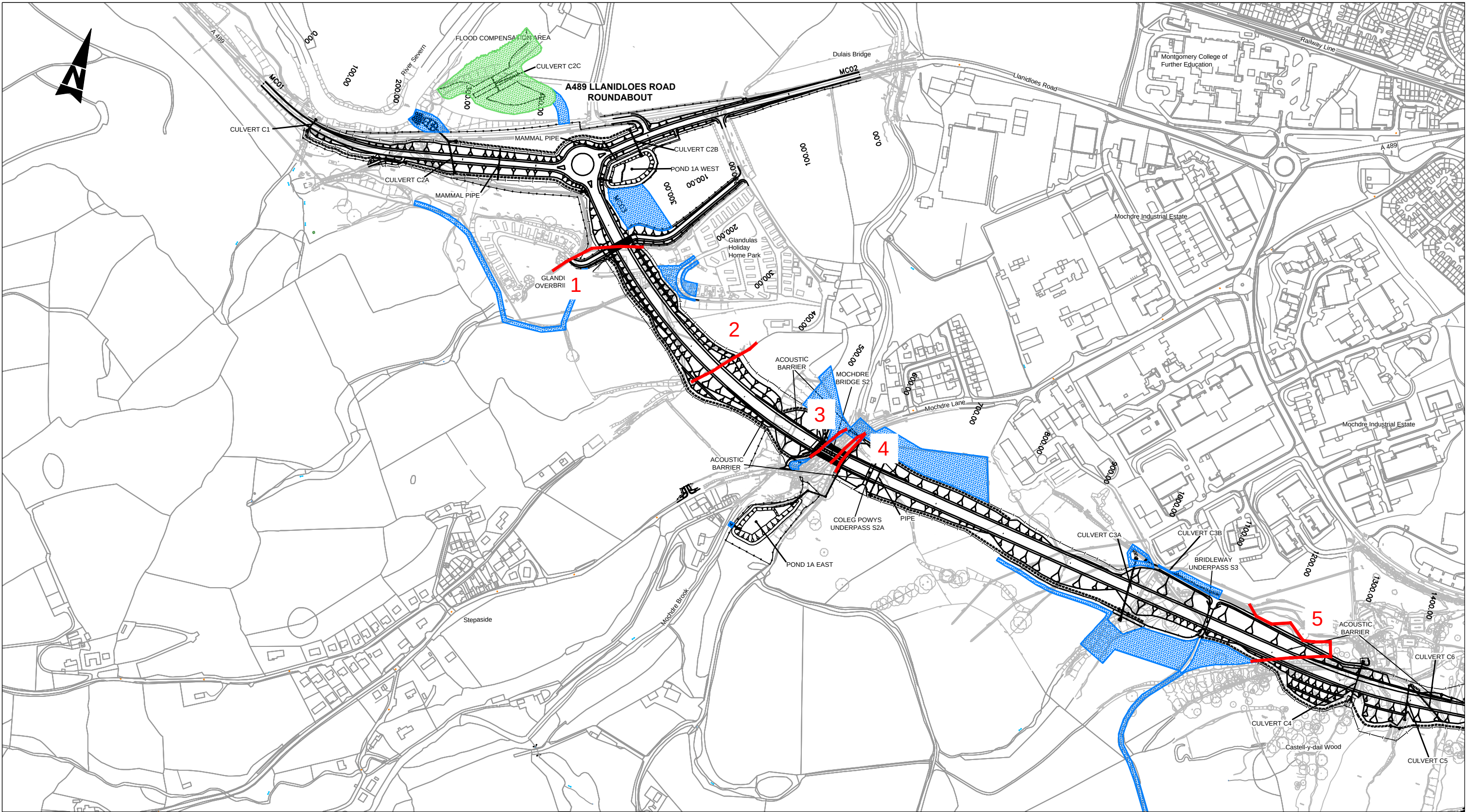
Hundt, I. (2012) *Bat Surveys: Good Practice Guidelines*. 2nd Edition, BCT.

Russ, J. (2012) *British Bat Calls*. Pelagic Publishing.

Appendices



Figure 1 – Survey Locations



KEY



Bat Activity Survey
2013 Transects



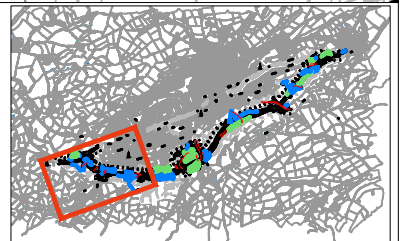
Site Compound &
Storage Areas



Attenuation Pond



Re-profiled
Areas



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Llywodraeth Cymru
Welsh Government



Job Title

A483/A489
Newtown Bypass

Drawing Title

Bat Activity Surveys 2013
Survey Locations

Sheet 1 of 4

Date

Sept 2014

Drawn by
FS

Scale at A3
1:5,000

Scale at A1
1:2,500

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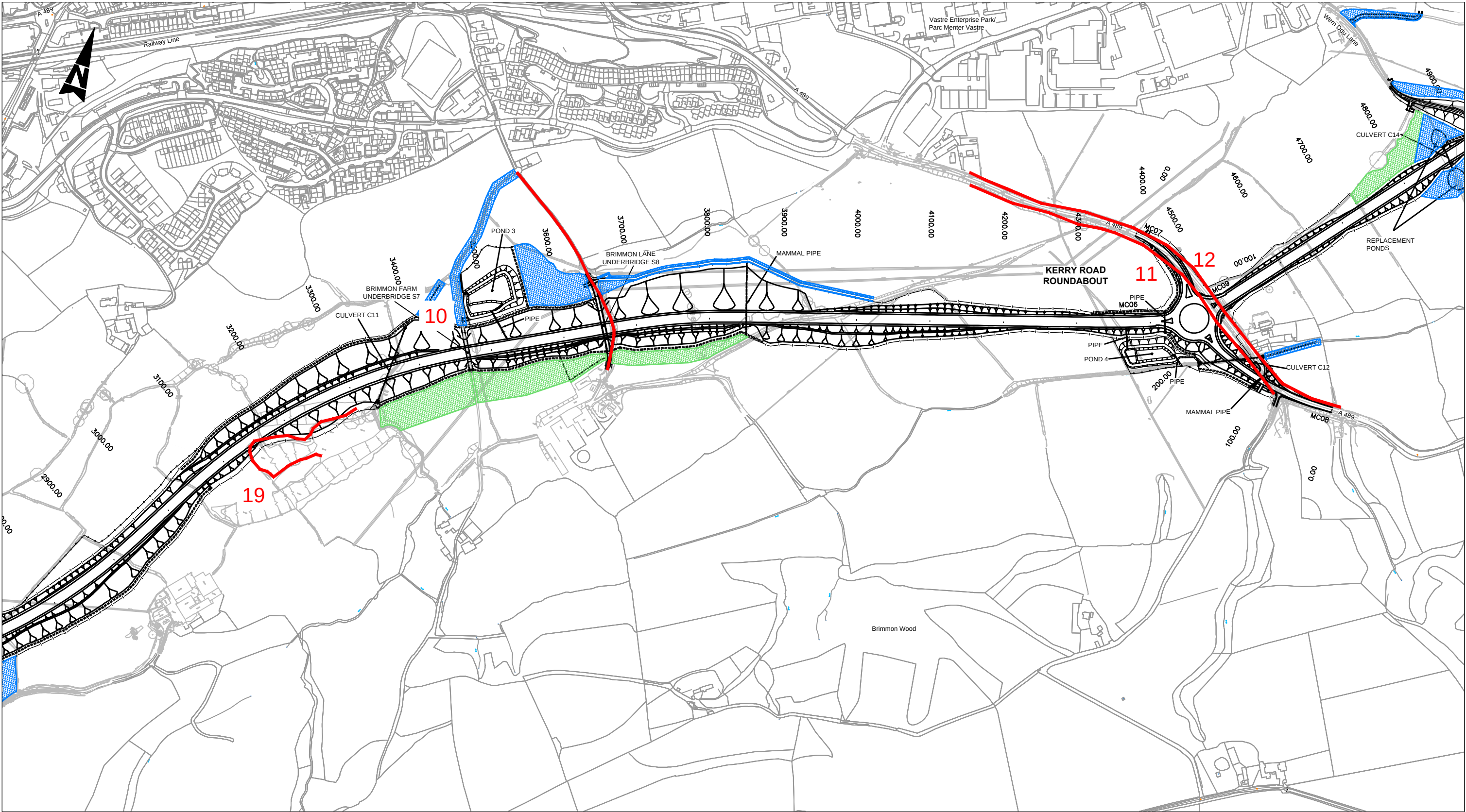
Drawing Status
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Approved
JW

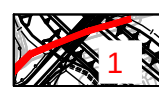
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Figure No
1a

Issue
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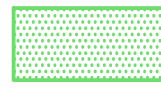
Bat Activity Survey
2013 Transects



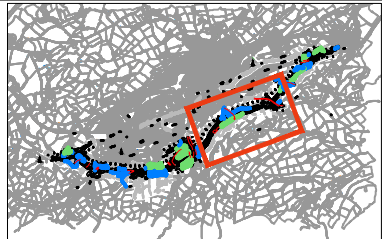
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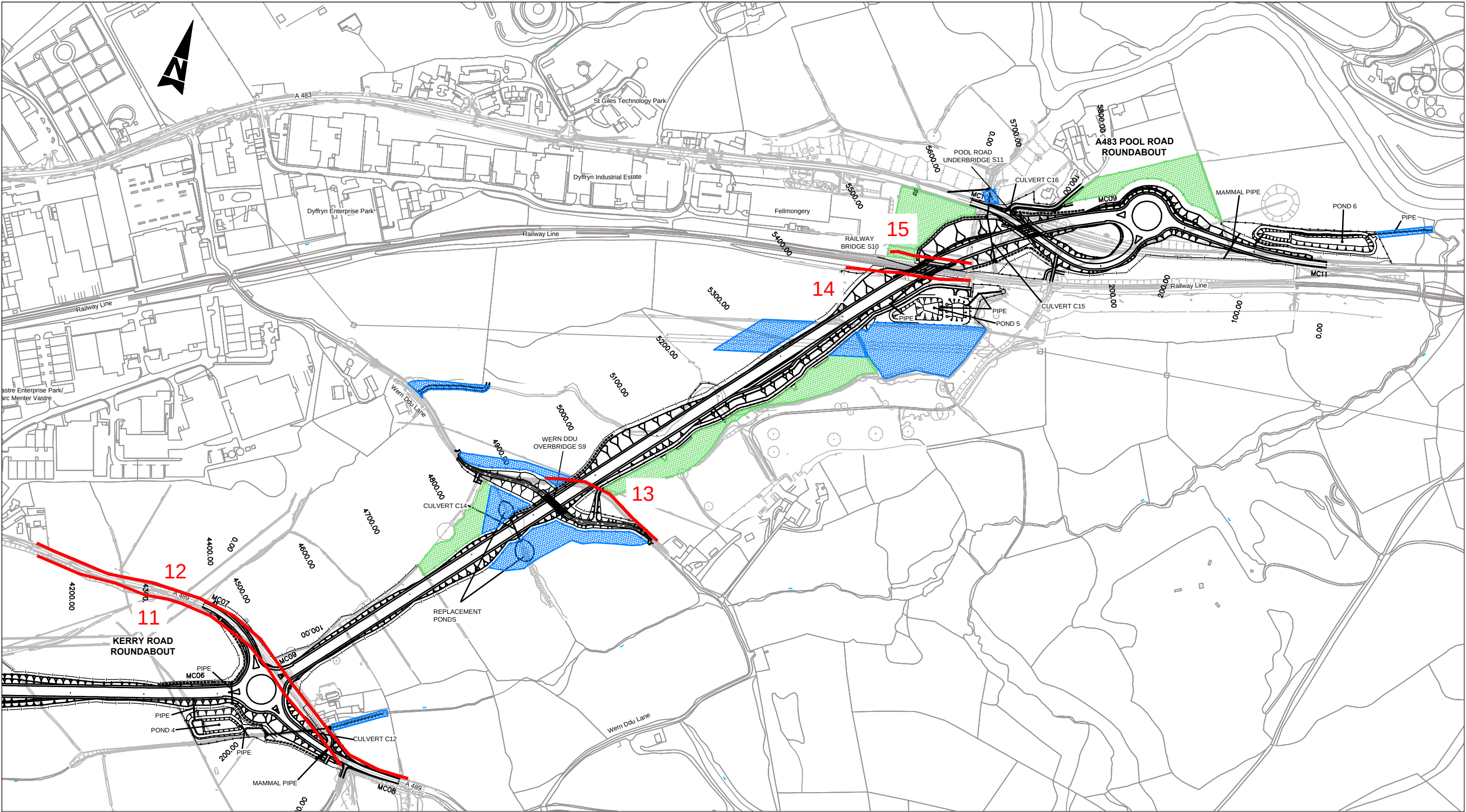


Site Compound &
Storage Areas



Re-profiled
Areas





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Bat Activity Survey 2013 Transects

Attenuation Pond

Site Compound & Storage Areas

Re-profiled Areas

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Date	Sept 2014	Drawn by	FS																	
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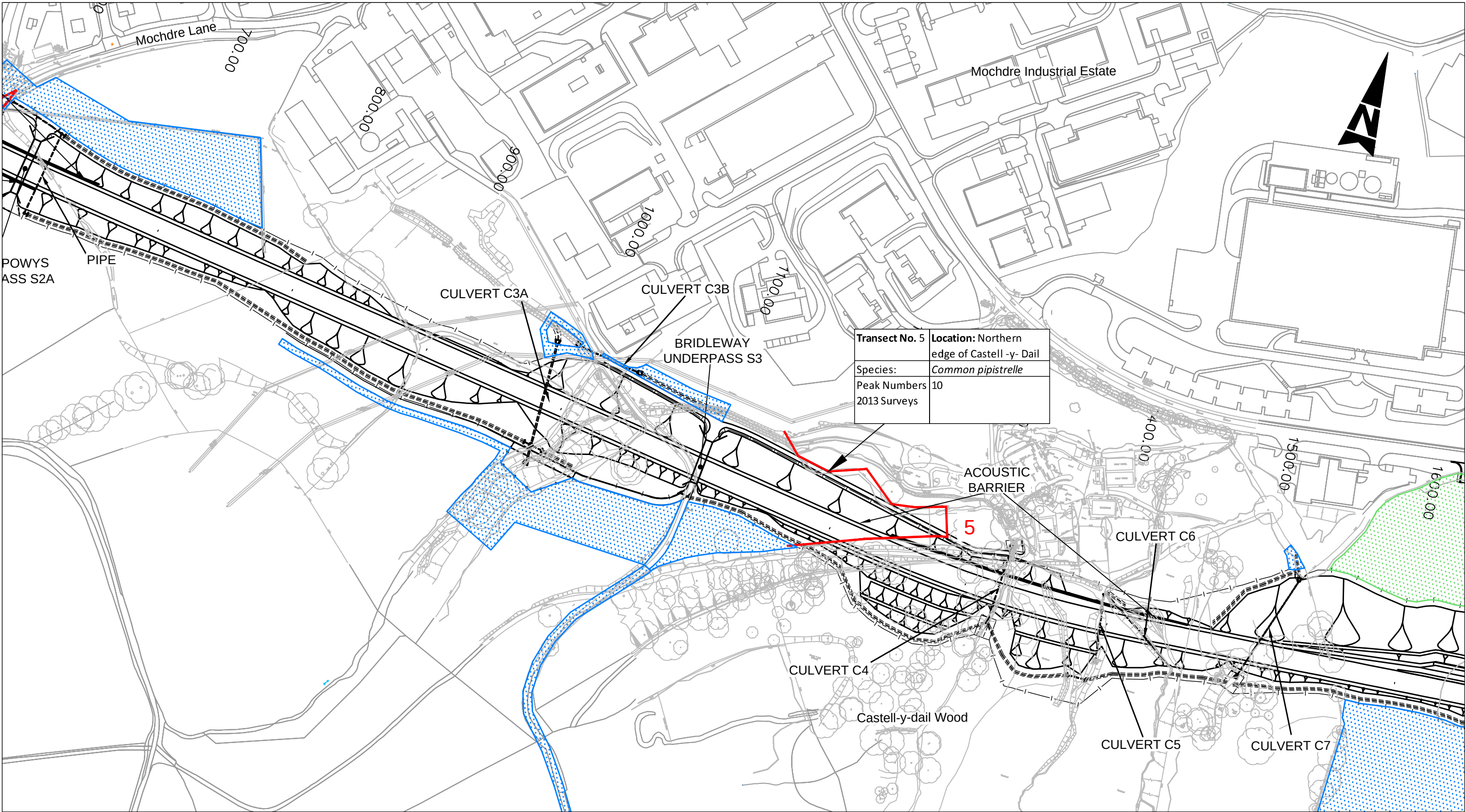


Figure 2 – Identified bat commuting routes



Llywodraeth Cymru
Welsh Government

A483 / A489 Newtown Bypass



KEY

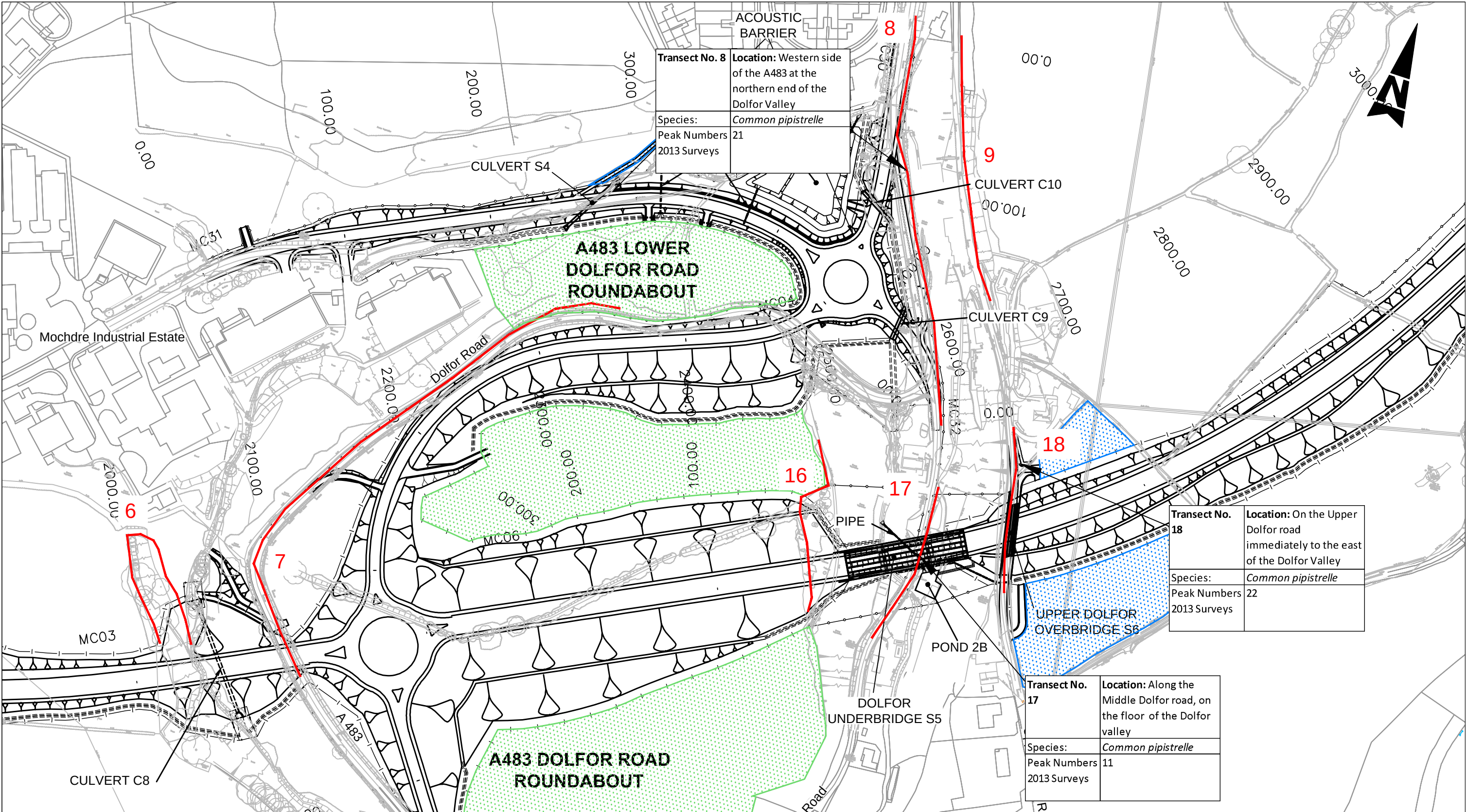
Bat Activity Survey 2013 Transects

Attenuation Pond

Site Compound & Storage Areas

Re-profiled Areas

No commuting bats were identified on transects 1, 2, 3, 4, 6, 7, 9, 11, 13, 14, 15, & 19.



Transect No. 8	Location: Western side of the A483 at the northern end of the Dolfor Valley
Species:	<i>Common pipistrelle</i>
Peak Numbers 2013 Surveys	21

Transect No. 18	Location: On the Upper Dolfor road immediately to the east of the Dolfor Valley
Species:	<i>Common pipistrelle</i>
Peak Numbers 2013 Surveys	22

Transect No. 17	Location: Along the Middle Dolfor road, on the floor of the Dolfor valley
Species:	<i>Common pipistrelle</i>
Peak Numbers 2013 Surveys	11

KEY

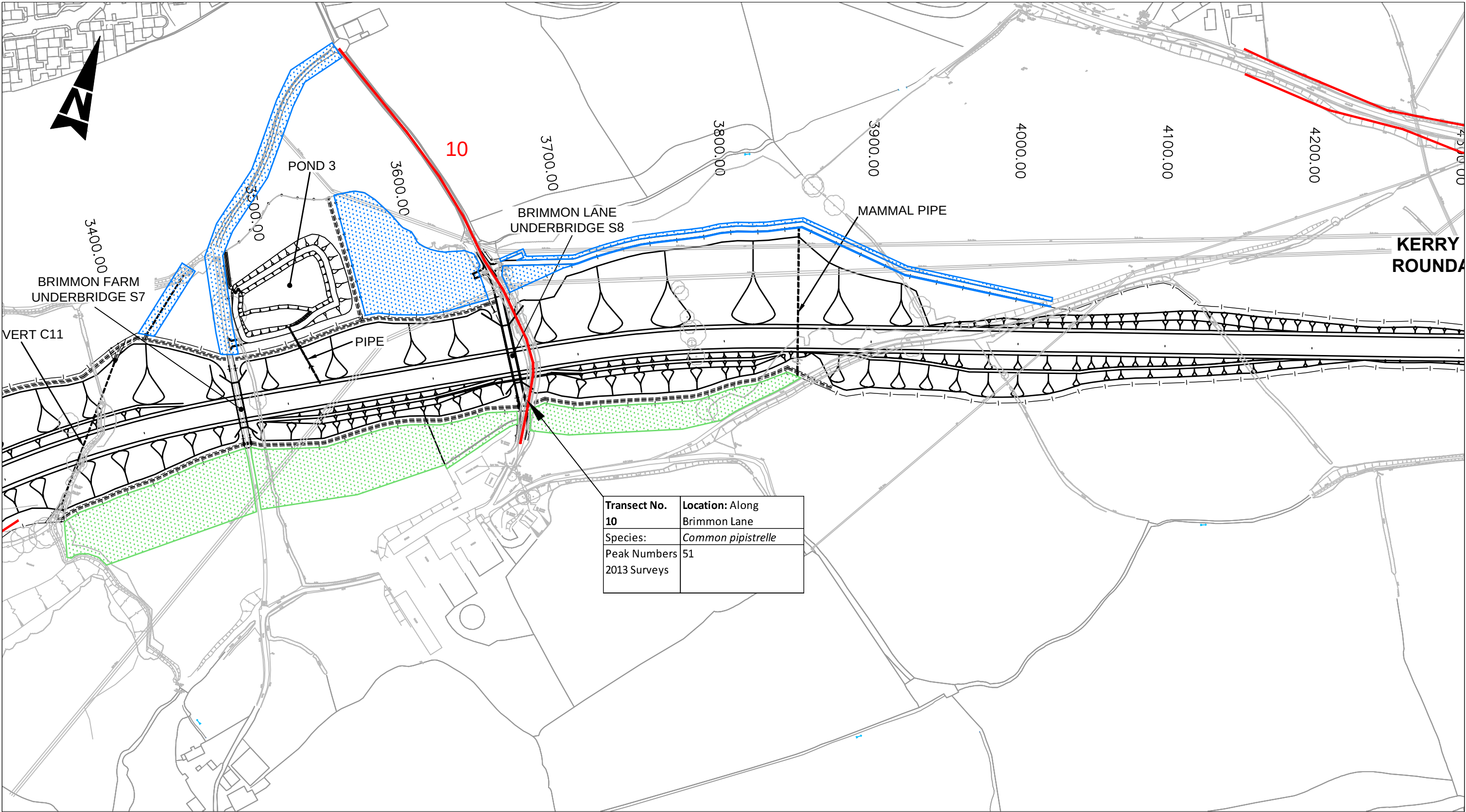
Bat Activity Survey 2013 Transects

Attenuation Pond

Site Compound & Storage Areas

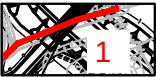
Re-profiled Areas

No commuting bats were identified on transects 1, 2, 3, 4, 6, 7, 9, 11, 13, 14, 15, & 19.



Transect No.	Location: Along Brimmon Lane
Species:	<i>Common pipistrelle</i>
Peak Numbers 2013 Surveys	51

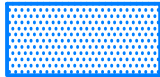
KEY



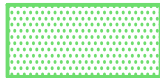
Bat Activity Survey
2013 Transects



Attenuation Pond

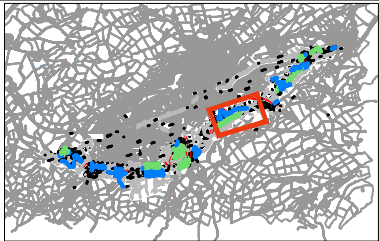


Site Compound &
Storage Areas



Re-profiled
Areas

No commuting bats were identified on transects
1, 2, 3, 4, 6, 7, 9, 11, 13, 14, 15, & 19.



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Llywodraeth Cymru
Welsh Government



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CAPITA

Job Title

A483/A489
Newtown Bypass

Drawing Title

Bat Activity Surveys 2013
Identified Bat Commuting Routes

Sheet 3 of 4

Date

Sept 2014

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FS

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Drawing Status

FINAL

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JW

Job No

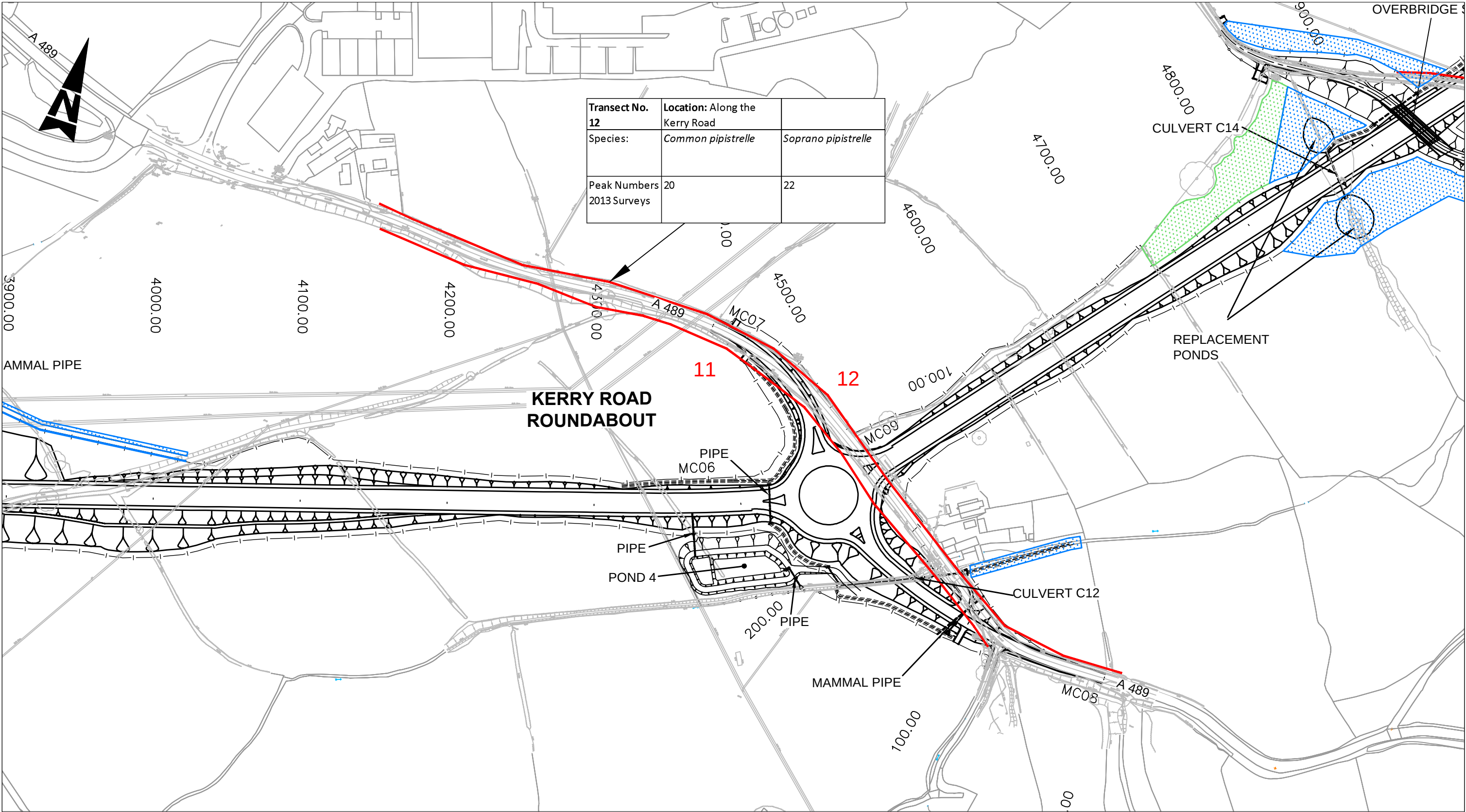
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Figure No

2c

Issue

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Transect No.	Location: Along the Kerry Road	
12		
Species:	Common pipistrelle	Soprano pipistrelle
Peak Numbers 2013 Surveys	20	22

KEY



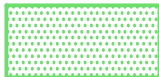
Bat Activity Survey
2013 Transects



Attenuation Pond

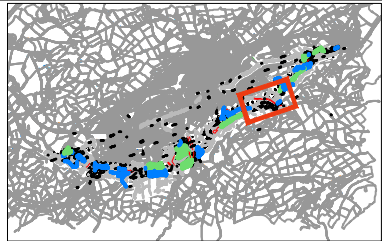


Site Compound &
Storage Areas



Re-profiled
Areas

No commuting bats were identified on transects
1, 2, 3, 4, 6, 7, 9, 11, 13, 14, 15, & 19.



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Newtown Bypass

Drawing Title

Bat Activity Surveys 2013
Identified Bat Commuting Routes

Sheet 4 of 4

Date

Sept 2014

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Scale at A3

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Drawing Status

FINAL

Approved

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Job No

60597

Figure No

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Issue

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Appendix E.9
Bat Building Report

Newtown Buildings Potential Bat Roost Inspections

(Updated 4.7.14)

Carried out on 12th August 2013,
20th April 2014 and 15th May 2014
by Susan Worsfold, Emma Davies,
Max Burrell and Nick Madani

Introduction

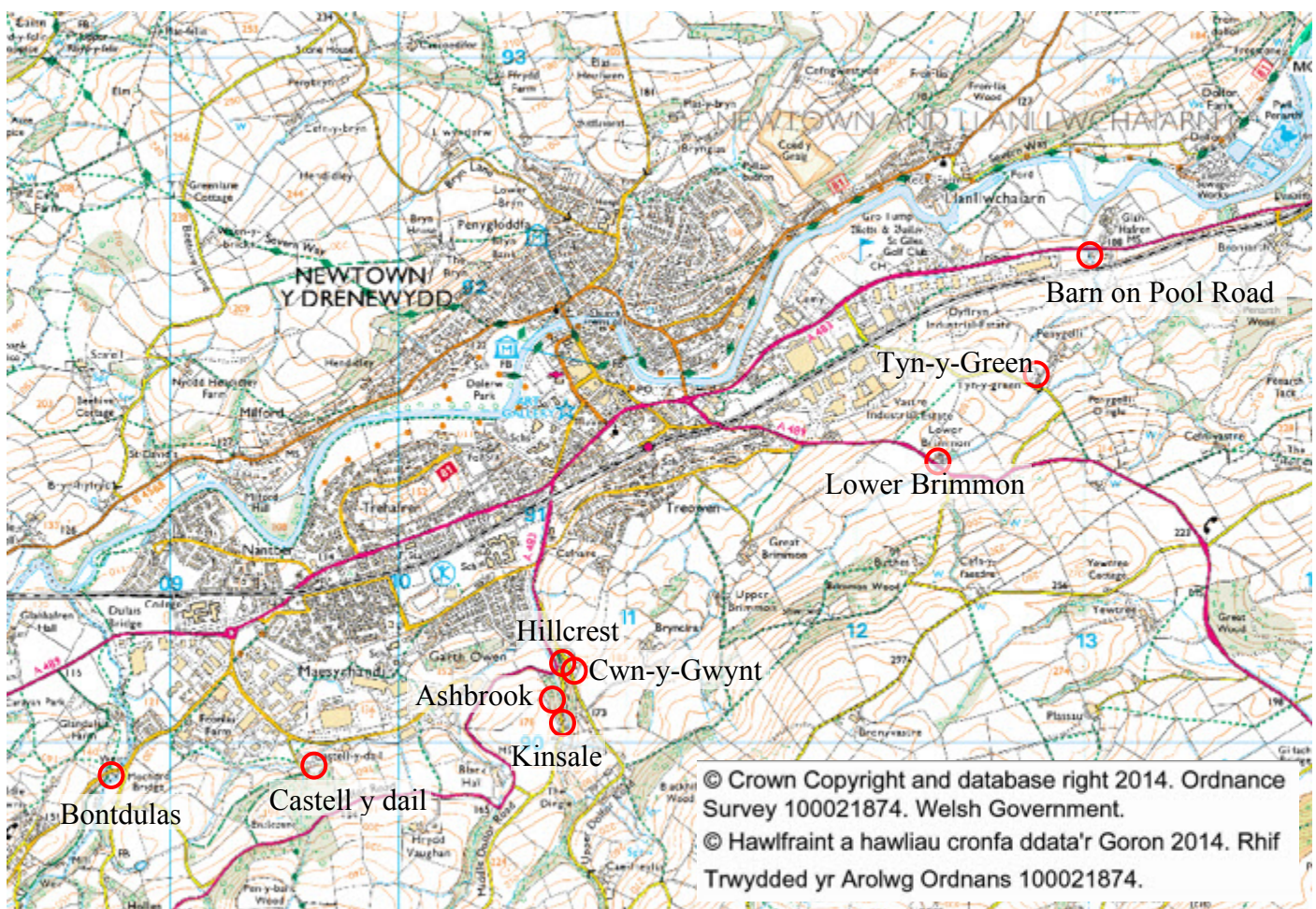
Several buildings and outbuildings were assessed for potential for use by bats in furtherance of proposals for a bypass in the area.

Four of the buildings had previously been identified as potentially suitable for use by bats in the Capita Symonds report of September 2012, 'A483/A489 Newtown By-Pass Interim Ecological Surveys 2012 and Bat Roost Assessment and Activity Surveys 2012'. Internal inspections were recommended in this report.

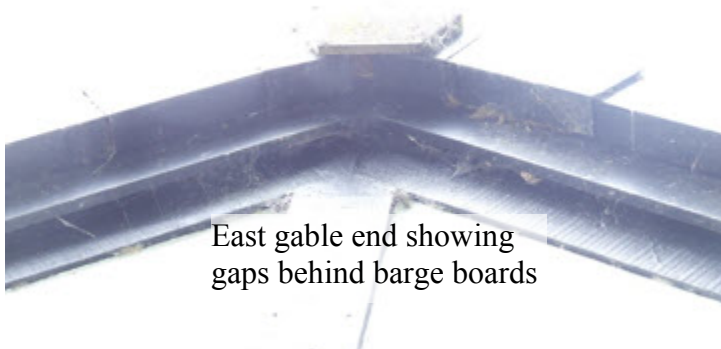
Ashbrook was identified as potentially being used by bats during the walked transect surveys in 2013 by surveyors who noted that bats appeared to be swarming around the building. Kinsale and Tyn-y-Green were identified as being used by bats during the transects of 2013 when bats were seen to enter and/or leave the buildings.

Methods

The buildings were examined in accordance with the BCT Good Practice Guidelines (2nd edition) for signs of use by bats, such as urine stains, rub marks, droppings and insect remains. Any crevices and potential access points were noted to determine the likelihood of use or potential for use as a roost by bats. Binoculars and ladders were used for observation of areas which were otherwise inaccessible. Any areas of significance were photographed. Droppings were collected and sent to the University of



Ashbrook - 12.8.13



East gable end showing gaps behind barge boards



The loft



View from the south east

Description:

Well maintained brick built house with tile roof, lined with bitumastic hessian. Attached garage also brick with lined tile roof. Tiles intact and none damaged or missing. Windows glazed and intact. Barge boards at gable ends.

Evidence of use by bats:

None

Roost potential:

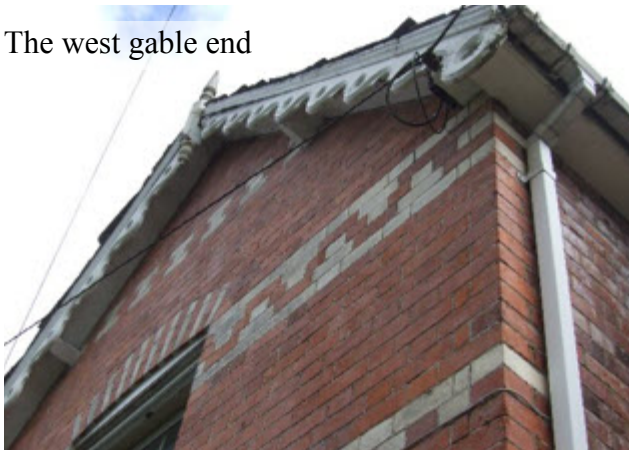
Limited potential for small numbers of transient bats behind barge boards and behind roof lining, also under corner tile of garage. No access points were identified.

Recommendations:

One emergence/re-entry survey to eliminate the possibility of bats using the roof lining as a roost via access points not visible during the inspection, for example under eaves.

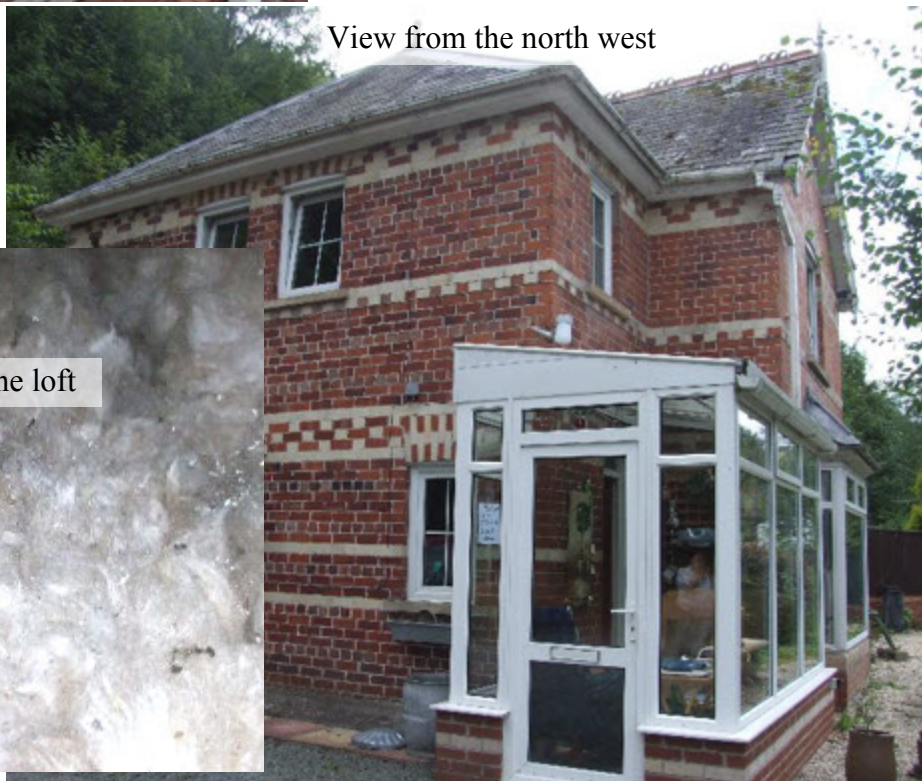
Kinsale - 12.8.13 and 15.5.14

The west gable end

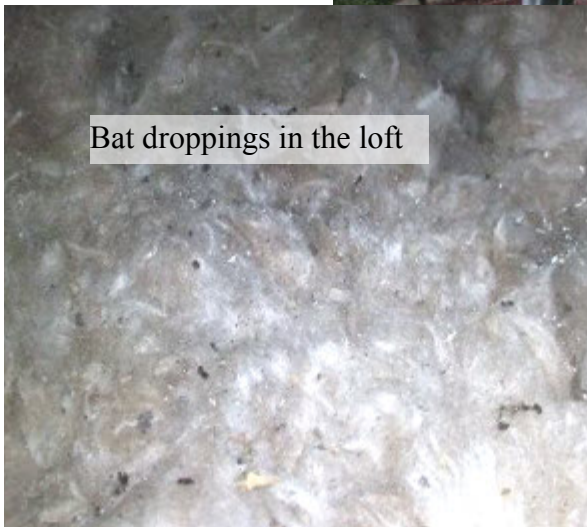


The loft

View from the north west



Bat droppings in the loft



Description:

Brick built house with slate roof, partially lined with bitumastic hessian. Some slates loose and damaged and some gaps in roof seen from the inside of the loft. Windows glazed and intact. Barge boards at gable ends.

Evidence of use by bats:

A small accumulation of 20-30 bat droppings was found in the loft. The same number of droppings were seen on the second visit on 15.5.14 when they were collected and sent for DNA analysis and identified as whiskered bat droppings (*Myotis mystacinus*). The droppings were believed to be the same ones seen on the first visit.

Roost potential:

Some potential behind barge boards and beneath roof lining. There appeared to be some small gaps at the west gable end, where the wall met the soffit. This was where the bat was thought to have been seen to enter during the walked transect.

Recommendations:

Two or three emergence/re-entry surveys to determine the nature of the roost, if it is still in use.

Hillcrest - 12.8.13



Description:

Brick built house with slate roof with torching. A small number of slates slightly damaged with small gaps under some slates including ridge tiles. Windows glazed and intact. Barge boards at gable ends. The loft was not accessible without risk of damage to the kitchen units, due to the position of the hatch, therefore not all areas of the loft could be examined. Photographs were taken through the hatch. There was also a brick built outbuilding with a flat felt roof and a wood garage with corrugated steel roof.

Evidence of use by bats:

None.

Roost potential:

Some potential under slates and ridge tiles of house.

Recommendations:

One emergence/re-entry survey to eliminate the possibility of bats using the loft as a roost via access points not visible during the inspection.

Cwn-y-Gwynt - 12.8.13



Description:

Brick built building with tile roof, some of which were loose or damaged. Roof lined with plastic woven membrane. Garage also brick with tile roof. One section of loft was not accessible.

Evidence of use by bats:

None.

Roost potential:

Some potential under tiles and behind roof lining.

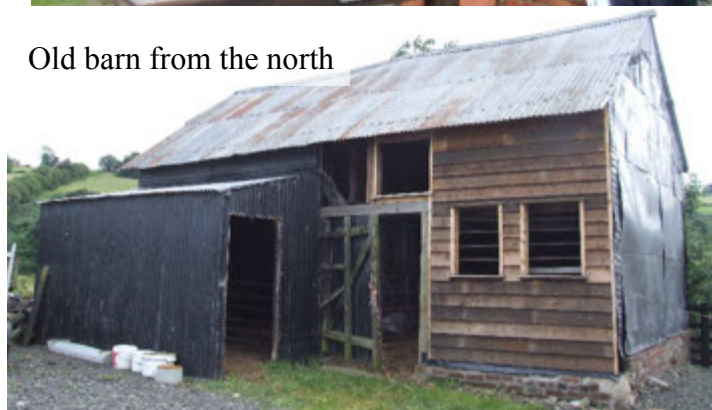
Recommendations:

Two emergence/re-entry survey surveys to establish use by bats, since all sections of the loft could not be examined and access points may not have been visible. A roost would not be apparent if behind the lining.

Tyn-y-Green - 12.8.13



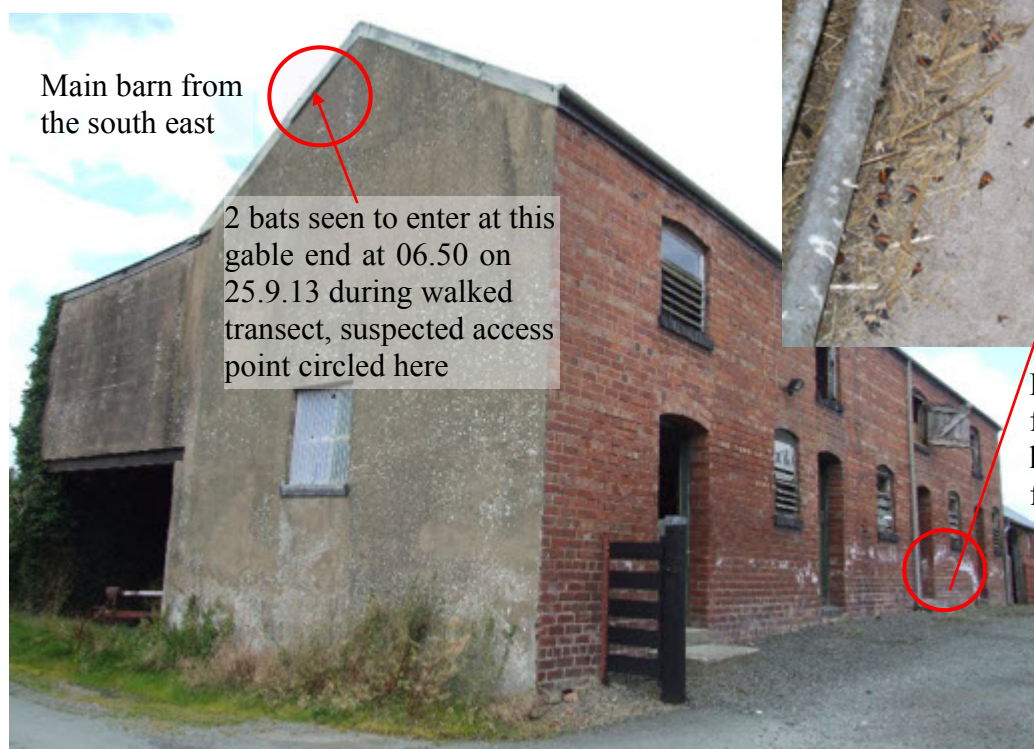
House and stable
from the south west



Old barn from the north



Part of old barn interior

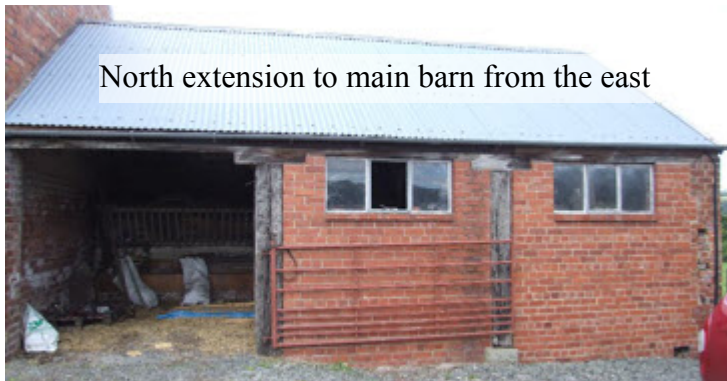


Main barn from
the south east

2 bats seen to enter at this
gable end at 06.50 on
25.9.13 during walked
transect, suspected access
point circled here

Butterfly wings
found just inside
here (3rd room
from the south)

Tyn-y-Green - 12.8.13



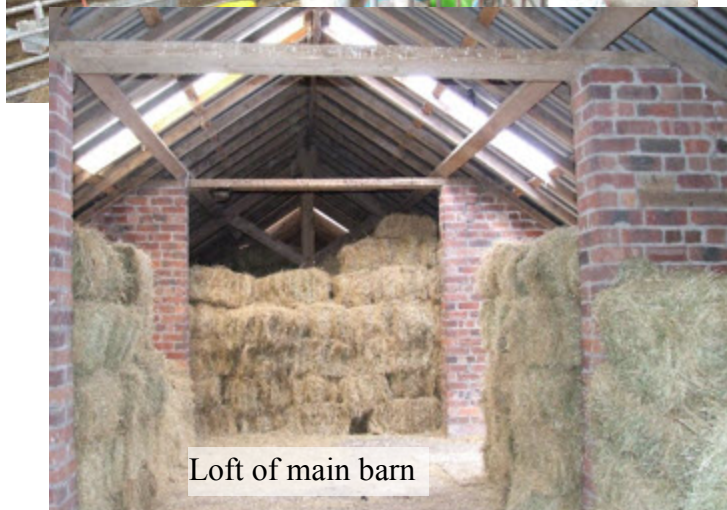
North extension to main barn from the east



One room of main barn interior



Room where butterfly wings were found



Loft of main barn



Dutch barn



Loft of house

Description:

Brick built house with slate roof in a good state of repair. Brick main barn with corrugated steel roof. Wood construction dutch barn with corrugated steel roof. Wood construction old barn with corrugated steel roof.

Evidence of use by bats:

Two significant accumulations of butterfly wings in the main barn, suggesting a regular feeding perch by brown long eared bats *Plecotus auritus*. However, no droppings were seen. Two bats were seen to enter at the south gable end at the end of the walked transect on 25th September 2013.

It is thought that they were using the gap behind the metal edging which had come away from the wall.

Roost potential:

Fairly low potential in the house and stable. However, there were some gaps under flashings and hanging slates at gable ends and behind barge boards of the house. The main barn and old barn had some potential in wooden beams and crevices, and potential access points at the doors and gaps in the wall.

Recommendations:

Two or three emergence/re-entry survey surveys to establish nature of use by bats, to include the main house, barn and old barn.

Lower Brimmon - 12.8.13, 20.4.14 and 15.5.14



View from the south west



The outbuildings from the west



Roof detail of tiled part of black barn



Part of the interior of the black barn

Lower Brimmon



Interior of main brick barn



Part of interior of rear barn



Part of interior of satellite barn



Steel barn

Description:

Brick house with slate roof with some damaged slates and potential access points. Unable to gain access to house interior. Adjacent garage wood and steel with corrugated steel roof. Lower garage wood construction with asbestos or fibre cement roof. Black barn interior. Central black barn is wood with slate roof, several dislodged and damaged. Lean to's brick or steel with corrugated steel roofs. Main brick barn has glazed intact windows and asbestos or cement fibre roof with some open windows. Two further brick/breeze block buildings/stables with asbestos or fibre cement roofs. The other outbuildings in the adjacent field have very low potential due to steel roofs and lack of enclosure. However, evidence of limited use by a barn owl was found in shed 3 in the form of droppings on a wood beam and a single owl pellet.

Evidence of use by bats:

2 droppings in shed 1 indicating single foraging bat

Roost potential:

Very low potential due to steel roofs and lack of enclosure. However, evidence of limited use by a barn owl was found in shed 3 in the form of droppings on a wood beam and a single owl pellet.

Recommendations:

No further surveys considered necessary.

Lower Brimmon Outbuildings - 20.4.14



Shed 1



Shed 1



Shed 1



Shed 2



Shed 2



Shed 3



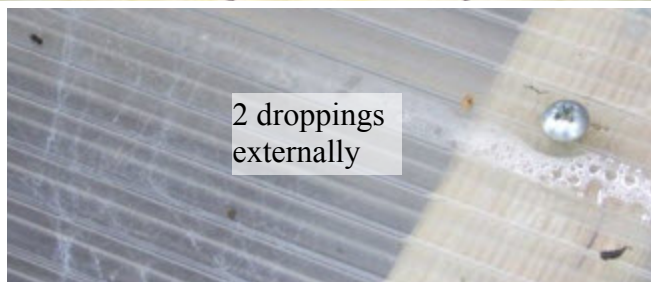
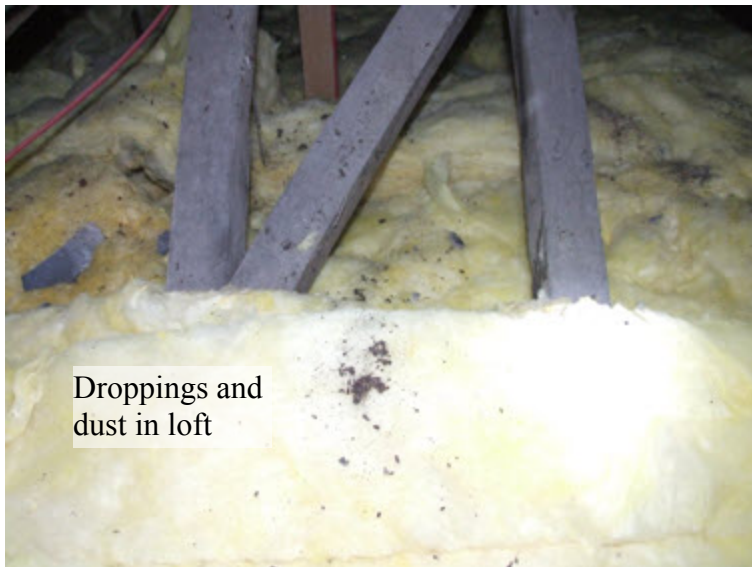
Shed 3

Owl droppings

Lower Brimmon Outbuildings - 20.4.14



Castell y Dail House - 20.4.14



Description:

Well maintained brick built house with tile roof, lined with plastic membrane. Tiles intact and none damaged or missing. Windows glazed and intact. Barge boards at gable ends. We were informed that the roof had been replaced approximately two years ago and a bat survey done at that time which had not identified a roost.

Evidence of use by bats:

Approximately 20 old droppings in each of the two loft areas which were collected and later identified as natterer's bat (*Myotis nattereri*) droppings. Three droppings were found externally at the north east gable end. No access points were identified.

Recommendations:

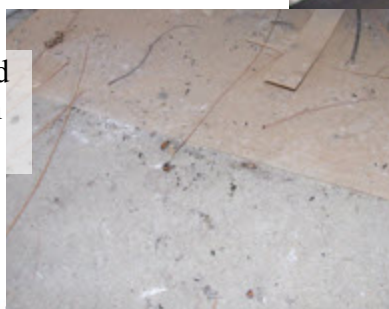
Two emergence/re-entry surveys to determine whether bats are using the loft as a roost via access points not visible during the inspection, for example under eaves.

Castell y Dail Centre - 20.4.14



The granary

Bat droppings and butterfly wings in granary



The granary interior



The north west wing



North west wing loft

Granary:

Description:

Brick building with tile roof in a good state of repair, lined with bitumastic hessian. Windows glazed and intact. Barge boards at gable ends.

Evidence of use by bats:

Two small accumulations of 20-30 bat droppings were found inside (upper storey) with feeding remains (butterfly wings) found in the same area, suggesting a regular feeding perch by bats, possibly brown long-eared bats (*Plecotus auritus*).

Recommendations:

Two or three emergence/re-entry survey surveys to determine the nature of the roost, if it is still in use.

North west wing (water tank loft):

Description:

Brick building with tile roof in a good state of repair, lined with bitumastic hessian. Windows glazed and intact.

Evidence of use by bats:

2 old droppings

Recommendations:

One emergence/re-entry survey.

Barn on Pool Road - 20.4.14



Roof detail



Barn exterior



Barn interior

Description:

Slatted wood walls and corrugated steel roof with plastic windows, concrete pillars and wood beams. Open steel lean-to at the east side.

Evidence of use by bats:

None. Two birds' nests.

Roost potential:

Negligible

Recommendations:

No further surveys considered necessary.

4, Bontdulas - 20.4.14



Description:

Brick built house with tile roof. Tiles intact and none damaged or missing. Windows glazed and intact. Some damage to soffits allowing possible access.

During the visit a neighbour at No. 3 informed us that bats had used the roof of their (the neighbour's) kitchen several years ago, leaving a urine stain on the ceiling, and that bats occasionally entered their house at night through open windows. No evidence of use was apparent at the time of the visit so it is likely that the neighbouring building is no longer used by bats. We were told that roof repairs were carried out 2 years previously which has probably blocked access.

Evidence of use by bats:

None.

Approximately 10 droppings in the storage spaces of the converted loft of no. 4 were collected and sent for DNA analysis but the species was identified as house mouse (*Mus musculus*).

Recommendations:

One emergence/re-entry survey for No. 3. This could also cover No. 4 at no extra effort to eliminate the possibility of any use by bats

Summary conclusions

Since all or some of the roofs at all sites were at least partially lined or inaccessible the only way to be certain if any of the buildings are currently being used by bats would be for at least one emergence/re-entry survey to be done at all sites.

The buildings which showed any significant evidence of use by bats were Kinsale (droppings in the loft), the main barn at Tyn y Green (butterfly wings) and the granary at Castell y Dail Centre (droppings and wings)

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NRW licence number 55624:OTH:CSAB:2014
May 23rd 2014

References

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Appendix E.10
Bat Tree Survey Report



Llywodraeth Cymru
Welsh Government



A483/A489 NEWTOWN BYPASS

Bat Tree Survey Report

July 2014



Llywodraeth Cymru
Welsh Government

A483/A489 Newtown Bypass

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Llywodraeth Cymru
Welsh Government

A483/A489 Newtown Bypass



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Figure 1.0 Preliminary Roost Assessment of Trees 2014



Llywodraeth Cymru
Welsh Government

A483/A489 Newtown Bypass



1. Introduction

1.1. Purpose of this Report

This report has been produced to identify trees which may offer potential as roosting habitat for bats that might be affected by the A483/A489 Newtown Bypass Scheme. It updates preliminary tree roost inspections undertaken in August 2012 following the revised Scheme alignment that is proposed for construction. The information will be used to establish mitigation and licencing requirements with respect to bats.

1.2. Description of the Project

1.2.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.2.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the ES.

1.3. Background

The Welsh Government commissioned Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WelTAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.



The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.

In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.4. The Project Objectives

1.4.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

The Welsh Government's mission is to:

"Promote the vision and transport strategy described in the Welsh Government's 'One Wales: Connecting the Nation', the Wales Transport Strategy, and the National and Regional Transport Plans".

1.4.2. Scheme / Planning Objectives

Seven specific Transport Planning Objectives (TPOs) have been identified for the scheme. These will be achieved by the successful ECI Contractor and several other stakeholders, namely Welsh Government (Objectives 2, 3, 6 and 7) and Powys County Council/TraCC (Objectives 1, 4 and 5). The objectives are detailed below:

Objective 1 – Maintain economic base

- Maintain economic base of Newtown measured by levels of local employment by the date in the local development plan (2025).

Objective 2 – Meeting relevant environmental targets

- Within Newtown settlement boundary limit and within 200m of the scheme;
- Meet targets and comply with appropriate environmental legislation and policies by 2018;
- Reduce greenhouse gas emissions along Pool Road and New Road by 3% from 2008 levels, by 2018 (in accordance with Wales Transport Strategy).



Objective 3 – Removing through traffic from local roads

- Reduce through traffic on Heol Treowen, Plantation Lane and Milford Road by 50% over 2008 levels by 2018;
- Reduce HGVs on Heol Treowen, Plantation Lane by 90% from 2008 levels, by 2018.

Objective 4 – Increasing level of usage for non-car forms of transport

- For travel with origin and destination within Newtown, achieve modal shift of 10% from car to non-car forms of transport (cycling, walking and public transport), over 2008 levels, by 2018;
- For travel with origin or destination within Newtown, achieve modal shift of 2% from car to public transport, over 2008 levels, by 2018.

Objective 5 – Integration of public transport

- Within Newtown limit interchange penalty linking bus services and train services to 20 minutes, by 2018;
- Within Newtown, during morning and evening peak hours (0700-0900 and 1600-1800) limit interchange penalty between bus services to 10 minutes, by 2018.

Objective 6 – Improve journey time consistency (North-South, East-West)

- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A470/A489 junction (Caersws) and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A470/A489 junction (Caersws) by 10% by 2018.

Objective 7 – Reduction in accidents

- Within Newtown settlement boundary limit, reduce road traffic accidents on A483(T), A489(T), Heol Treowen, Plantation Lane and Milford Road by 25% by 2018.

1.5. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.



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Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.

The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.

The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.

The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this roundabout into the Mochdre Industrial Estate along Heol Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Overbridge. A westbound lay-by would be provided east of Wern Ddu Lane.



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An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.



2. Previous work

2.1. Preliminary assessment of trees 2012

A preliminary assessment of trees was undertaken in August 2012 in accordance with the Bat Conservation Trust's Good Practice Guidelines [1]. This focused on a survey corridor base on the then preferred Scheme.

The surveys identified twenty-two 'Category 1' trees, and hedges and areas of woodland containing Category 1 trees within the survey boundary [2]. A number of 'Category 2' trees were also identified both within and outside the survey boundary. These were mature trees with no obvious bat roost features which offered limited roosting potential for bats. Trees that offered no potential for roosting bats were identified as 'Category 3 trees'.

A summary of previous work undertaking in relation to buildings is provided in the Bat Building Survey Report (ES Volume 3, Appendix E.9) and a summary of previous work undertaken in relation to bat activity is provided in the Bat Activity Survey Report (ES Volume 3, Appendix E.8).

2.2. Confirmed roosts in trees from previous activity surveys

During the bat activity surveys conducted in 2013, a possible common pipistrelle tree roost was identified in woodland north-west of Upper Brimmon Farm along with a roost of a single noctule *Nyctalus noctula* in a walnut tree to the north of the Castell-y-Dail woodland (refer to Tree B64 in Table 5.1 and Figure 1.0).



3. Bat Ecology and Legislation

Bats are the only flying mammals, and all UK species are nocturnal and insectivorous, either catching insects on the wing or (for some species) plucking insects from vegetation or from the ground. As in temperate climates there is insufficient insect food during the winter months, all UK bats hibernate during the winter months.

Bats hibernate in features which provide stable low temperatures and high humidity, such as underground sites or well-insulated holes in trees. In contrast, summer roost sites typically receive warmth from the sun or man-made sources, and maternity roosts in particular tend to retain heat well once they are warmed up (this benefits the pups, which cannot thermoregulate for several days following birth). Bats give birth to a single pup in June or July; some of the larger species may only breed every other year, and some species may not start breeding until they are three years old.

Bats navigate around the landscape surrounding their roosts primarily by echolocation: interpreting the echoes produced by nearby objects when high frequency calls are produced. The attenuation of sound in air places an upper limit on how far ahead bats can perceive objects, which for some species may be less than ten metres. Consequently, bats can find it difficult to cross open areas or gaps created in hedgerows, or do so very close to ground level. Bats are therefore typically found in areas providing a combination of roost sites (in buildings or trees), foraging habitats providing good insect biomass, and a network of linear habitat features, such as hedgerows or ditches which allow bats to commute between roosts and foraging areas.

Some species have specific foraging preferences, such as Daubenton's bats (*Myotis daubentonii*) foraging over water, whilst others are able to exploit a wider range of foraging habitats.

All bats are European Protected Species listed under Annex IV of the Habitats Directive (Council Directive 92/43/EEC), which is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (as amended). Four species: lesser horseshoe (*Rhinolophus hipposideros*), greater horseshoe (*Rhinolophus ferrumequinum*), Bechstein's (*Myotis bechsteinii*) and Barbastelle bats (*Barbastella barbastellus*); are also listed on Annex II of the Directive and are therefore species for which Special Areas of Conservation can be designated. Bats also receive limited protection under the Wildlife and Countryside Act 1981 (as amended).

Seven bat species are currently listed as Species of Principal Importance for nature conservation under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006: soprano pipistrelle (*Pipistrellus pygmaeus*), greater horseshoe, lesser horseshoe, Bechstein's, barbastelle, noctule (*Nyctalus noctula*) and brown long-eared bats (*Plecotus auritus*). Lesser horseshoe and pipistrelles (all species) are also Powys Local BAP priority species, and all bats are TREBAP priority species.



4. Survey Methodology

4.1. Preliminary inspection of trees for roost potential

A preliminary inspection of trees affected by or near to the Scheme was carried out to assess their roosting potential for bats. This followed the protocol for visual inspection of trees due to be affected by aboricultural work as described within the Bat Conservation Trust's Good Practice Guidelines [1].

Trees were inspected from the ground with the aid of close focusing binoculars and a high powered torch. Each tree was then categorised for its value to bats (refer to Table 4.2) based on the presence of features commonly used by bats to roost and field signs that may indicate use of trees by bats (refer to Table 4.1).

The inspections were undertaken on 2nd, 3rd, 9th, 15th, 16th and 23rd April 2014. Trees inspected at this time of year were not in leaf or were just coming into leaf. This meant that views of the trees from the ground were less obstructed than if the trees were surveyed during summer when they are in leaf fully. Undertaking survey at this time of year means bats are less likely to be roosting in trees than during the summer months. Therefore there is less chance of identifying some of the field signs (refer to Table 4.1), which may indicate the presence of bats (e.g. finding droppings or hearing squeaks from entrance holes).

All trees identified as being Category 1*, 1 or 2 (as defined in Table 4.2) were photographed and marked with white and red marker tape in the field and their location marked on a plan. There were some exceptions where trees were not marked with tape, due to potential sensitivities of land owners. Notes were made about the features observed which lead to the categorisation of each tree. Some difficulties were encountered precisely locating some trees in the dense canopy of Castell-y-Dial Wood.

A list of all trees categorised with supporting target notes is provided in Table 5.1.

Table 4.1 'Features of trees commonly used by bats for roosting and shelter and field signs that may indicate use of trees by bats' [1].

<i>Features of trees used as bat roosts</i>	<i>Signs indicating possible use by bats</i>
• <i>Natural holes</i> • <i>Woodpecker holes</i> • <i>Cracks/splits in major limbs</i> • <i>Loose bark</i> • <i>Hollows/cavities</i> • <i>Dense epicormic growth (bats may roost in it)</i> • <i>Bird and bat boxes</i>	• <i>Tiny scratch marks around entry point</i> • <i>Staining around entry point</i> • <i>Bat droppings in, around or below entrance</i> • <i>Audible squeaking at dusk or in warm weather</i> • <i>Flies around entry point</i> • <i>Distinctive smell of bats</i> • <i>Smoothing of surface around cavity</i>



Table 4.2 'Protocol for visual inspection of trees due to be affected by arboricultural work, to assess the value of the trees to bats' [1].

Tree category and description	Further measures to inform proposed mitigation
Known or confirmed roost	Follow NE guidance and Bat Conservation Trust (2012) guidelines, to establish the extent to which bats use the site.
1* Trees with multiple, highly suitable features capable of supporting larger roosts	Avoid disturbance to trees where possible. Further dusk and pre-dawn surveys to establish the presence, species, numbers of bats present and the type of roost.
1 Trees with definite bat potential, supporting fewer suitable features than category 1* trees or with potential for use by single bats	Avoid disturbance to trees where possible. Further dusk and pre-dawn surveys to establish the presence, species, numbers of bats present and the type of roost.
2 Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats	Avoid disturbance to trees where possible. No further surveys
3 Trees with no potential to support bats	None



5. Results

Table 5.1 below identifies and describes all trees that were categorised as either 1*, 1 or 2 that are close to or are affected by the Scheme. The locations and categories of each tree are shown on Figure 1.0 and a catalogue of photographs of each tree and in some cases, the key features of the tree are provided in Appendix A.

All category 1* and 1 trees directly affected by the Scheme in Table 5.1 are highlighted yellow. Category 2 trees directly affected are highlighted blue. Those category 1* and 1 trees not directly affected but within the vicinity of junctions that will be lit are highlighted orange. Trees that have been identified as having roosting bats present through previous survey work are highlighted red (although this not is directly affected).

Table 5.1 – Results of 2014 preliminary inspection to identify trees with potential for supporting roosting bats.

Key:

	Category 1* and 1 trees on Scheme footprint (directly affected)
	Category 1* and 1 trees close to lit Junctions (possibly indirectly affected)
	Category 2 trees on Scheme footprint (directly affected)
	Roost confirmed during previous activity surveys (regards of whether directly/indirectly affected).

Ref. No	Species	Notes	Category ¹
B1	Willow	Dead / dying. Much obscured by ivy some ivy stems wrist thick. One limb fallen. Some limited potential.	2
B2	Not known	Looks mostly dead and covered with ivy. Dead broken limb with ivy lying across gives some limited potential.	2
B3	Oak	Thick ivy stems have some limited potential. Ivy also obscures much of tree. Some dead limbs.	2
		Large tree (probably Oak) on opposite side of the river which looks probably Category 1.	
B4	Oak	Split in trunk approx. 5m up, but can't tell depth.	2

¹ Tree categories based on Hunt, L (2012) Bat Surveys: Good Practice Guidelines, Second Edition. Bat Conservation Trust



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Ref. No	Species	Notes	Category ¹
B5	Oak	Small splits in bark at chest height, has some limited potential. Small hole left from broken branch above head height also has limited potential.	2
B6	Oak	Split in bark on main trunk and onto limb approx. 6 – 8m up. Also appears to be cavities in lowest limb.	1
		No features that have potential for roosting bats were observed in other trees within this group.	
B7	Sycamore	Hole leading to split along one of the main vertical stems (approx. south facing) also damaged and rotten sections with some crevices giving some other minor potential.	1
B8	Ash?	Slender tree. Two woodpecker holes near the top of the trunk facing approx. east / southeast.	1
B9	Sycamore	Several holes. One in branch hanging down appears to have good potential. Some other small rot holes on south side of tree.	1
B10	Sycamore	Several holes including a fairly large south facing hole in trunk.	1*
B11	Beech	Large tree with a number of natural cavities in the trunk underneath branches. These are on all sides of the tree. Note that these cavities that can be observed at ground level do not appear to extend to any great depth.	1
B12	Sycamore	Fairly large hole in trunk facing north approximately 2.5m from ground.	1
B13	Sycamore	Several holes in rotting branches, one facing southwest and leading upwards.	1
B14	Ash	Small tree which appears to be dying, with tree (larch?) lying against it. Fairly large hollow in trunk which appears to lead upward.	1
B15	Sycamore	Several south facing rot holes in branches leading to cavities. From the ground, these do not appear to be very deep. Other holes higher up.	1
B16	Sycamore	Small tree with several dead limbs that have several holes and crevices, most on southern side of tree.	1
		Note: monolithed tree (larch?) adjacent to B16 with bird next box	



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Ref. No	Species	Notes	Category ¹
B17	Cherry?	Good approx. south facing cavity in trunk, which appears to lead upwards for some way, but unsure of extent.	1
B18	Ash	No obvious features but fairly dense ivy growth around trunk and some thicker than wrist. Tree is large so may be some cavities that are not seen.	2
		Large Oak next to B18, but no suitable features visible (Cat 3).	
B19	Hawthorn	Hollow between two trunks meeting that extends upwards.	2
B20	Ash	Fairly large tree with limited potential, but a split along one dead vertical limb with ivy growing along.	2
B21	Hazel	Corner of Mochdre lane. Two trunks twisted together providing possible crevice. Much obscured by ivy (thin). Some limited potential possible.	2
		Other trees in the area that were looked at include an Ash opposite B22. Trunks were growing together, but no suitable crevice. Also Willow on the east side of Mochdre Brook inspected. A few broken branches and shallow rot holes, but no crevices suitable for bats.	
B22	Ash	Small tree, lots of dead wood. Some shallow crevices under bark. One small hole from broken branch, which could not be seen into.	2
B23	Ash	Large tree with dense ivy growth, with some stems thigh thickness. Other features observed include split bark and a hole from broken branch.	1
B24	Sycamore?	Very large tree with multiple holes suitable for roosting bats. Main trunk appears hollow and could have quite a wide cavity inside.	1*
B25	Ash	Fairly large tree. Woodpecker hole approximately 6 – 8m up. Also some splits in the bark on one limb. Ivy may obscure other potential.	1
B26	Ash	(next to B25) Hole in trunk where branch has rotted and fallen off (approx. 5m up). Woodpecker hole also and cracks at the bottom of a broken limb.	1
B27	Oak	Located near the start of the disused part of the badger sett. No great potential other than a split	2



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Ref. No	Species	Notes	Category ¹
		between a limb which may have a cavity leading back. Good sized Oak.	
		Two other Oak, one next to B27 and one just down the slope of good size, but no obvious features.	
B28	Ash	Fairly large tree, with a couple of holes. Not sure how far back they go. Could have some potential. On proposed access track, will be retained if possible.	2
B29	Oak	Fairly large tree with rotten split limbs which offer some potential. Also a small hole, near the top of the trunk and some splits in the bark. On proposed access track, will be retained if possible.	1
B30	Oak	Group of x3 Oak trees. Not many visible signs – visible holes in the two smaller trees.	2
B31	Ash	Large split going all the way up trunk. Seems mostly superficial, but definitely some room behind, giving potential. Also a rotten limb approximately 8m up.	1
B32	Ash	Two woodpecker holes next to each other on underside of a limb. Wearing noted below one of the holes. Looks a good sign, but the only one noted.	1
B33	Ash	Fallen tree with large split along trunk revealing what appears to be a deep cavity. Other splits further up the trunk. Possibly view with endoscope?	1*
B34	Ash	One feature – a hole / crevice at the bottom of a rotten broken-off limb.	2
B35	Ash	Next to path. Large split running all the way up trunk and up the second limb. Seems fairly superficial, but possibly some room behind.	2
B36	Alder	Next to gate. Split running upwards along one limb.	1
B37	Alder	Good potential with hole leading into what appears to be a quite hollow trunk	1
B38	Willow sp.	Large stump with cavity inside.	2
B39	Alder	Fairly largish tree with one hole observed. Unsure how far back it goes. Black bird nesting near the base in epicormic growth.	2
B40	Ash	No very obvious potential but thick ivy stems so some potential to get behind. Much of the tree is also obscured by ivy so there could be unseen potential.	2



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Ref. No	Species	Notes	Category ¹
B41	Oak	No obvious signs other than splits where limbs have fallen / have been cut off. One hole from broken branch approx. 3m up, but does not look as though it goes back very far.	2
B42	Ash	Split in the limb could have some minor potential (approx. 5m up).	2
B43, B44, B45 & B46	Ash	Group of four trees, no very obvious signs, but fairly large trees with some minor features such as splits in bark.	2
B47	Oak	Bat box. No other features present	2
B48	Oak	Large tree with some dead / dying branches. No obvious potential other than some cracks and crevices around dead and dying branches.	2
B49	Oak?	Three small holes. Two appear to have minor potential, the other has better potential.	1
B50	Unknown	Dead / dying tree with some cracks and crevices which have minor potential. On proposed access track, will be retained if possible.	2
B51	Oak	Hole facing east, which does not appear to have any significant depth, but cannot be sure. On proposed access track, will be retained if possible.	2
B52	Oak	Fairly large tree next to path. No real positive features other than splits and possible crevice in a lower broken limb (difficult to see).	2
B53	Oak?	Near gate into Coleg Powys land. No obvious features, although some fairly thick ivy stems. Other potential possible due to size of tree.	2
		A smaller Oak alongside, and although it has several rotten limbs, no holes were seen.	
B54	Oak?	Small crevice where bough has broken, which has some limited potential	2
B55	Ash?	Located next to B56. Split running up the trunk on the southern side of tree has good potential.	1
B56	Birch	Tree leaning against another tree just south of the split in the path. Hollow running upwards inside tree has good potential. Located on southern side of tree.	1



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Ref. No	Species	Notes	Category ¹
B57	Oak	No obvious features other than crevices either side of where a dead limb has grown over another limb.	2
B58	Ash	Tree with bat box. No other potential	2
B59	Unknown	Dead tree. Split in trunk but no depth to cavity. Hole also in trunk on north side, which does not appear to be deep. On proposed access track, will be retained if possible.	2
B60	Oak	Dying tree with some potential such as cracks and splits around rotting branches.	2
B61	Oak?	Moss covered tree with several dying branches. Hole in trunk, but does not seem to go back. Minor potential with lifting bark and cracks around rotting branches. On proposed access track, will be retained if possible.	2
B62	Oak?	Dead / dying tree. No obvious potential other than small crevices around dead branches and some peeling bark.	2
B63	Oak	Large tree next to path. Only feature observed was a split along one of the lower limbs. No holes observed.	2
B64	Walnut	Very large hollow in coppiced section. A number of other holes in the other trunk which also has a hollow section.	Previously confirmed roost
B65	Oak	Number of dead limbs. Lower limb has a hole present, but does not appear to go too far back. Possibly other unseen potential.	2
B66	Weeping Ash	Tree in grounds of Castell-y-Dial. Good hole with possible staining running out the bottom. A number of other holes also present. Note – from conversations with owner and observations during visit on 09/04/2013 – squirrels are present within tree. This would reduce the likelihood of bats being present.	1*
B67	Oak	Fairly large Oak. Very little potential visible other than lifting bark from lower limbs.	2
B68	Oak	Smaller tree next to B67. One small hole observed.	2
		Note: Fairly large Ash next to style at start of Bridleway at Castell-y-Dial, but no features observed (Cat. 3).	



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Ref. No	Species	Notes	Category ¹
B69, B70 & B71	Oak	Group of three Oaks next to stream. No real signs visible, but two are a good size and partly obscured by ivy growth so could have some potential.	2
B72	Beech	Large tree with dead broken vertical limb near the top of tree facing approx. east with a hole (probably woodpecker). Not much other potential visible – a few dead limbs with minor cracks and splits.	1
B73	Beech	Large tree with two trunks (located down slope from B127). Limited potential visible such as minor cracks and splits in dead limbs, but good sized tree.	2
B74	Beech	Slim tree with small Oak leaning against it. There appears to be a hole where the two trunks meet currently occupied by Blue Tits (entrance cannot be seen, but Blue Tits observed going in and out)	2
B75	Oak?	Large tree, partly ivy clad. Possible hole near top of the trunk (but could be just gap behind ivy). No other obvious features other than behind ivy.	2
B76	Oak	Moss covered, with some dead branches with small shallow cracks and crevices - minor potential.	2
B77	Oak?	Large moss covered tree. Some dead branches with small shallow cracks and crevices, which have minor potential. Other than that no potential visible.	2
B78	Birch	Hollow along branch possibly extending upwards.	1
B79	Ash	Large tree at top of road next to Castell-y-Dial House. A number of holes, some in rotten limbs. Also splits in broken branches. Looks to have good potential. Note – marker left on hawthorn next to tree.	1
B80	Oak?	Small dead / dying tree. Split towards top of trunk which faces south-west does not appear to be very deep, but possibly some potential.	2
B81	Unknown	Fairly small tree with a hole in a limb that may extend upwards.	1
B82	Oak	Some suitable features including a small split in one stem. Couple of holes, but not sure how deep.	2
B83	Unknown	Fairly small tree which looks dead. Some potential as there are a number of areas where bark has lifted. Some holes that do not appear to go back very far.	2



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Ref. No	Species	Notes	Category ¹
B84 & B85	Oaks	Two large Oaks. Much of their crowns obscured by other trees. No signs observed, but may have unseen potential.	2
		Fairly large Oak just to the east checked, but no signs observed.	
B86	Ash	Fairly large tree along fence line. A small hole in trunk, but no other visible features other than minor pieces of loose bark. On proposed access track, will be retained if possible.	2
		Other trees along fence line to the north were observed, but no potential features recorded.	
B87	Oak	Oak with large split through the middle of its trunk. Limited potential. A few shallow rot holes and areas of loose bark. Good sized tree.	2
		No observed potential in other trees in group.	
B88	Oak	Number of dead lower limbs. Hole in one lower limb, unsure of extent. No other potential features noted.	2
B89	Dead tree	Dead tree with several small cracks, crevices and peeling bark. Hole in trunk does not lead in.	2
B90	Ash	Three holes observed, two woodpecker and one rot hole from fallen branch.	1
B91	Ash	Hollow observed in east-facing limb. Other crevice feature on a damaged higher branch. No marker.	1
B92	Oak	Large tree no marker. Only one minor feature noted – small split in one of the lower limbs. No other feature observed, but good sized tree.	2
B93	Ash	Good woodpecker hole in western vertical limb, smaller hole in the crack next to it.	1
B94	Hawthorn	Small hawthorn with hollow trunk. Access holes from the top and bottom. Nuthatch flew out of top hollow, could be nesting.	2
		Dead larch with broken top looked at, but not considered to have potential as holes towards the top were too shallow and exposed.	
B95	Oak	Fairly large Oak at the top of a very steep embankment overlooking a stream. West facing	2



Ref. No	Species	Notes	Category ¹
		hollow at the base of the tree, which may lead to a hollow cavity inside trunk No other features observed.	
B96	Alder	Woodpecker holes in the west facing trunk. Some minor potential near the base where there are some crevices created from trunks coming together.	1
B97	Oak	A number of lower limbs rotting, but no obvious good potential. Some minor potential under lifting bark and splits in dead lower limbs.	2
B98	Oak	Fairly large Oak. Three woodpecker holes and one hole from a split. Fairly good potential.	1
B99	Oak	Mature tree with limited potential visible. Split along one limb, but facing upwards.	2
B100	Oak	Tree within hedgerow, which has been coppiced at one time. Some minor potential where there is a gap between rotten stump and trunk.	2
B101	Ash	Next to B102. Hole in trunk offers some potential. Other minor features such as loose bark.	2
B102	Ash	Several holes where branches once were, provides some potential, but unsure of depth of holes.	1
B103	Oak	Minor potential – shallow crevices where branches have rotted and limbs have broken.	2
B104a	Oak	Hole in trunk, leading to cavity. Board covering an open part of the cavity in the trunk. Additional hole above this in limb.	1
B104b	Oak	Thick ivy (arm thickness) providing a matt on trunk with room behind. Some splits in lower limbs and loose bark.	2
B104c	Oak	Some dead branches with some splits giving minor potential.	2
B104d	Oak	Hole visible in north facing limb. Some other minor rot holes, crevices where limbs have grown over each other and some splits on underside of limb.	1
B105	Oak	Fairly large tree with only features with minor potential visible including a crevice at the end of a split limb under some bark and some loose bark where the central limb is dead.	2



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Ref. No	Species	Notes	Category ¹
B106	Oak	Some features with minor potential including a small hole in the main trunk, some small pieces of lifting bark and a split along one of the lower limbs.	2
B107	Oak	Smaller Oak next to B106. Some potential including a small rot hole where a branch has broken off.	2
		Note both B106 and B107 are at the top of a hill and are quite exposed, which perhaps reduces the likelihood of usage by bats.	
B108	Oak	Woodpecker hole in main trunk, a few other minor features including a split in the underside of a limb, which could lead to a cavity. Some shallow holes in the bark and a split where a limb has broken.	1
B109	Oak	Small slim tree overlooking the bus park on Middle Dolfor Road. One small hole in the main trunk, just above the first dead limb.	1
B110	Alder?	Small, slim tree, with a rot hole extending upwards where a limb has broken.	1
B111	Ash	Some minor potential including a rot hole at the bottom but no deep crevice. One hole also in the trunk which is quite narrow and small, but some decay in the tree might mean there is an inner cavity.	2
B112	Larch	Large dense matt of lifting ivy all the way up main trunk, which provides some potential. Appears to be holes / indents in ivy matt which may be holes leading inwards.	2
B113	Oak	Large tree with one potential roost feature observed; a hole that appears to go back a little way.	2
B114	Oak	Fairly large tree with split in one of the lower limbs. Some other smaller splits in other limbs which have less potential.	2
B115	Willow Sp.	Fairly large tree in private garden opposite bus park. Hole in one of the main boughs. Could have potential if the cavity goes upwards. No marker.	2
B116	Ash	Difficult access. Viewed from outside the bus park on Middle Dolfor Road. Hole from where branch once was with two other holes above this.	1
B117	Beech	Fairly large tree. Good features including rot hole in lower branch. Woodpecker hole in underside of limb and split along limb. No tag	1



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Ref. No	Species	Notes	Category ¹
B118	Oak	Only minor features visible including a small split in limb with small cavity, but a good looking tree at first glance.	2
B119	Oak	Fairly large tree. A number of cavities splits and holes including a fairly large hole into the main trunk where a limb has fallen. Looks to have good potential. No tag.	1
B120	Oak	A number of dead limbs with two holes, one where light can be seen from the back. The other hole seems to be heading downward but as the back of the hole can be seen, so potential considered low. Other minor potential such as small splits and lifting bark.	2
B121	Oak	Large tree. Small hole with very obvious black staining running out of the bottom of the hole. Not many other features visible. Some splits from broken limb.	1*
		Note a number of smaller trees to the south with some potential, but sufficient distance from Scheme.	
B122	Unknown	Three woodpecker holes in damaged trunk. Small hole with possible staining on adjacent larger trunk.	1*
B123	Willow	Two woodpecker holes (north facing). Large split in the main trunk possibly leading to a hollow inside. Other minor features including splits in limb.	1
B124	Willow	Large tree. East facing woodpecker hole and other features such as splits. Good potential.	1
B125	Willow	Large tree with a broken hanging limb. Three woodpecker holes which seems fairly superficial. Better and larger hole above these facing easts. Two other woodpecker holes facing west and other features of lower potential including splits in limbs.	1*
B126	Willow	Large tree also with broken limb. Five approx. south-facing woodpecker holes and two approx. north facing. Three large split limbs. Very good potential.	1*
B127	Oak	Good woodpecker hole about head height and a hole below it leading upwards into trunk (could be a good sized cavity inside). No other features observed.	1
		No potential features observed in Oak next to B127	



Ref. No	Species	Notes	Category ¹
B128	Oak	Next to B129. Minor potential with rot hole in underside of smallish branch.	2
B129	Ash	Limited potential, but some thick (arm thickness) ivy over tree with some small crevices where branches have broken.	2
B130	Oak	Fairly small tree. Features with minor potential include lifting bark and a couple of holes where branches have broken, but do not seem to go in very far. A nice split in a higher limb with what appears to be a cavity leading up.	1
B131	Oak	A number of features with minor potential such as a small hole in the main trunk. Unsure of extent. Some small pieces of lifting bark.	2
B132	Oak	Woodpecker hole facing approximately south-west. Other features with some potential include crevice at base of rotten broken limb and other crevices where limbs have broken.	1
B133	Ash	Split towards top of main trunk, also hollow branch appearing to lead into trunk below this.	1
B134	Oak	Fairly large hole leading into what seems to be a fairly large cavity in trunk. Trunk split at the top where two vertical limbs come off.	1
B135	Ash	No very good features, but a number of small rot holes plus one larger one (going downwards) facing south unsure of depth, may just be superficial.	2
B136	Oak	Only very minor potential. Small hole facing north, unsure of extent. Crevice between bark and main branch where limb has snapped.	2
B137a	Oak	Veteran tree. No obvious holes, other than small south facing hole at top of the southern vertical limb (looks like it may be quite shallow). Good potential under numerous areas of peeling bark and in epicormic growth and splits in the main limbs. Not much suitable surrounding vegetation.	1
B137b	Oak	Heavily coppiced old Oak, next to Lower Brimmon Farm House. A number of cracks and hollows in the trunk which provide good potential	1
B138	Oak	Large tree, no good holes observed, but many areas of peeling bark and crevices around rotten and broken branches.	2



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Ref. No	Species	Notes	Category ¹
B139	Ash	Limited potential, but small hole where branch has broken. Not sure of depth, could be quite shallow, but some potential if it is sufficient depth.	2
B140	Willow	Stump of large tree, with new growth sprouting. Hole leading into stump. Stump appears quite hollow in places.	2
B141	Sweet Chestnut	Big tree –near veteran. Good looking hole in branch off one of the lower limbs with possible black staining underneath. Other features with less potential include a small hole on the north side at the top of a rotten cut off limb, some lifting bark and small cracks and crevices.	1
B142	Ash	Limited potential, some cracks and splits where limbs have broken.	2



6. Recommendations

Following the preliminary roost assessment, it is recommended that Category 1* and 1 trees affected by the footprint of the Scheme or lighting from the junctions (i.e. those highlighted either yellow or orange in Table 5.1 above) should be subject to closer inspection through tree climbing surveys (34 trees in total). Category 2 trees affected by the footprint of the Scheme (i.e. those highlighted light blue in Table 5.1) would be felled taking reasonable avoidance measures, described in the Bat Tree Method Statement (refer to Appendix B) which has been agreed with NRW. This follows the general approach outlined in the Bat Conservation Trust's Good Practice Guidelines [1] (refer to Table 4.1).

Further survey work on trees that are not affected directly by the Scheme footprint or lighting from junctions should be negated on the basis that activity surveys have been carried out and mitigation has been designed for the identified commuting routes (i.e. underpasses and oversized culverts provided under the road).

Tree climbing inspections of Category 1* and 1 trees directly and indirectly affected would involve a licenced and appropriately trained bat worker (or licence bat worker supervising an appropriately trained person in tree climbing from the ground) to climb the trees and investigate in more detail with the use of an endoscope the features that have the potential to support roosting bats. As it is not possible to confirm the potential of a feature in a tree from the ground, it is considered that potential of many of the trees to support bats would be revised following the tree climbing inspection. The exercise may also confirm the presence of roosts and identify which species are using them and in what numbers.

It is proposed that during the tree climbing inspection, features such as holes or crevices would be blocked up to prevent them being used in the future as roosts by bats. This would only be carried out on trees directly affected by the Scheme (i.e. those to be lost during site clearance), those which are not known roosts and where there is no evidence of use by bats following a full endoscopic inspection to confirm all parts of the cavity are unoccupied.

Following the tree climbing assessment any trees that have evidence of use by bats or which could not be checked during the tree climbing inspections would be subject to dusk emergence / dawn re-entry surveys in accordance with the Bat Conservation Trust's Good Practice Guidelines [1].

It is recommended that tree climbing inspections are undertaken in spring/summer 2015 and close liaison with NRW will be maintained during the course of the surveys. Site clearance work is programmed to commence in autumn 2015. Therefore if tree climbing inspections and dusk exit / dawn re-entry surveys were to take place during summer 2014, further surveys would be required prior to construction.

All Category 1* and 1 trees subject to tree climbing inspections and dawn and dusk surveys would be felled in accordance with the Bat Tree Method Statement (refer to Appendix B), provided the surveys confirmed there was no evidence of roosting bats. If any trees affected were confirmed as bat roosts, these would need to be felled under an



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EPS Licence. A Ghost EPS Licence has been prepared in relation to known building roosts (refer to ES Volume 3, Appendix E.11). It is not considered appropriate to prepare a Ghost Licence for potential roosts in trees as no roosts are currently known. A formal licence application will be made prior to construction, if roosting bats are found within any trees to be affected.



7. References

- [1] Hundt, L. (2012). Bat Surveys: Good Practice Guidelines (2nd Edition). Bat Conservation Trust ISBN-13:9781872745985
- [2] Capita Symonds. (2012). A483/A489 Newtown Bypass Interim Ecological Surveys 2012: Bat Roost Assessment and Activity Surveys – September 2012. Welsh Government.

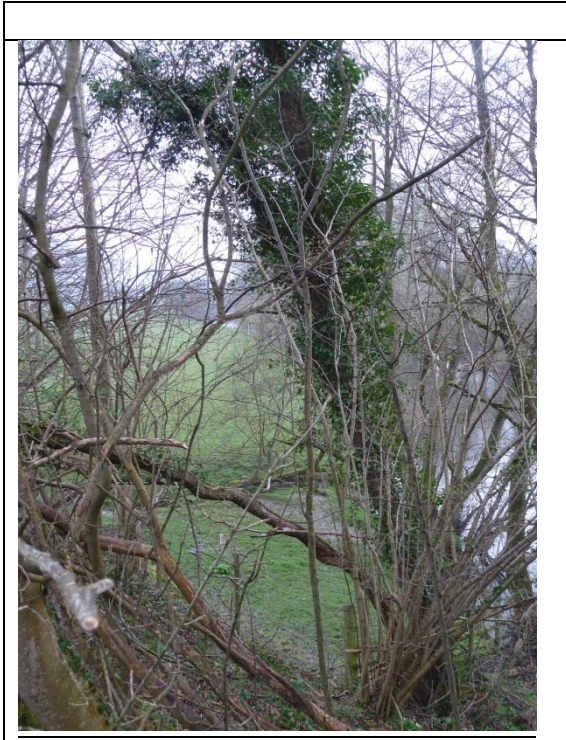
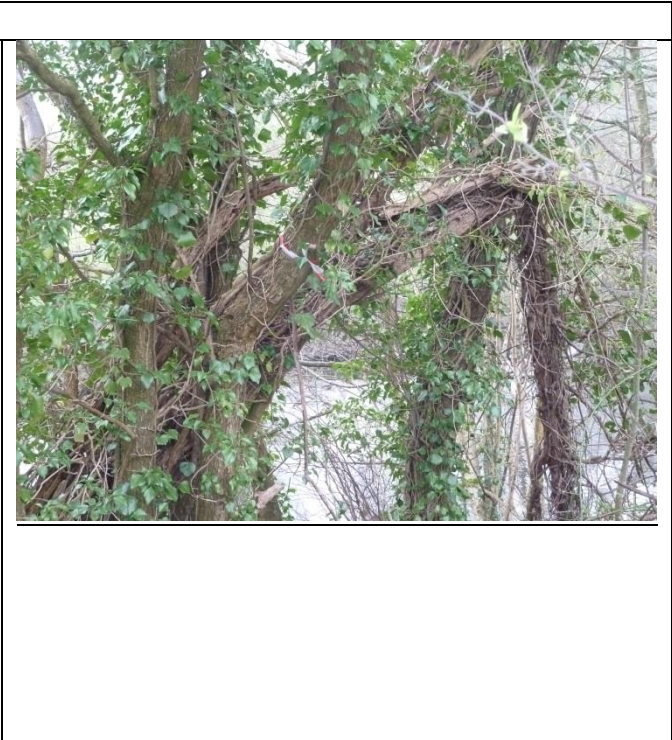
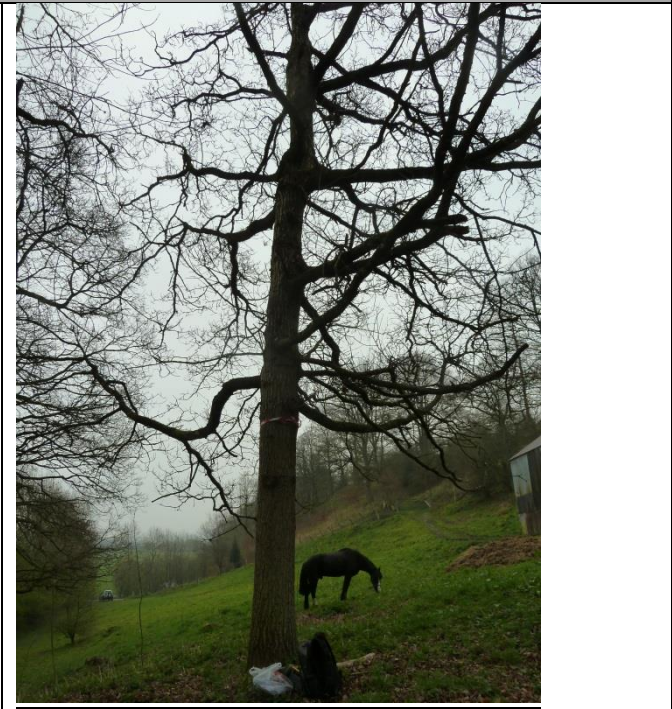


Appendices



Appendix A – Preliminary Roost Assessment of Trees 2014 Photographs

Appendix A – Photographs of trees with bat roost potential

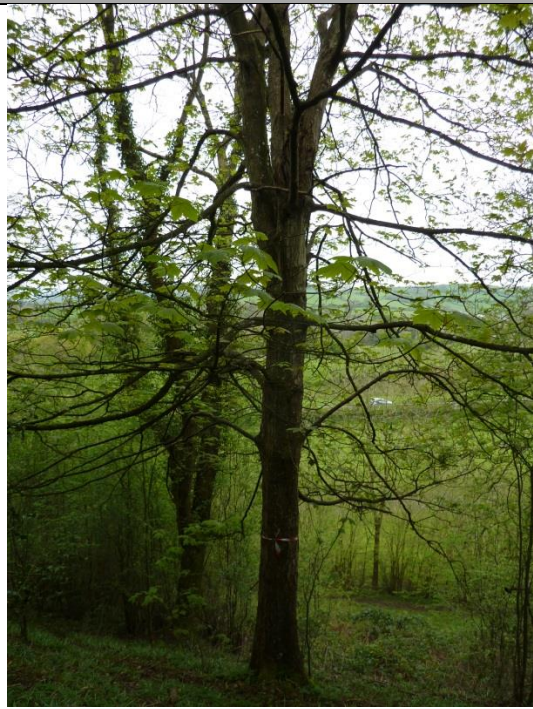
	
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Tree Reference B3	Tree Reference B4



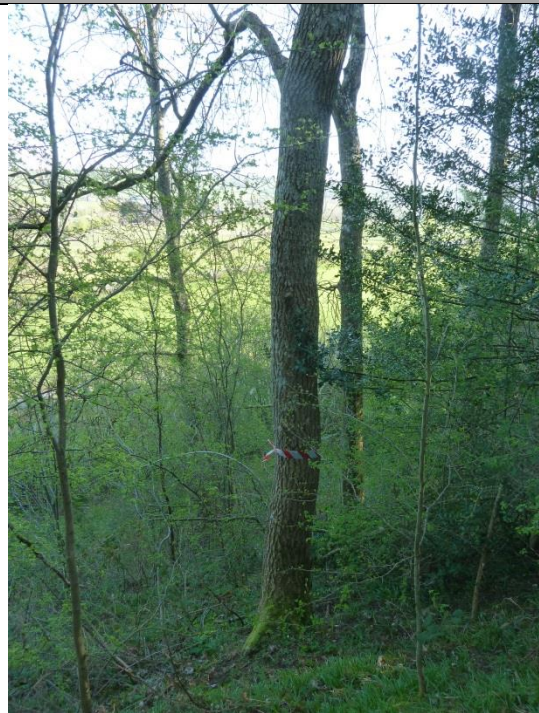
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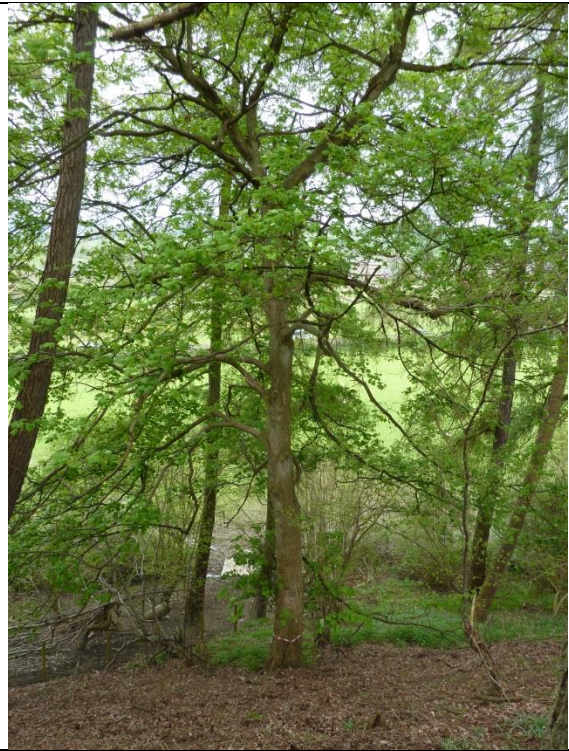
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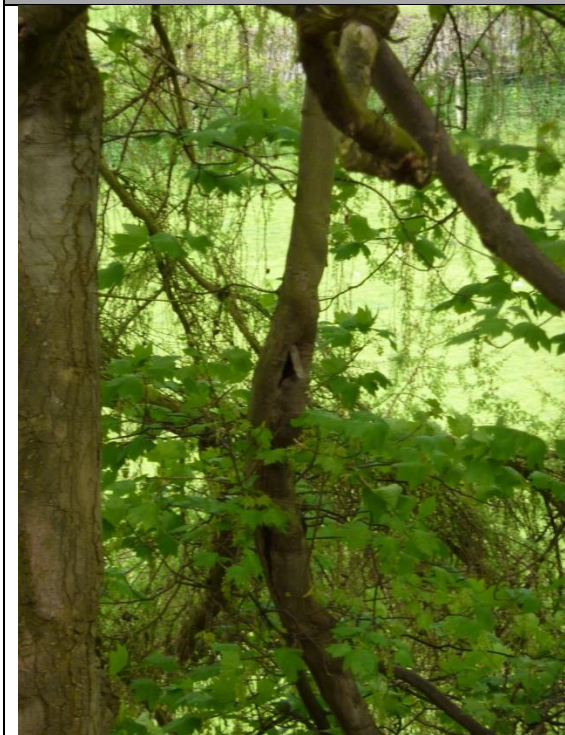
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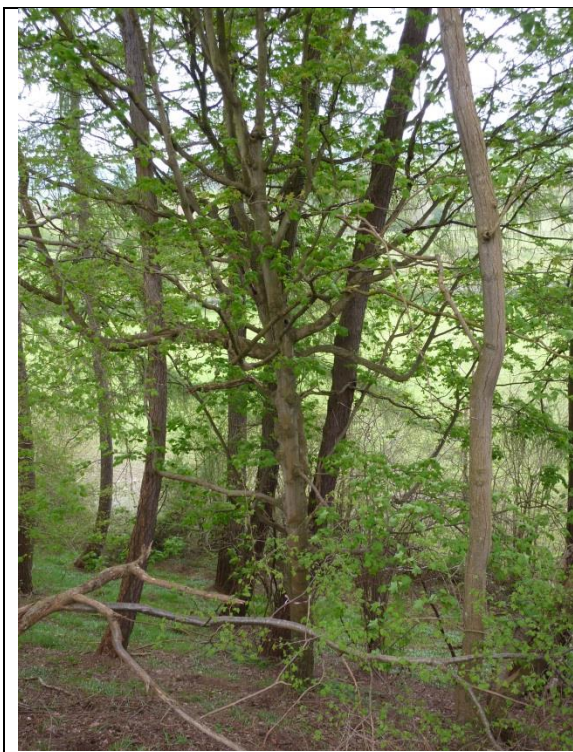
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Tree Reference B9



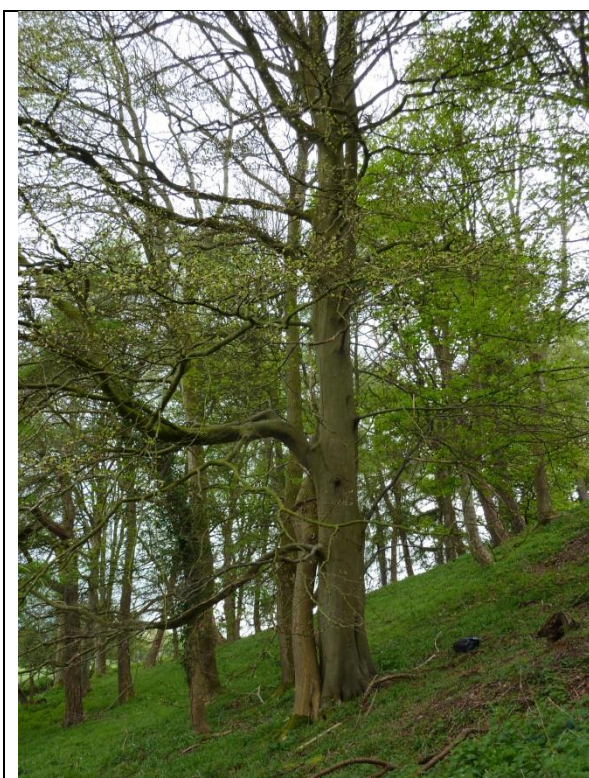
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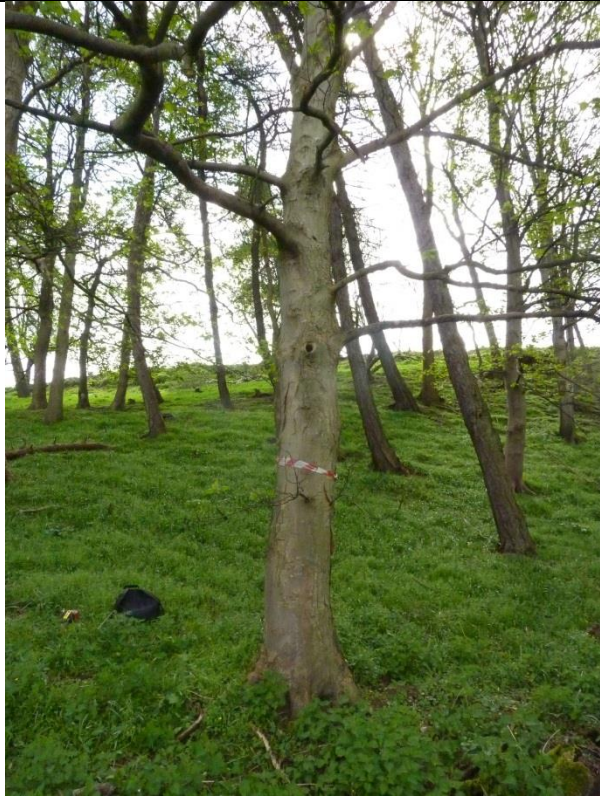
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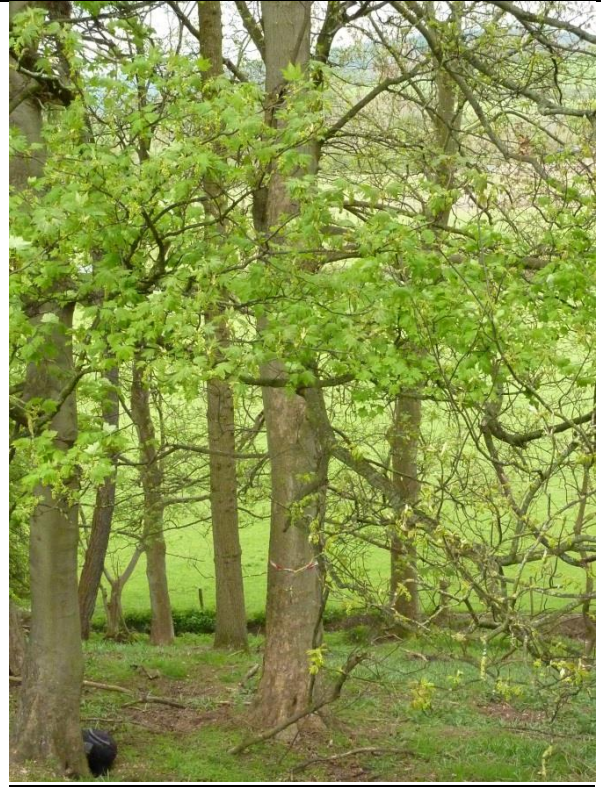
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Tree Reference B11 Feature



Tree Reference B12



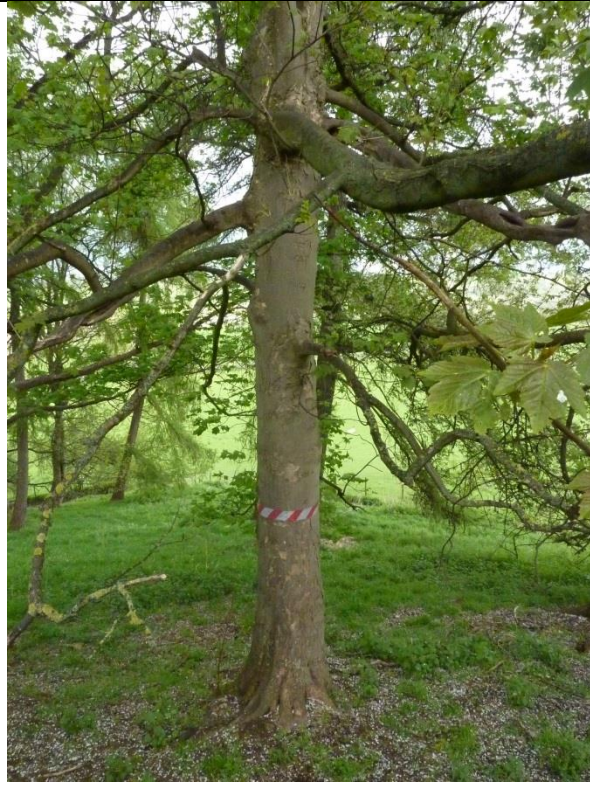
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Tree Reference B13 Feature



Tree Reference B14



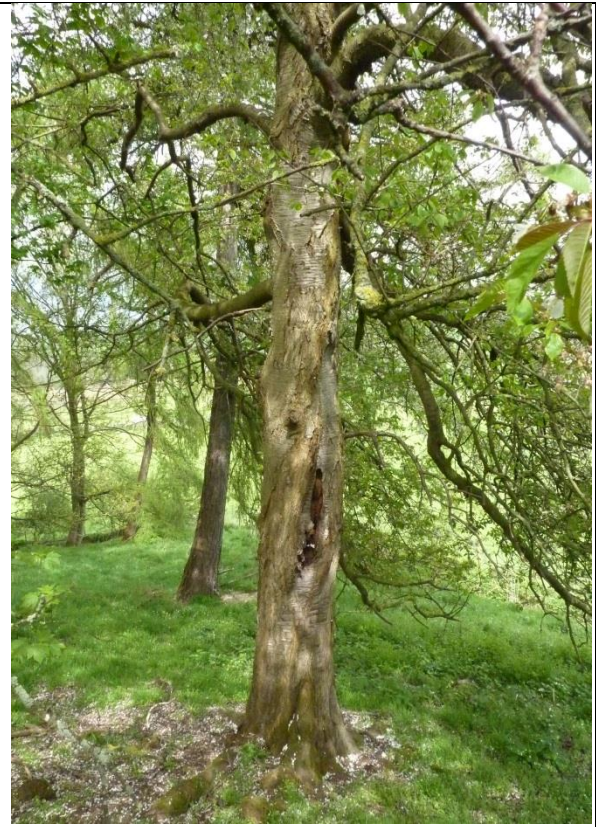
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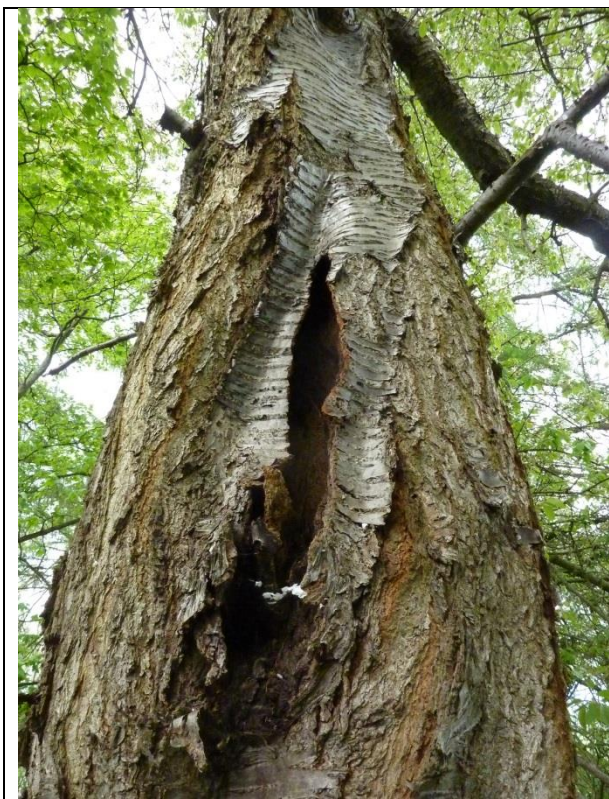
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Tree Reference B16 Feature



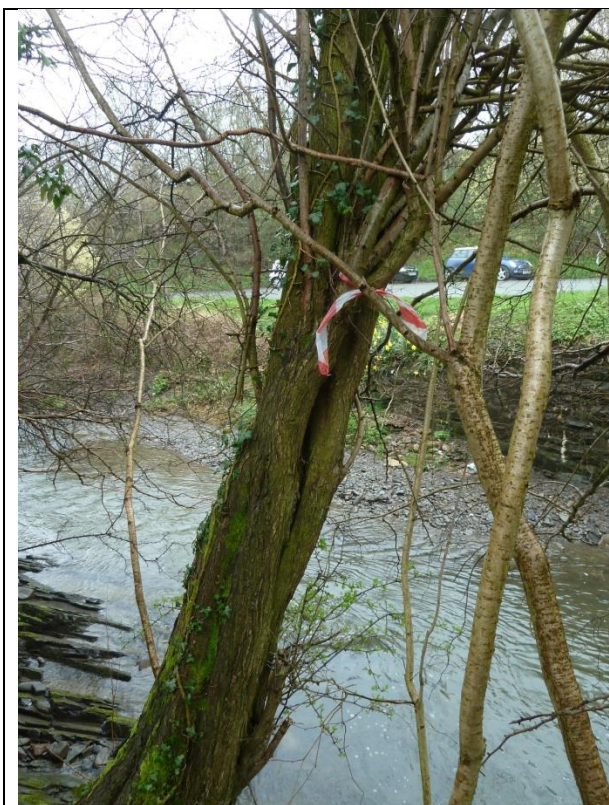
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Tree Reference B17 Feature



Tree Reference B18



Tree Reference B19



Tree Reference B20



Tree Reference B21



Tree Reference B22



Tree Reference B23



Tree Reference B24



Tree Reference B25



Tree Reference B25 Feature



Tree Reference B26



Tree Reference B27



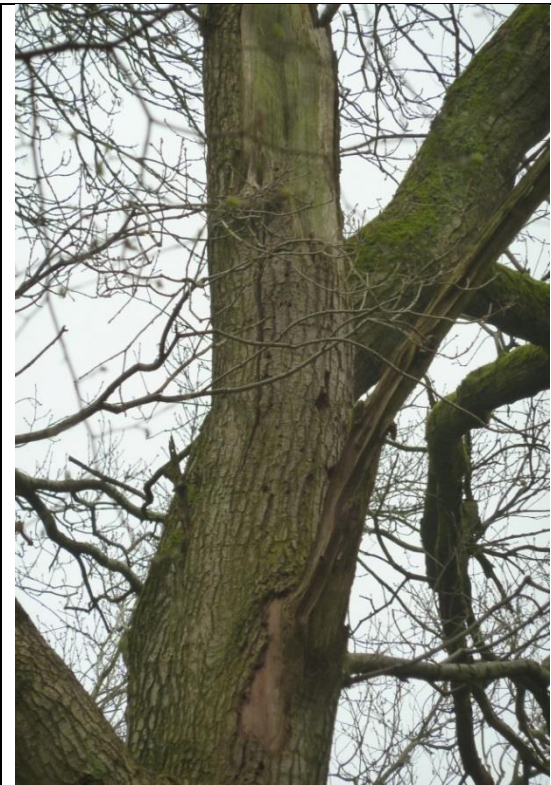
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Tree Reference B28



Tree Reference B29



Tree Reference B29 Feature



Tree Reference B30



Tree Reference B31



Tree Reference B32



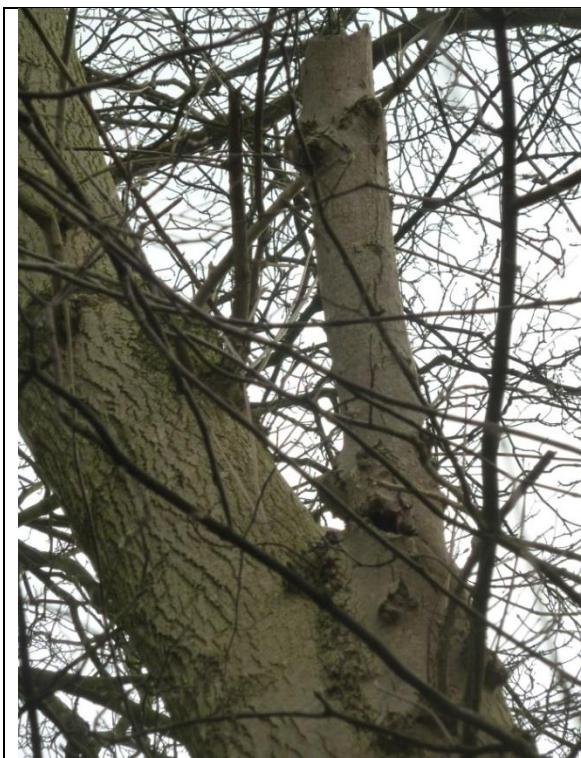
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Tree Reference B33



Tree Reference B34



Tree Reference B34 Feature



Tree Reference B35



Tree Reference B36



Tree Reference B37



Tree Reference B38



Tree Reference B38 Feature



Tree Reference B39



Tree Reference B39 Feature



Tree Reference B40



Tree Reference B41



Tree Reference B42



Tree Reference B43-46



Tree Reference B47



Tree Reference B48



Tree Reference B49



Tree Reference B49 Feature



Tree Reference B50



Tree Reference B51



Tree Reference B51 Feature



Tree Reference B52



Tree Reference B53



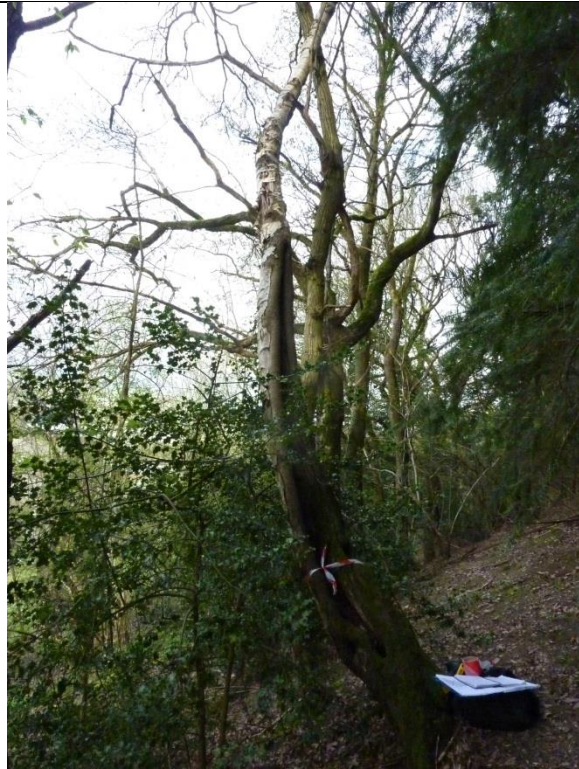
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Tree Reference B55



Tree Reference B55 Feature



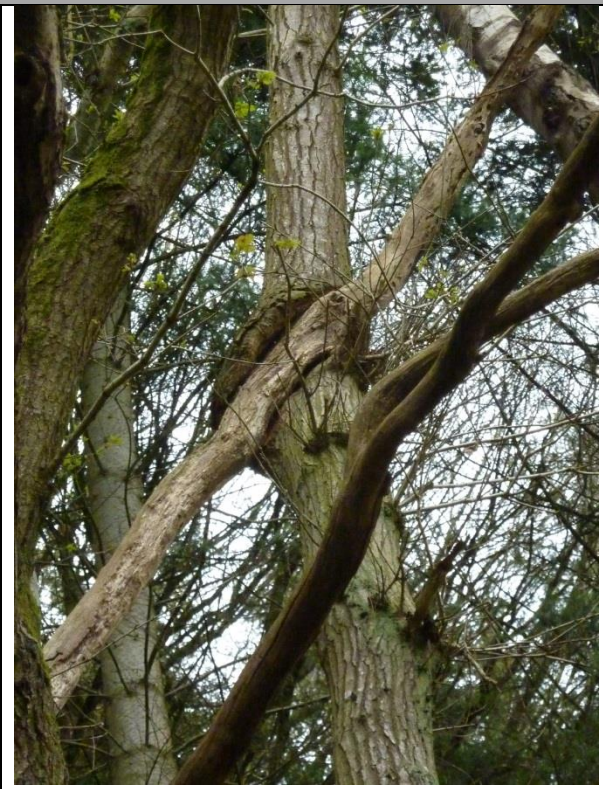
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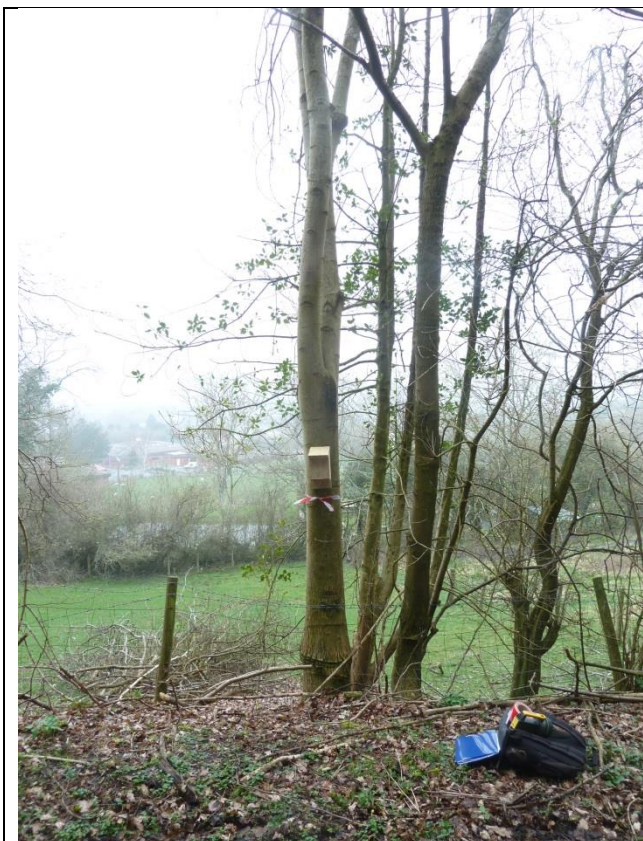
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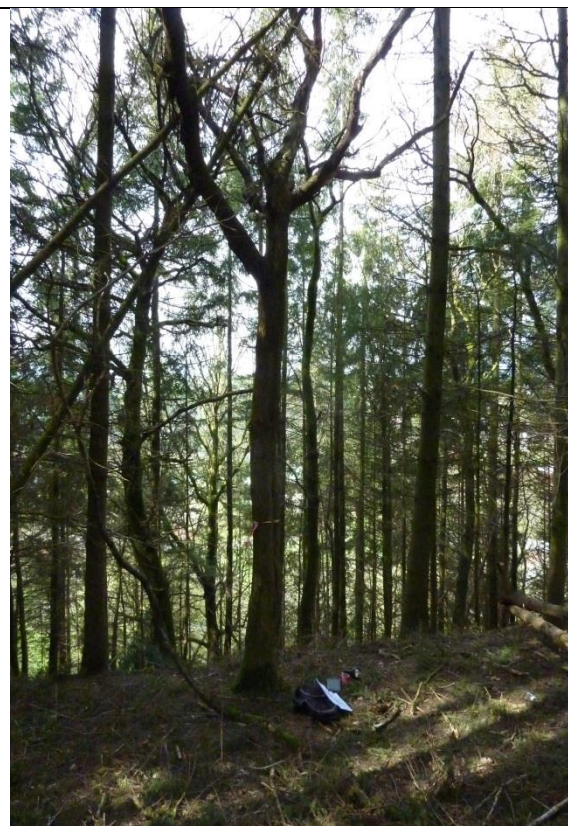
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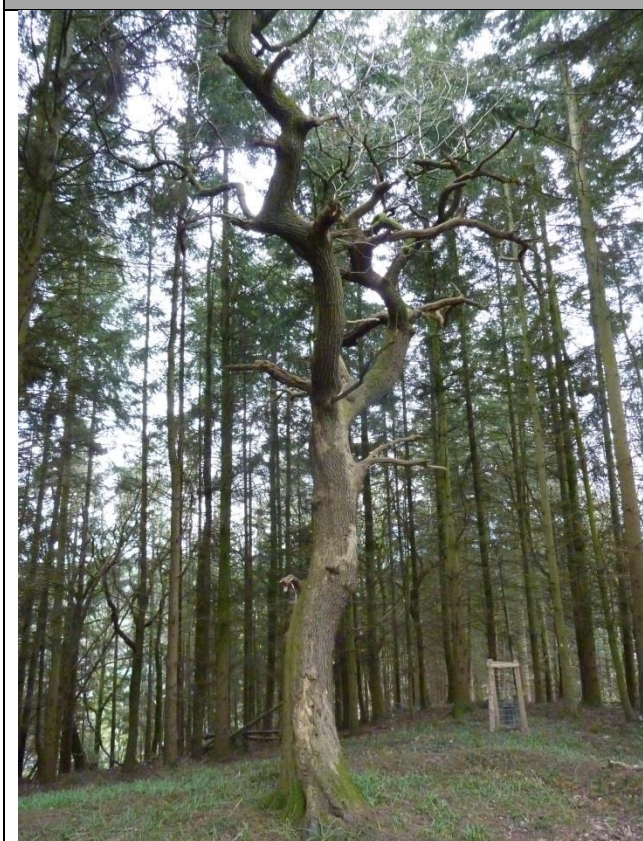
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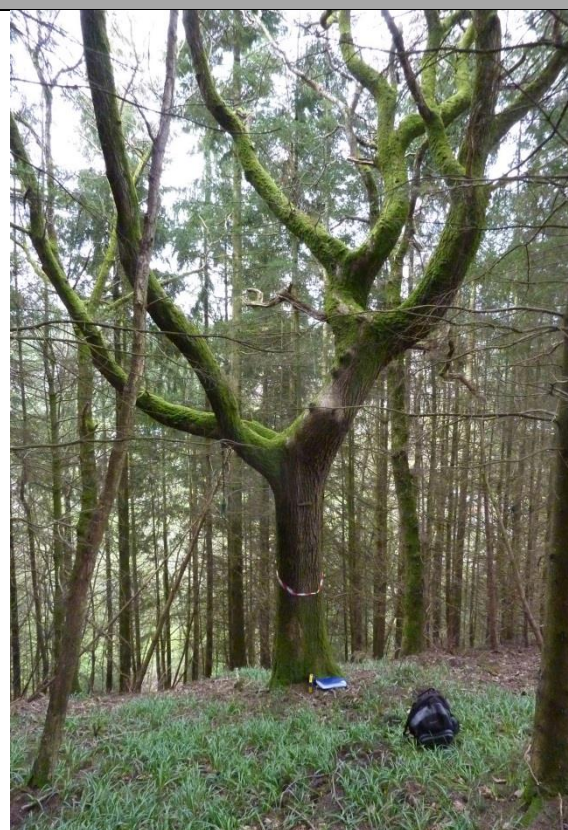
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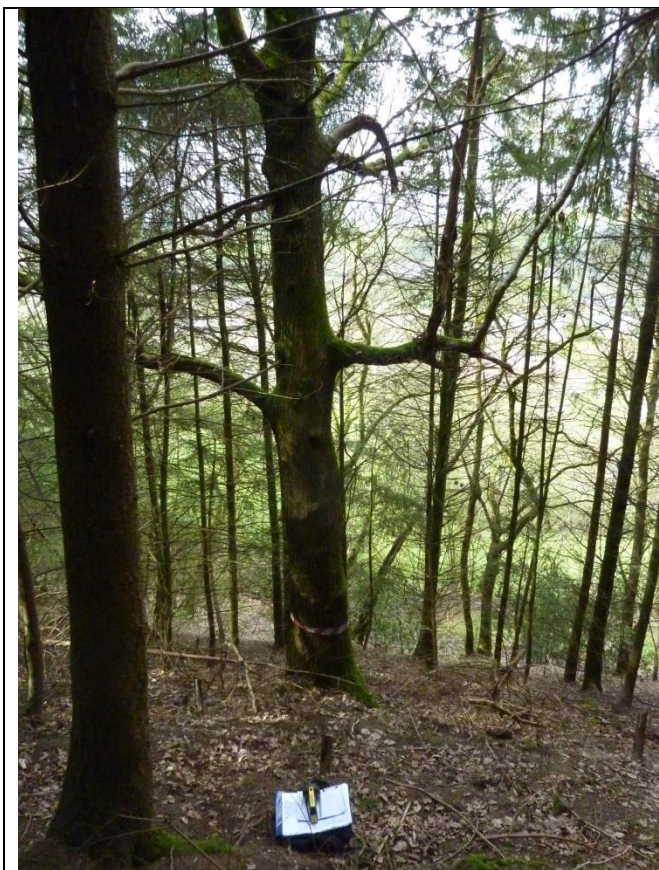
Tree Reference B59



Tree Reference B60



Tree Reference B61



Tree Reference B62



Tree Reference B63



Tree Reference B64



Tree Reference B64 – Feature 1



Tree Reference B64 Feature 2



Tree Reference B65



Tree Reference B66



Tree Reference B67



Tree Reference B68



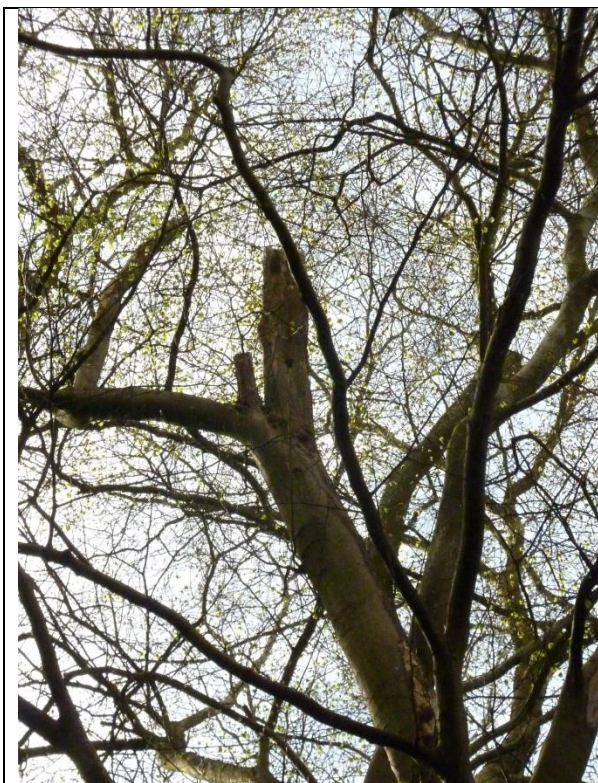
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Tree Reference B71



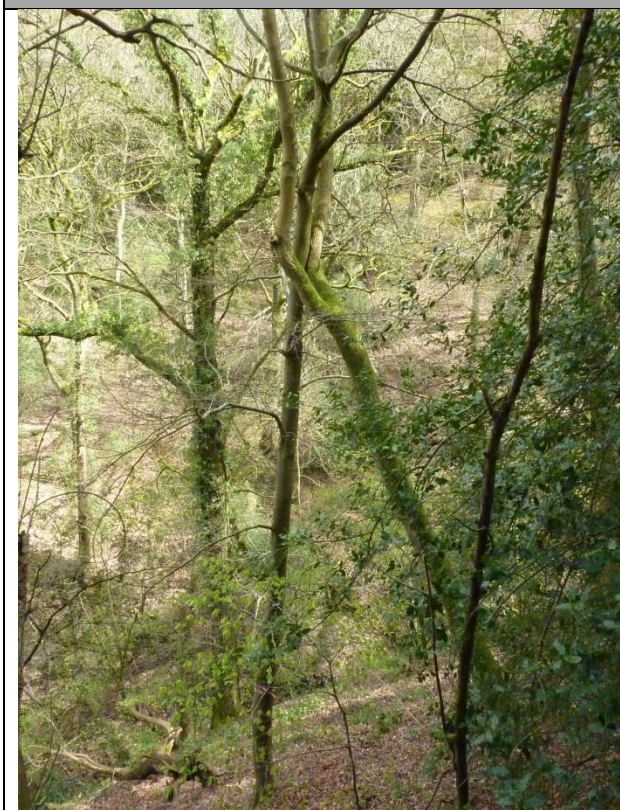
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Tree Reference B72 Feature



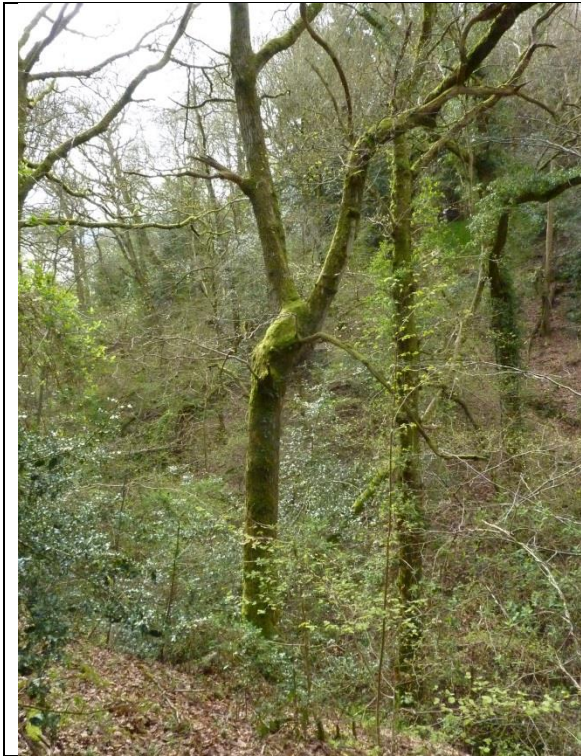
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Tree Reference B74



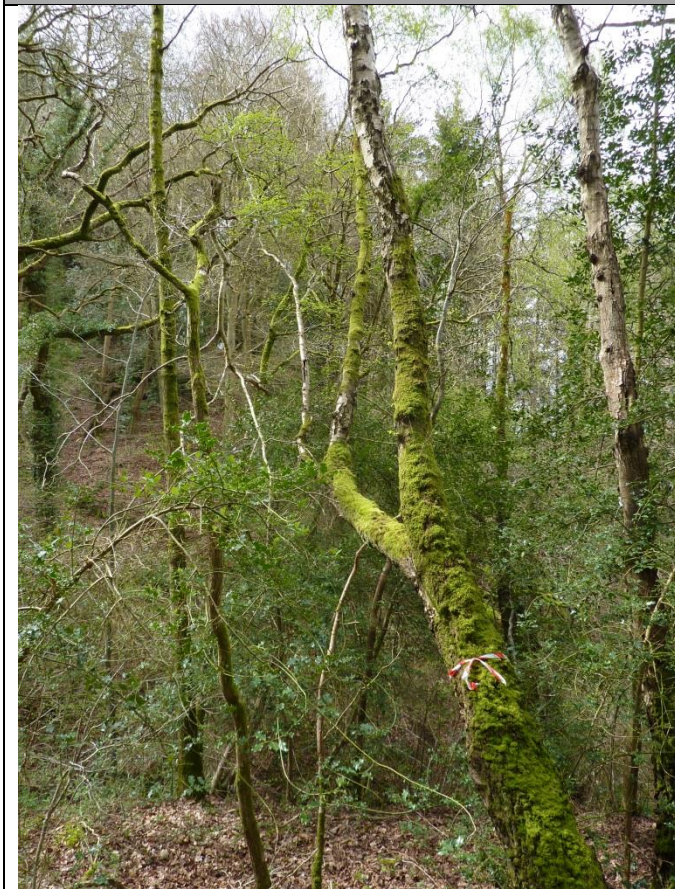
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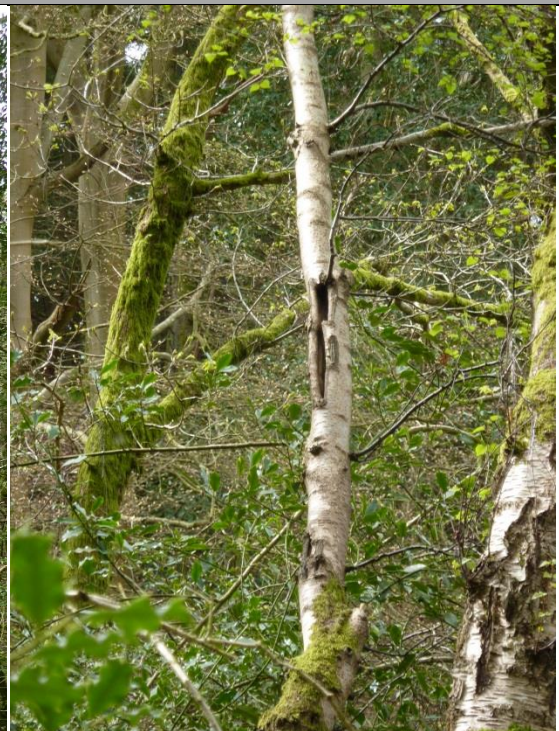
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Tree Reference B77



Tree Reference B78



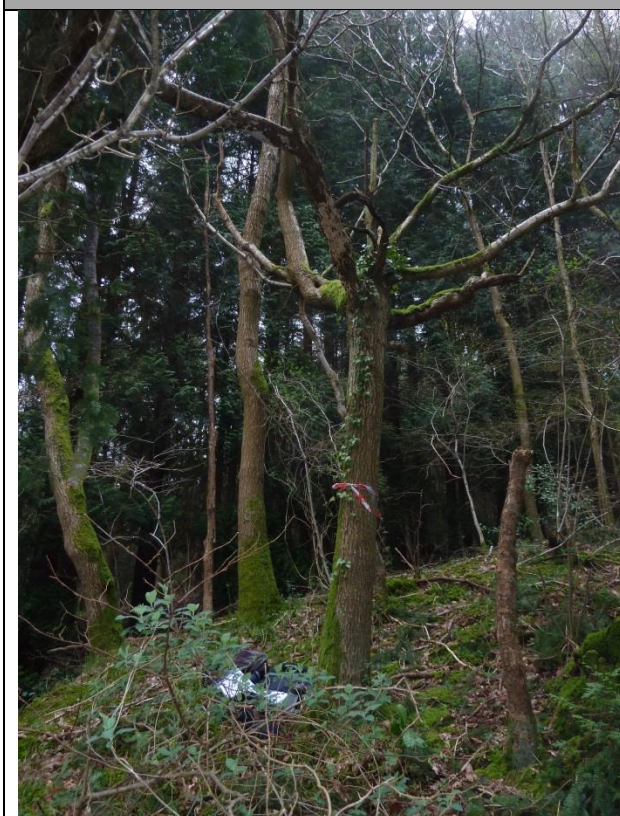
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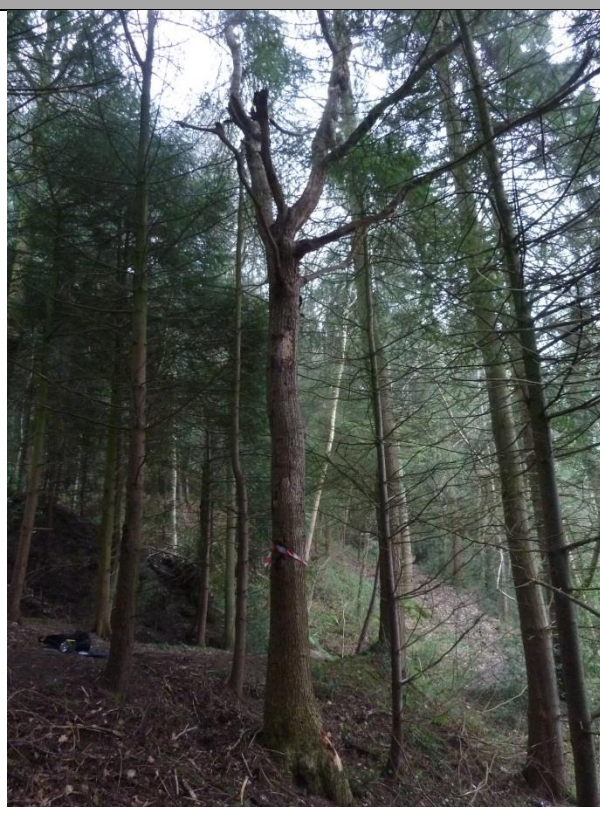
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Tree Reference B80



Tree Reference B81



Tree Reference B82



Tree Reference B83



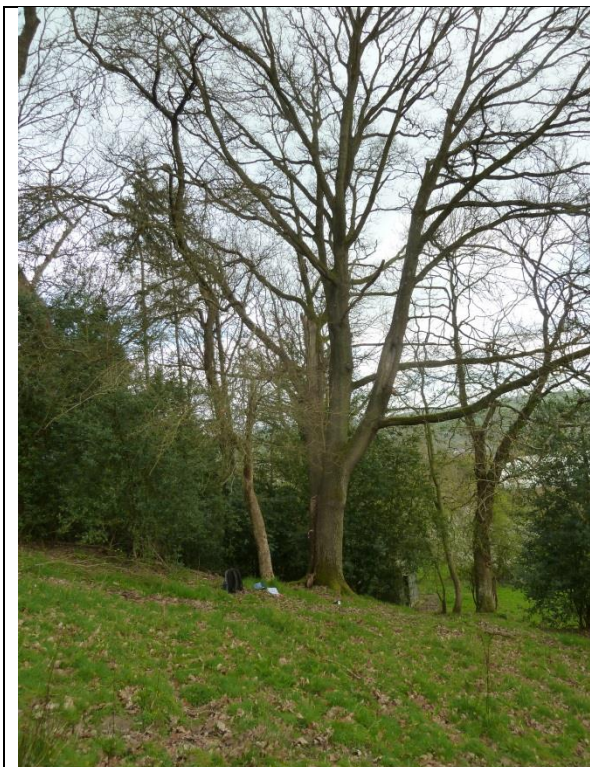
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Tree Reference B86



Tree Reference B87



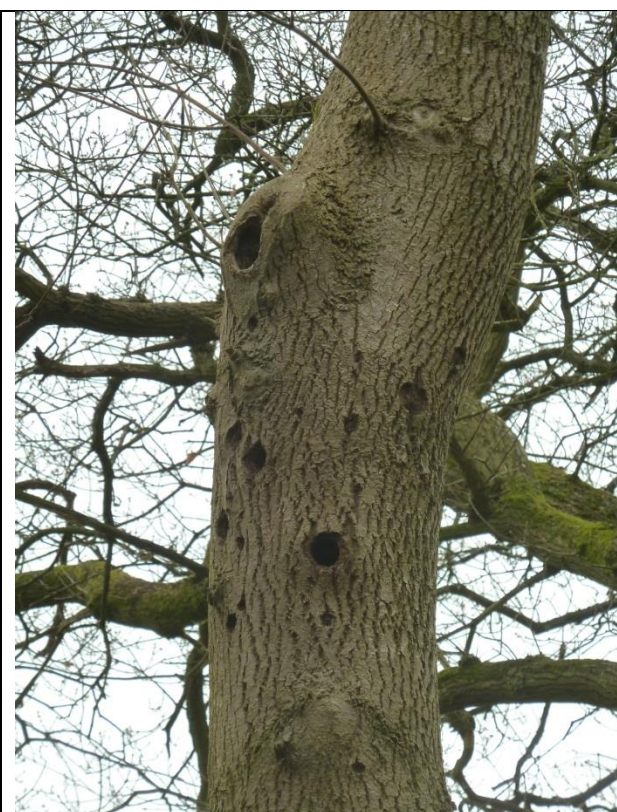
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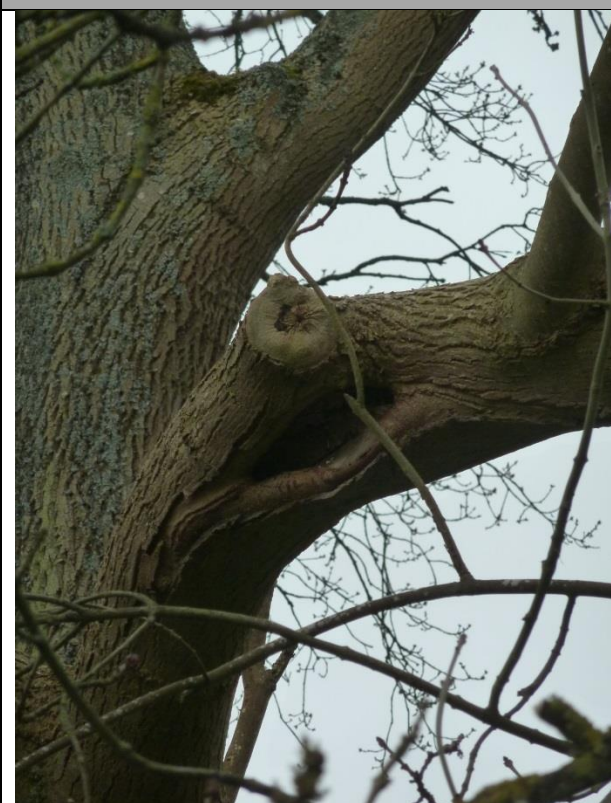
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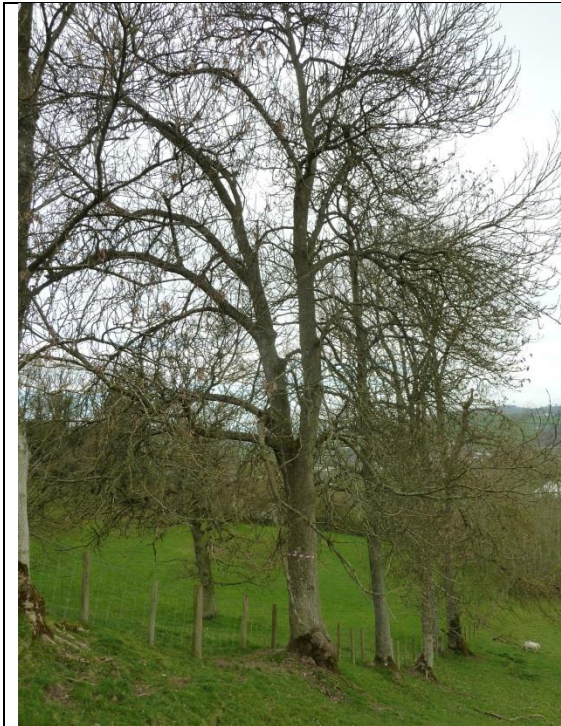
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Tree Reference B91 Feature



Tree Reference B92

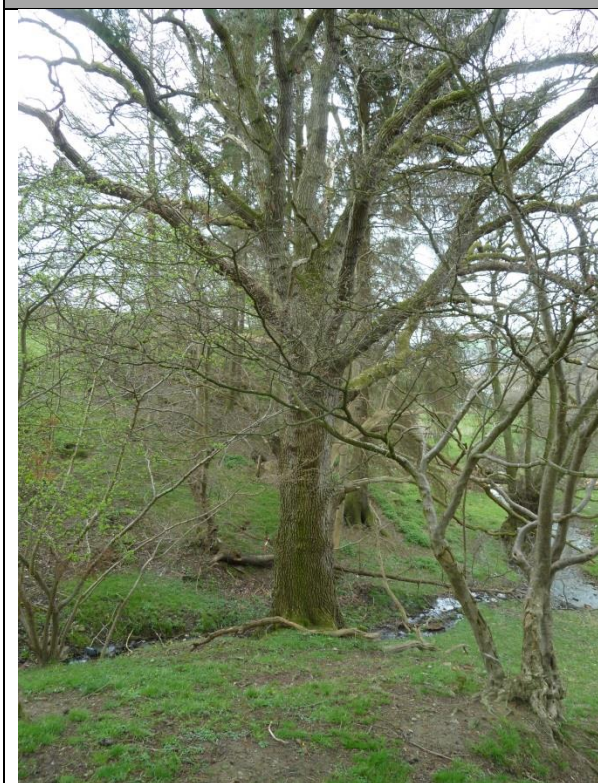
	
Tree Reference B93	Tree Reference B93 Feature
	
Tree Reference B94	Tree Reference B95



Tree Reference B96



Tree Reference B96 Feature



Tree Reference B97



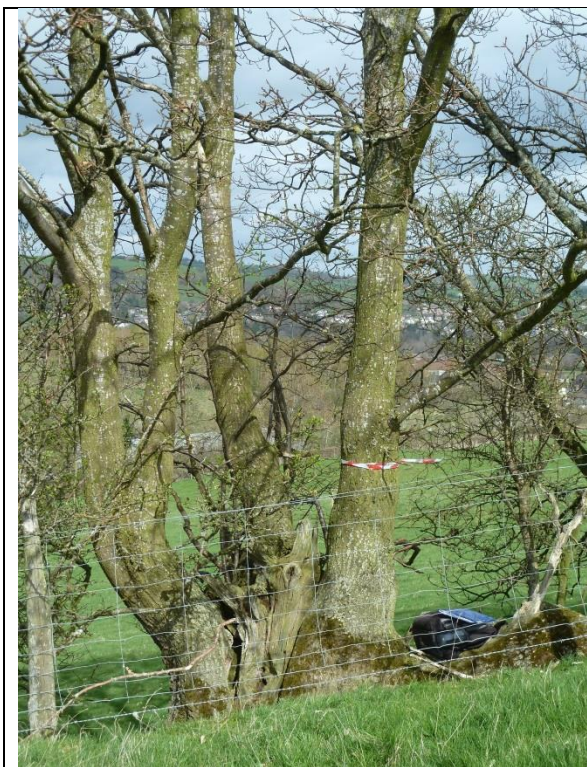
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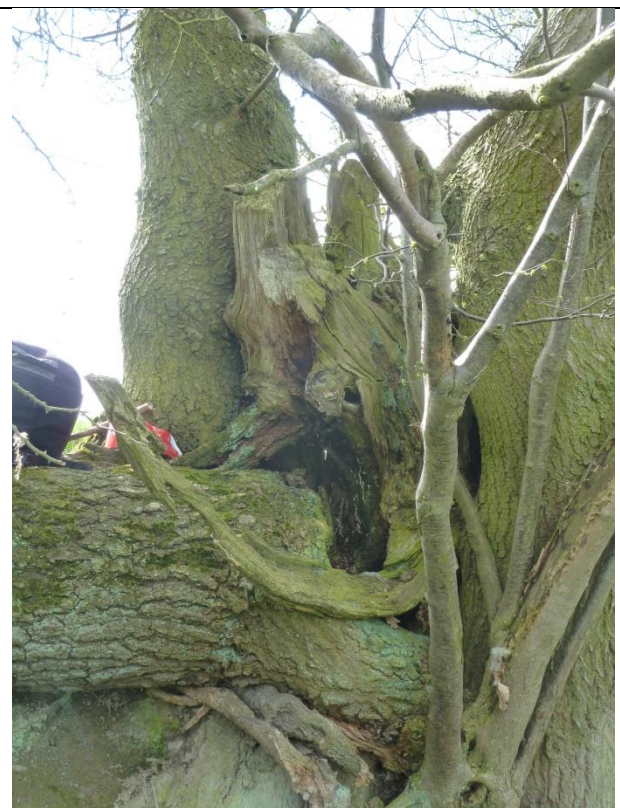
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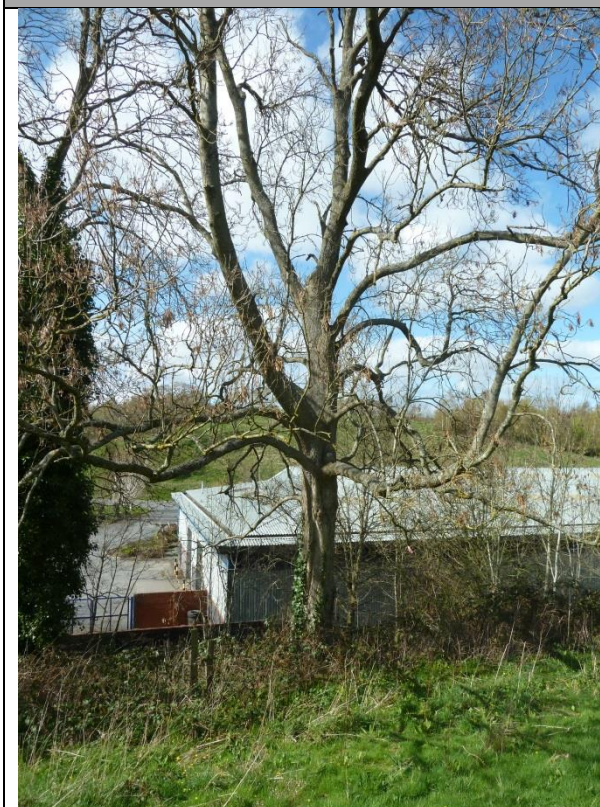
Tree Reference B99



Tree Reference B100



Tree Reference B100 Feature



Tree Reference B101

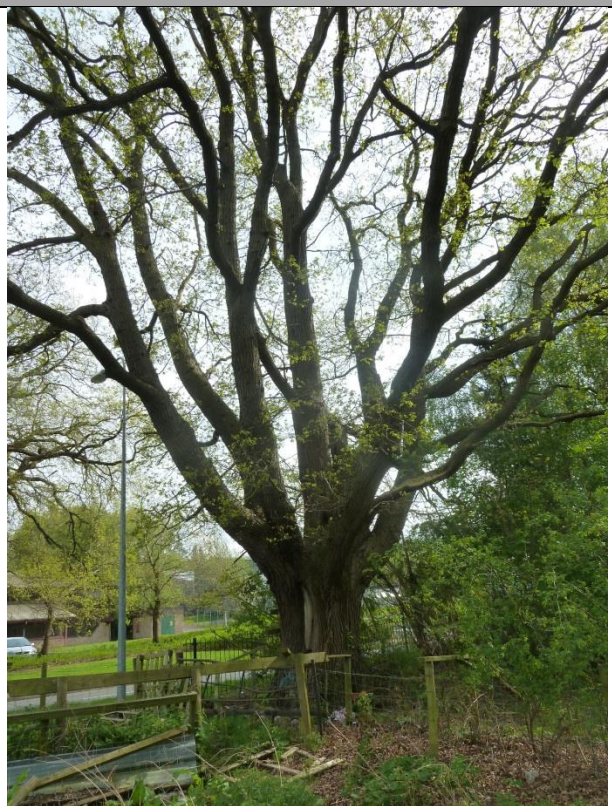




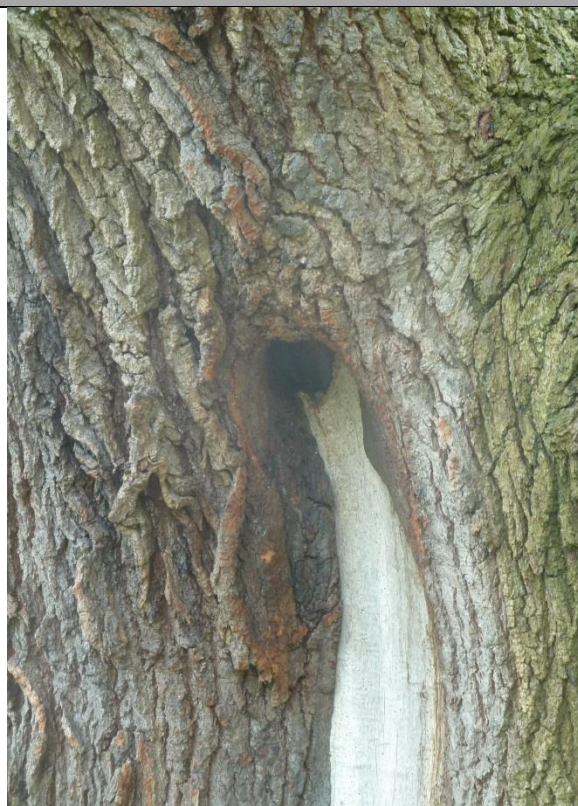
Tree Reference B102



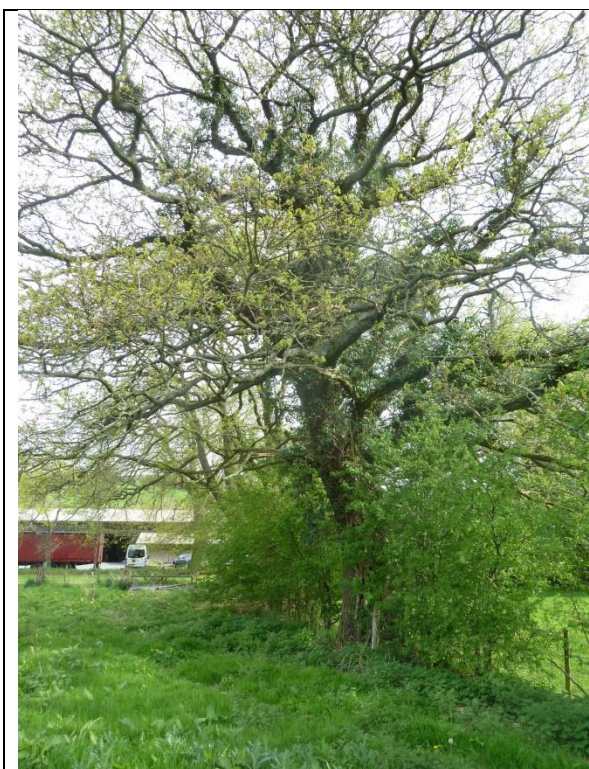
Tree Reference B103



Tree Reference B104a



Tree Reference B104a Feature



Tree Reference B104b



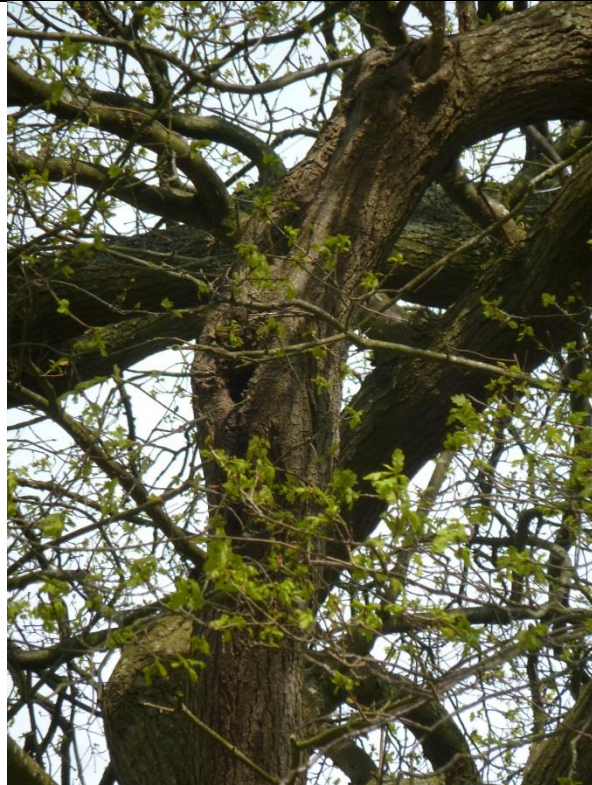
Tree Reference B104b Feature



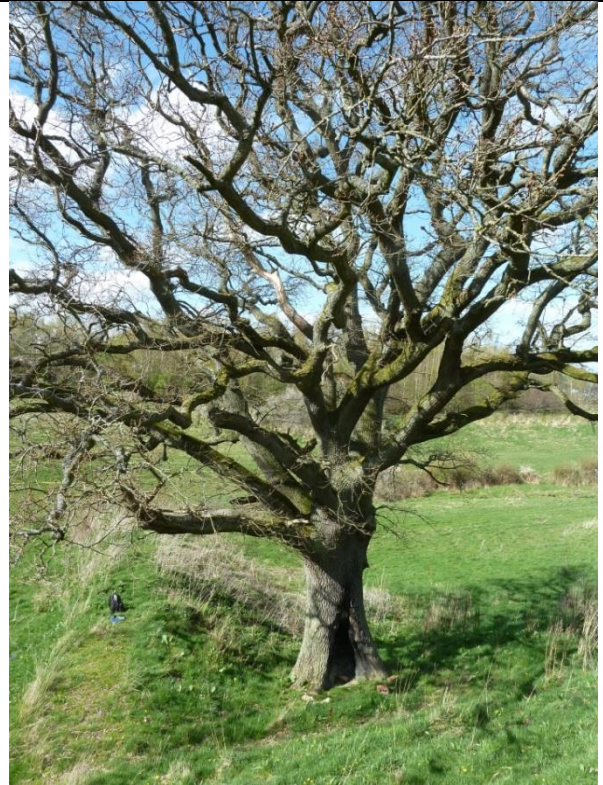
Tree Reference B104c



Tree Reference B104d



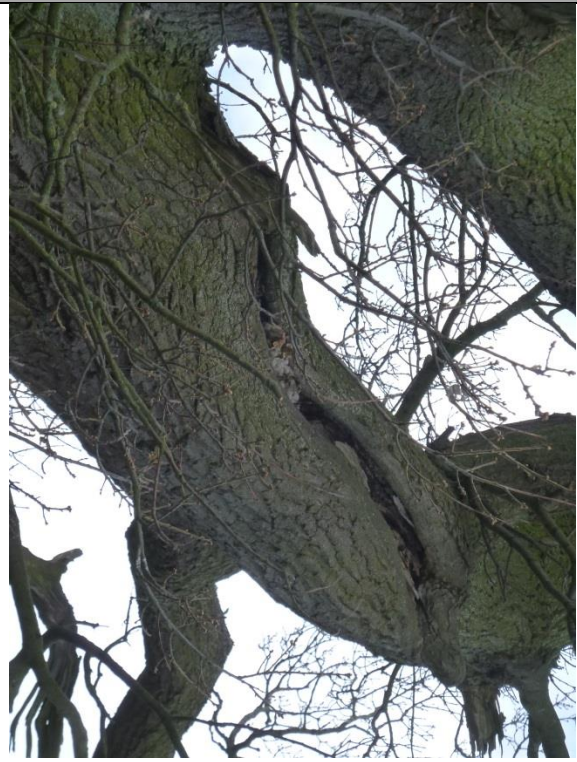
Tree Reference B104d Feature



Tree Reference B105



Tree Reference B106



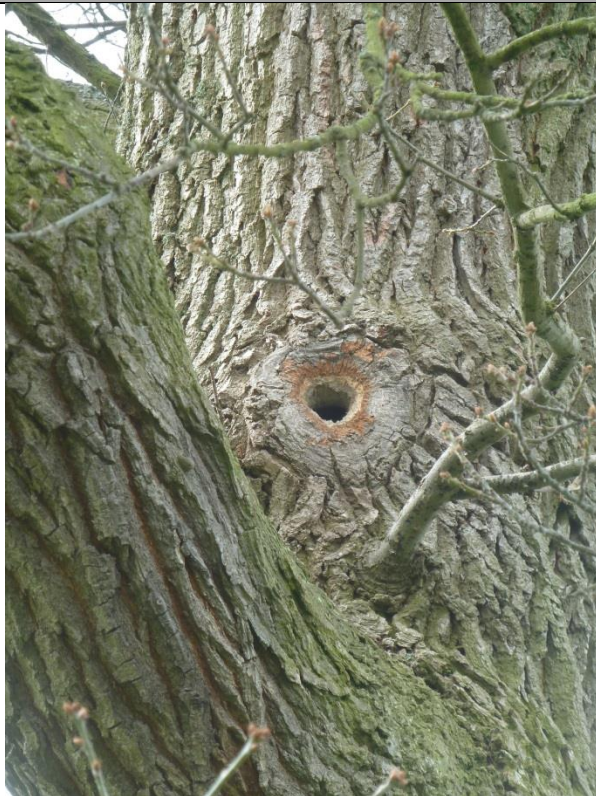
Tree Reference B106 Feature



Tree Reference B107



Tree Reference B108



Tree Reference B108 Feature



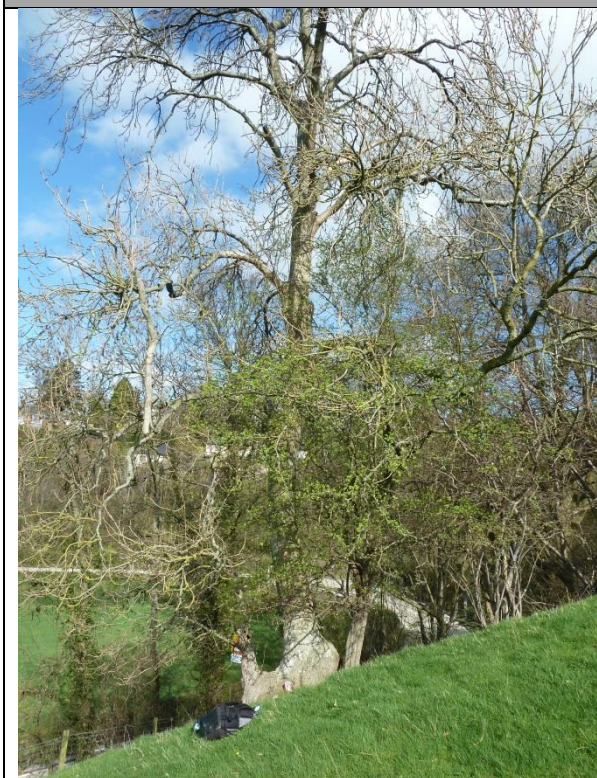
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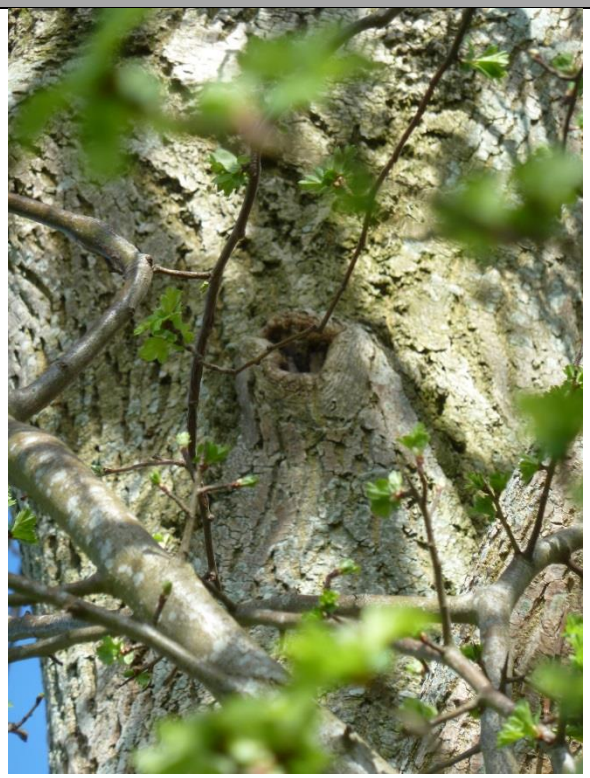
Tree Reference B110



Tree Reference B110 Feature



Tree Reference B111

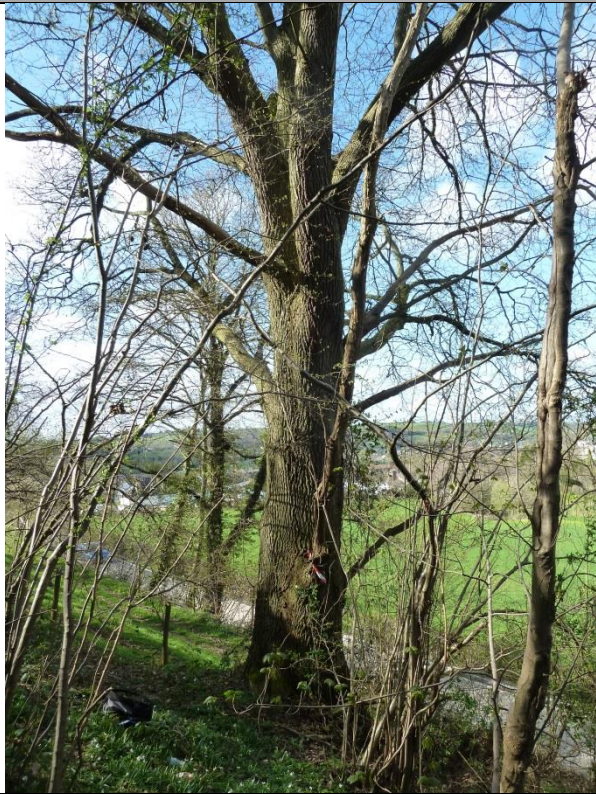


Tree Reference B111 Feature



Tree Reference B112

Tree Reference B112 Feature

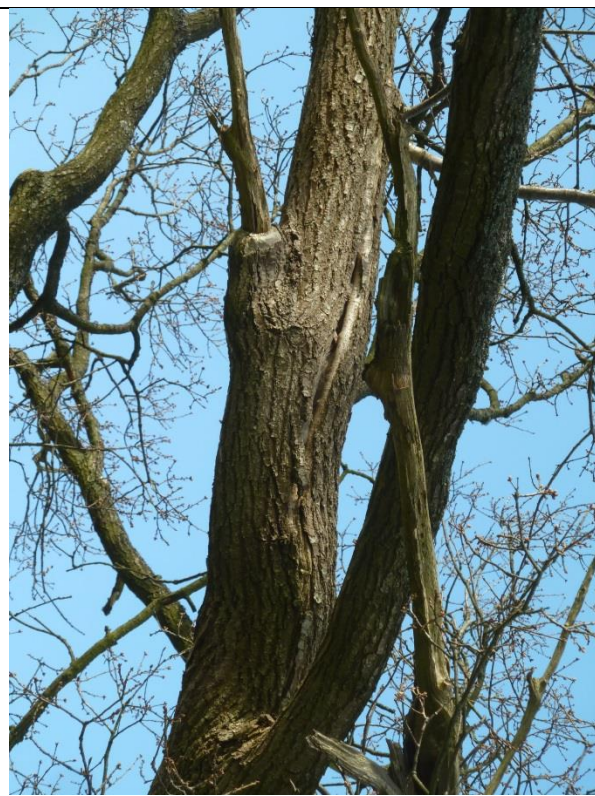


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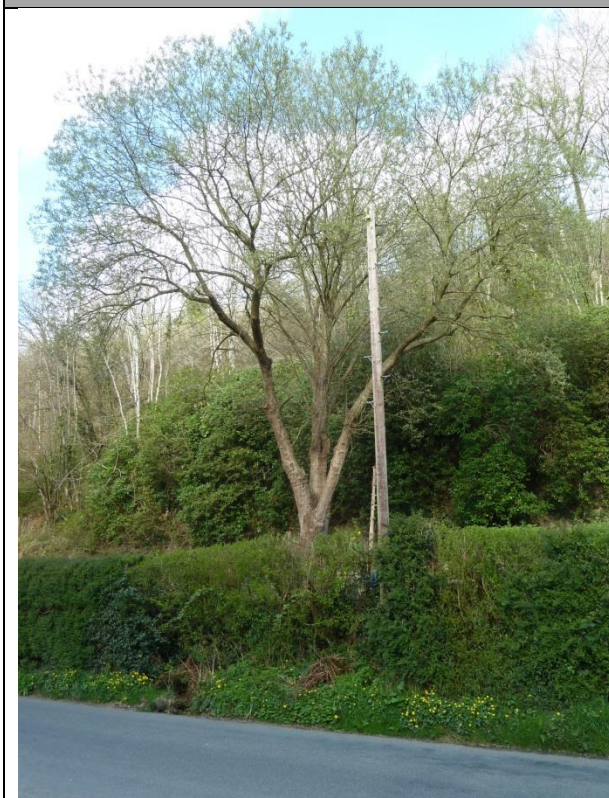
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Tree Reference B114



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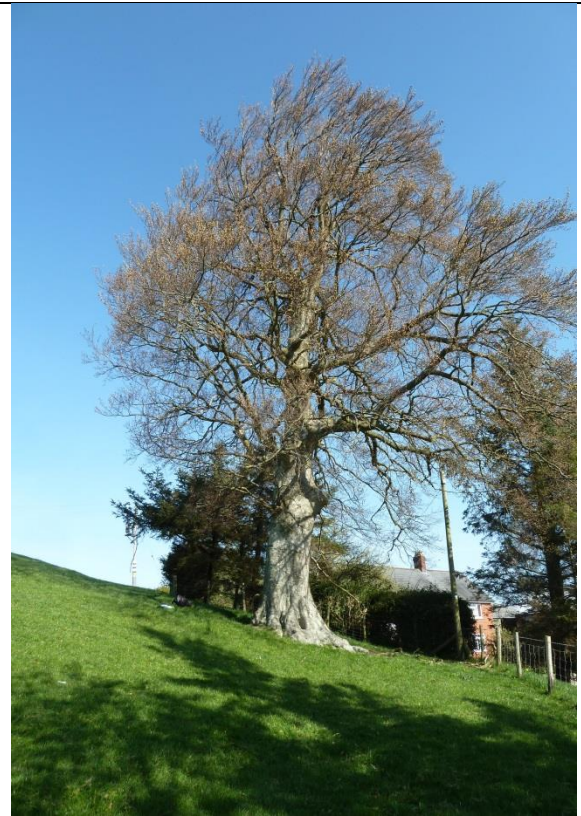
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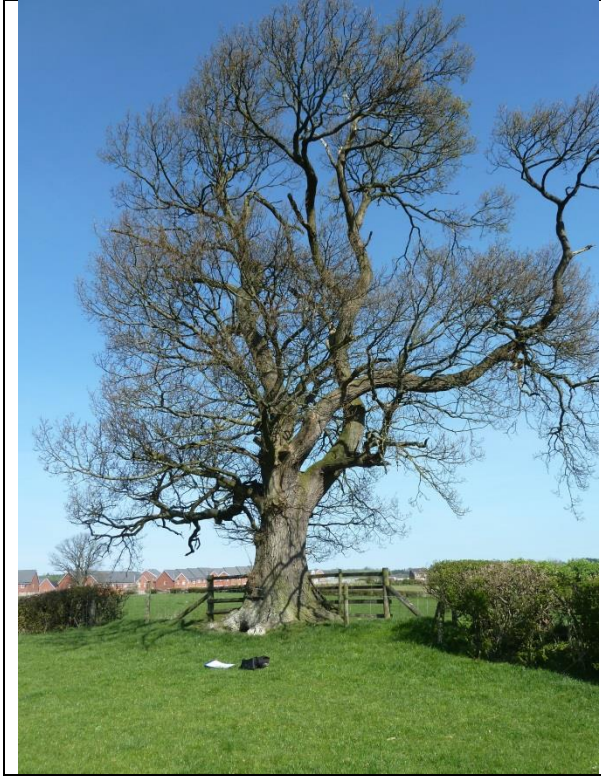
Tree Reference B117



Tree Reference B117 Feature



Tree Reference B118

	
Tree Reference B119	Tree Reference B119 Feature
	
Tree Reference B120	Tree Reference B121



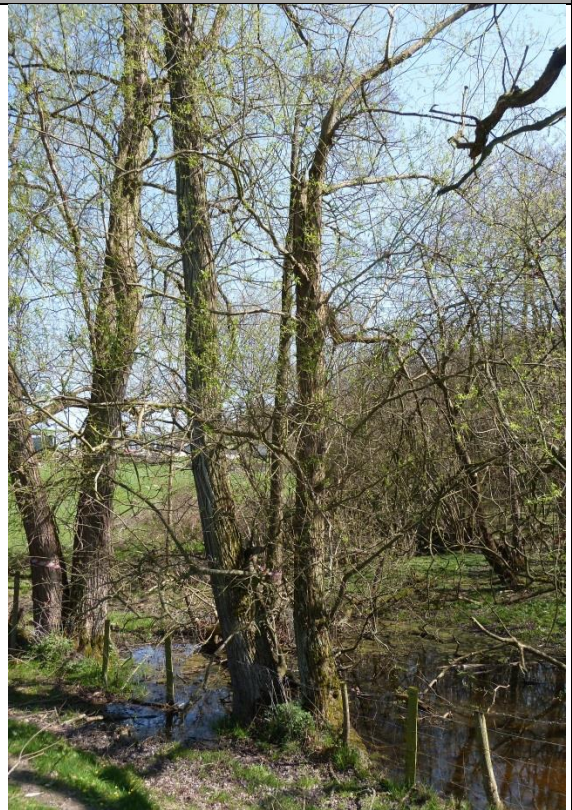
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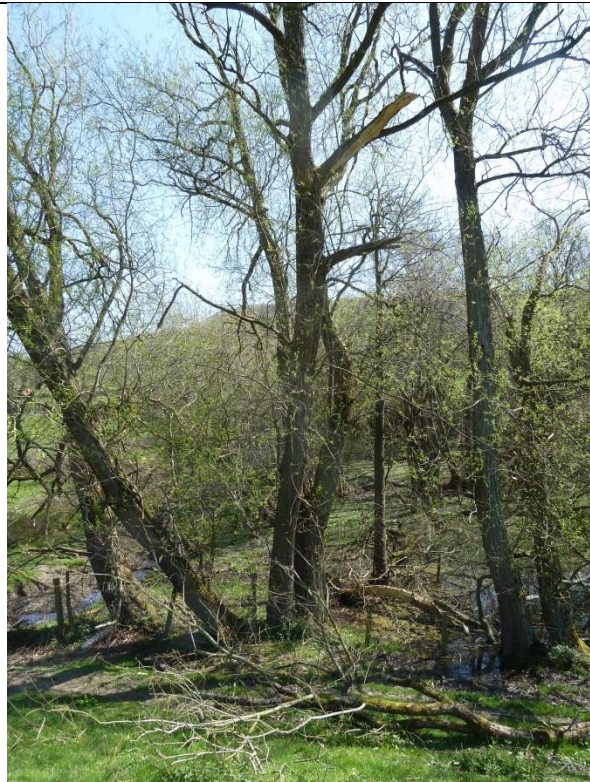
Tree Reference B122



Tree Reference B122 Feature



Tree Reference B122 (2)



Tree Reference B123



Tree Reference B123 Feature



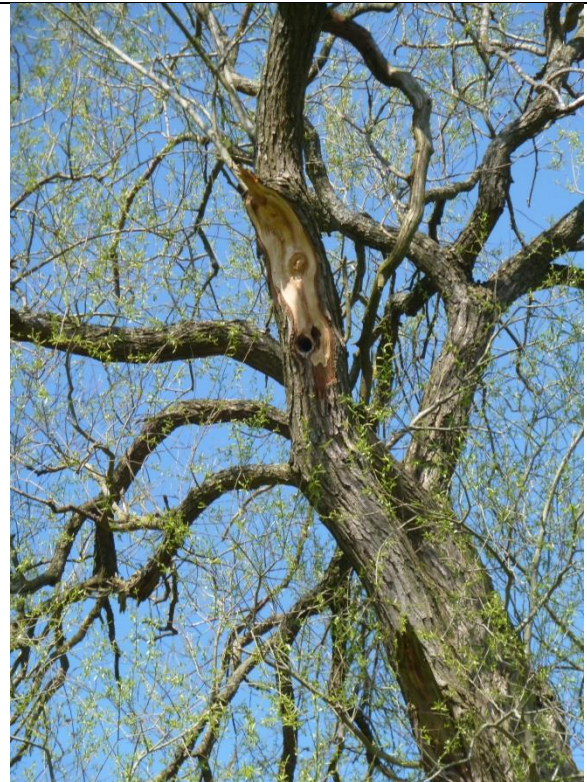
Tree Reference B124



Tree Reference B124 Feature



Tree Reference B125



Tree Reference B125 Feature



Tree Reference B126



Tree Reference B126 Feature



Tree Reference B127



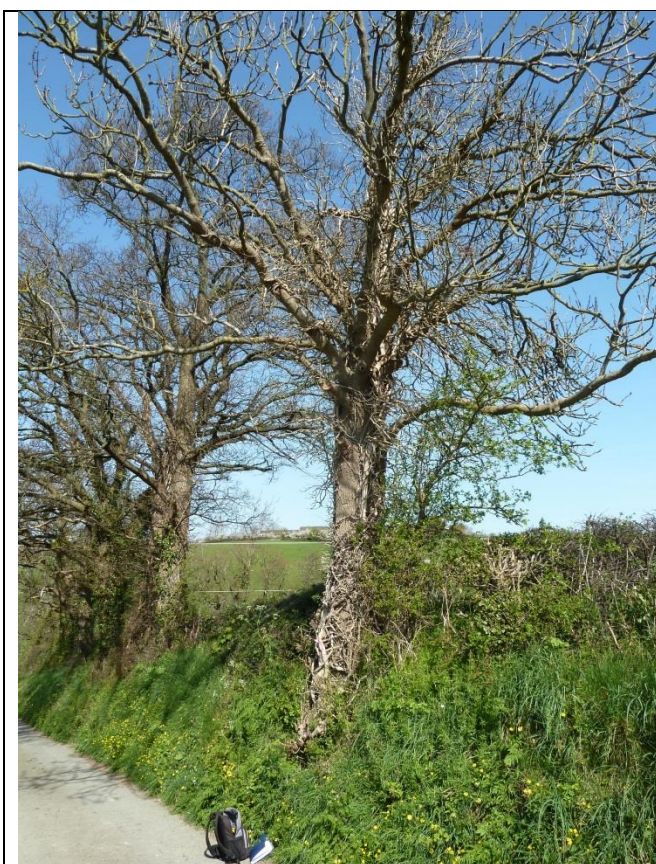
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Tree Reference B127 Feature 2



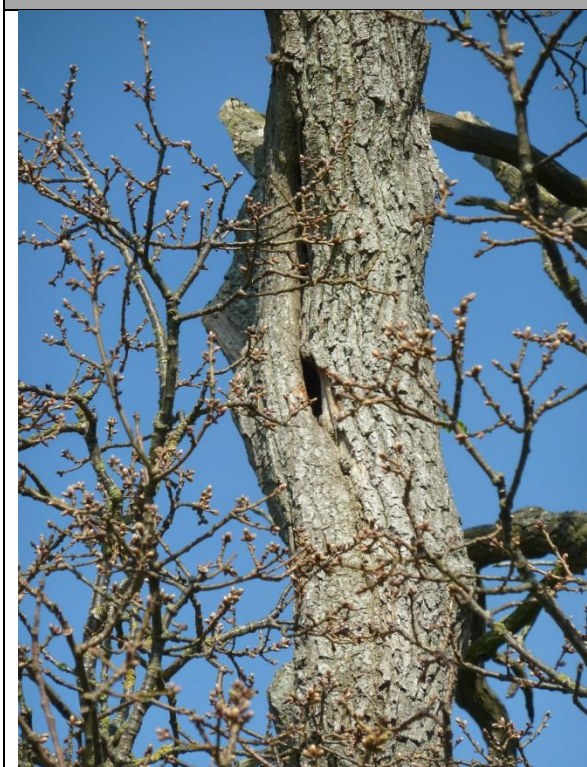
Tree Reference B128



Tree Reference B129



Tree Reference B130



Tree Reference B130 Feature



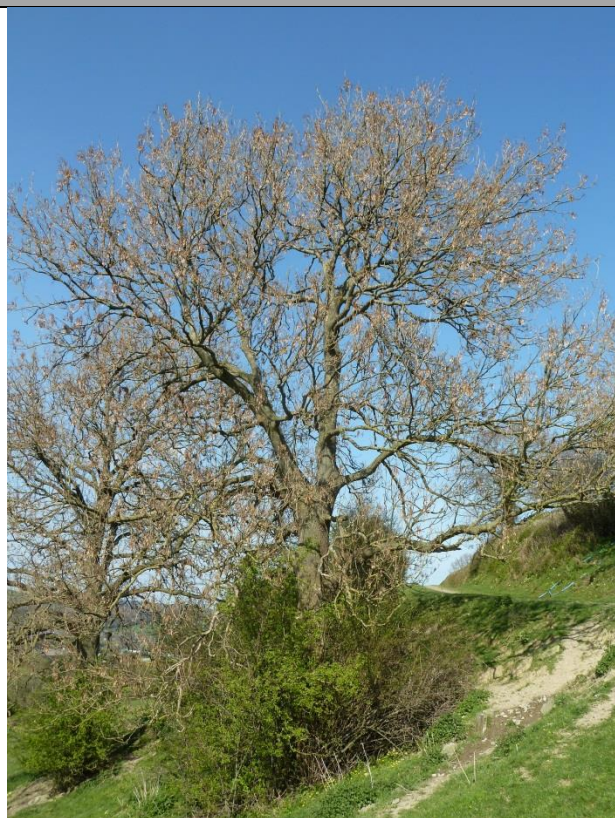
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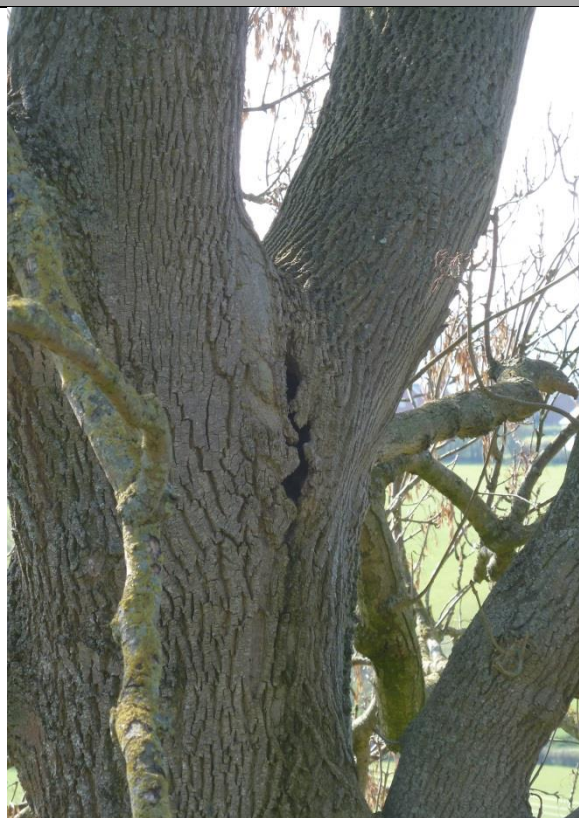
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Tree Reference B132 Feature



Tree Reference B133



Tree Reference B133 Feature



Tree Reference B134



Tree Reference B134 Feature



Tree Reference B135



Tree Reference B136



Tree Reference B137



Tree Reference B137b



Tree Reference 137b Feature



Tree Reference B138



Tree Reference B139



Tree Reference B140



Tree Reference B141



Tree Reference B141 Feature

	
Tree Reference B142	

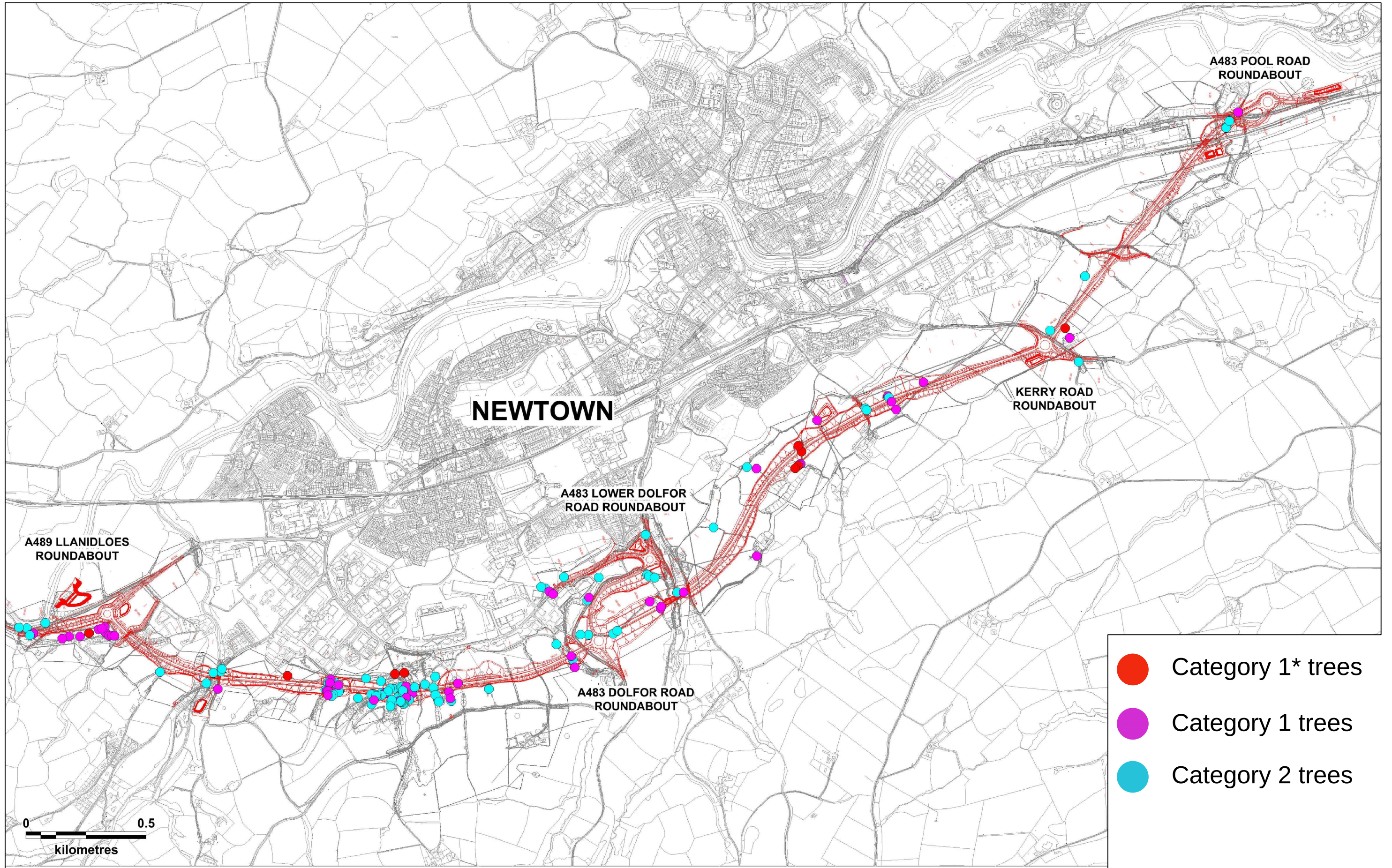


Appendix B – Bat Tree Method Statement



Detailed Method

- Trees with bat roost potential (as identified in the Bat Tree Survey Report 2014 – 5105742/ENV/ECO/RT217) or subsequent reports can only be felled if:
 - They are identified as Category 2 trees within the Bat Tree Survey Report 2014 (5105742/ENV/ECO/RT217) or subsequent reports
 - They are identified as Category 1* or 1 trees that have been subject to tree climbing inspections and / or dusk emergence, dawn re-entry surveys (programmed for spring / summer 2015), where roosts have not been found.
 - The relevant 'permit to work' has been signed off by the Environmental Coordinator or Environmental Clerk of Works.
- The felling of trees which have been identified as roosts can only take place if a European Protect Species (EPS) licence is granted for the activity by NRW. Felling work would need to take place in accordance with the Method Statement associated with the licence.
- Tree felling would take place in the autumn months, prior to the bat hibernation period.
- A licenced bat worker must be present to oversee the felling work of trees with bat roost potential as identified in the Bat Tree Survey Report 2014 (5105742/ENV/ECO/RT217) or subsequent reports.
- Operatives undertaking the tree felling work must attend a 'tool box talk' given by the Environmental Clerk of Works or overseeing licenced bat worker prior to undertaking the work. The talks should cover methods for felling the trees, features bats most commonly used for roosts in trees, what to do if bats are encountered and why the work is being carried out using the proposed methods (i.e. the conservation and legislative context).
- Felling shall take place taking 'reasonable avoidance measures', to avoid harm to possible roosting bats. This might include soft felling certain sections of the tree which have good potential roost features. It may also include allowing the tree to be brought to the ground in a controlled manner (e.g. by winching a tree on a hinge or gently pushing or pulling it over with construction plant). The methods used should be at the discretion of the licenced bat worker overseeing the work as some trees have greater potential than others for supporting roosting bats.
- Trees that have been soft felled or brought down in a controlled manner and on inspection have confirmed possible bat roost potential should be left for 48 hours before being sectioned.
- In the unlikely event of bats being encountered prior to a tree being felled then an EPS Licence would need to be granted prior to the tree being felled.
- In the unlikely event that a bat is discovered in a tree once it has been felled, it should be collected by the overseeing licenced bat worker. NRW should be contacted immediately in order to establish the best way to proceed.
- Tree felling must also conform with mitigation regarding to dormice.



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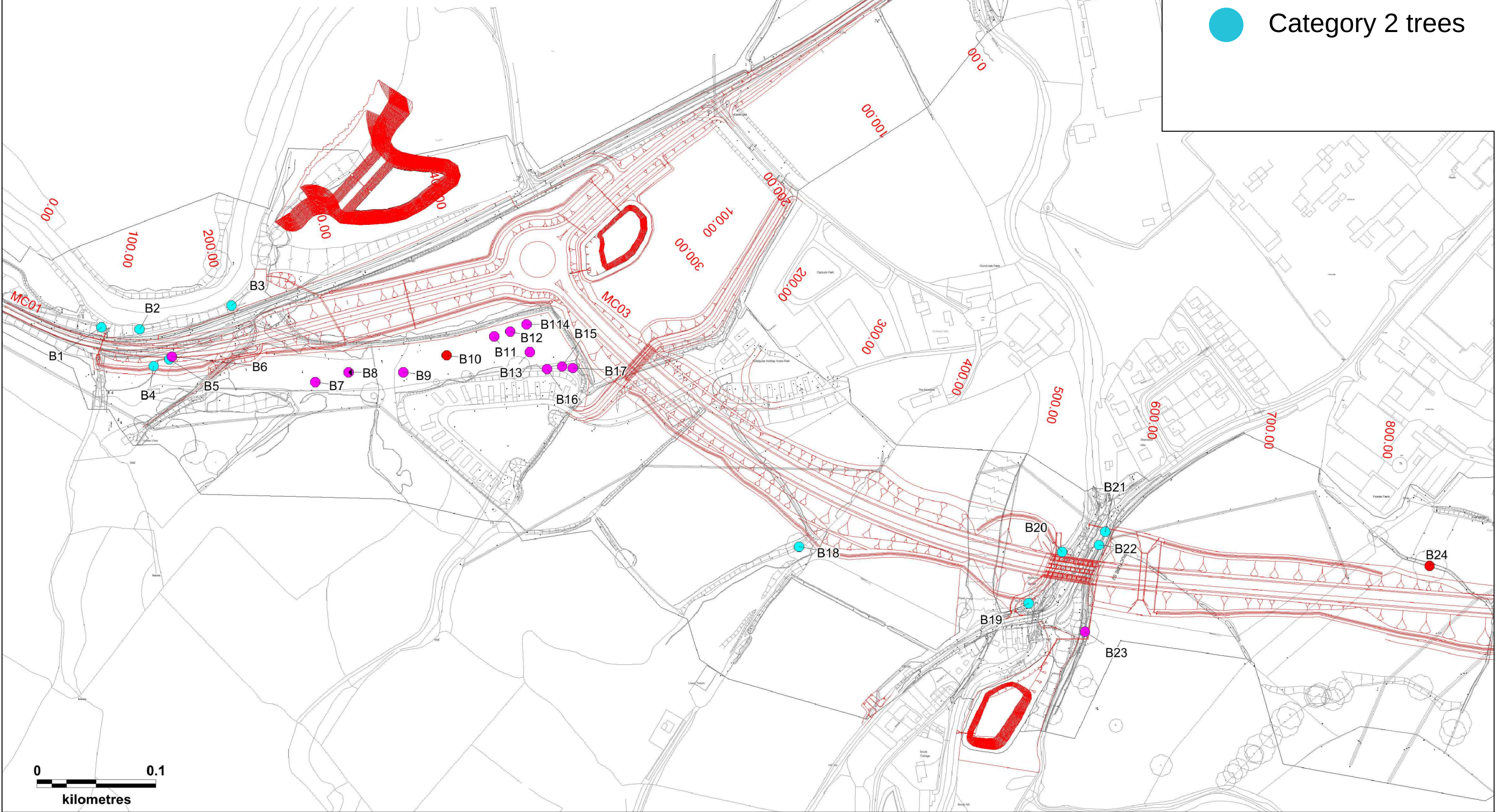
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A489 LLANIDLOES ROUNDAABOUT

- Category 1* trees
- Category 1 trees
- Category 2 trees



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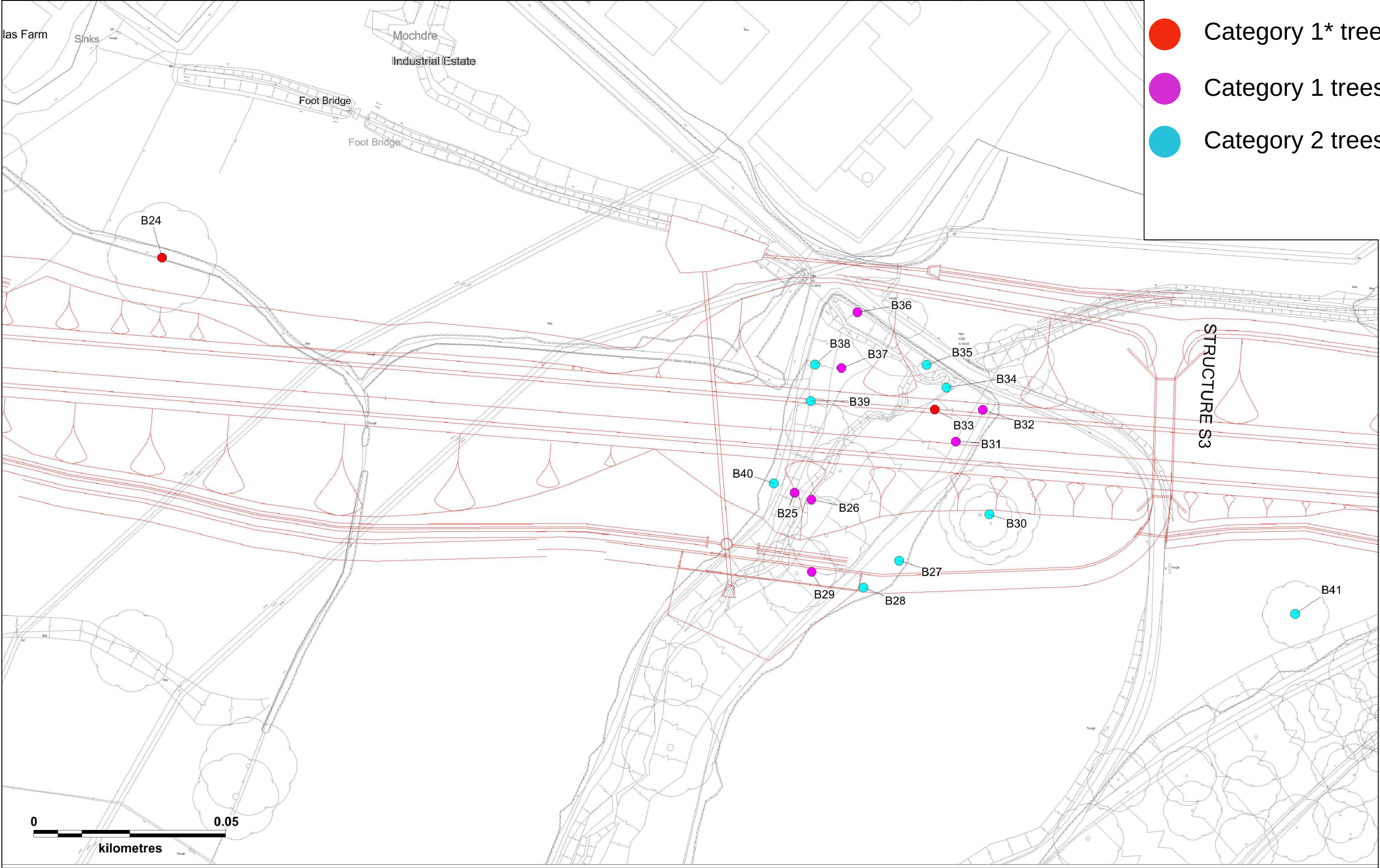
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1.0b

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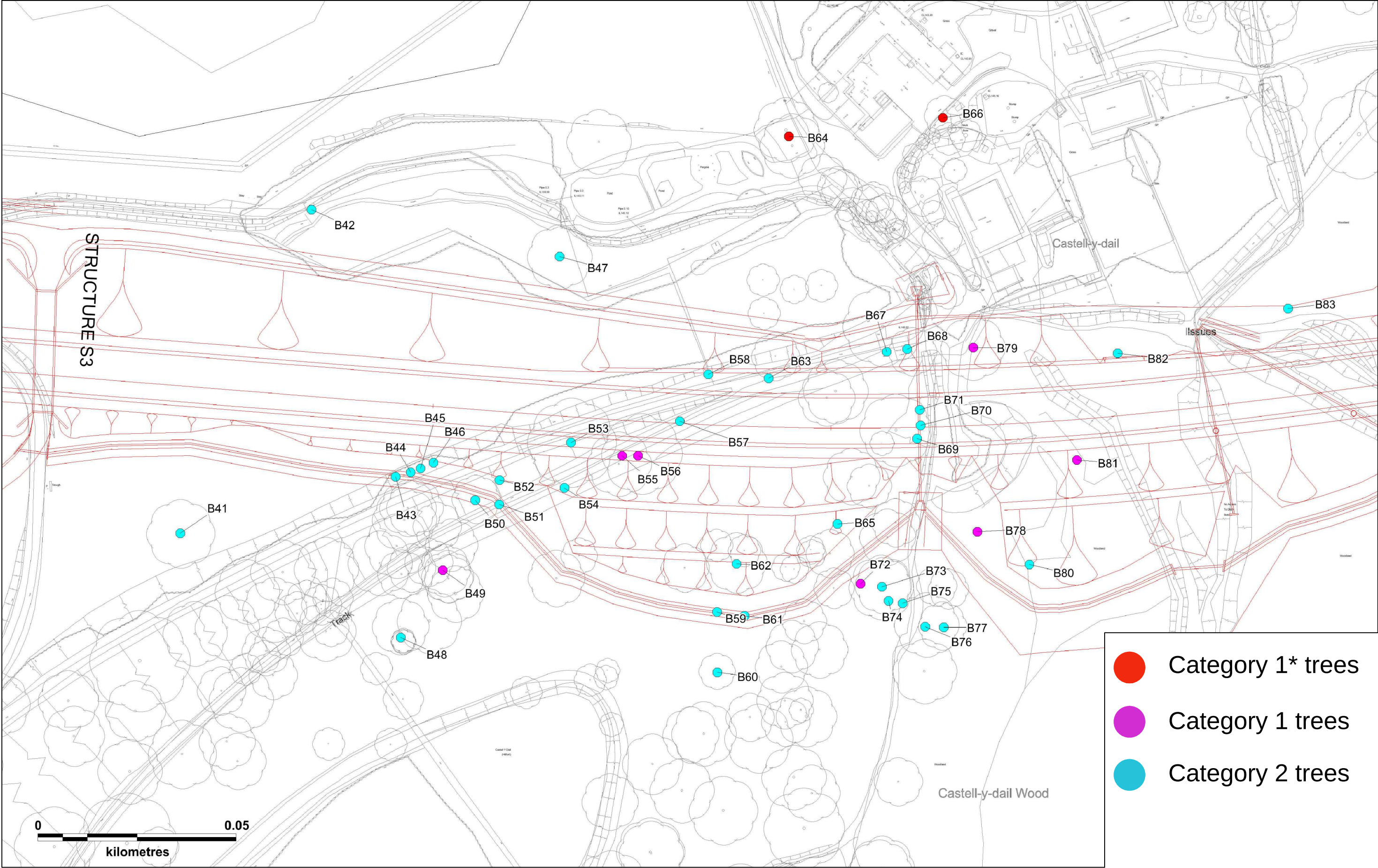
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- Category 1* trees
- Category 1 trees
- Category 2 trees

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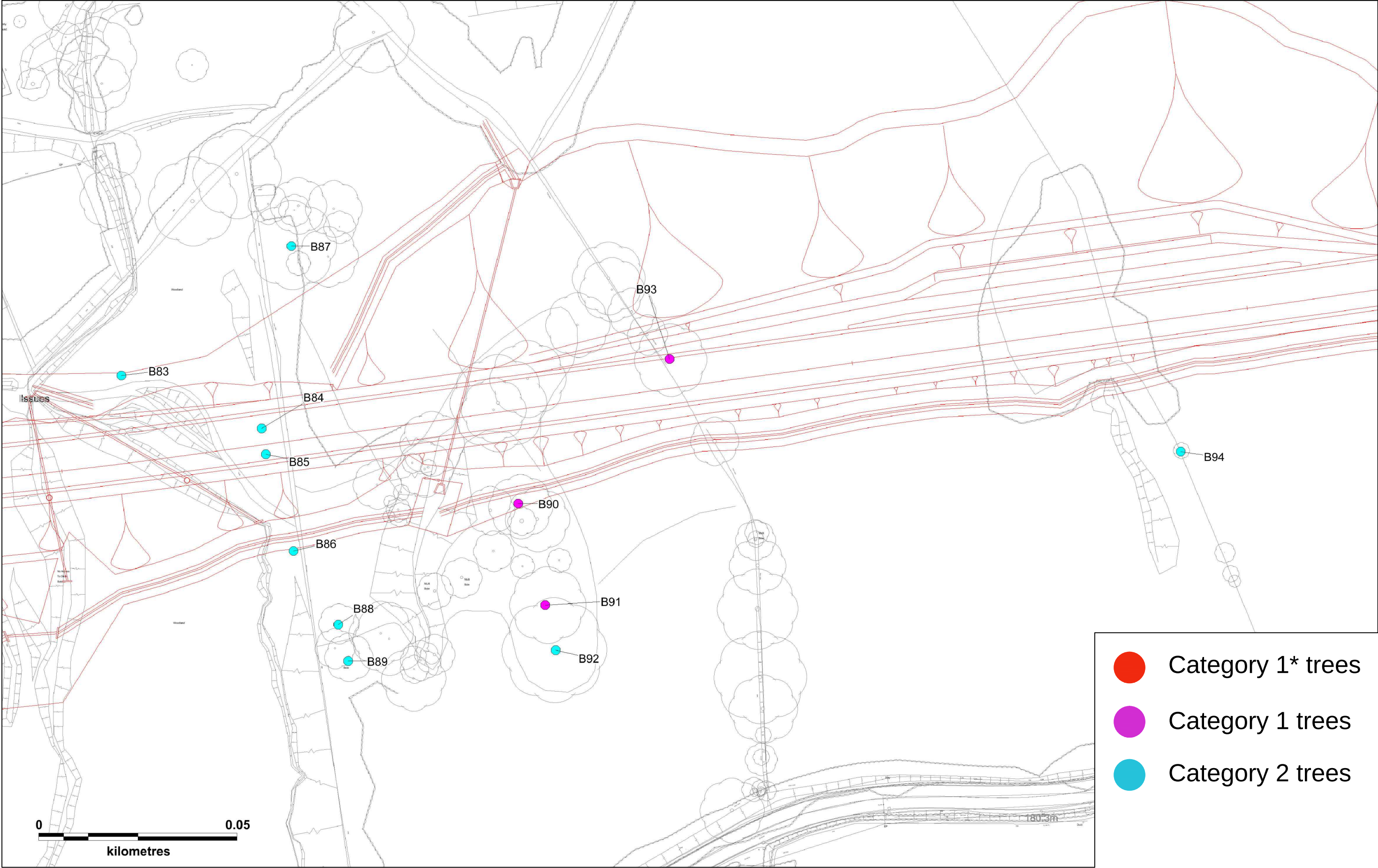
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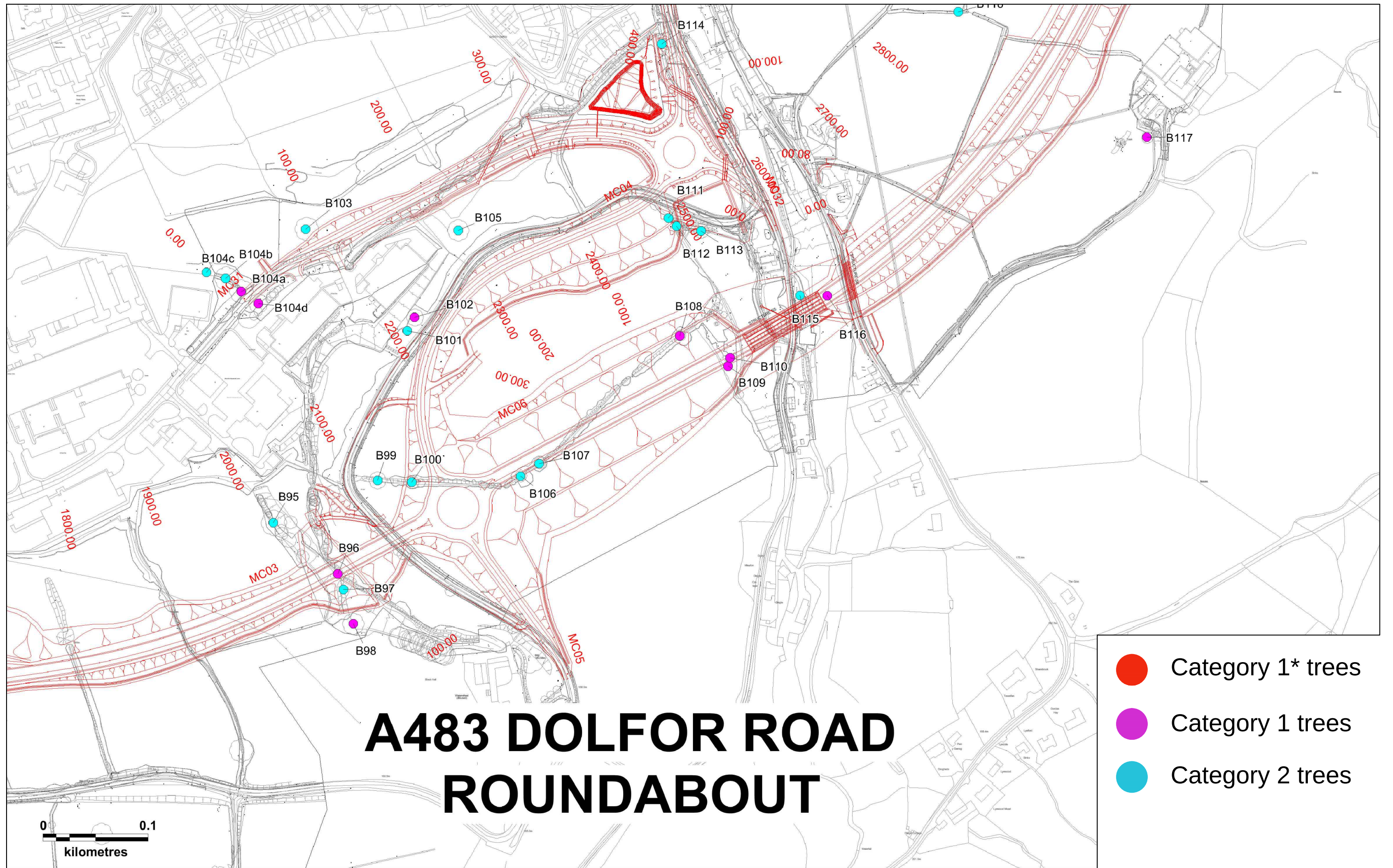
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Figure No

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Issue

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A483 DOLFOR ROAD ROUNDABOUT

- Category 1* trees
- Category 1 trees
- Category 2 trees

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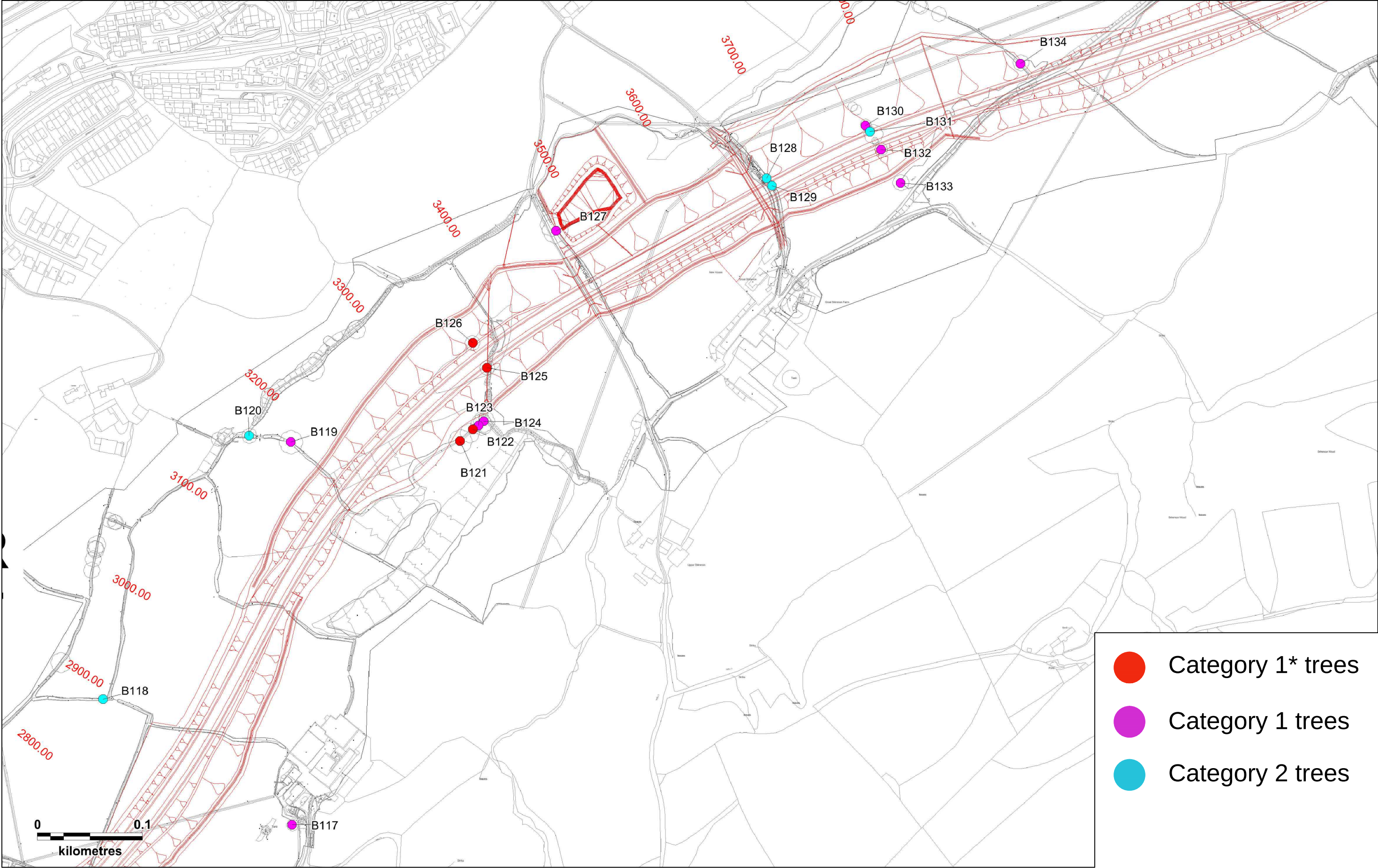
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- Category 1* trees
- Category 1 trees
- Category 2 trees

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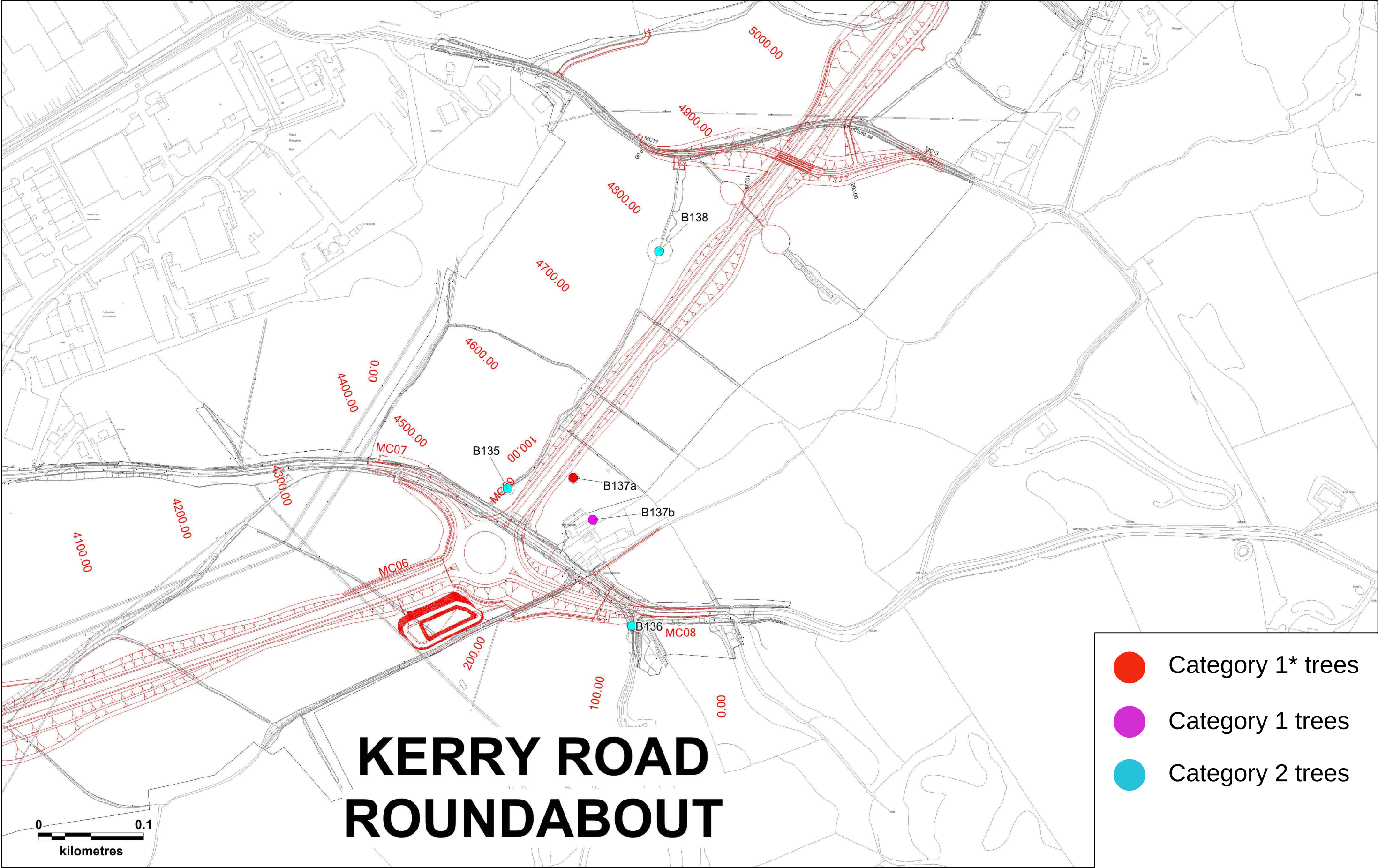
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- Category 1* trees
- Category 1 trees
- Category 2 trees

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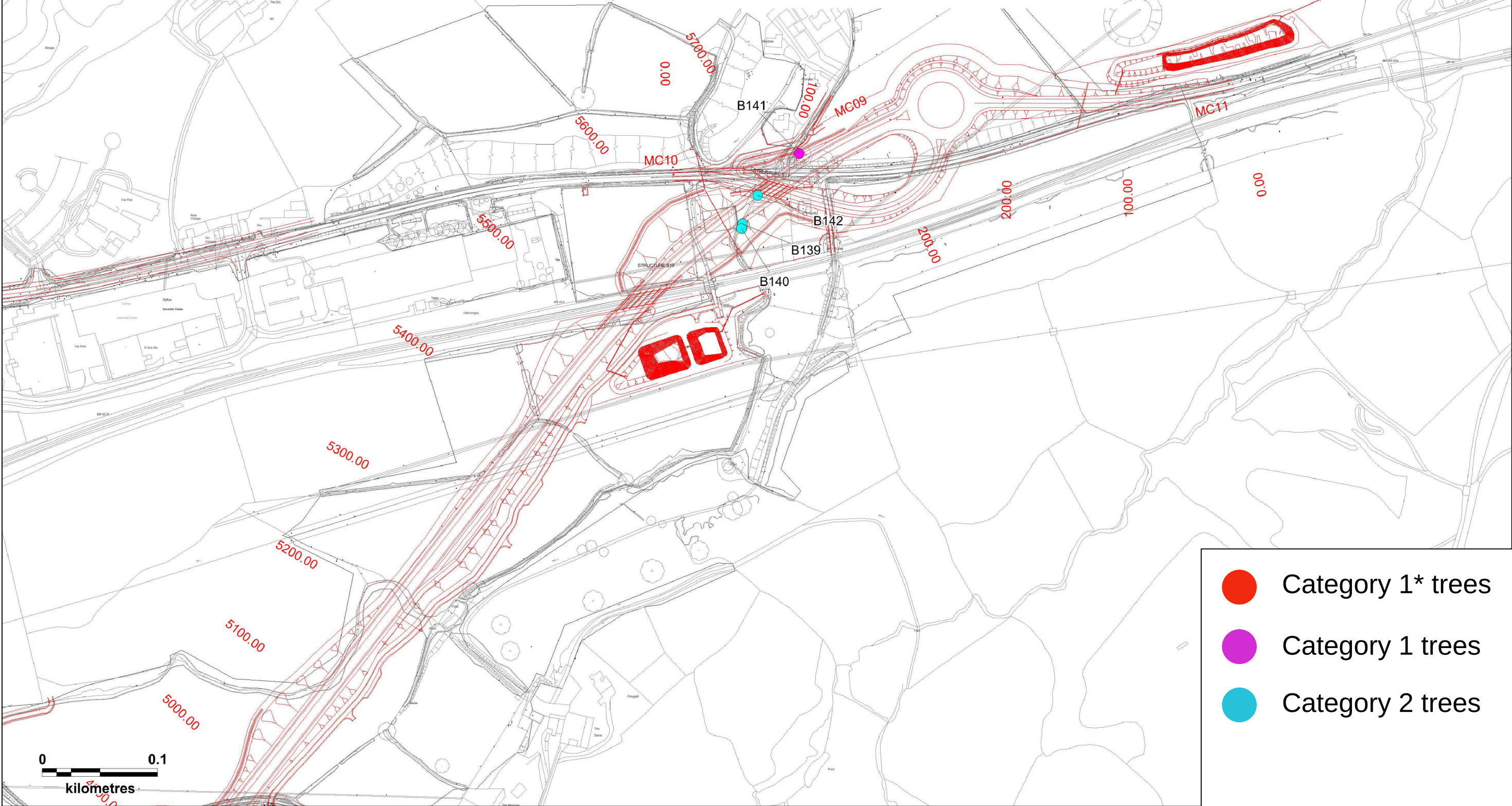
Figure No

1.0h

Issue

-

A483 POOL ROAD ROUNDAABOUT



- Category 1* trees
- Category 1 trees
- Category 2 trees

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1.0i

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Appendix E.11
Bat Ghost Licence



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A483/A489 NEWTOWN BYPASS

Bat Ghost Licence

August 2014



Llywodraeth Cymru
Welsh Government

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ATKINS LTD
TRANSPORTATION ENGINEERING DIVISION

Atkins Ltd
West Glamorgan House
12 Orchard Street
Swansea
SA1 5AD
Telephone No: 01792 641172
Fax No: 01792 472019

DOCUMENT REFERENCE:
5105742/ENV/ECO/RT219

CLIENT: The Welsh Government
Transport

PROJECT: A483/A489 Newtown Bypass

Report Title: Bat Ghost Licence

Issue: F1

Status: Final

F1	23/09/14	Final	DW/MB	JW	RB
D3	31/07/14	Draft	DW/MB	JW	RB
D2	30/06/14	Draft	DW/MB	JW	RB
D1	09/06/14	Draft	DW/MB	JW	RB
Issue	Date	Status	Written	Reviewed by	Authorised by Project Manager



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Welsh Government

A483/A489 Newtown Bypass



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Figure 1.0 Scheme layout and roost location



Llywodraeth Cymru
Welsh Government

A483/A489 Newtown Bypass



1. Introduction

1.1. Purpose of this Report

This document has been prepared as the construction and operation of the Scheme is likely to affect the resting places (i.e. roosts) of Soprano pipistrelle and Whiskered bats, which are protected under the Conservation (Natural Habitats &c.) Regulations 2010 (and 2011/2012 amendment regulations). A detailed explanation of the requirements of the legislation is provided in Section 1.6 below.

In accordance with these regulations a European Protected Species (EPS) Licence must be granted by the licencing authority, Natural Resources Wales (NRW) in order to construct the Scheme.

In the case of the A483/A489 Newtown Bypass Scheme, a licence may be granted by NRW as its construction and operation constitute *'imperative reasons of overriding public interest including those of a social or economic nature'* and *'there is no satisfactory alternative'* and *'the action authorised will not be in detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'*.

The prefix 'Ghost' is used in this document as the actual EPS licence would not normally be considered by NRW until the formal permission for a scheme or project had been granted. In the case of a trunk road, under the Highways Act, 1980 (as amended), this formal permission would be the Welsh Minister's Decision following a Public Inquiry (if one was required). Therefore, the Welsh Government advises that 'Ghost Licences' be prepared during scheme development as a means to demonstrate that due consideration of mitigation measures for EPS species has been made and agreed with NRW. Therefore the preparation of 'Ghost' Licences in tandem with the ES provide reference sources to inform the decision making process for the Scheme during the statutory process leading up to the Minister's Decision.

This "Ghost" licence application has been prepared in relation to the residential property - 'Kinsale', Middle Dolfor Road, Newtown, Powys (SY16 4BG) and a corrugated barn along Pool Road, Newtown, Powys (SY16 3AL) and sets out the proposed mitigation strategy for the demolition of these known building roosts.

1.2. Description of the Project

1.2.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion



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along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.2.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the ES.

1.3. Background

The Welsh Government commissioned Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WelTAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.

The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.

In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.4. The Project Objectives

1.4.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.



The Welsh Government's mission is to:

"Promote the vision and transport strategy described in the Welsh Government's 'One Wales: Connecting the Nation', the Wales Transport Strategy, and the National and Regional Transport Plans".

1.4.2. Scheme / Planning Objectives

Seven specific Transport Planning Objectives (TPOs) have been identified for the scheme. These will be achieved by the successful ECI Contractor and several other stakeholders, namely Powys County Council/TraCC (Objectives 1, 4 and 5) and Welsh Government (Objectives 2, 3, 6 and 7). The objectives are detailed below:

Objective 1 – Maintain economic base

- Maintain economic base of Newtown measured by levels of local employment by the date in the local development plan (2025).

Objective 2 – Meeting relevant environmental targets

- Within Newtown settlement boundary limit and within 200m of the scheme;
- Meet targets and comply with appropriate environmental legislation and policies by 2018;
- Reduce greenhouse gas emissions along Pool Road and New Road by 3% from 2008 levels, by 2018 (in accordance with Wales Transport Strategy).

Objective 3 – Removing through traffic from local roads

- Reduce through traffic on Heol Treowen, Plantation Lane and Milford Road by 50% over 2008 levels by 2018;
- Reduce HGVs on Heol Treowen, Plantation Lane by 90% from 2008 levels, by 2018.

Objective 4 – Increasing level of usage for non-car forms of transport

- For travel with origin and destination within Newtown, achieve modal shift of 10% from car to non-car forms of transport (cycling, walking and public transport), over 2008 levels, by 2018;
- For travel with origin or destination within Newtown, achieve modal shift of 2% from car to public transport, over 2008 levels, by 2018.

Objective 5 – Integration of public transport

- Within Newtown limit interchange penalty linking bus services and train services to 20 minutes, by 2018;
- Within Newtown, during morning and evening peak hours (0700-0900 and 1600-1800) limit interchange penalty between bus services to 10 minutes, by 2018.



Objective 6 – Improve journey time consistency (North-South, East-West)

- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A470/A489 junction (Caersws) and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A470/A489 junction (Caersws) by 10% by 2018.

Objective 7 – Reduction in accidents

- Within Newtown settlement boundary limit, reduce road traffic accidents on A483(T), A489(T), Heol Treowen, Plantation Lane and Milford Road by 25% by 2018.

1.5. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.

Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.

The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.



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The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.

The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this roundabout into the Mochdre Industrial Estate along Hoel Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Overbridge. A westbound lay-by would be provided east of Wern Ddu Overbridge.

An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.

1.6. Requirements of the legislation

Under the Conservation (Natural Habitats &c.) Regulations 2010 (and 2011/2012 amendment regulations), Regulation 41(1): 'a person who:

- a) *Deliberately captures, injures or kills any wild animal of a European Protected Species,*
- b) *Deliberately disturbs wild animal of any such species,*
- c) *Deliberately takes or destroys the eggs of such an animal, or*
- d) *Damages, destroys a breeding site, or resting place of such an animal.*

Is guilty of an offence'



However, under Regulation 53 (1 & 2), *'the relevant licencing body may grant a licence for the purposes specified'* below:

- a) *'Scientific or educational purposes;*
- b) *'Ringing or marking, or examining any ring or mark on, wild animals;*
- c) *'Conserving wild animals or wild plants or introducing them to particular areas;*
- d) *'Protecting any zoological or botanical collection;*
- e) *'Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*
- f) *'Preventing the spread of disease; or*
- g) *'Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property to fisheries'.*

Under Regulation 53(9) *'the relevant licensing body must not grant a licence under this regulation unless they are satisfied:*

- a) *'That there is no satisfactory alternative; and*
- b) *'That the action authorised will not be in detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.*

1.7. Guidance documents used

The contents of this Ghost Licence is based on the requirements for full licence applications from the licencing authority – NRW. This includes NRW's *'Information to be provided in European Protected Species Licence Application'* [1] and *'Application for a Licence – Bat Method Statement'* [2].

Guidance has also be sought from the Bat Conservation Trust's *Good Practice Guidelines* (2nd Ed.) [3].

1.8. Detail of the work on site to be covered by the licence

The proposed works will involve the demolition of the property 'Kinsale' which is located along Middle Dolfor Road at Ch. 2600.00 (refer to Figure 1.0). Surveys indicate this is used as a non-breeding summer roost for Soprano pipistrelle (*Pipistrellus pygmaeus*) and an occasional summer roost or transitional roost for Whiskered bats (*Myotis mystacinus*), with bats less likely (but not certain) to be absent during winter. The building has to be demolished in order to build the Dolfor Underbridge, which is one of the Scheme's key structures. It is proposed to demolish the building in autumn 2015, which would avoid the breeding or hibernation periods.

The proposed works will also involve the demolition of a corrugated barn which is located along Pool Road at Ch. 5700.00 (refer to Figure 1.0). Surveys indicate this is used as a non-breeding summer roost for Soprano pipistrelle (*Pipistrellus pygmaeus*), bats, with bats less likely (but not certain) to be absent during winter. The building has to be demolished in order to build the Pool Road Underbridge, which is another of the Scheme's key structures. It is also proposed to demolish the building in autumn 2015, which would avoid the breeding or hibernation periods.



2. Survey and Site Assessment

2.1. Existing information of the bat species at the survey site

Surveys for bats have taken place in the vicinity of the entire Scheme length since 2008. This has established a good level of understanding regarding the distribution of bats in the wider area, and the potential effects the Scheme may have on them. In summary, the surveys which have taken place are as follows:

- A review of existing records of bats within 10km of the centre of Newtown, and activity transect surveys (2008).
- Activity transects and preliminary tree roost and building assessments (2012)
- Activity transects and internal and external inspections of buildings (2013)
- Internal and external inspections of buildings, preliminary roost assessments and dusk emergence / dawn re-entry surveys (2014)

The detailed results of these surveys are discussed in the ES Volume 3, Appendix E.8, E.9, E.10 and E.12

The results of the activity surveys, the internal and external building inspections and dusk emergence / dawn re-entry surveys undertaken at Kinsale and the Barn along Pool Road in 2013 and 2014 will be described further in this 'Ghost' Licence Application.

2.2. Further surveys and other possible licence applications

Survey work to date has found no evidence of bat roosts within other buildings and trees that are to be affected by the Scheme, other than Kinsale and the Barn along Pool Road. Further surveys of trees and a building 'Gelli' will take place during spring / summer 2015, prior to construction. A formal licence application would be made, following the publication of the draft Orders, should any roosts be found following these surveys.

2.3. Statutory sites notified for the species within 10km

There are no statutory sites designated for any bat species within 10km of Kinsale, the Barn along Pool Road or the wider Scheme.

2.4. Methodology

2.4.1. Activity surveys

Bat activity surveys were undertaken along 19 transects on three occasions in 2013: in May, July and September. The full activity survey report is available in ES Volume 3, Appendix E.8. The location and frequency of survey had been agreed with NRW. One of the nineteen transects was along Middle Dolfor Road, along which Kinsale is located.

On each occasion, the transect was surveyed by two people, using handheld broadband bat detectors and recording devices. Each survey team monitored activity at one transect per night, monitoring commuting activity along the feature continuously as well



as walking up and down the feature to identify foraging behaviour by bats. Wherever possible the behaviour of bats observed was recorded (such as direction of flight) to allow identification of commuting routes. Each survey comprised two hours of monitoring after dusk and two hours before dawn on the following morning.

Survey teams carried at least three bat detectors, in order to maximise chances of recording lesser horseshoe and barbastelle bats. Two detectors were used in heterodyne mode, tuned to approximately 110kHz and 35kHz, and a third detector was used in time expansion/frequency division mode to record other bat activity, with any recordings made analysed later using Batsound and AnalookW software, and identified by reference to *British Bat Calls* [4].

The level of survey effort employed corresponds with that recommended in Bat Surveys – Good Practice Guidelines [3] for activity surveys of low value habitats. Automatic detectors were not used during these surveys as their primary aim was to confirm presence or absence of commuting routes from the Scheme, using surveyor observations to identify direction of flight for bats recorded.

2.4.1.1. Constraints

On some occasions surveys were affected by poor weather conditions; where this could be predicted in advance, surveys were rescheduled and completed in more suitable weather conditions later in the same month. A small number of May surveys took place in early June as a result of postponement due to poor weather conditions.

Recordings made on Transect 17 in July were lost due to a computer failure and consequently the data are not available for one of the three occasions that this transect was surveyed.

2.4.2. Internal and external inspections

An internal and external inspection of Kinsale was carried out on 12th August 2013 by Susan Worsfold BSc, GradCIEEM (NRW Bat Licence No. 55624:OTH:CSAB:2014) and Emma Davies of Alun Griffiths (Contractors). An internal and external inspection of the Barn along Pool Road was carried out on 20th April 2014 by Susan Worsfold and Max Burrell (BSc hons, MSc, MIEMA). The objective of the internal and external inspections was to determine the presence / absence of bats within the buildings. The location of Kinsale and the Barn along Pool Road in relation to the Scheme is shown on Figure 1.0. A full survey report of all the buildings inspected is included in ES Volume 3, Appendix E.9.

The building was examined for the signs of use by bats, such as urine stains, rub marks, dropping and insect remains. Any crevices and potential access points were noted to determine the likelihood of use or potential for use as a roost by bats. Binoculars and ladders were used for observation of areas which were otherwise inaccessible.

Droppings within the loft of Kinsale were collected on 15th May 2014. These were sent to Dr. Robin Allaby at the University of Warwick for species identification from their DNA profile.

2.4.3. Emergence / re-entry surveys

Two dusk emergence and one dawn re-entry survey were undertaken at Kinsale on:



- 8th July 2014 between 21:15 – 23:15 (time of sunset – 21:35)
- 10th July 2014 between 03:00 – 05:00 (time of sunrise – 05:02)
- 15th July 2014 between 21:15 – 23:15 (time of sunset – 21:30)

One dawn re-entry survey was conducted at the Barn along Pool Road on:

- 25th July 2014 between 03:25 – 05:25 (time of sunrise – 05:22)

The location of these buildings in relation to the Scheme is shown on Figure 1.0. The number of survey visits to each building was based on the potential for the buildings to support roosting bats as set out in the *Good Practice Guidelines* [3]. Following the internal and external inspections of buildings Kinsale was considered to have a ‘high’ roost potential and the Barn along Pool Road a ‘low’ potential. As only one survey was proposed at the Barn along Pool Road, a dawn re-entry survey was undertaken. Bats are usually better observed returning to their roosts as they usually circle several times outside before entering.

Three surveyors were used at Kinsale and three at the Barn along Pool Road. Each surveyor watched for bats either leaving the building at dusk or returning at dawn. The locations where bats left or returned were noted. The surveyors used either AnaBat SD2 frequency division or Pettersson D240x time expansion detectors and recording devices to record bats entering or leaving the buildings. Bat calls recorded were later analysed using AnalookW or Bat Sound software. Species were determined with reference to *British Bat Calls* [4].

A full survey report of the emergence / re-entry of buildings is included in ES Volume 3, Appendix E.12. Sonograms of all bats recorded either entering or leaving buildings are provided in Appendix B.

2.4.4. Static detector survey

The dusk emergence / dawn re-entry surveys at Kinsale were supplemented with an AnaBat with a 12v battery placed within the loft between 8th and 17th July 2014.

Recordings were later analysed using AnalookW software.

2.5. Survey Results

2.5.1. Activity surveys

Species recorded along the Dolfor Valley in the vicinity of Kinsale include the following:

- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Possible Nathusius pipistrelle (*Pipistrellus nathusii*)
- Noctule (*Nyctalus noctula*)
- Brown Long-eared (*Plecotus auritus*)
- Serotine (*Eptesicus serotinus*)
- Natterer's (*Myotis nattereri*)
- Daubenton's (*Myotis daubentonii*)
- Unidentified *Myotis* sp.



During the dawn survey in May 2013, a Soprano pipistrelle (*Pipistrellus pygmaeus*) was observed entering the property at the western gable end.

A peak count of eleven commuting Common pipistrelle (*Pipistrellus pipistrellus*) bats was recorded along the floor of the Dolfor Valley adjacent to Kinsale.

Survey transects conducted either side of the railway, adjacent to the Barn along Pool Road recorded few species with Common (*Pipistrellus pipistrellus*) and Soprano pipistrelles (*Pipistrellus pygmaeus*) being the most common.

No commuting bats were recorded adjacent to the Barn along Pool Road.

2.5.2. Internal and external inspections

2.5.2.1. Kinsale

Kinsale is a brick built house with slate roof, partially lined with bitumastic hessian. Some slates are loose and damaged and some gaps in the roof were seen from the inside of the loft. All windows are glazed and intact and there are barge boards at the gable ends of the property.

There is some potential for roosting bats behind the barge boards and beneath roof lining. There appeared to be some small gaps at the west gable end, where the wall met the soffit. This is likely/considered to be the point of entry noted during the walked transect.

A small accumulation of bat droppings was found within the loft during the survey (approximately 20 – 30). The DNA test results show that the droppings analysed were that of a Whiskered bat (*Myotis mystacinus*) (refer to test results at Appendix A). Photographs of the house and loft are shown below.

Photo 1 – exterior of the property, view from the north-west





Photo 2 – View of the western gable end

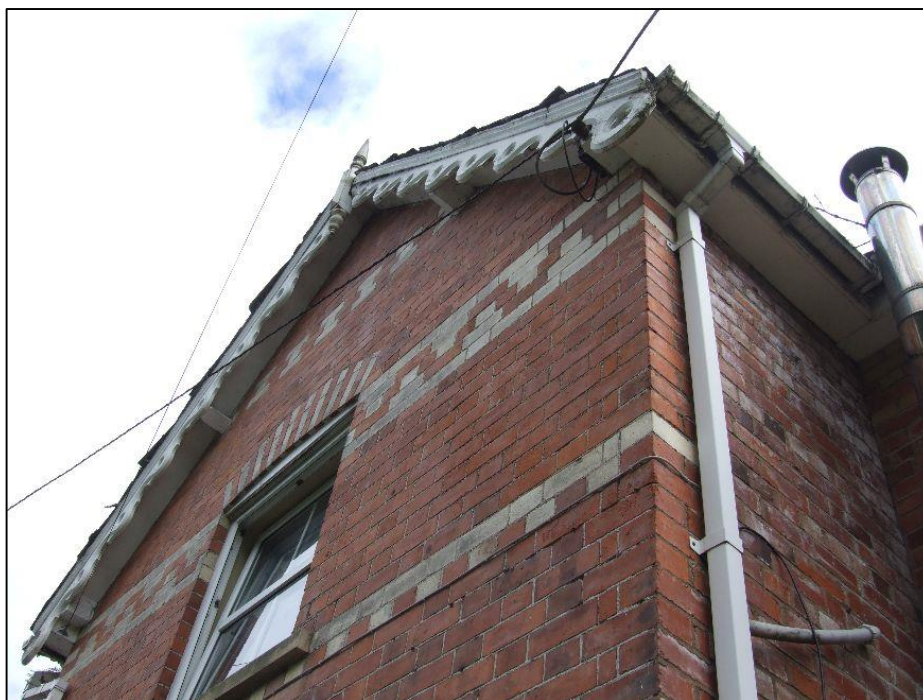


Photo 3 – View of inside the loft





Photo 4 – Droppings found within the loft of Kinsale



2.5.2.2. Barn along Pool Road

The Barn along Pool Road has slatted wood walls and a corrugated steel roof with plastic windows, concrete pillars and wood beams. There is an open steel lean-to at the east side.

No evidence of use by bats was observed during the survey and the potential for it to be used was considered low. Photographs of the main features of the barn are shown below:

Photo 5 – Barn exterior





Photo 6 – Barn interior



Photo 7 – Roof detail





2.5.3. Dusk emergence / dawn re-entry surveys

2.5.3.1. Kinsale

Results are shown in Table 1.0 below:

Table 1.0 – Dusk emergence / dawn re-entry survey results - Kinsale

Time	Species	Notes
8th July 2014 (dusk survey)		
21:46	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Emerged from the west facing gable end of the property and then flew in a northerly direction. Species confirmed through later examination of call recordings.
10th July 2014 (dawn survey)		
04.41	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Bat returned to the same place it was recorded emerging on 08/07/2014. Presumed to be the same animal. Entry point underneath the second tile down on the southern aspect of the roof near the west facing gable end (refer to Photograph 8 below).
15th July 2014 (dusk survey)		
21:46	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Emerged from the west facing gable end of the property as before.



Photograph 8 – Emergence /re-entry location of the Soprano pipistrelle (*Pipistrellus pygmaeus*) at the west facing gable end of Kinsale



2.5.3.2. Barn along Pool Road

Results are shown in Table 2.0 below:

Table 2.0 – Dawn re-entry survey results – Barn along Pool Road

Time	Species	Notes
25th July 2014 (dawn survey)		
05:01	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Returned to southern side of barn and entered under one of the vertical wooden slats. Roost location presumed to be under one of the slats (refer to Photograph 9).



Photograph 9 – Re-entry location of the Soprano pipistrelle (*Pipistrellus pygmaeus*) at the south facing side of the Barn along Pool Road



2.5.3.3. Static detector survey

No bats were recorded on the AnaBat placed within the loft of Kinsale.

2.6. Interpretation/evaluation of survey results

Based on these survey findings it is considered likely that Kinsale supports a non-breeding summer roost for Soprano pipistrelle (*Pipistrellus pygmaeus*) and an occasional summer roost or transitional roost for Whiskered bats (*Myotis mystacinus*), with bats less likely (but not certain) to be absent during winter.

It is also considered likely that the Barn along Pool Road supports a non-breeding summer roost for small numbers of Soprano pipistrelle bats (*Pipistrellus pygmaeus*).

It is considered likely that all of these roosts support fewer than five animals and most likely single animals in each case.



3. Impact Assessment

3.1. Short-term and long-term impacts

The impact on the roost at Kinsale and the Barn along Pool Road has been considered in the overall Ecological Impact Assessment that has been carried out for the entire Scheme in accordance with DMRB (HA205/08) [5] and CIEEM [6] guidelines. The overall assessment is reported in Section 8, Nature Conservation of the ES, Volume 1, which provides information on the assigning values to the ecological receptors and magnitude and significance of impact (refer to ES Volume 1, Section 8.2.2).

Kinsale and the Barn along Pool Road require demolition in order to construct two of the Scheme's key structures; the Dolfor Underbridge and the Pool Road Underbridge. The overall impact on the roosts at Kinsale and the Barn along Pool Road will have a negative impact which, if the Scheme goes ahead as planned will be certain to occur and will constitute a direct loss. The impact will however be limited to these two roost sites which are considered to house a small number of non-breeding animals. The impacts will be a permanent one-off loss that is not reversible.

The magnitude of these impact is assessed as 'moderate negative' and slight adverse in the absence of mitigation.



4. Mitigation, compensation and Monitoring

4.1. Works to be undertaken

As the identified roosts in Kinsale and the Barn along Pool Road are used by small numbers of non-breeding bats, it is possible that bats may be present throughout much of the year. Works would therefore be programmed to allow demolition of Kinsale and the Barn along Pool Road during the autumn, avoiding the breeding or hibernation periods.

Demolition of Kinsale would be preceded by the careful removal of roof tiles and other potential roosting features by hand, under the supervision of a suitably qualified and licensed ecologist, in order to catch and remove any bats present. Similarly, the wooden slats around the exterior of the Barn along Pool Road and other potential roosting features would also be carefully removed by hand under the supervision of a suitably qualified and licensed ecologist and any bats present would be caught and removed.

'Toolbox talks' would be given to the contractors undertaking the work, prior to the demolition in order to brief them on how they should proceed to avoid injury to bats. Only once all roost sites have been investigated will the remainder of the buildings be demolished. Any bats found would be released into nearby bat boxes, which will be provided as described below:

4.2. New Roost Creation (including bat houses and boxes)

Mitigation for loss of the Kinsale roost site would be provided using bat boxes, either positioned on retained trees close to the Scheme, or if no suitable trees are present on wooden 'telegraph poles' within the footprint of the Scheme. It is proposed to use three Schwegler 2F for the loss of the Soprano pipistrelle roost and three 2F DFP for the loss of the Whiskered bat roost. Wherever possible, bat boxes would be provided in advance of the building being demolished. However, if wooden poles are used within the Scheme boundary, earthworks requirements may prevent these being provided immediately.

Similarly, mitigation for the loss of the Barn along Pool Road roost would be provided using bat boxes either positioned on retained trees close to the Scheme, or if no suitable trees are present on wooden 'telegraph poles' within the footprint of the Scheme. It is proposed to use three Schwegler 2F for the loss of the Soprano pipistrelle roost. Wherever possible, bat boxes would be provided in advance of the building being demolished. However, if wooden poles are used within the Scheme boundary, earthworks requirements may prevent these being provided immediately.

4.3. Mechanisms for delivery

Under the terms of the contract, the AGC Team are required to produce and implement a Construction Environmental Management Plan (CEMP) [7] throughout the construction phase of the Scheme. Central to this is the Register of Commitments (ROC), which lists the obligations made in documents, such as this Ghost Licence and the overall ES (e.g.



the measures listed in Sections 4.1 and 4.2 above). The AGC Team's Environmental Coordinator and Environmental Clerk of Works, (who will be a full time member of staff onsite during construction) will be responsible for the implementation and monitoring of the CEMP and thus the obligations made in this Ghost Licence and the overall ES.

The AGC Team would monitor, measure and review the environmental performance against the commitments, objectives and targets/key performance indicators identified in the CEMP (contained in the ROC). The CEMP shall contain procedures for checking, auditing and corrective action.

4.4. Biosecurity risk assessment

None of the work associated with this ghost licence is considered to present a biosecurity risk.

With regards to the wider Scheme, planting will be of UK grown native species.

4.5. Post development site safeguards

4.5.1. Habitat site management / maintenance

As part of the ECI Contract, there would be a 5-year post construction maintenance period, which would include management and monitoring of the effectiveness of mitigation measures such as those put forward in Section 4.1 and 4.2.

Requirements during this post construction maintenance period would be set out in the '*Environmental Landscape and Ecology Aftercare and Management Plan*' (ELEAMP). This would be developed during the construction phase and would include biannual monitoring of bat boxes included as mitigation for the loss of the Kinsale and Pool Road Barn roosts and procedures for repairing or replacing boxes that were damaged. The monitoring and maintenance of other mitigation measures such as habitat replacement would also be addressed within the ELEAMP.

Following the five-year post construction maintenance period a Maintenance Environmental Management Plan (MEMP) would set out a proposed strategy for the future maintenance and management of all Environmental Areas (including landscape and ecological areas) for a 10-year period. This would be produced in consultation with NRW during the 5-year post construction maintenance period and would be implemented by the North and Mid-Wales Trunk Road Agency (NMWTRA), who have the long-term responsibility for the management and maintenance of the north and mid-Wales trunk road network.



5. Programme of Work

A summary of current work programme in relation to this Ghost Licence application is provided below:

- | | |
|--|---|
| 1. Autumn 2015 | AGC take control of A483/A489 Newtown Bypass site |
| 2. Autumn 2015 | Bat boxes are erected to mitigate for loss of Kinsale and Barn along Pool Road roosts. Location of boxes to be agreed with NRW and placed out under the supervision of the Environmental Clerk of Works in accordance with the CEMP and the formal licence application. Kinsale and the Barn along Pool Road are demolished in accordance with Section 4.1 of this Ghost Licence. |
| 3. Summer 2016 – winter 2017/2018 (end of construction) | Biannual monitoring and reporting of condition and use of bat boxes. Remedial measures to be undertaken as necessary in accordance with the CEMP, by the contractor (AGC) |
| 4. 5-year post construction maintenance period | Biannual monitoring and reporting of condition and use of bat boxes. Remedial measures to be undertaken as necessary in accordance with the ELEAMP, by the contractor (AGC) |
| 5. Long-term management (10-year) following post construction maintenance period | Monitoring, management and maintenance of bat boxes to be undertaken in accordance with MEMP, by the trunk road agent (NMWTRA) |



6. References

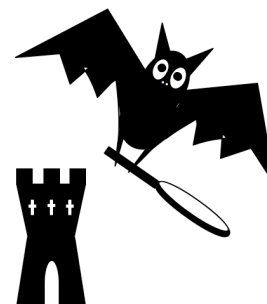
- [1] NRW (2013). Information to be provided in a European Protected Species Licence Application. Natural Resources Wales
- [2] NRW (2013). Application for a Licence – Bats Method Statement. Natural Resources Wales.
- [3] Hundt, L. (2012). Bat Surveys: Good Practice Guidelines (2nd Edition). Bat Conservation Trust ISBN-13:9781872745985
- [4] Russ, J. (2012). British Bat Calls – A Guide to Species Identification. Pelagic Publishing
- [5] Highways Agency (2008). HD 205/08/09 Assessment and Management of Environmental Effects. *Design Manual for Roads and Bridges, Volume 11 – Environmental Assessment, Section 2, Part 5.*
- [6] IEEM (2006). Guidelines for Ecological Impact Assessment in the United Kingdom. Chartered Institute of Ecological and Environmental Management.
- [7] Welsh Government Transport (2013). A483/A489 Newtown Bypass – ECI Design and Build Contract. Volume 2a – Works Information. Welsh Government.



Appendices



Appendix A – Bat Dropping DNA Test Results



3rd June 2014

Re: Bat Identification Results for Nick Madani, TACP.

Bat job number 003462 received 20/05/2014

Sample labelled: Kinsale, Newtown

PCR amplification successful. DNA sequence:

GGGGCAGGAAGGTCGATAAATGAGCTATTAATAATTTTTACTAAGGGGTGGGATTTT
CGAATGTTG

Phylogenetic analysis identification: *Myotis mystacinus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Robin Allaby
Associate Professor.

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Dr Robin Allaby

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Fax: 02476574500
Email: r.g.allaby@warwick.ac.uk



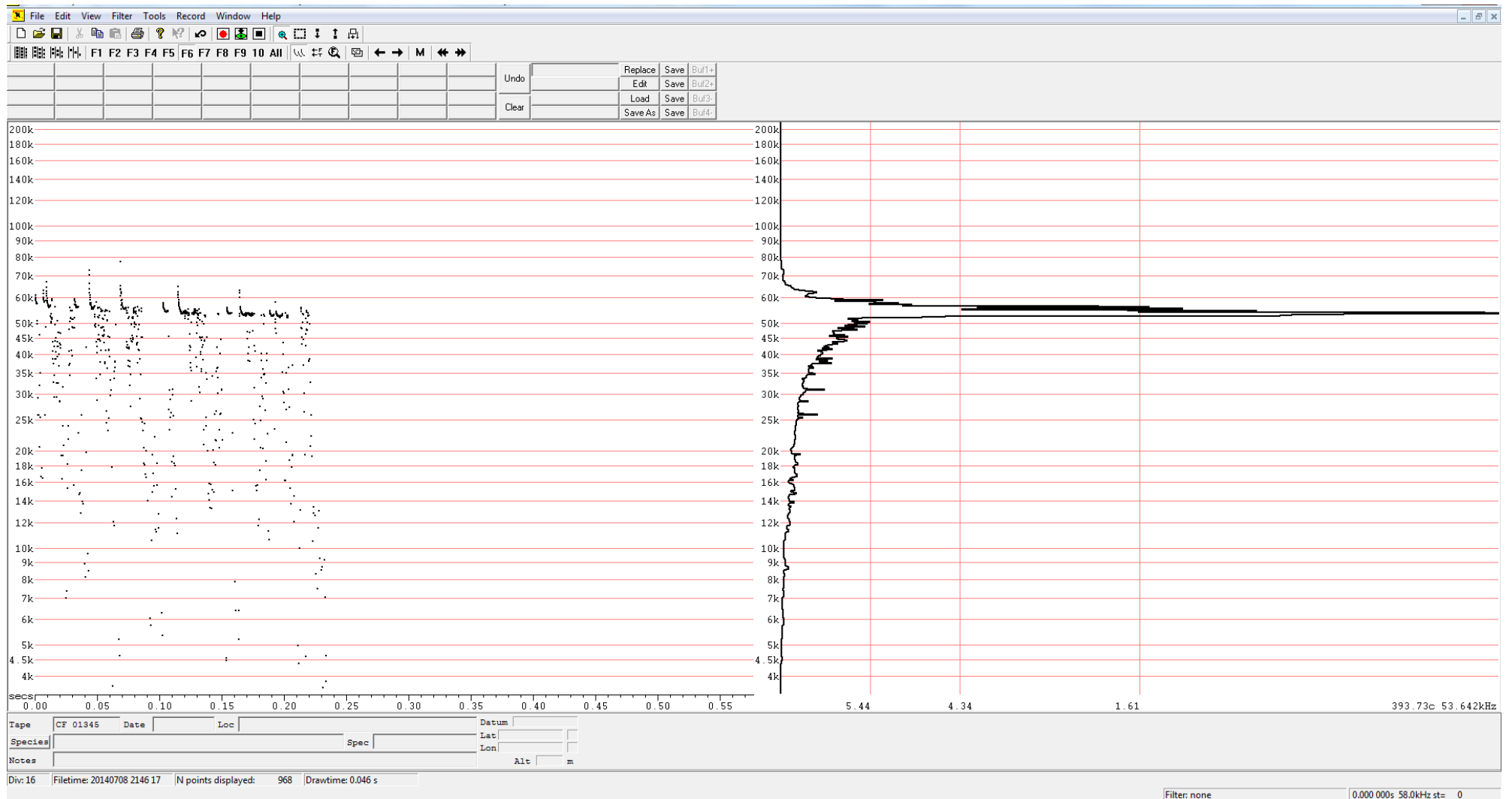
Appendix B – Sonograms



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Welsh Government

A483/A489 Newtown Bypass

Sonogram in 'AnalogW' (F6 compressed with 'split screen cycles') of Soprano pipistrelle (*Pipistrellus pygmaeus*) exiting Kinsale at 21:46 on 08/07/2014

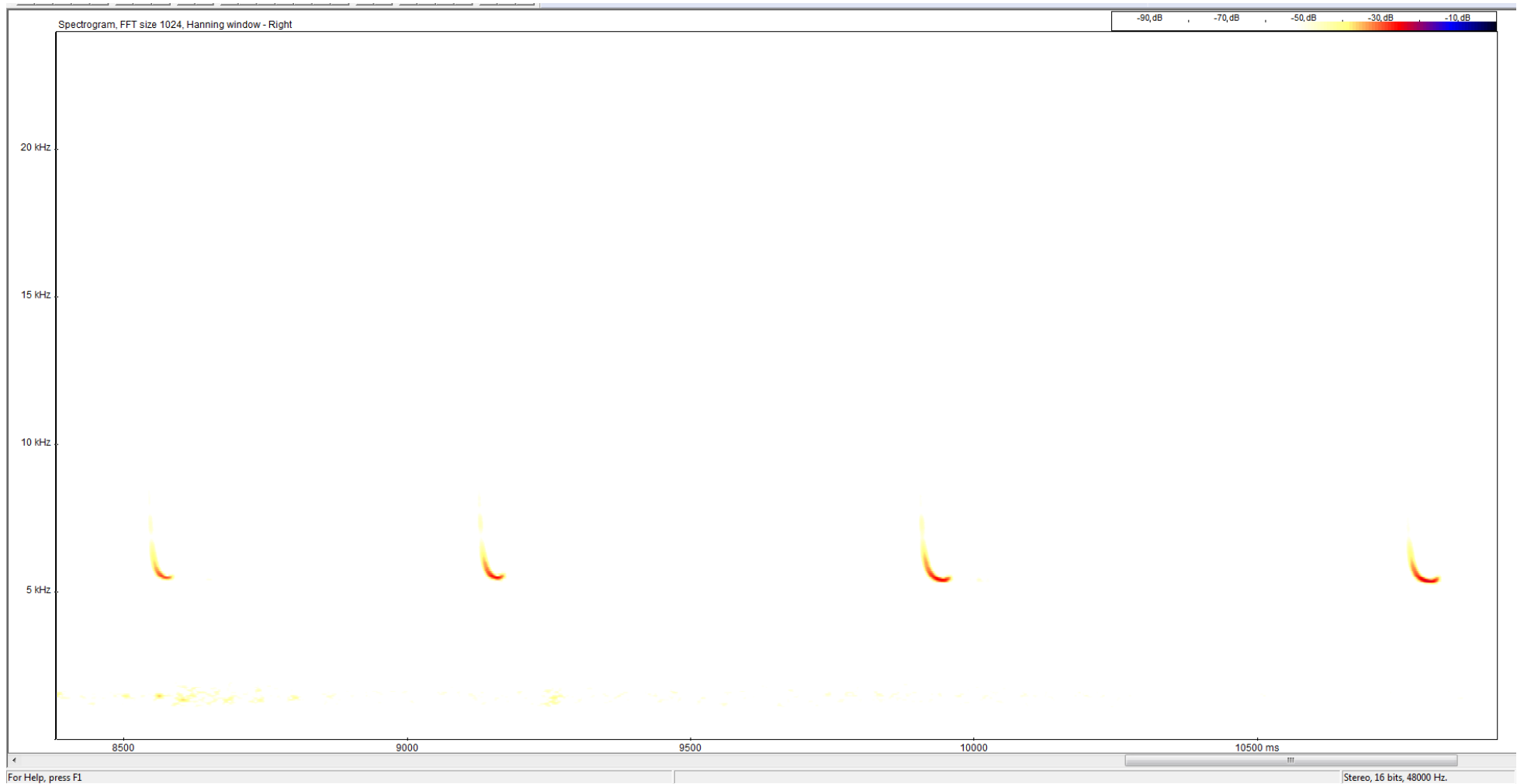




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A483/A489 Newtown Bypass

Sonogram in 'Bat Sound of Soprano pipistrelle (*Pipistrellus pygmaeus*) entering Kinsale at 04:41 on 10/07/2014

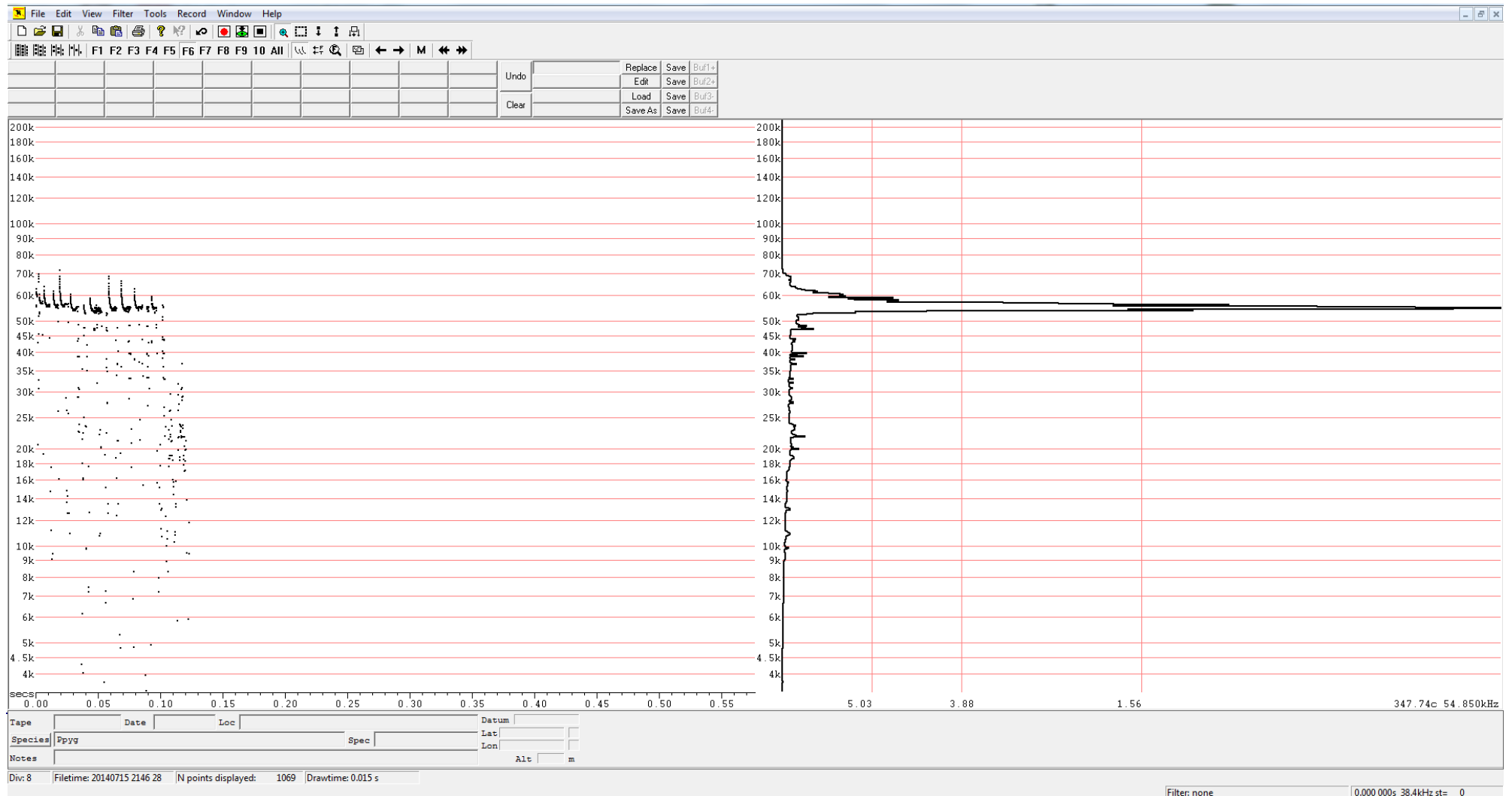




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Welsh Government

A483/A489 Newtown Bypass

Sonogram in 'AnalogW' (F6 compressed with 'split screen cycles') of Soprano pipistrelle (*Pipistrellus pygmaeus*) exiting Kinsale at 21:46 on 15/07/2014

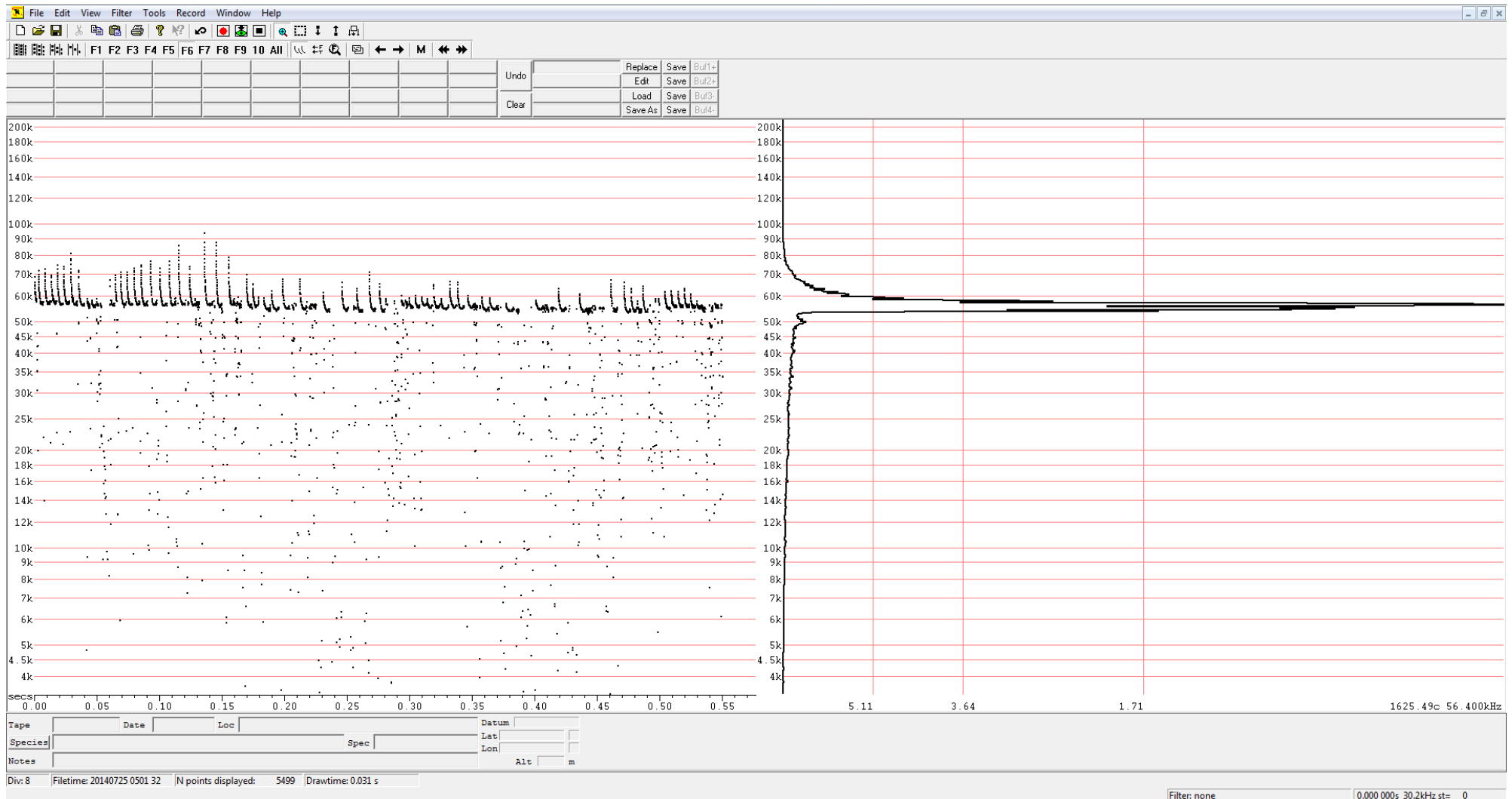


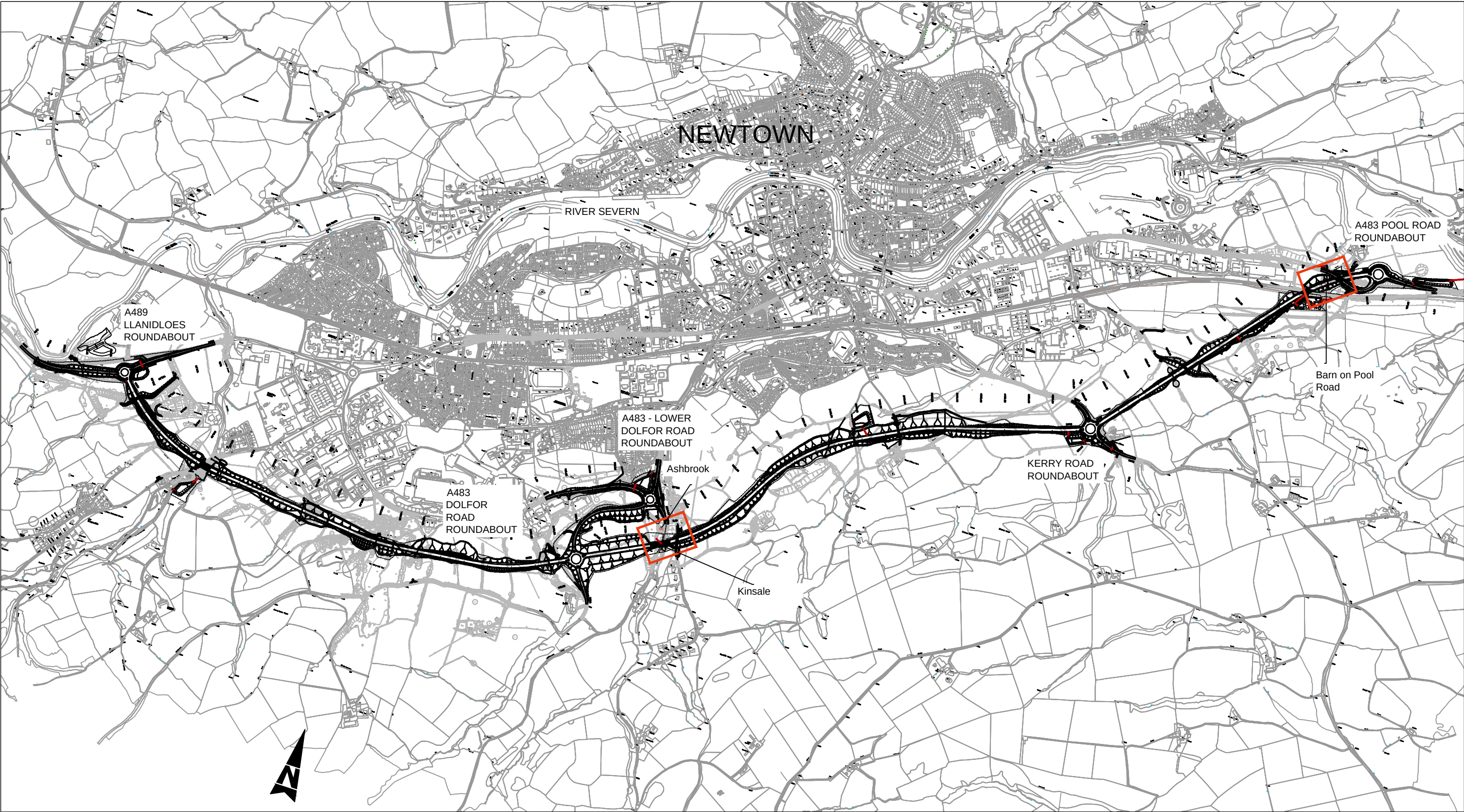


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A483/A489 Newtown Bypass

Sonogram in 'AnalogW' (F6 compressed with 'split screen cycles') of Soprano pipistrelle (*Pipistrellus pygmaeus*) entering the Barn along Pool Road at 05.01 on 25/07/2014





Proposed Scheme

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Client/Team



Llywodraeth Cymru
Welsh Government



GRIFFITHS
civil engineering and construction



ATKINS



TACP



CORDEROY CAPITA

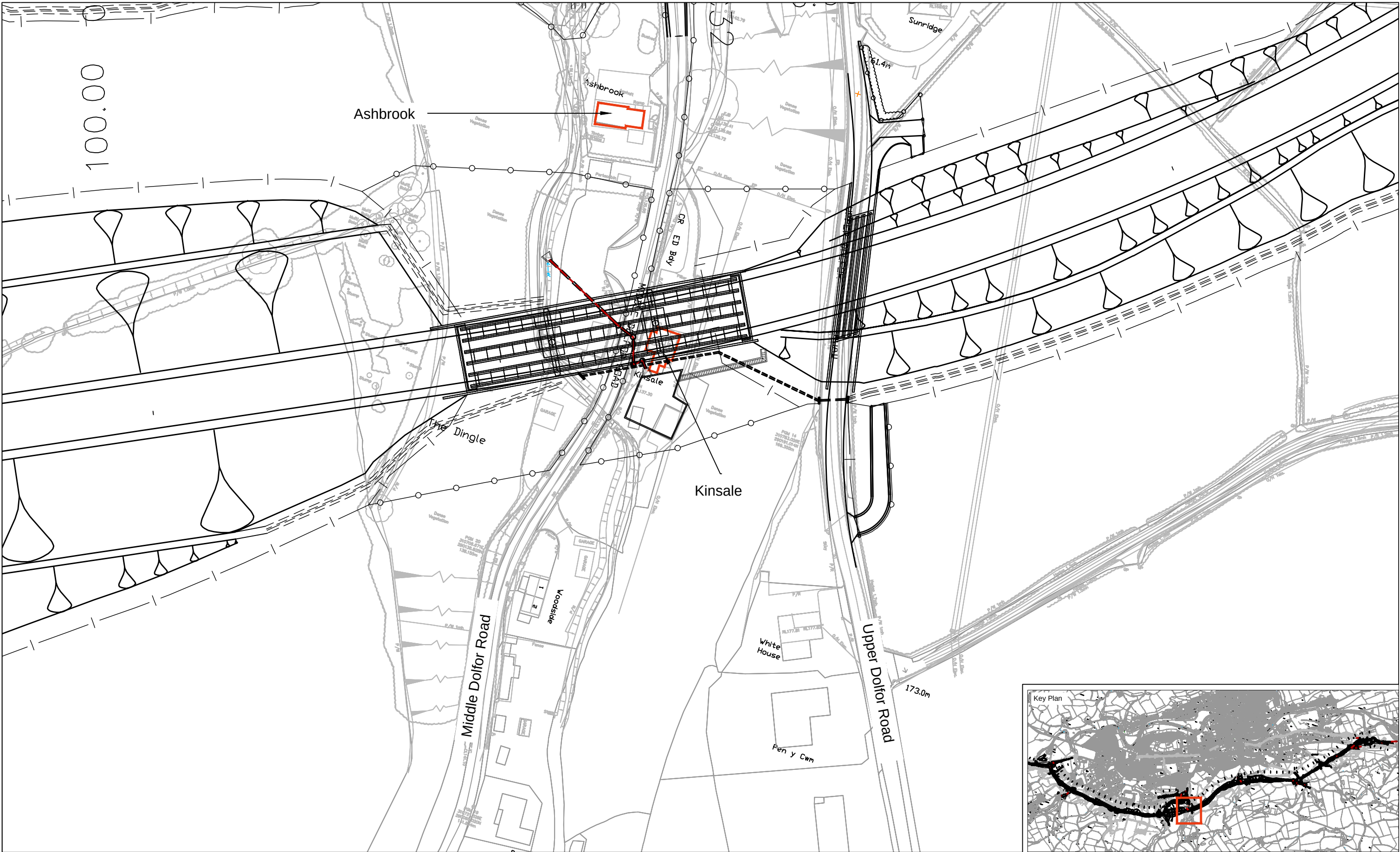
Job Title

A483/A489
Newtown Bypass

Drawing Title

Scheme Layout and Roost Locations
Sheet 1 of 3

Date	Sept 2014	Drawn by	FS
Scale at A3	Not To Scale	Checked	MB
Drawing Status	FINAL	Approved	JW
Job No	60597	Figure No	Figure 1a
		Issue	-



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Job Title

A483/A489
Newtown Bypass

Drawing Title

Scheme Layout and Roost Locations
Sheet 2 of 3

Date

Sept 2014

Drawn by

FS

Scale at A3

1:1000 at A3

Checked

MB

Drawing Status

FINAL

Approved

JW

Job No

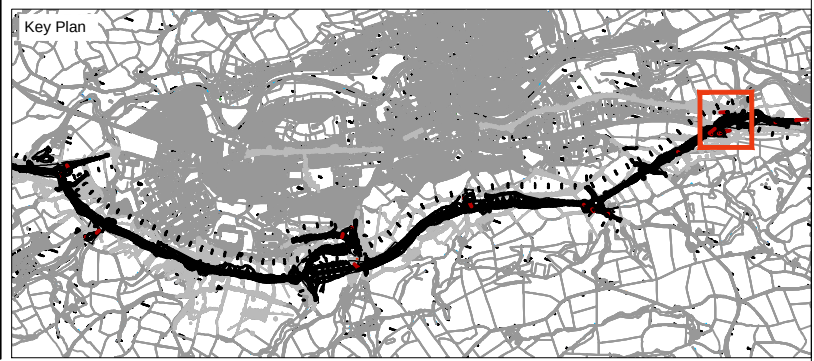
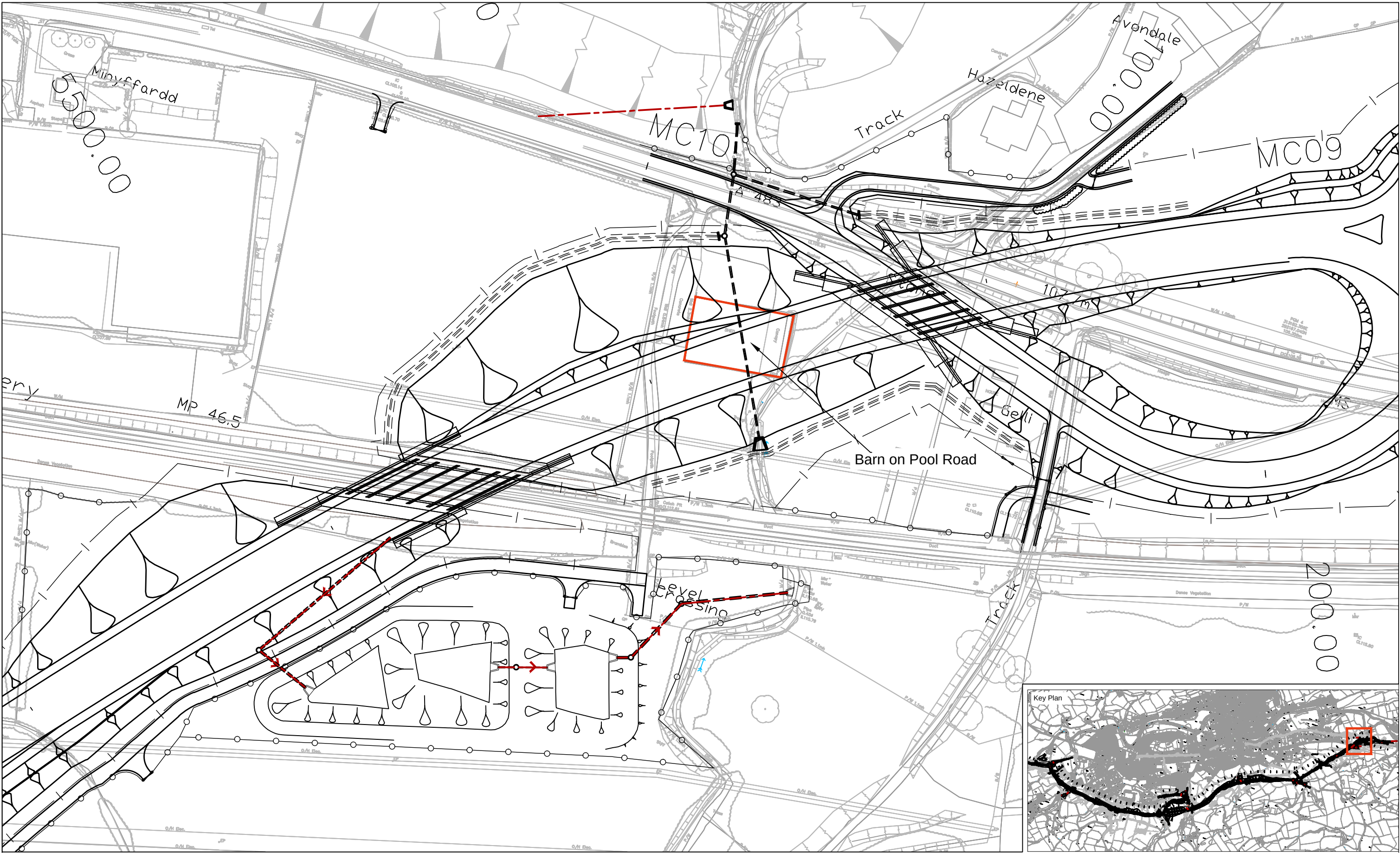
60597

Figure No

Figure 1b

Issue

-



Appendix E.12
Bat Emergence and
Re-entry of Building
Surveys 2014



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A483/A489 NEWTOWN BYPASS

Bat Emergence and Re-entry Surveys of Buildings 2014

August 2014



Llywodraeth Cymru
Welsh Government

A483/A489 Newtown Bypass

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CLIENT: The Welsh Government
Transport

PROJECT: A483/A489 Newtown Bypass

Report Title: Bat Emergence and Re-entry Surveys of Buildings 2014

Issue: F1

Status: Final

F1	24/09/14	Final	MB	DW/JW	DR
D1	20/08/14	Draft	MB	DW/JW	DR
Issue	Date	Status	Written	Reviewed by	Authorised by Project Manager



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A483/A489 Newtown Bypass



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A483/A489 Newtown Bypass



1. Introduction

1.1. Purpose of this Report

This document describes the methods and results of dusk emergence and dawn re-entry surveys undertaken at the properties 'Kinsale' and 'Ashbrook' along the Middle Dolfor Road in Newtown and a corrugated barn along Pool Road on the eastern edge of Newtown. The locations of these buildings in relation to the Scheme are shown on Figure 1.0.

1.2. Description of the Project

1.2.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.2.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the Environmental Statement (ES).

1.3. Background

The Welsh Government commissioned Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WelTAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.



The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.

In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.4. The Project Objectives

1.4.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

The Welsh Government's mission is to:

"Promote the vision and transport strategy described in the Welsh Government's 'One Wales: Connecting the Nation', the Wales Transport Strategy, and the National and Regional Transport Plans".

1.4.2. Scheme / Planning Objectives

Seven specific Transport Planning Objectives (TPOs) have been identified for the scheme. These will be achieved by the successful ECI Contractor and several other stakeholders, namely Welsh Government through the Scheme (Objectives 2, 3, 6 and 7) and Powys County Council/TraCC (Objectives 1, 4 and 5). The objectives are detailed below:

Objective 1 – Maintain economic base

- Maintain economic base of Newtown measured by levels of local employment by the date in the local development plan (2025).

Objective 2 – Meeting relevant environmental targets

- Within Newtown settlement boundary limit and within 200m of the scheme;
- Meet targets and comply with appropriate environmental legislation and policies by 2018;
- Reduce greenhouse gas emissions along Pool Road and New Road by 3% from 2008 levels, by 2018 (in accordance with Wales Transport Strategy).



Objective 3 – Removing through traffic from local roads

- Reduce through traffic on Heol Treowen, Plantation Lane and Milford Road by 50% over 2008 levels by 2018;
- Reduce HGVs on Heol Treowen, Plantation Lane by 90% from 2008 levels, by 2018.

Objective 4 – Increasing level of usage for non-car forms of transport

- For travel with origin and destination within Newtown, achieve modal shift of 10% from car to non-car forms of transport (cycling, walking and public transport), over 2008 levels, by 2018;
- For travel with origin or destination within Newtown, achieve modal shift of 2% from car to public transport, over 2008 levels, by 2018.

Objective 5 – Integration of public transport

- Within Newtown limit interchange penalty linking bus services and train services to 20 minutes, by 2018;
- Within Newtown, during morning and evening peak hours (0700-0900 and 1600-1800) limit interchange penalty between bus services to 10 minutes, by 2018.

Objective 6 – Improve journey time consistency (North-South, East-West)

- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A470/A489 junction (Caersws) and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A470/A489 junction (Caersws) by 10% by 2018.

Objective 7 – Reduction in accidents

- Within Newtown settlement boundary limit, reduce road traffic accidents on A483(T), A489(T), Heol Treowen, Plantation Lane and Milford Road by 25% by 2018.

1.5. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.



A483/A489 Newtown Bypass

Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.

The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.

The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.

The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this roundabout into the Mochdre Industrial Estate along Heol Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Lane Overbridge. A westbound lay-by would be provided east of Wern Ddu Overbridge.



An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.

1.5.1. Existing information of bat species at the survey site

Surveys for bats have taken place in the vicinity of the entire Scheme length since 2008. This has established a good level of understanding regarding the distribution of bats in the wider area, and the potential effects the Scheme may have on them. In summary, the surveys which have taken place are as follows:

- A review of existing records of bats within 10km of the centre of Newtown, and activity transect surveys (2008)
- Activity transects and preliminary tree roost and building assessments (2012)
- Activity transects, preliminary tree roost assessments, internal and external inspections of buildings (2013 – 2014).

The detailed results of these surveys are discussed in the ES Volume 3, Appendix E.8, E.9 and E.10.

In order to construct the A483/A489 Newtown Bypass Scheme, the property Kinsale requires demolition. Activity surveys undertaken along the Middle Dolfor Road (refer to ES Volume 3, Appendix E.8) recorded a Soprano pipistrelle (*pipistrellus pygmaeus*) bat entering the west facing gable end of this building. An inspection of the loft of this house found approximately 20-30 droppings. The DNA profile of these droppings were analysed, which revealed they were of a Whiskered bat (*Myotis mystacinus*) (refer to ES Volume 3, Appendix E.9).

As previous surveys have shown that this building is a resting place for bats it is protected under the Conservation (Natural Habitats &c.) Regulations 2010 (and 2011/2012 amendment regulations) and a European Protected Species (EPS) Licence will be required in order for it to be demolished (refer to Section 1.6 regarding the requirements of the legislation).

Internal and external inspections of the Barn along Pool Road did not reveal any evidence of use by bats (refer to ES Volume 3, Appendix E.9). The structure is considered to have a low potential to accommodate roosting bats.

1.5.2. Aims of the survey

Further surveys are required at Kinsale in order to gain a better understanding of the characteristics of the roost so that the appropriate level of mitigation can be provided to off-set the impact of its loss.

If a maternity roost were found to be present in Kinsale, Ashbrook could provide a replacement roost suitable to accommodate them. The suitability of Ashbrook as a replacement roost would depend on whether bats are present in this building already and this is the reason why it is to be surveyed.



The barn along Pool Road is to be demolished as part of the Scheme. The re-entry survey is proposed to establish whether the building supports any roosting bats.

1.6. Requirements of the legislation

Under the Conservation (Natural Habitats &c.) Regulations 2010 (and 2011/2012 amendment regulations), Regulation 41(1): 'a person who:

- a) *Deliberately captures, injures or kills any wild animal of a European Protected Species,*
- b) *Deliberately disturbs wild animal of any such species,*
- c) *Deliberately takes or destroys the eggs of such an animal, or*
- d) *Damages, destroys a breeding site, or resting place of such an animal.*

Is guilty of an offence'

However, under Regulation 53 (1 & 2), '*the relevant licencing body may grant a licence for the purposes specified'* below:

- a) *'Scientific or educational purposes;*
- b) *Ringling or marking, or examining any ring or mark on, wild animals;*
- c) *Conserving wild animals or wild plants or introducing them to particular areas;*
- d) *Protecting any zoological or botanical collection;*
- e) *Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*
- f) *Preventing the spread of disease; or*
- g) *Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property to fisheries'.*

Under Regulation 53(9) '*the relevant licensing body must not grant a licence under this regulation unless they are satisfied:*

- a) *That there is no satisfactory alternative; and*
- b) *That the action authorised will not be in detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.*



2. Methodology

2.1. Dusk emergence / dawn re-entry surveys

Surveys have been undertaken in accordance with *Bat Surveys – Good Practice Guidelines* [1]. Two dusk emergence and one dawn re-entry survey were undertaken at Kinsale on:

- 8th July 2014 between 21:15 – 23:15 (time of sunset – 21:35)
- 10th July 2014 between 03:00 – 05:00 (time of sunrise – 05:02)
- 15th July 2014 between 21:15 – 23:15 (time of sunset – 21:30)

One dusk emergence and one dawn re-entry survey was conducted at Ashbrook on:

- 8th July 2014 between 21:15 – 23:15 (time of sunset – 21:35)
- 10th July 2014 between 03:00 – 05:00 (time of sunrise – 05:02)

One dawn re-entry survey was conducted at the Barn along Pool Road on:

- 25th July 2014 between 03:25 – 05:25 (time of sunrise – 05:22)

The number of survey visits to each building was based on the potential for the buildings to support roosting bats as set out in the *Good Practice Guidelines* [1]. Following the internal and external inspections of buildings (refer to ES Volume 3, Appendix E.9) Kinsale was considered to have a '*high*' roost potential, Ashbrook a '*low to moderate*' roost potential and the Barn along Pool Road a '*low*' potential. As only one survey was proposed at the Barn along Pool Road, a dawn re-entry survey was undertaken. Bats are usually better observed returning to their roosts as they usually circle several times outside before entering.

Three surveyors were used at Kinsale, two at Ashbrook and three at the Barn along Pool Road. Their positions around the buildings are shown in Figure 2.0, Figure 3.0 and Figure 4.0. Each surveyor watched for bats either leaving the building at dusk or returning at dawn. The locations where bats left or returned were noted. The surveyors used either AnaBat SD2 frequency division or Pettersson D240x time expansion detectors and recording devices to record bats entering or leaving the buildings. Bat calls recorded were later analysed using AnalookW or Bat Sound software. Species were determined with reference to *British Bat Calls* [2].

Whether conditions during the surveys were as follows:

- 8th July – dry, very light north westerly wind, 20-30% cloud cover, temperatures between 14°C (start) and 10°C (end). Three-quarter moon providing some natural light.
- 10th July – dry, no wind, 0% cloud cover, temperatures between 10°C (start) and 8°C (end).
- 15th July – dry, no wind, 30% cloud cover, temperature between 15°C (start) and 12°C (end).



- 25th July – dry, no wind, 0% cloud cover, temperatures between 14°C (start) and 11°C (end).

2.2. Personnel used

Surveys were undertaken by:

- Max Burrell BSc (hons), MSc, MIEMA, nine years bat survey experience (8th & 10th July)
- Sue Worsfold BSc, GradCIEEM, NRW Licence No. 55624:OTH:CSAB:2014, five years bat survey experience (8th & 10th July),
- Oliver Amy BSc, GradCIEEM, Natural England Licence No. WML-CL18, two years bat survey experience (8th, 10th, 15th & 25th July),
- Nicola Wheeler NRW Licence No. 41846:OTH:CSAB:2012, four years bat survey experience (8th, 10th, 15th & 25th July),
- Simon Mootz BA (hons), PGCE, eleven years bat survey experience (8th, 10th, 15th & 25th July).

2.3. Static detector survey

The dusk emergence / dawn re-entry surveys at Kinsale were supplemented with an AnaBat with a 12v battery placed within the loft between 8th and 17th July 2014.

Recordings were later analysed using AnalookW software.

2.4. Survey constraints

All surveys were conducted within a relatively short time period, which means that only bats using the buildings during this time period could be detected. Bats often change their roost sites throughout the year and so may only be present at certain times. The fact that surveys were not spread throughout the year is therefore a constraint and may result in bats not being recorded if they used the buildings at other times of the year (e.g. as spring or autumn transitional roosts).

Survey effort was concentrated within the time that bats give birth and raise young (between May and August) [1] to ensure that if any maternity roosts were present within the buildings they would be recorded. If a maternity roost was present a higher level of mitigation would be required than if only one or two non-breeding bats were present. If surveys were spread throughout the year then there would be less chance of detecting a maternity roost.



3. Results

3.1. Kinsale

3.1.1. Dusk emergence / dawn re-entry survey

Results are shown in Table 1.0 below:

Table 1.0 – Dusk emergence / dawn re-entry survey results - Kinsale

Time	Species	Notes
8th July 2014 (dusk survey)		
21:46	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Emerged from the west facing gable end of the property and then flew in a northerly direction. Species confirmed through later examination of call recordings.
Other notes: The following species were also recorded foraging or commuting within the vicinity of the surveyors: Common pipistrelle (<i>Pipistrellus pipistrellus</i>), Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>) and Noctule (<i>Nyctalus noctula</i>).		
10th July 2014 (dawn survey)		
04.41	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Returned to the same place bat was recorded emerging on 08/07/2014. Presumed to be the same animal. Entry point underneath the second tile down on the southern aspect of the roof near the west facing gable end (refer to Photograph 1 below).
Other notes: The following species were also recorded foraging or commuting within the vicinity of the surveyors: Common pipistrelle (<i>Pipistrellus pipistrellus</i>), Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), Noctule (<i>Nyctalus noctula</i>) and a <i>Myotis</i> species considered to be either Whiskered, Brandt's or Alcatheo (<i>Myotis mystacinus</i> , <i>M. brandtii</i> / <i>M. alcathoe</i>).		
15th July 2014 (dusk survey)		
21:46	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Emerged from the west facing gable end of the property. Species confirmed through later examination of call recordings.



	<i>(Pipistrellus pygmaeus)</i>	
Other notes: The following species were also recorded foraging or commuting within the vicinity of the surveyors: Common pipistrelle (<i>Pipistrellus pipistrellus</i>), Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), Noctule (<i>Nyctalus noctula</i>) and Brown long-eared (<i>Plecotus auritus</i>).		

Photograph 1 – Emergence /re-entry location of the Soprano pipistrelle (*Pipistrellus pygmaeus*) at the west facing gable end of Kinsale



3.1.2. Static detector survey

No bats were recorded on the AnaBat placed within the loft of Kinsale.



3.2. Ashbrook

3.2.1. Dusk emergence / dawn re-entry survey

Results are shown in Table 2.0 below:

Table 2.0 – Dusk emergence / dawn re-entry survey results - Ashbrook

Time	Species	Notes
8th July 2014 (dusk survey)		
N/A	N/A	No bats were recorded emerging from the building.
Other notes: The following species were also recorded foraging or commuting within the vicinity of the surveyors: Common pipistrelle (<i>Pipistrellus pipistrellus</i>), Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>) and a <i>Myotis</i> species.		
10th July 2014 (dawn survey)		
04:04	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	Entered at apex of the west facing gable end.
Other notes: The following species were also recorded foraging or commuting within the vicinity of the surveyors: Common pipistrelle (<i>Pipistrellus pipistrellus</i>), Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), Natterer's (<i>Myotis nattereri</i>) and at least one other <i>Myotis</i> species.		



3.3. Barn along Pool Road

3.3.1. Dawn re-entry survey

Results are shown in Table 3.0 below:

Table 3.0 – Dawn re-entry survey results – Barn along Pool Road

Time	Species	Notes
25 th July 2014 (dawn survey)		
05:01	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Returned to southern side of barn and entered under one of the vertical wooden slats. Roost location presumed to be under one of the slats (refer to Photograph 2).
Other notes: Two other bats recorded foraging or commuting during the survey. These were: Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>) and Noctule (<i>Nyctalus noctula</i>).		

Photograph 2 – Re-entry location of the Soprano pipistrelle (*Pipistrellus pygmaeus*) at the south facing side of the Barn along Pool Road



Sonograms of all bats recorded either entering or leaving buildings are provided in Appendix A.



4. Discussion and Conclusions

4.1. Kinsale

The results of the activity survey and AnaBat survey suggest that Kinsale is used by at least one Soprano pipistrelle bat with the entrance to the roost site located under the second tile down on the south facing aspect of the roof, at the west facing gable end (refer to Photograph 1 above and Figure 2.0). This corresponds with observations made during the bat activity surveys undertaken during 2013 (refer to ES Volume 3, Appendix E.8).

Evidence of Whiskered bats (approximately 20 -30 droppings) was found during the internal roof inspections (refer to ES Volume 3, Appendix E.9). As no evidence of Whiskered bats emerging or returning to Kinsale was observed during the activity surveys it would suggest the site is used occasionally or at a different times of the year possibly as a transitional roost by a low number of bats of this species.

A European Protected Species (EPS) Licence will be required for the demolition of the building. The detailed mitigation strategy for the loss of the roost at Kinsale is discussed within the ES Volume 1 – Technical Assessment Report, Chapter 8 – Nature Conservation, Section 8.5 – Proposed Mitigation and ES Volume 3, Appendix E.11 – Bat ‘Ghost’ Licence.

4.2. Ashbrook

The results from this survey suggest that Ashbrook is used by one Common pipistrelle bat with the entrance to the roost site located near the apex, at the west facing gable end (refer to Figure 3.0). The results from the surveys undertaken at Kinsale to date mean that this property will not be required in the mitigation strategy for the loss of the Kinsale roost.

Ashbrook will not require demolition as part of the Scheme.

4.3. Barn along Pool Road

The results of the activity survey suggest that the Barn along Pool Road is used by one Soprano pipistrelle bat with the entrance to the roost site located under one of the vertical wooden slats on the south facing side of the building (refer to Photograph 2 above and Figure 4.0).

An EPS Licence will be required for the demolition of the building. The detailed mitigation strategy for the loss of the roost at the Barn along Pool Road is discussed within the ES Volume 1 – Technical Assessment Report, Chapter 8 – Nature Conservation, Section 8.5 – Proposed Mitigation and ES Volume 3, Appendix E.11 – Bat ‘Ghost’ Licence.



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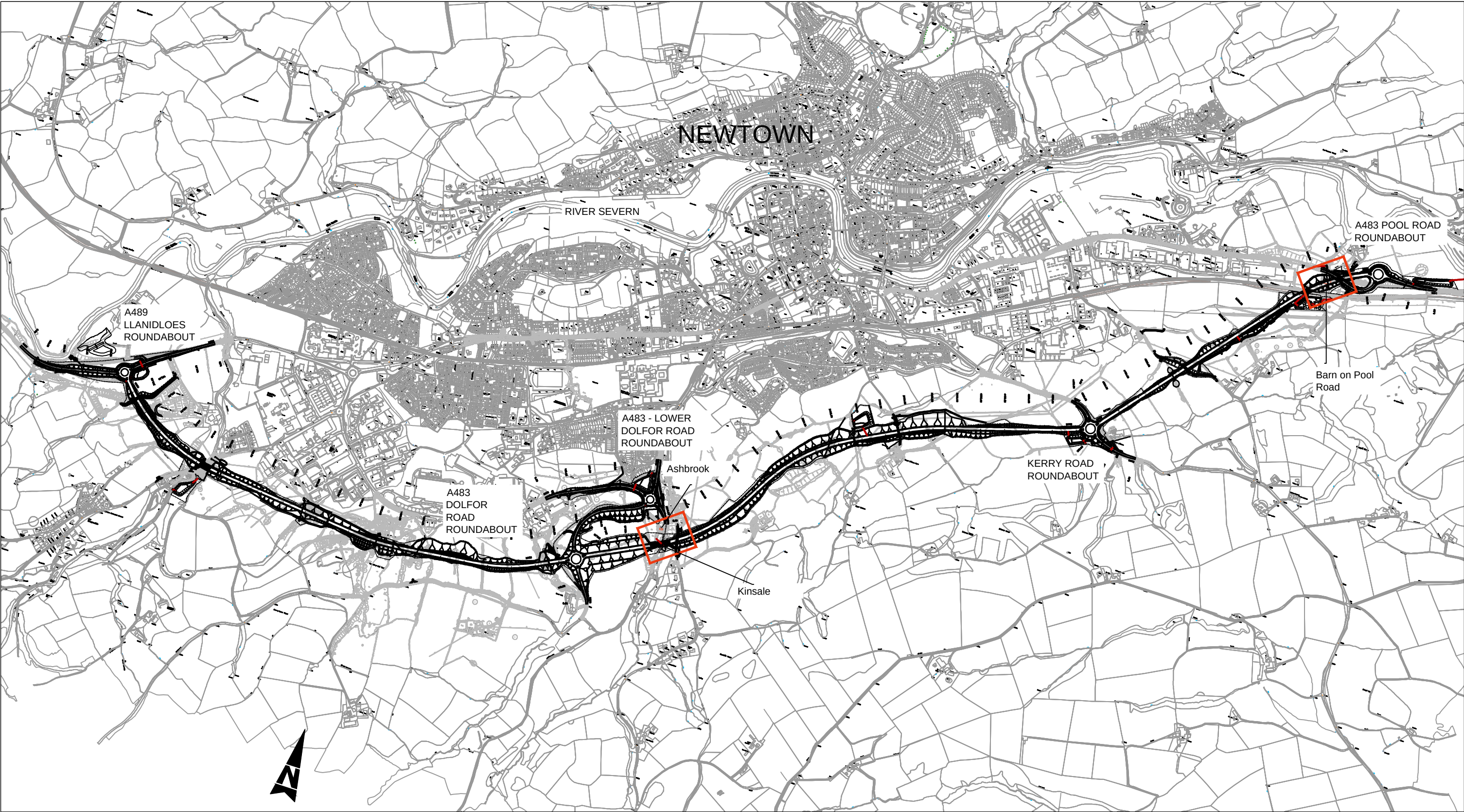


5. References

- [1] Hundt, I. (2012) *Bat Surveys: Good Practice Guidelines*. 2nd Edition, Bat Conservation Trust.
- [2] Russ, J. (2012) *British Bat Calls – A Guide to Species Identification*. Pelagic Publishing.



Figures



Proposed Scheme

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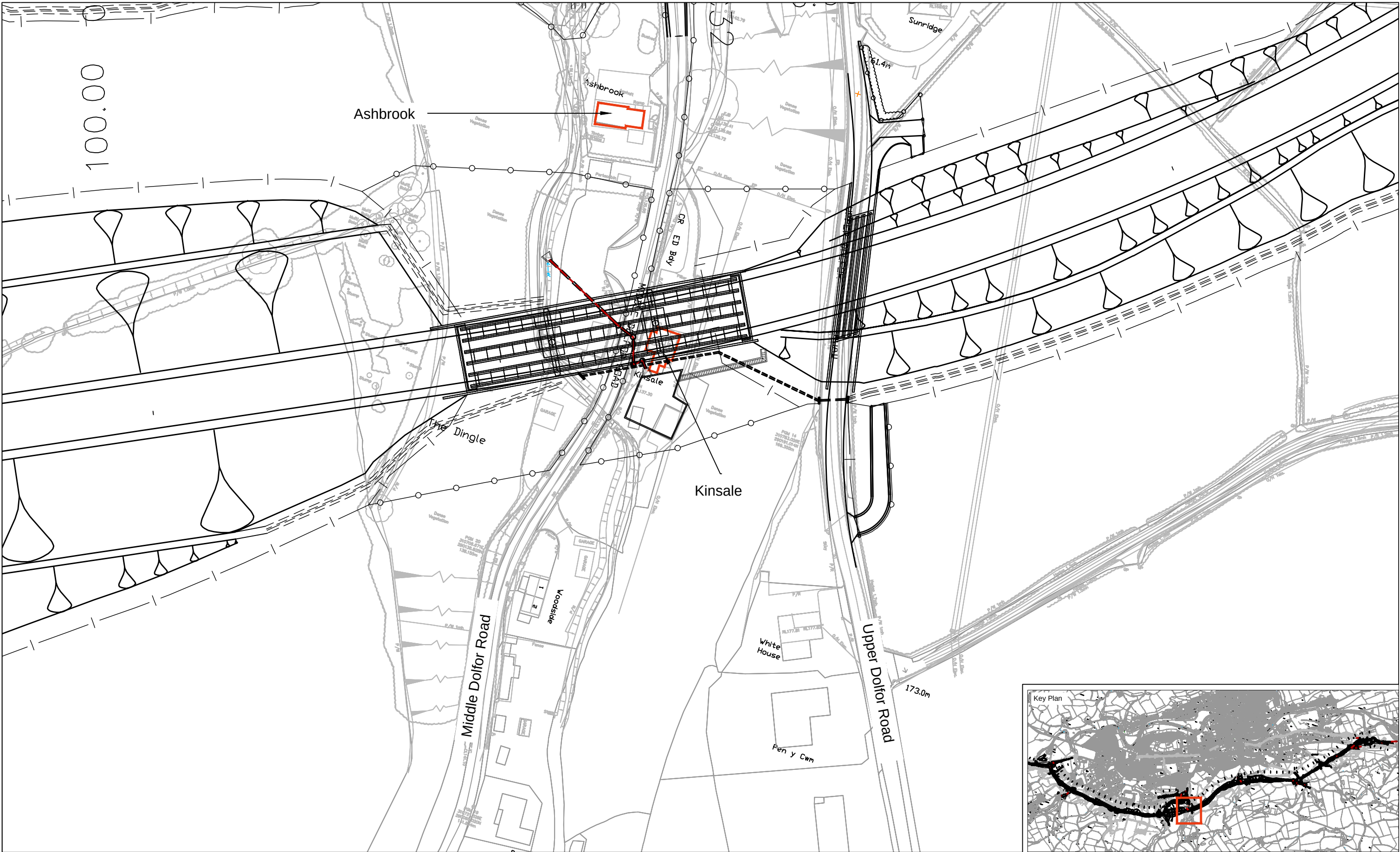
Job Title

A483/A489
Newtown Bypass

Drawing Title

Scheme Layout and Roost Locations
Sheet 1 of 3

Date	Sept 2014	Drawn by	FS
Scale at A3	Not To Scale	Checked	MB
Drawing Status	FINAL	Approved	JW
Job No	60597	Figure No	Figure 1a
		Issue	-



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Job Title

A483/A489
Newtown Bypass

Drawing Title

Scheme Layout and Roost Locations
Sheet 2 of 3

Date

Sept 2014

Drawn by

FS

Scale at A3

1:1000 at A3

Checked

MB

Drawing Status

FINAL

Approved

JW

Job No

60597

Figure No

Figure 1b

Issue

-

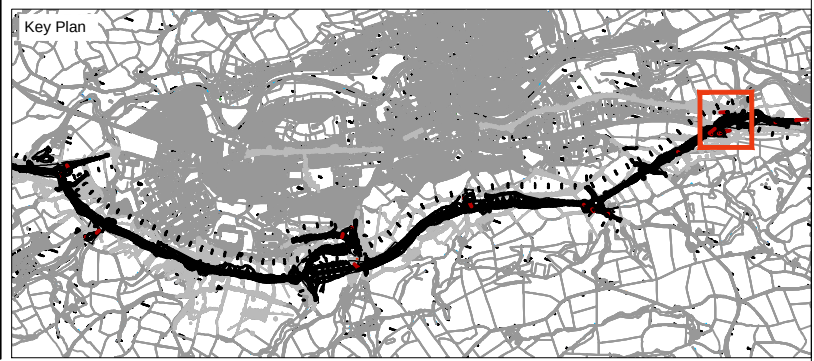
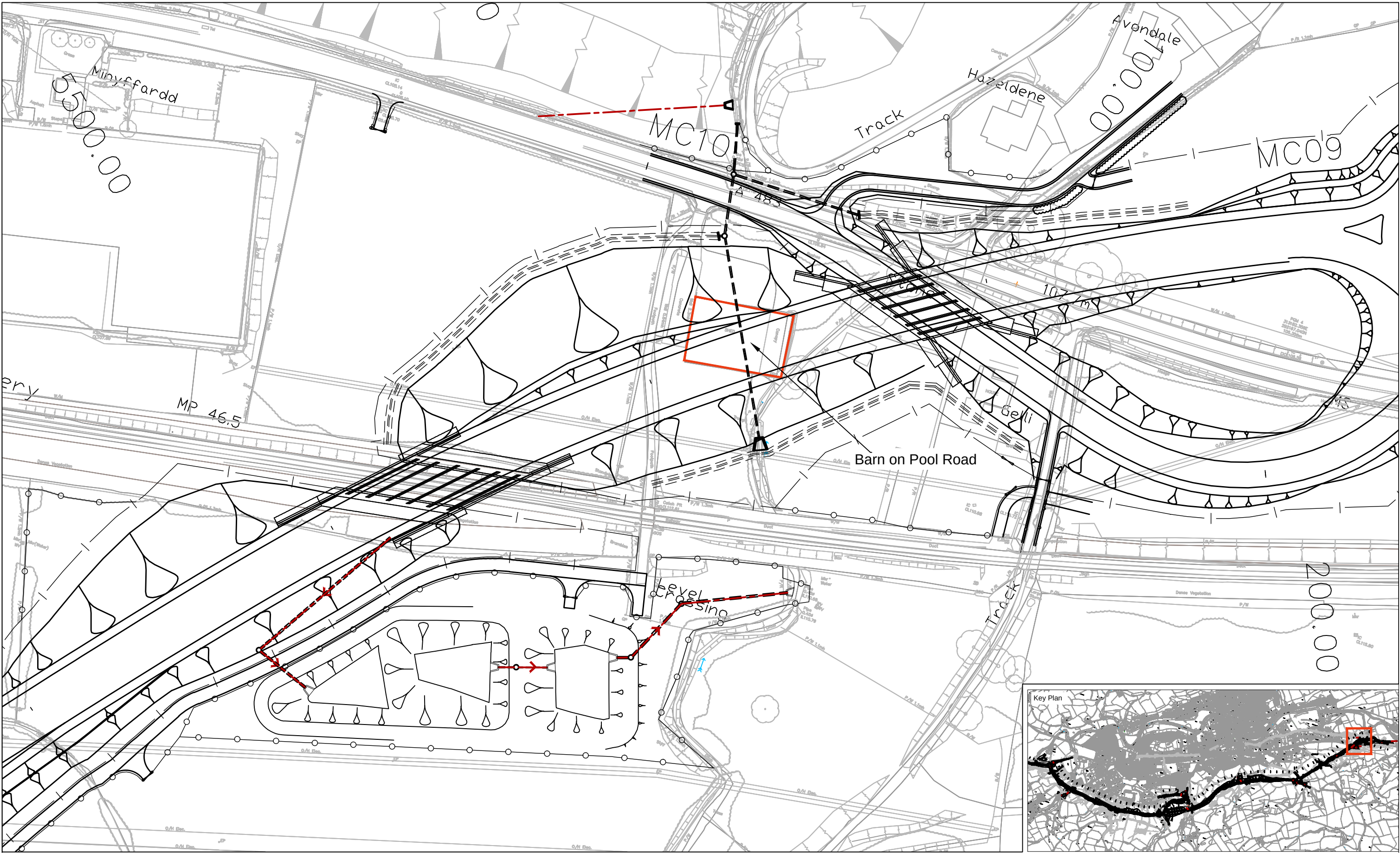


Figure 2.0 – Positioning and line of sight of surveyors at Kinsale

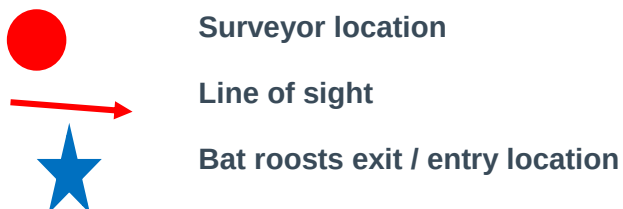
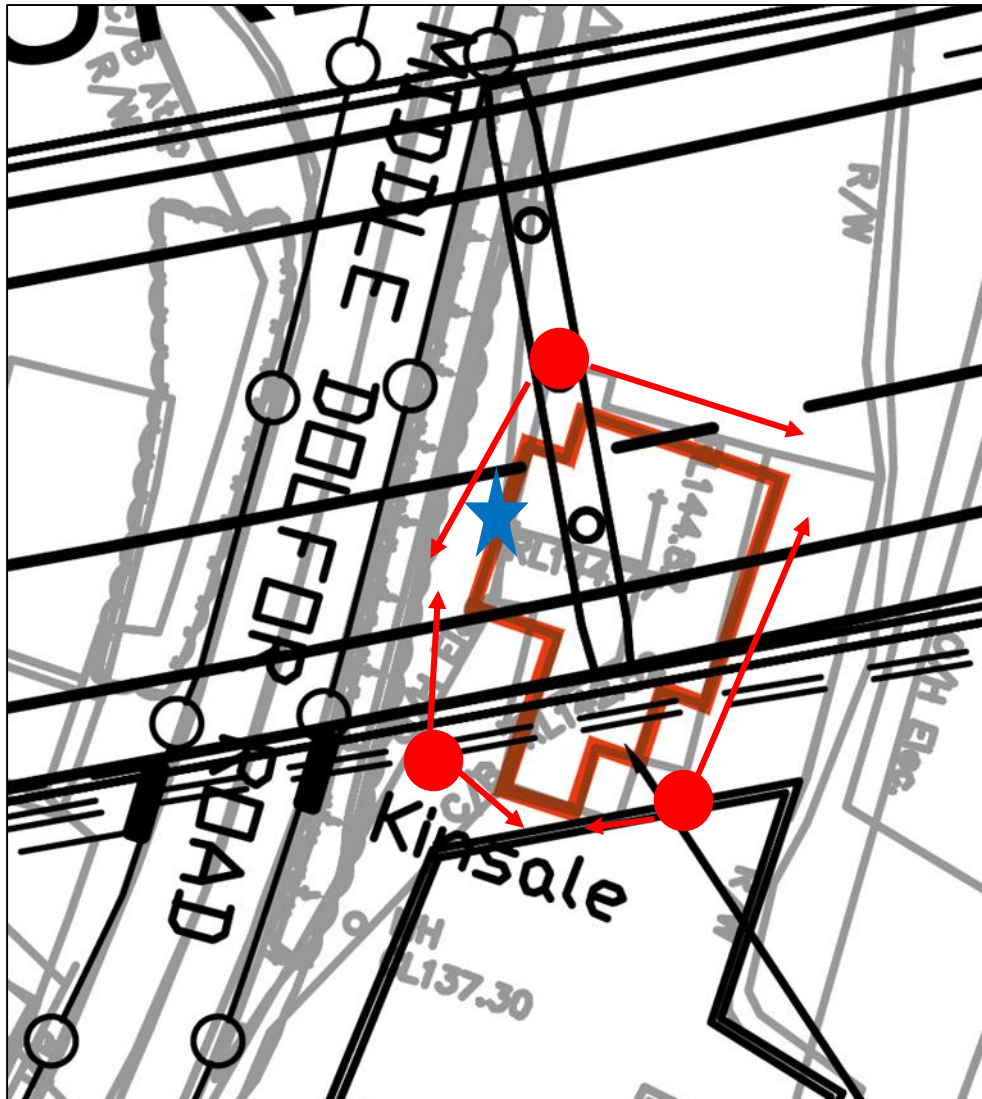




Figure 3.0 – Positioning and line of sight of surveyors at Ashbrook

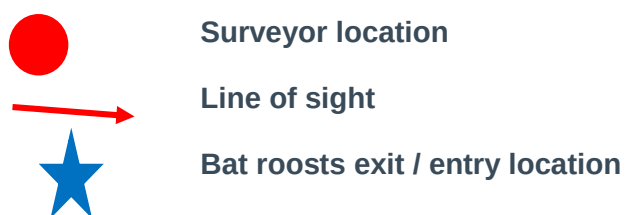
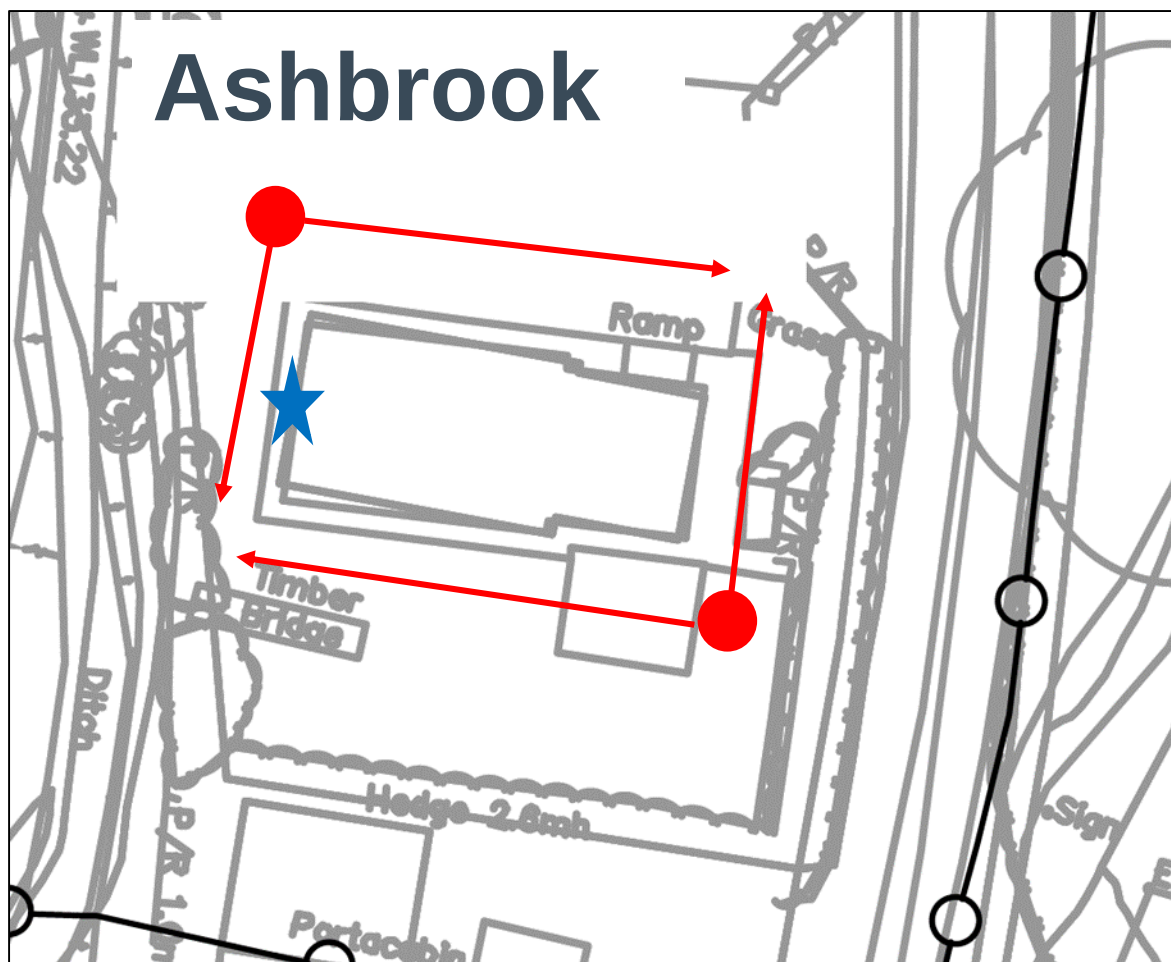
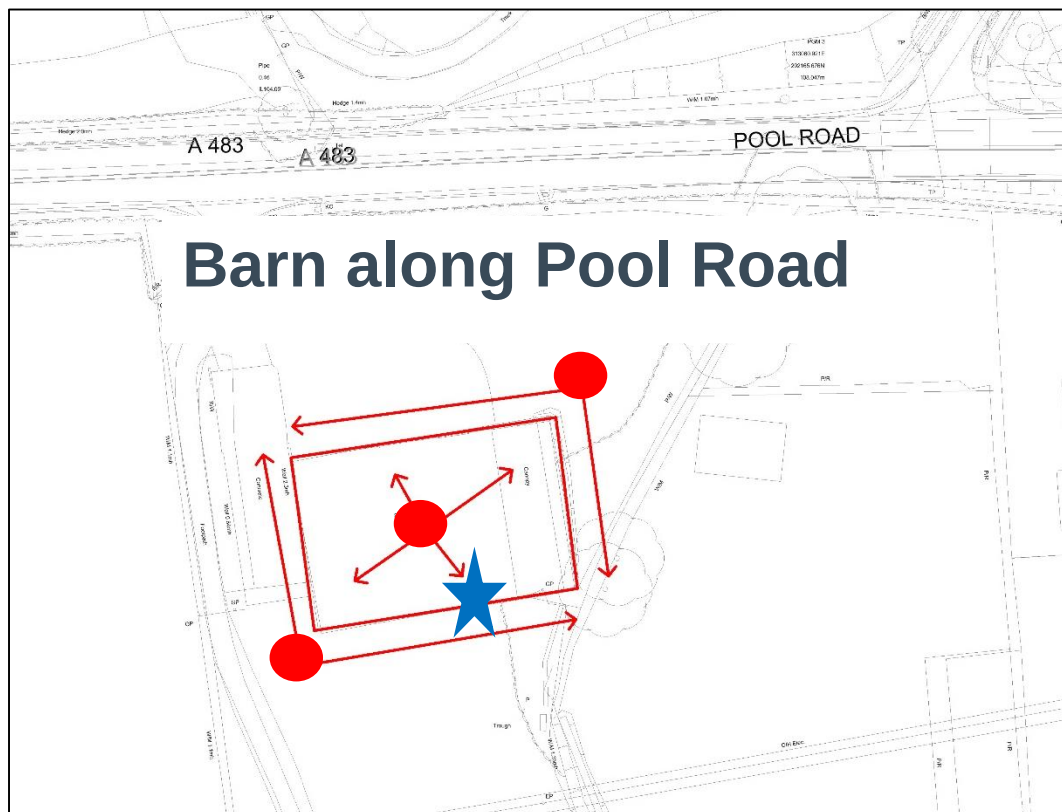




Figure 4.0 – Positioning and line of sight of surveyors at Barn along Pool Road



Surveyor location



Line of sight



Bat roosts exit / entry location



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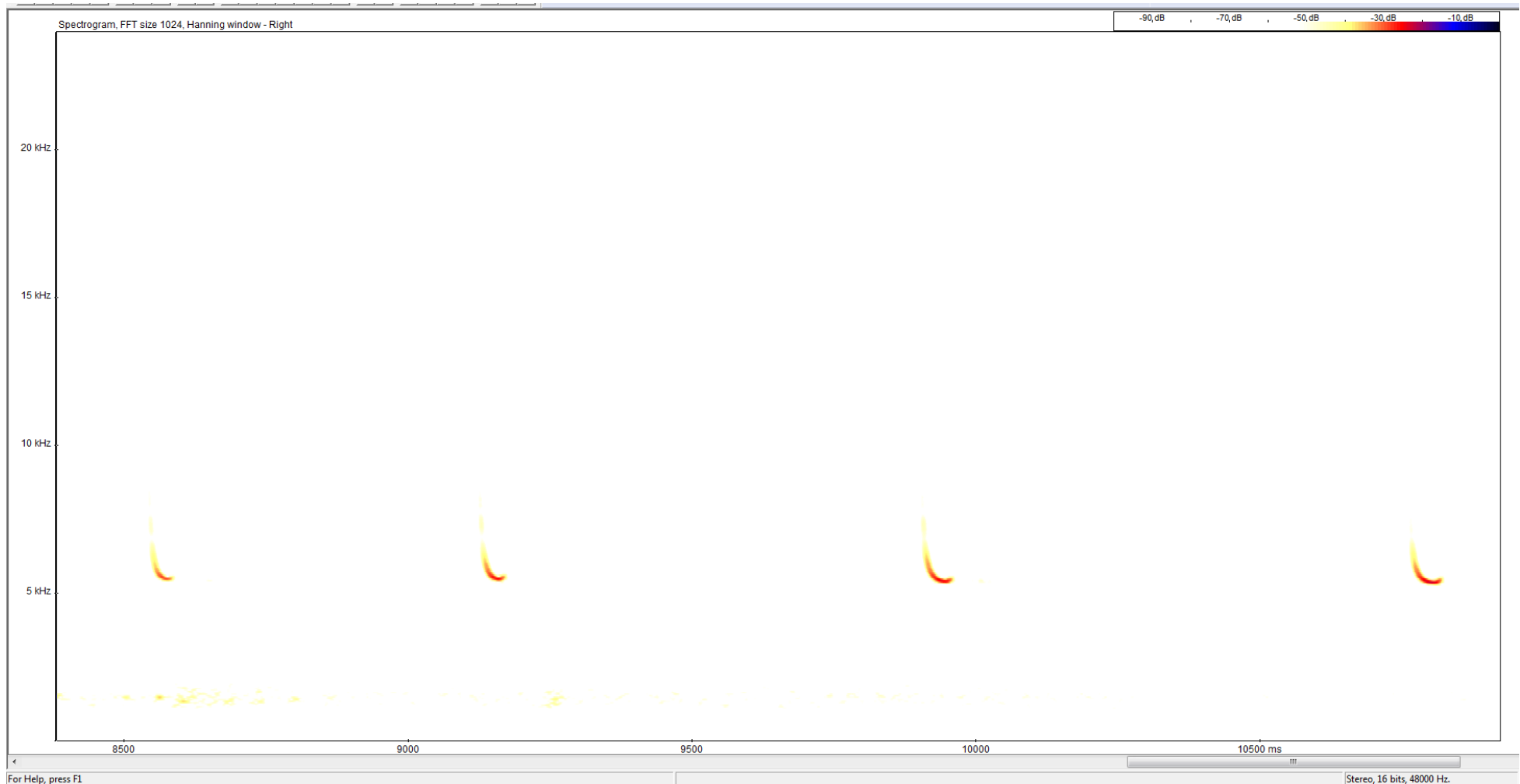
Appendix A – Sonograms



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Sonogram in 'Bat Sound of Soprano pipistrelle (*Pipistrellus pygmaeus*) entering Kinsale at 04:41 on 10/07/2014

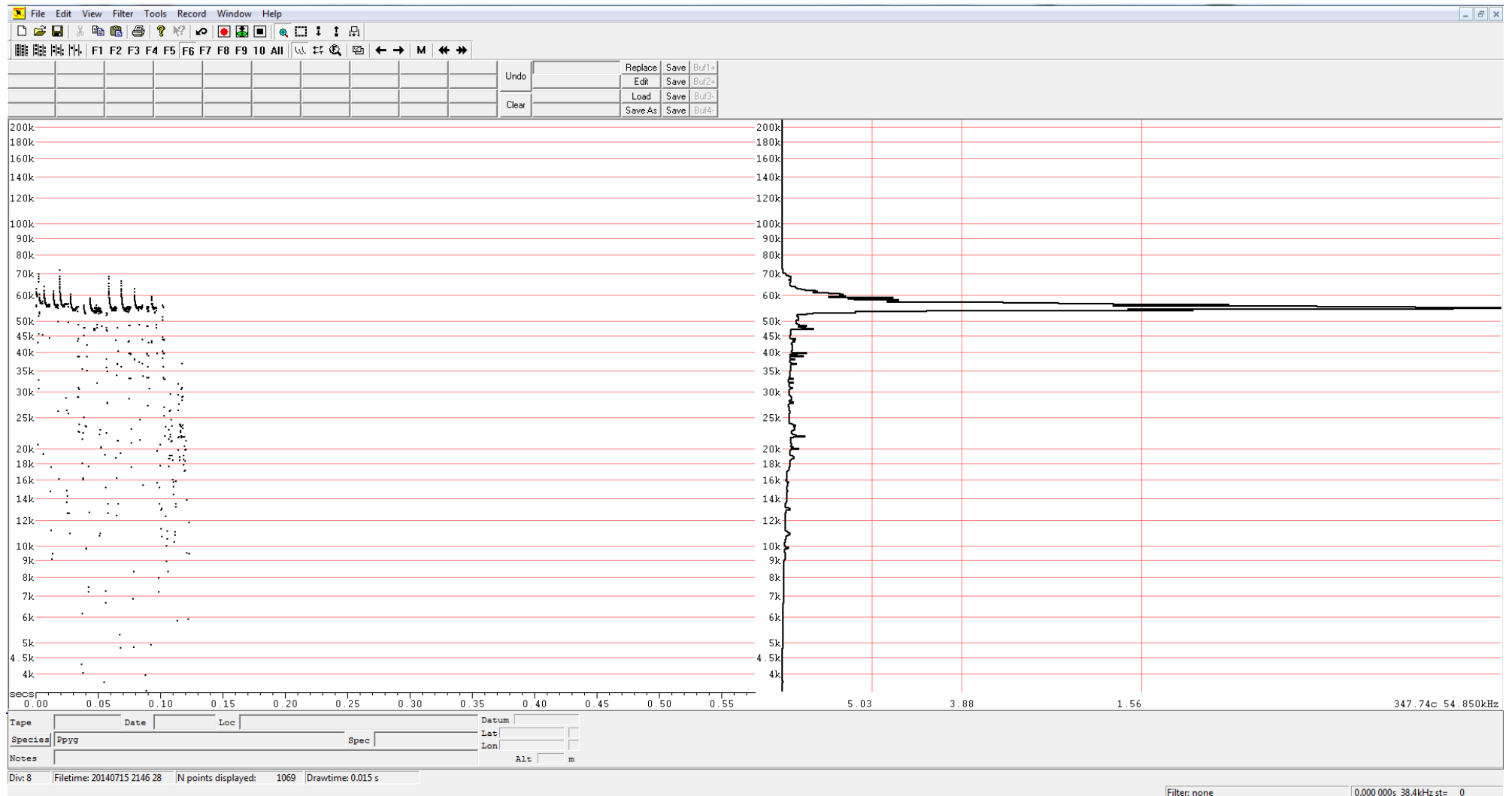




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Sonogram in 'AnalogW' (F6 compressed with 'split screen cycles') of Soprano pipistrelle (*Pipistrellus pygmaeus*) exiting Kinsale at 21:46 on 15/07/2014

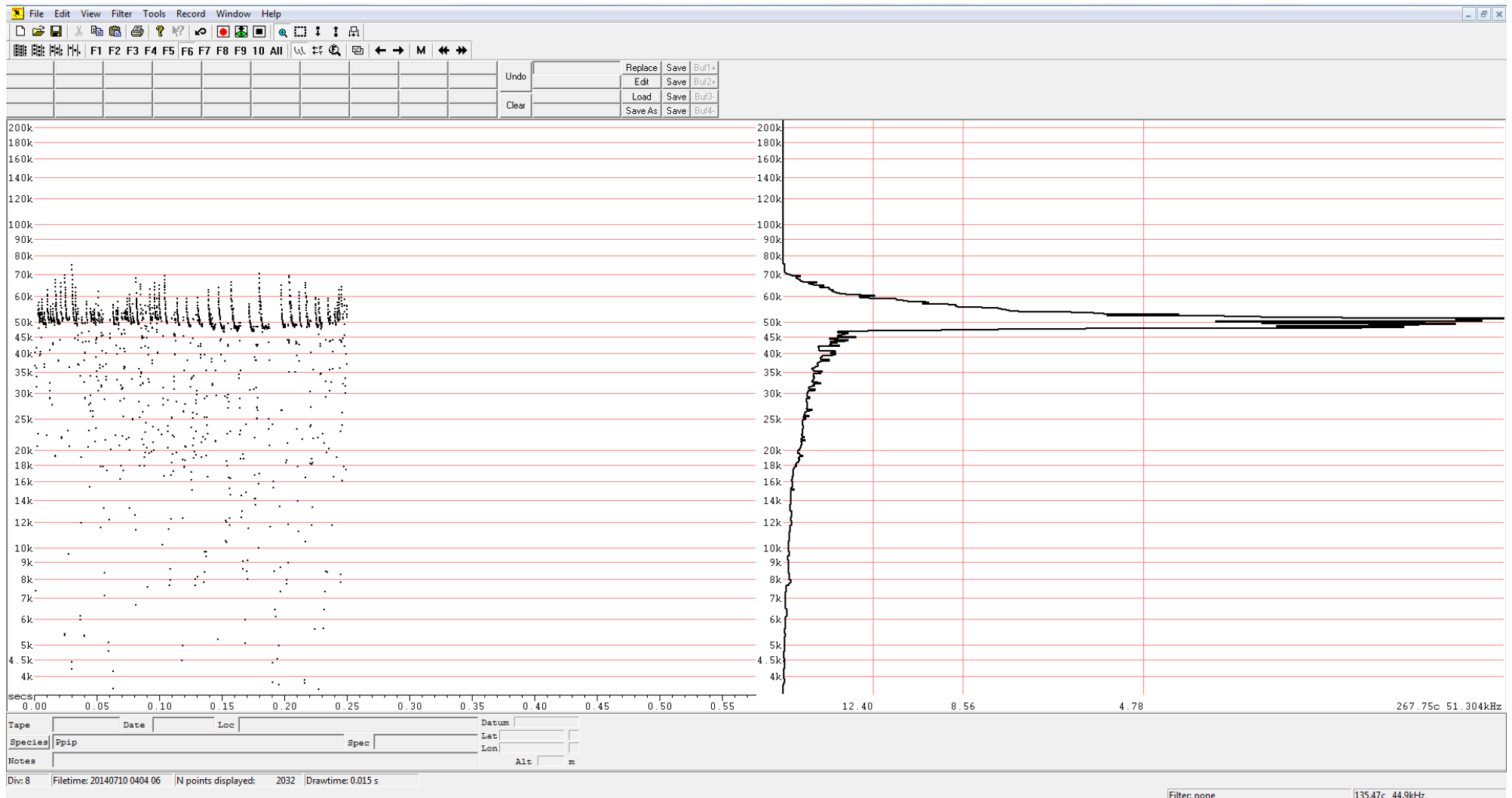




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Sonogram in 'AnalookW' (F6 compressed with 'split screen cycles') of Common Pipistrelle (*Pipistrellus pipistrellus*) entering Ashbrook at 04:04 on 10/07/2014

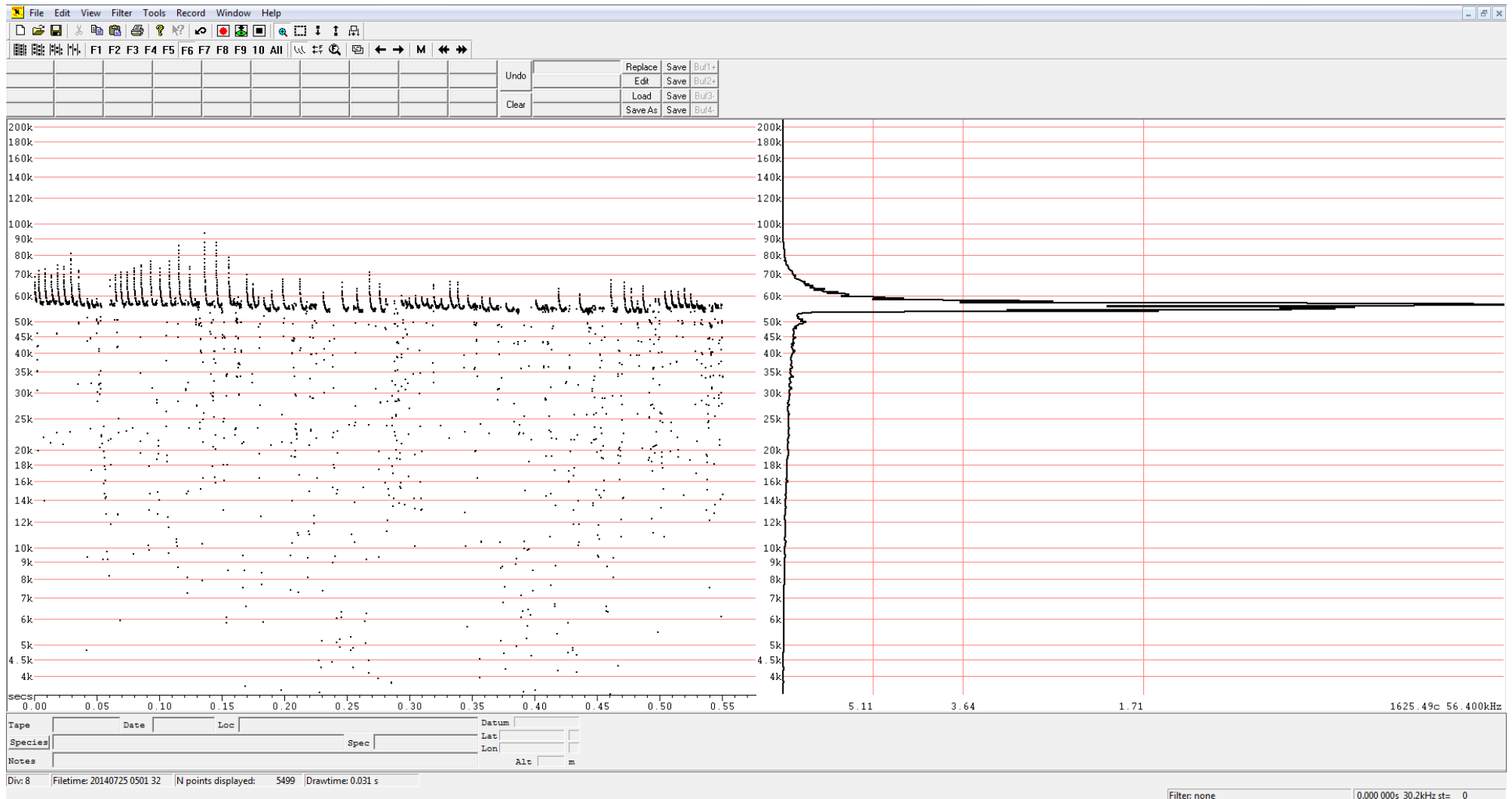




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Sonogram in 'AnalogW' (F6 compressed with 'split screen cycles') of Soprano pipistrelle (*Pipistrellus pygmaeus*) entering the Barn along Pool Road at 05.01 on 25/07/2014



Appendix E.13

Dormouse Survey Report 2013



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A483/A489 NEWTOWN BYPASS

Dormouse Surveys 2013

March 2014



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Welsh Government

A483 / A489 Newtown Bypass

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CLIENT: The Welsh Government
Transport

PROJECT: A483 / A489 Newtown Bypass

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Issue	Date	Status	Written	Reviewed by	Authorised by Project Manager

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Glossary and Abbreviations

BAP – Biodiversity Action Plan

CCW – Countryside Council for Wales (now part of Natural Resources Wales)

CIEEM – Chartered Institute of Ecology and Environmental Management

CRoW Act – Countryside Rights of Way Act 2000

DMRB – Design Manual for Roads and Bridges

EA / EAW – Environment Agency / Environment Agency Wales (now part of Natural Resources Wales)

EIA – Environmental Impact Assessment

ES – Environmental Statement

JNCC – Joint Nature Conservation Committee

LBAP – Local Biodiversity Action

NERC Act – Natural Environment and Rural Communities Act 2006

NRW – Natural Resources Wales

PCC – Powys County Council

SINC – Site of Importance for Nature Conservation (termed Wildlife Sites in Powys)

SSSI – Site of Special Scientific Interest

TREBAP – Trunk Road Estates Biodiversity Action Plan



1. Introduction

1.1. Purpose

TACP were commissioned to undertake a number of ecological surveys in 2013 including update surveys for hazel dormouse (*Muscardinus avellanarius*) along the route of the Proposed Newtown Bypass Scheme.

The purpose of these surveys and this document is to provide updated information on the presence and likely distribution of dormice on the route of the proposed Scheme and surrounding area, in order to inform mitigation proposals and assist in the preparation of the Environmental Statement for the Scheme. Surveys in 2013 comprised a combination of updating survey data for areas in which dormice had previously been recorded (see below) and surveying areas without previous records.

1.2. Description of the Project

1.2.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.2.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the Environmental Statement (ES).

1.3. Background

The Welsh Government commissioned Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WelTAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.

The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A



road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.

In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.4. The Project Objectives

1.4.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

1.5. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.

Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.

The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.

The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.

The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this



A483 / A489 Newtown Bypass

roundabout into the Mochdre Industrial Estate along Heol Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Lane Overbridge. A westbound lay-by would be provided east of Wern Ddu Overbridge.

An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.

1.6. Summary of existing data

Previous surveys of the Scheme corridor had identified evidence of dormice. A desktop study and field surveys to find evidence of dormice (characteristically chewed hazelnuts) in spring 2008 identified dormice in three areas: south-west of the Glandulas Holiday Home Park (existing records and characteristically chewed hazelnuts found); south of the Scheme in the Mochdre Brook valley (existing records); and in woodland south of Penygelli, close to the eastern end of the Scheme (hazelnuts). Following on from these surveys sixteen areas were searched in October 2008 for characteristically chewed hazelnuts indicating presence of dormice; this revealed evidence of dormice in an additional two locations: in the Dolfor valley on the route of the Scheme; and in an unnamed woodland to the west of Brimmon Wood and south-east of Upper Brimmon Farm.

Nest tube surveys were undertaken in 2012. Small numbers of nest tubes were installed in sixteen locations in hedgerows on the route of the Scheme between May and August 2012, and checked at intervals thereafter until November 2012. The surveys confirmed the presence of dormice, from nests constructed in the tubes, in roadside hedgerows on the A489 Kerry Road and on the A483 Pool Road close to the eastern end of the Scheme, but did not record evidence of dormice elsewhere.



2. Dormouse Ecology and Legislation

The hazel dormouse is a nocturnal rodent which feeds on flowers, fruits and seeds, being unable to digest leaves as many other rodents can. Their dietary requirements mean that dormice must hibernate during the winter months (October – April), when food is not available. Hibernation nests are typically woven balls of leaves within deep leaf litter, loose stones or dead stumps at or below ground level. In contrast, during the summer months dormice are almost entirely arboreal, making nests of stripped bark and leaves in dense vegetation or tree holes above ground level and up to tree canopy height. They are reluctant to come down to ground level during the summer months and are therefore considered vulnerable to fragmentation of populations when gaps are created in dormouse habitats, though some movement of dormice (particularly dispersal movements in spring and autumn) has been recorded across gaps of at least 12m over active road carriageways. Dormice breed during the summer and autumn, typically producing one or two litters of four or five young. Dormice will use artificial nest tubes or nest boxes as alternative sites for creating summer nests. Dormice live at low densities for a small mammal, often less than 10 animals per hectare.

Due to their specialist diet and poor dispersal abilities, dormouse populations are typically found in established (often ancient) broadleaved woodlands and species rich hedgerow networks. Dormice also occur in other habitats, such as roadside planting, conifer plantations and scrub, particularly where these habitats are connected to more typical habitat areas for the species.

The hazel dormouse is a European Protected Species listed under Annex IV of the Habitats Directive (Council Directive 92/43/EEC), which is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (as amended). The hazel dormouse also receives limited protection under the Wildlife and Countryside Act 1981 (as amended) and is a Species of Principal Importance for nature conservation under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006. It is also a Powys Local BAP priority species and a TREBAP priority species.



3. Survey Methodology

3.1. Survey locations

Because the majority of potentially suitable habitat areas affected by the Scheme are too small to support the number of nest tubes required in order to provide robust survey results (typically 50 tubes at 20m spacings), nest tube surveys were undertaken in larger areas of potentially suitable habitat, including those potentially severed by the Scheme or directly connected to habitat which would be. Results from these survey locations can then be used to reliably infer where dormice are likely to be present on the Scheme and therefore where the Scheme could result in fragmentation of dormouse populations.

Some survey locations were in parts of the Scheme not previously surveyed, whilst others aimed to update older survey information from the desktop study or surveys in 2008.

Nest tube survey sites comprised:

- Castell-y-Dail woodland (severed by proposed Scheme and without existing records)
- Mochdre Brook and lane corridors (severed by proposed Scheme, without recent records)
- Hedgerows north of Penygelli (no existing records)
- The Dingle (existing old records)
- South of Glandulais Farm (existing old records)

An additional survey location in woodland west of Upper Brimmon Farm, close the route of the proposed Scheme and where there were no existing records had been proposed for surveys in 2013 but was found to have insufficient suitable habitat present for installation of nest tubes.

In parallel with nest tube surveys of these strategic locations, all hedgerows and woodland areas within the footprint of the proposed Scheme were assessed for their suitability to support dormice.

3.2. Nest tube surveys

Nest tube surveys were undertaken between May and November 2013.

Nest tubes were installed in hedgerows and woodland areas on 13th to 15th May 2013, being fixed to horizontal or near horizontal branches using cable ties, at approximately 20m spacings. 60 tubes were installed at four of the five survey sites; the Mochdre Brook site was only large enough to install 20 tubes at the 20m spacing, however assessment of habitat links between this site and the Glandulas Holiday Home Park survey site indicated that the two sites were connected by unbroken hedgerows and therefore confirmation of dormice in either would indicate that it was likely a dormouse population would be present in both.

Nest tubes were checked by a licensed surveyor on 15th to 18th July, 16th to 18th September, and 4th to 5th November 2013, following guidelines provided in Bright *et al* (2006) and Chanin & Woods (2003). Any dormice or dormouse nests were recorded. Nest tubes were collected in during the November 2013 check. Using the 'points' system outlined in Bright *et al* (2006), and further clarified in Natural England (2011), each of the survey sites except the Mochdre Valley would achieve 24 points (the minimum required for reliable presence/absence surveys being 20 points in normal circumstances). The Mochdre Valley site would, if viewed in isolation from the adjoining Glandulas site, score eight points.

Nest tube survey locations are shown on Figure 1.



3.3. Nut search surveys

During the November 2013 nest tube check nut searches of the same survey sites were also undertaken, comprising up to five 20 minute searches of 10m by 10m areas below heavily fruiting hazels, as outlined in the *Dormouse Conservation Handbook*. Nut search survey effort was concentrated in survey locations where presence of dormice had not been confirmed using nest tubes.

Unfortunately, insufficient heavily fruiting hazel was present to confirm presence or likely absence of dormice (the majority of hazelnuts present had been taken by grey squirrel (*Sciurus carolinensis*) prior to ripening) in any of the survey locations.

3.4. Habitat assessment

In addition to the direct survey methods described above, the likely suitability of habitats on the route of the proposed Scheme for dormice was also investigated by assessing all hedgerows, woodlands and scrub within the footprint of the Scheme. These surveys were undertaken in June 2013. The diversity of foodplant species, connectivity to other habitats, structure and management were recorded in order to assign each feature to one of the following categories:

- A – optimal habitat for dormice, with a high diversity of foodplants, sympathetic management, good structural complexity for creation of nest sites and links to other suitable habitats;
- B – suitable habitat for dormice, but with a lower diversity, poorer structure, less sympathetic (but not entirely adverse) management, or more isolated;
- C – sub-optimal habitat for dormice, lacking one or more of the optimal characteristics described above;
- D – suitable only for dispersal by dormice, due to low diversity or unsympathetic management, these features may be used by dormice dispersing from adjacent habitats but are unlikely to support resident dormice;
- E – unsuitable for dormice, comprising fences or ditches rather than hedgerow field boundaries.

The approximate extent of habitat affected by the Scheme was also recorded.



4. Results

4.1. Nest tube surveys

Nest tube surveys recorded evidence of dormice (dormouse nests) in two survey locations: at the Glandulas Holiday Home Park (nest found 16th September), and at the hedgerows north of Penygelli (nests found 17th September and 5th November), see Figure 1, and Appendix 1. None of the nests were occupied by dormice at the time they were found; the nest at Glandulas was occupied by a wood mouse, though was considered due to its structure and the nest materials used to be a dormouse nest.

The nest tube surveys therefore confirmed the continued presence of dormice in the Glandulas Holiday Home Park hedgerow network and identified the presence of dormice in the hedgerows north of Penygelli. No evidence of dormice was recorded during nest tube surveys at Mochdre Brook, Castell-y-Dail, or the Dolfor Valley.

4.2. Nut searches

Nut searches were attempted at Castell-y-Dail and the Dolfor Valley. However at both sites insufficient heavily fruiting hazel was found to allow a comprehensive survey to be undertaken. Of the hazelnuts found, none been eaten by dormice.

4.3. Habitat assessment

A total of 107 hedgerows and woodlands on the route of the proposed Scheme were assessed for their potential to support dormice.

The majority of these features were considered to be at best sub-optimal for dormice:

- 13 features were considered optimal for dormice (Category A);
- 28 features were considered suitable for dormice (Category B);
- 55 features were considered sub-optimal for dormice (Category C);
- 9 features were considered suitable only as dispersal corridors (Category D);
- 2 features were considered unsuitable for dormice (category E).

A high proportion of the Category A and B sites were woodlands rather than hedgerows, or were unmanaged hedgerows bordering woodland sites. Consequently the Category A and B sites were located in discrete parts of the route, particularly at Glandulas, Mochdre Valley, Castell-y-Dail, the Dolfor Valley and around Penygelli. This comprehensive survey of the Scheme therefore also provides some support for the choice of strategic nest tube survey sites used.

For those features which were sub-optimal, the most common factor leading to this classification was regular management of hedgerows by tractor-mounted flail. It was evident that many of the hedgerows were regularly managed this way, which will tend to remove the growth of trees and shrubs on which the flowers and fruits are borne. Dormice nesting in hedgerows also often nest in the dense tangles of branches at the height where the hedge has previously been trimmed to, consequently hedgerow management during the summer months may also directly affect dormice.

A small number of features were considered suitable only as dispersal corridors, while two fencelines were considered unsuitable for dormice.

The distribution of features in each category is shown in Figure 2; hedgerow survey data are provided in Appendix 2, with reference codes also shown on Figure 2.



5. Assessment and conclusions

5.1. Presence/absence surveys

Surveys in 2013 only confirmed the continued presence of dormice in two areas on the proposed Scheme, at Glandulas Holiday Home Park and Penygelli. Previous surveys have also found dormice in the Mochdre Valley, Dolfor Valley, a hedgerow on the Kerry Road and a hedgerow on Pool Road. However, it is considered that the Glandulas Holiday Home Park and Mochdre Valley areas are sufficiently well connected by hedgerows that the same dormouse population will have access to both.

The apparent absence of dormice from the Dolfor Valley during 2013 surveys is surprising given the existence of previous records and the suitable habitat present. However, dormouse populations are known to have experienced reduced breeding success during the prolonged wet weather in 2012 (White, 2013). Consequently dormice may either have been present in 2013 but at a low population density, or may have suffered from local extinction in this area. Similarly, the absence of dormice from Castell-y-Dail is surprising, and consequently the survey results here could also indicate either a genuine absence of dormice, or that dormice were only present at low density. It is therefore considered that a precautionary approach with respect to dormice should also be followed in these areas.

5.2. Habitat assessment

The habitat assessment revealed that the most suitable features for use by dormice had a clumped distribution along the route of the Scheme, and that the most suitable habitat areas tended to be woodlands or woodland edges.

The results of the habitat assessment can be used in combination with the results of other dormouse surveys, in order to infer where on the proposed Scheme dormice are likely to be present. Although there is no conclusive data on how far dormice may disperse through sub-optimal habitats, it is considered unlikely that they would travel more than 500m (Bright *et al*, 2006) through sub-optimal habitat to reach other areas. Consequently suitable or sub-optimal habitats within 500m (as a linear distance along hedgerows) of identified dormouse populations are considered likely to support dormice.

5.3. Likely distribution of dormice on the proposed Scheme

Using the confirmed dormouse survey locations and the results of the hedgerow assessment, the following sections of the proposed Scheme are considered likely to support dormice:

- From woodland west of Glandulas Farm eastwards to the eastern side of the Mochdre Valley (including the roadside hedgerow on the A489);
- From the A489 Kerry Road eastwards to the eastern end of the Scheme;

On a precautionary basis it is also considered that the following should be considered likely to support dormice:

- From the belt of woodland in the Coleg Powys farm eastwards to the eastern edge of the Castell-y-Dail Woodlands;
- From the west side of the Valley carrying the A483 Dolfor Road eastwards to the eastern side of the Dolfor Valley.



6. References

Bright, P. Morris, P. & Mitchell-Jones, A. (2006) *The Dormouse Conservation Handbook*. 2nd Edition, English Nature.

Chanin, P. & Woods, M. (2003) *Surveying dormice using nest tubes: Results and experiences from the South West Dormouse Project*. English Nature Research Report 524.

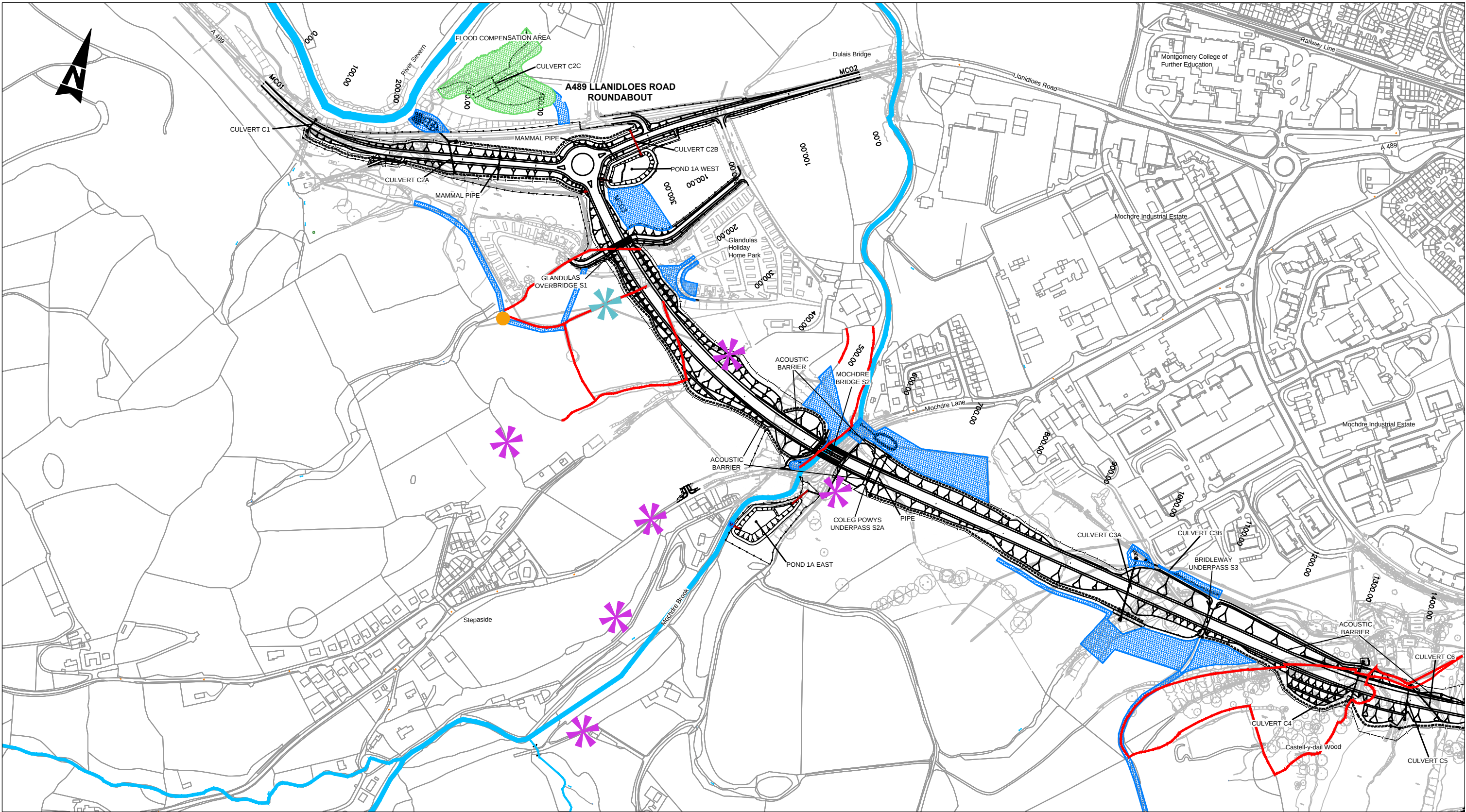
Natural England (2011) *Dormouse surveys for mitigation licensing – best practice and common misconceptions*. Interim Natural England Advice Note.

White, I. (2013) *Dormouse populations throughout England and Wales, 2013*. In *The Dormouse Monitor*, Vol 1, 2013, p 8-13.



Figures

Figure 1: Nest Tube Survey Locations



KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

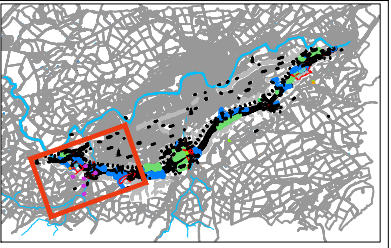
BIS records from 2008

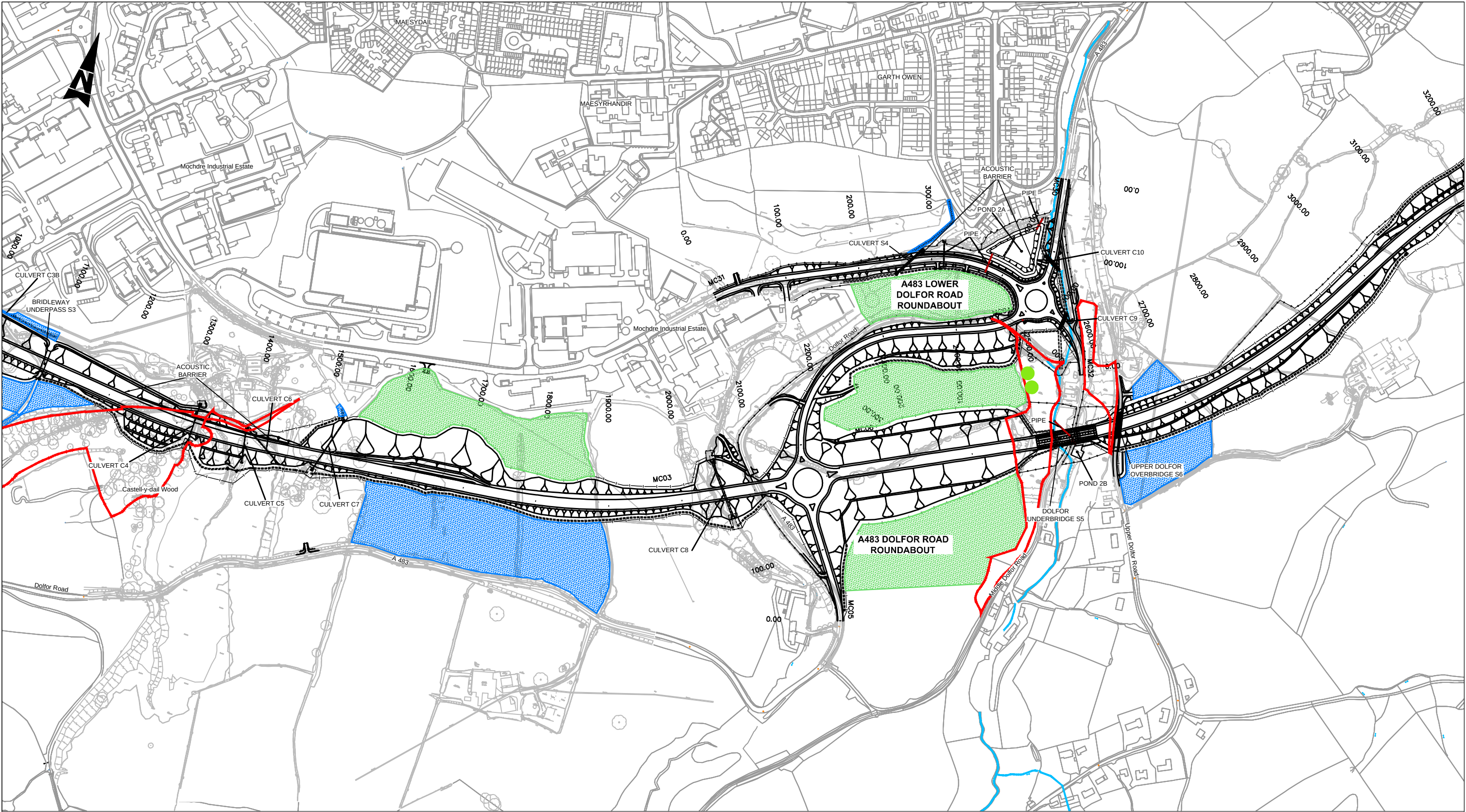
Gnawed Hazelnuts 2008 - Spring

Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses





KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

BIS records from 2008

Gnawed Hazelnuts 2008 - Spring

Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses

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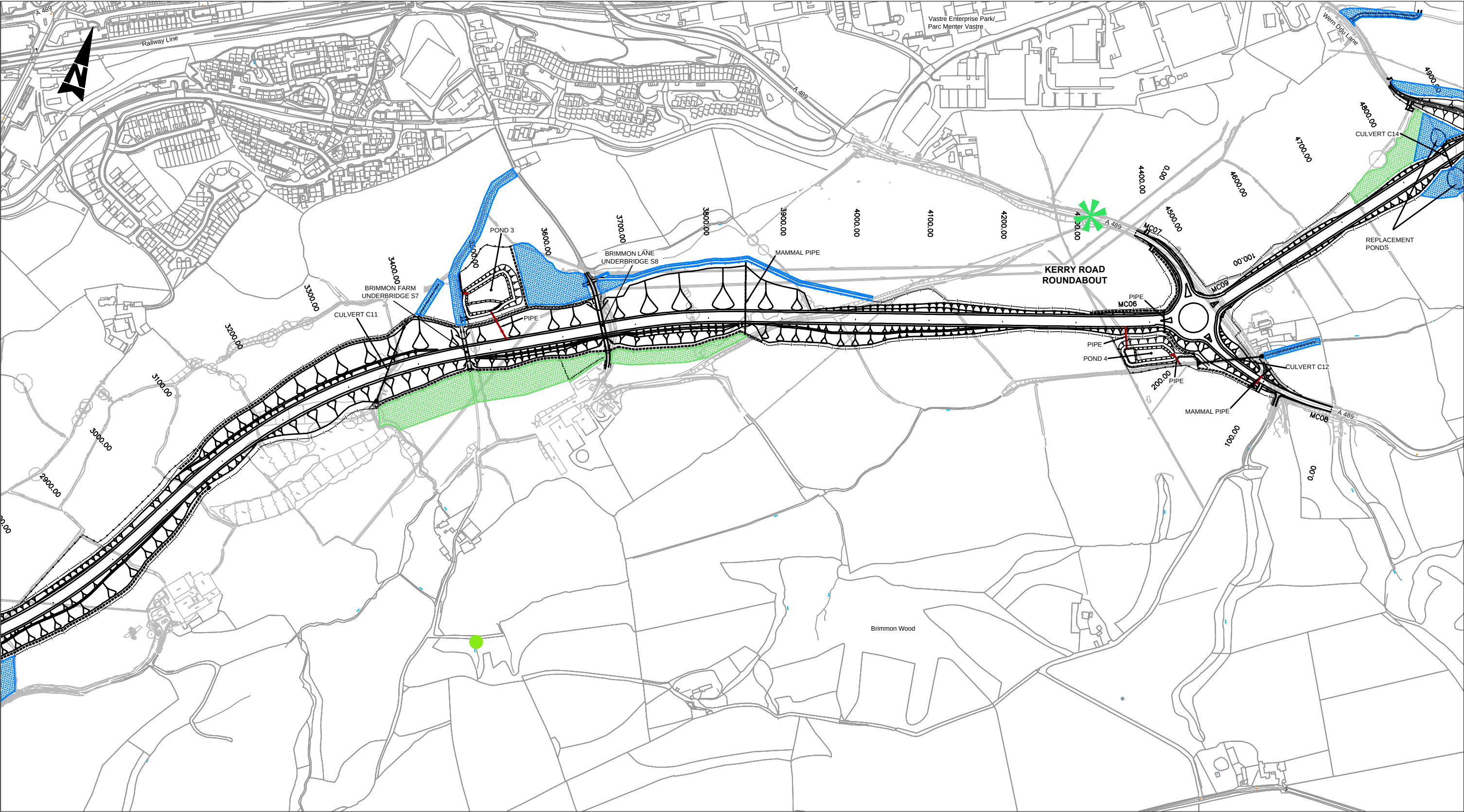
Drawing Title

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Dormouse Survey 2013
Nest Tube Survey Locations

Sheet 2 of 4

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Scale at A3	1:5,000	Scale at A1	1:2,500
Checked	MB	Approved	JW
Drawing Status	FINAL	Issue	-
Job No	60597	Figure No	1b



KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

BIS records from 2008

Gnawed Hazelnuts 2008 - Spring

Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses

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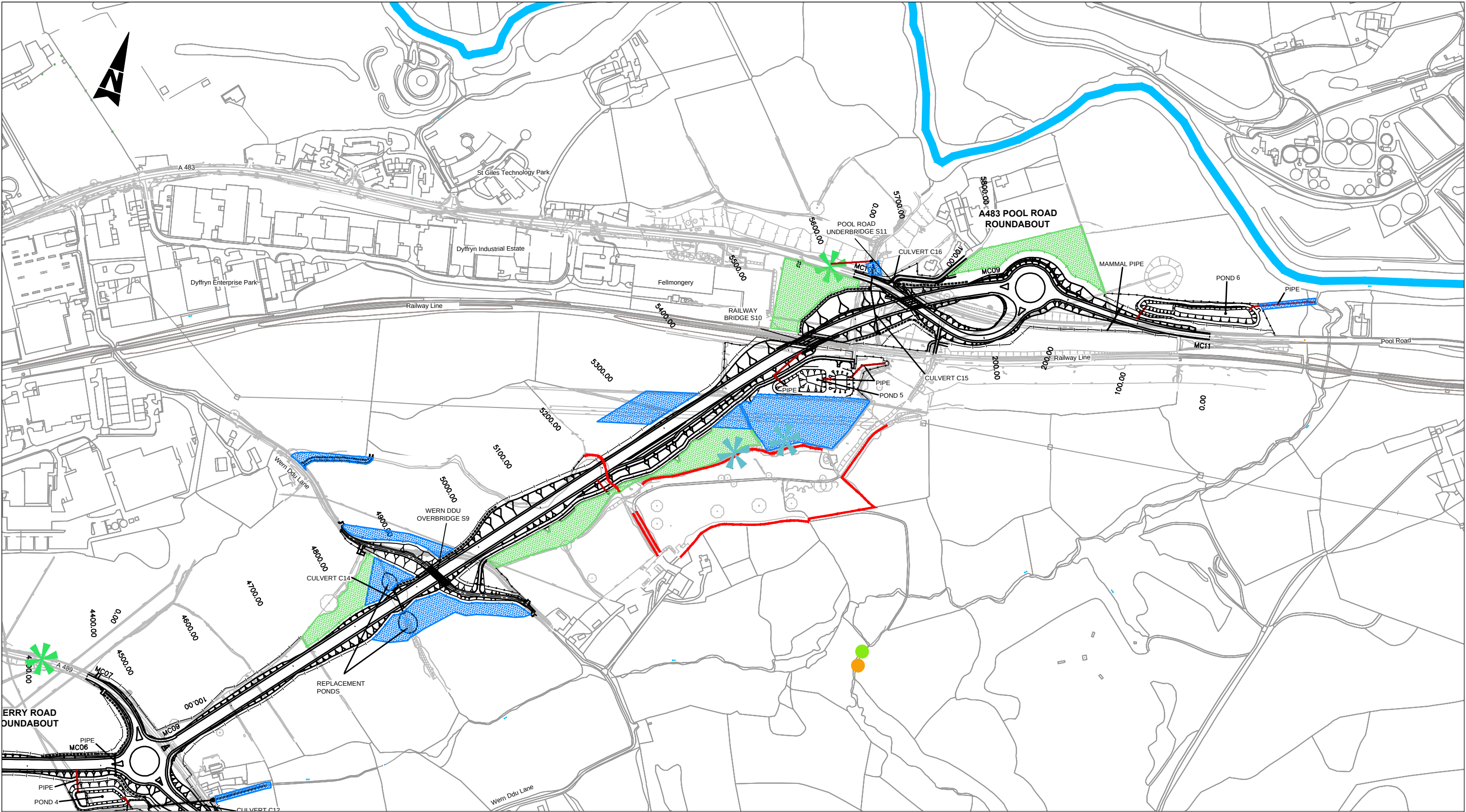
A483/A489
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Drawing Title

Dormouse Surveys 2013
Nest Tube Survey Locations

Sheet 3 of 4

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Drawing Status	FINAL	Approved	JW
Job No	60597	Figure No	1c
		Issue	-



KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

BIS records from 2008

Gnawed Hazelnuts 2008 - Spring

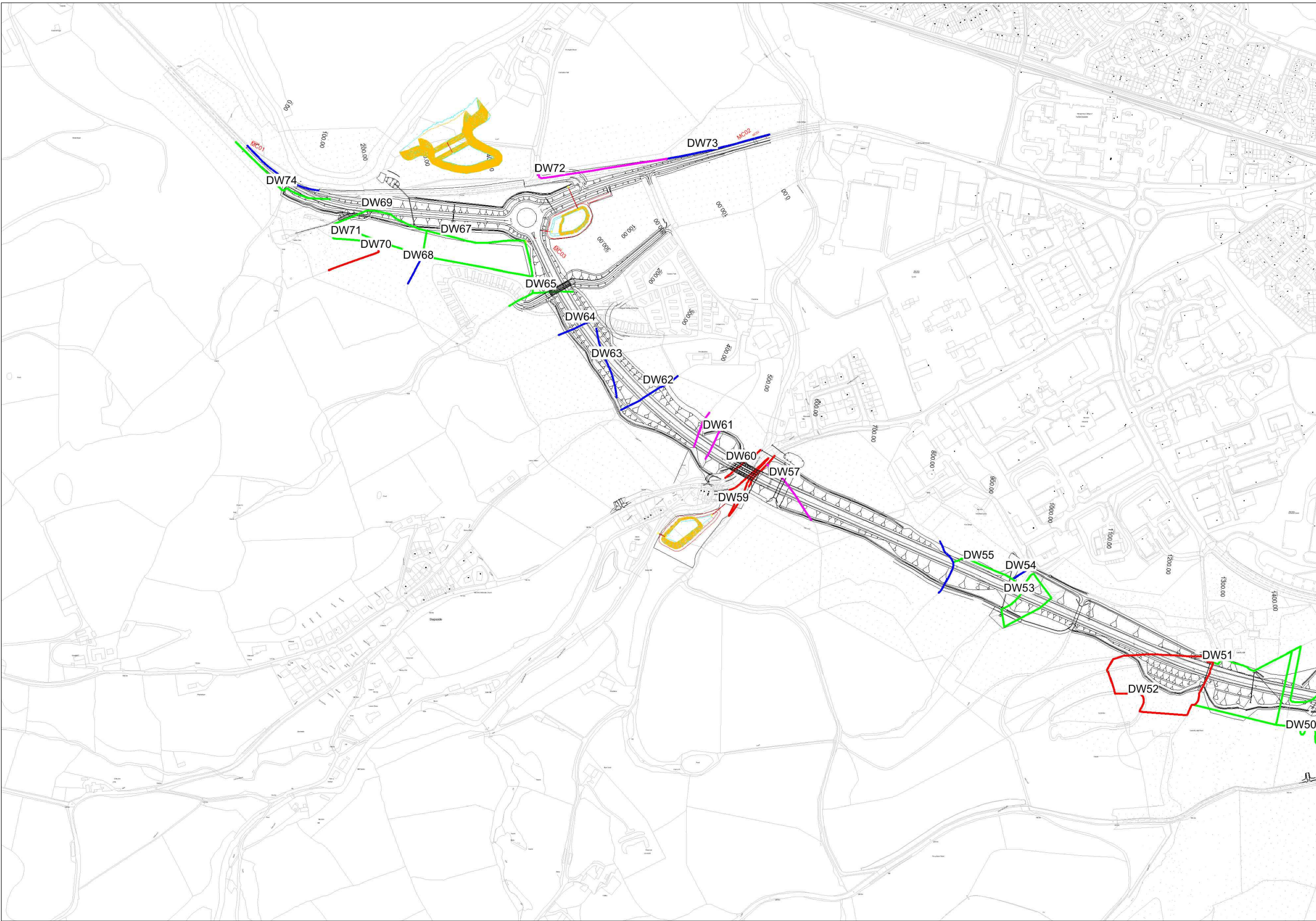
Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses



Figure 2: Habitat Assessment Results



Dormouse Habitat Assessment

A - Optimal habitat

B- Suitable habitat

C - Sub-optimal habitat

D - Suitable dispersal corridors

E - Unsuitable habitat

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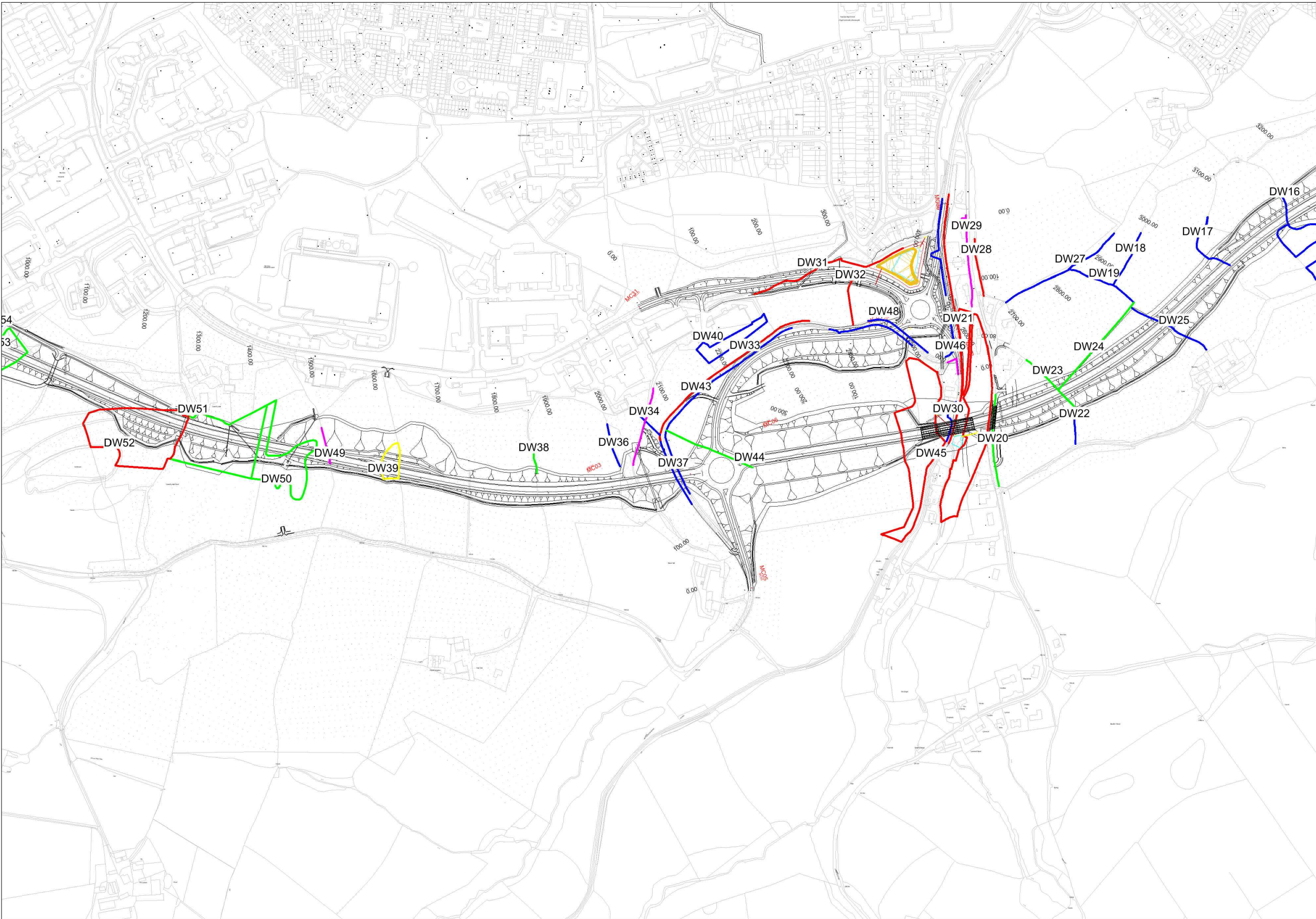
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Drawing Title

Dormouse Survey 2013
Habitat Assessment Results

Sheet 1 of 4

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Scale at A3	Not to Scale	Checked	MB
Drawing Status	FINAL	Approved	JW
Job No	60597	Figure No	2.a
		Issue	-



- Dormouse Habitat Assessment
- A - Optimal habitat
 - B - Suitable habitat
 - C - Sub-optimal habitat
 - D - Suitable dispersal corridors
 - E - Unsuitable habitat



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Dormouse Survey 2013
Habitat Assessment Results

Sheet 2 of 4

Date

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FS

Scale at A3

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Checked

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Drawing Status

FINAL

Approved

JW

Job No

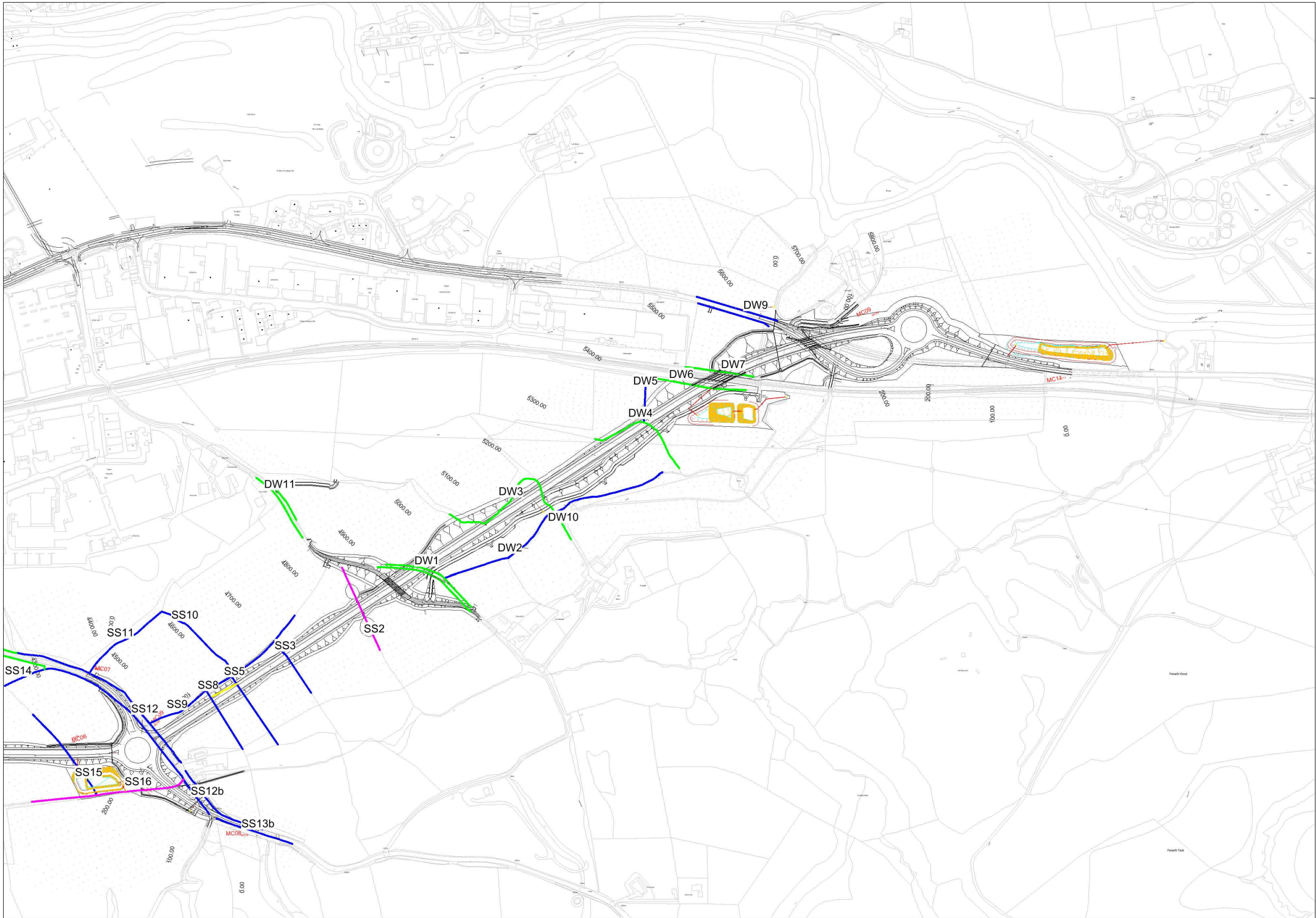
60597

Figure No

2.b

Issue

-



- Dormouse Habitat Assessment
- A - Optimal habitat
 - B- Suitable habitat
 - C - Sub-optimal habitat
 - D - Suitable dispersal corridors
 - E - Unsuitable habitat



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Drawing Title

Dormouse Survey 2013
Habitat Assessment Results

Sheet 4 of 4

Date	Sept 2014	Drawn by	FS
Scale at A3	Not to Scale	Checked	MB
Drawing Status	FINAL	Approved	JW
Job No	60597	Figure No	2.d
		Issue	-

Appendices



Appendix A.

Photographs of dormouse nests found:

Glandulais Caravan Park:





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Penygelli:





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Appendix B.

Habitat Assessment data: Hedgerows

Hedgerow Number on Site Plan	Hedge Assessment	Average Height in metres	Average width in metres	No of standard trees per 100m	Hedge Condition	Proportion of Hedgerow Comprising Gaps	Hedge Connectivity: Woodland/ Hedges	How many of each kind	Species Present
DW1	B	2.5m	2m	0	Intact, Dense, Flaied	< 5 %	Yes	0/2	Ash, Blackthorn, Dog Rose, Elder, Hawthorn, Hazel, Honeysuckle, Oak sp., Sycamore
DW2	C	1.8m (40m section 6m)	1.2m (40m section 4m)	1-2	Intact, Dense, Flaied, Straggly	25% fenced	Yes	1/5	Blackthorn, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Sycamore, Willow sp.
DW3	B	4-5m	3m	0	Intact, Dense, Unmanaged, Straggly	< 5 %	Yes	0/4	Blackthorn, Elder, Field Maple, Hawthorn, Hazel, Wild Cherry, Willow sp.
DW4	B	2m(40m), 4m(30m)	2m	0	Intact, Dense, Unmanaged	10%	Yes	0/2	Blackthorn, Dog rose, Elder, Hawthorn, Hazel,
DW5	C	5m	2m(low down), 4m (canopy)	0	Intact, Unmanaged, Straggly	25%	Yes	1/1	Dog rose, Elder, Hawthorn, Hazel,
DW6	B	6m	10m +	0	Dense, Unmanaged	5%	Yes		Blackthorn, Bramble, Dog Rose, Elder, Field Maple, Hawthorn, Hazel, Wild Cherry, Willow sp.



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DW7	B	5m	3-4m	0	Intact, Dense, Unmanaged	0%	Yes		Blackthorn, Bramble, Dog Rose, Elder, Hawthorn, Oak sp.
DW8	C	1.5m	1m	0	Intact, Flaied, Straggly	0%	Yes	0/2	Blackthorn, Dog Rose, Hawthorn, Hazel, Oak sp.
DW9	C	2m	1.5m	0	Intact, Dense, Flaied	0%		0/2	Blackthorn, Bramble, Elder, Field Maple, Hawthorn
DW10	B	6m	6m	0	Defunct, Dense, Unmanaged	10%	Yes	0/1	Blackthorn, Elder, Hawthorn, Hazel, Willow sp.
DW11	B	2m	2m	0	Intact, Dense, Flaied	0%	Yes	0/3	Blackthorn, Dog Rose, Field Maple, Field Rose, Hawthorn, Hazel
DW12	B	1.5m	1.5m	8	Intact, Dense, Flaied	< 5%	Yes	0/2	Ash, Blackthorn, Bramble, Elder, Elm sp. Field Maple, Field Rose, Hawthorn, Hazel, Holly, Honeysuckle, Oak sp. Sycamore
DW13	B	1.5m	1.5m	1	Intact, Dense, Flaied	< 5%	Yes	0/1	Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Honeysuckle, Oak sp., Sycamore
DW14	C	1.8m	1.5m	1.5	Defunct, Straggly, Flaied	< 5%	Yes	0/2	Blackthorn, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Oak sp.
DW15	C	1.5m	1m	6	Defunct, Dense, Flaied	40%	Yes	1/1	Alder, Blackthorn, Elder, Hawthorn, Hazel, Honeysuckle, Willow sp.



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DW16	C	1.5m	1.5m	1	Defunct, Straggly, Flaied	10%	Yes	1/3	Blackthorn, Elder, Field Rose, Hawthorn, Hazel
DW17	C	1.8m	1.5m	0	Defunct, Dense, Flaied	5%	Yes	1/2	Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Gooseberry
DW18	C	2m	1.5m	0	Intact, Dense, Straggly, Flaied, Laid	0%	Yes	0/2	Blackthorn, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Oak sp.
DW19	C	2m	2m	1	Intact, Dense, Flaied	0%	Yes	0/4	Blackthorn, Crab Apple, Field Rose, Hawthorn, Hazel, Oak sp.
DW20	B	1.5m	2m	0	Intact, Dense, Flaied	0%	Yes	0/2	Ash, Blackthorn, Elder, Elm sp. Field Rose, Hawthorn, Hazel, Oak sp. Wild Cherry
DW21 (Hedge bordering Upper Dolfor Rd.)	A	1.8m	1.5m	0	Intact, Dense, Flaied	0%	Yes	1/0	Ash, Blackthorn, Bramble, Elder, Elm sp. Field Maple, Field Rose, Hawthorn, Hazel, Holly, Honeysuckle, Oak sp. Sycamore, Yew. Apple, Cherry, Rhododendron,
DW22	C	1m	1m	0	Intact, Laid(Recently)	< 5%	Yes	0/2	Blackthorn, Bramble, Crab Apple, Hawthorn, Hazel
DW23	B	4m	2m	0	Intact, Straggly, Flaied	0%	Yes	0/3	Ash, Blackthorn, Field Rose, Hawthorn, Hazel, Oak sp
DW24	B	1.5m	1.5m	0	Intact, Dense, Flaied	0%	Yes	0/2	Ash, Blackthorn, Bramble, Elder, Elm sp., Field Maple, Field Rose,



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									Hawthorn, Hazel, Oak sp., Willow sp., Rowan
DW25	C	1.8m	1.5m	0	Intact, Dense, Flailed	10%	Yes	0/3	Bramble, Field Maple, Hawthorn, Hazel, Rowan
DW27	C	1.5m	1m	0	Intact, Dense, Flailed, Laid	5%	Yes	0/4	Blackthorn, Field Rose, Hawthorn, Hazel, Rowan
DW28	A	12m/1.5m (By Road)	10m		Flailed (on roadside)				Ash, Blackthorn, Bramble, Elm sp. Field Rose, Hawthorn, Hazel, Oak sp., Broom
DW29	D	2m	1m	0	Intact, Dense, Clipped	< 5%	Yes	1/0	Ash, Elm sp. Field Rose, Hawthorn, Hazel, Holly, Oak sp. Sycamore, Privet, Rhododendron, Leylandii
DW30	C	2m	1.5m	1	Intact, Dense, Clipped	0%	Yes	1/0	Ash, Elder, Hawthorn, Holly, Honeysuckle (Shrubby Garden type), Sycamore
DW31	A	8m	5m	0	Defunct, Dense, Straggly, Unmanaged	20%	Yes	0/3	Ash, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Guelder Rose, Hawthorn, Hazel, Honeysuckle, Willow sp.
DW32	A	5m	5m	1	Intact, Dense, Unmanaged, Flailed	0%	Yes	0/2	Ash, Elder, Field Maple, Field Rose, Hawthorn, Hazel
DW33	A	6m	3m + 5m	1	Intact, Dense, Unmanaged, Flailed	0%	Yes	0/4	Ash, Blackthorn, Bramble, Dog Rose, Elm sp, Field Maple, Field Rose, Hawthorn, Hazel, Oak Sp.



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DW34	C	4m	3m	0	Defunct, Dense, Unmanaged	25%	Yes	0/4	Blackthorn, Bramble, Dog Rose, Elm sp. , Field Rose, Hawthorn,
DW35	D	8m	4m	0	Defunct, Straggly, Unmanaged	40%	Yes	2/2	Alder, Bramble, Elder, Elm sp, Hawthorn,
DW36	C	8m	5m	1	Defunct, Straggly, Unmanaged	10%	Yes	1/2	Ash, Hawthorn, Oak sp
DW37	C	1.8m	1m	1	Intact, Dense, Flaied, Laid	0%	Yes	0/2	Blackthorn, Elder, Elm sp., Field Maple, Hawthorn, Hazel, Oak sp, Sycamore
DW38	B	4m	2m	1	Intact, Dense, Unmanaged, Flaied	5%	Yes	0/3	Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Oak sp
DW41	D	2m	1m	0	Intact, Dense, Clipped	0%	No		Leylandii
DW42	C	1.5m (Mainly) 8m (Some)	1m/5m	2	Defunct, Straggly, Flaied, Laid (long ago)	0%	Yes	1/2	Ash, Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Oak sp, Willow sp
DW43	C	1m	1m	0	Intact, Dense, Flaied, Laid	0%	Yes	0/3	Blackthorn, Bramble, Elder, Field Maple, Hawthorn, Hazel
DW44	B	5m	4m	2	Defunct, Straggly, Unmanaged	10%	Yes	1/1	Blackthorn, Elm sp. Field Maple, Field Rose, Hawthorn, Hazel, Oak sp, Willow sp
DW46	C	1.5m	1m	0	Intact, Dense, Flaied	0%	Yes	0/2	Ash, Bramble, Hawthorn
DW47 (Roadside)	C	1.5m	1m	0	Straggly, Flaied	0%			Alder, Ash, Bramble, Dog Rose, Hawthorn, Hazel, Sycamore, Willow sp, Knotweed



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DW48	C	2.5m	2m	0	Intact, Dense, Flaied	0%	Yes	0/3	Ash, Blackthorn, Bramble, Elm sp, Field Maple, Field Rose, Hawthorn, Hazel, Oak sp, Sycamore
DW49	D	10m	5m	20 (Treeline, Not Hedge)	Defunct, Straggly, Unmanaged	10%	Yes	1/2	Ash, Gorse
DW54	C	4m	3.5m	0	Intact, Dense, Flaied, Laid,	0%	Yes	1/1	Elder, Field Rose, Hawthorn, Hazel
DW55	B	1.8m	1.5m	0	Intact, Straggly, Flaied	0%	Yes	0/2	Blackthorn, Bramble, Elder, Elm sp, Field Maple, Field Rose, Hawthorn, Hazel
DW56	C	1.8m	1.5m	0	Intact, Straggly, Flaied	10%	Yes	0/2	Blackthorn, Dog Rose, Elder, Hawthorn
DW57	D	1.5m	1.5m	0	Defunct, Straggly, Flaied	50%	Yes	0/1	Ash, Blackthorn, Dog Rose, Elder, Hawthorn, Hazel, Spindle
DW58	A	10m	4m	0	Intact, Dense, Flaied (Lightly)	0%	Yes	1/3	Ash, Blackthorn, Elm sp, Field Maple, Field Rose, Hawthorn, Hazel, Oak sp, Spindle, Sycamore
DW60	A	10m	4m	2	Defunct, Dense, Unmanaged	0%	Yes	0/2	Ash, Blackthorn, Dog Rose, Elm sp, Hawthorn, Hazel, Oak sp, Sycamore, Horse Chestnut
DW61	D	6m	10m	0	Defunct, Straggly, Unmanaged	50%	Yes	0/2	Ash, Bramble, Dog Rose, Elder, Elm sp, Hawthorn, Bracken



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DW62	C	5m	4m	1	Defunct, Straggly, Unmanaged	20%	Yes	0/3	Ash, Dog Rose, Elm sp, Field Maple, Hawthorn, Holly, Apple
DW63	C	3m	2.5m	0	Intact, Dense, Unmanaged	0%	Yes	0/2	Blackthorn, Elder, Hawthorn, Hazel
DW64	C	3m	2m	0	Intact, Straggly, Unmanaged	10%	Yes	0/2	Blackthorn, Elder, Hawthorn, Hazel
DW65	B	4m	2m	0	Intact, Dense, Flaied	20%	Yes	0/2	Blackthorn, Dog Rose, Elder, Elm sp, Field Maple, Hawthorn, Hazel
DW66	B	3m	2m	0	Intact, Dense, Unmanaged	5%	Yes	1/1	Elder, Field Maple, Hawthorn, Hazel
DW68	C	3.5m	2m	0	Defunct, Dense, Unmanaged	40%	Yes	1/2	Ash, Blackthorn, Bramble, Gorse, Hawthorn, Hazel
DW70	A	4m	3m	1	Intact, Dense, Unmanaged	0%	Yes	1/1	Ash, Bramble, Dog Rose, Hawthorn, Oak sp, Sycamore
DW71	B	4m	8m	1	Defunct, Straggly, Unmanaged	0%	Yes	1/1	Ash, Beech, Bramble, Dog Rose, Hawthorn, Oak sp,
DW72	D	1m	1m	0	Intact, Dense, Flaied	0%	Yes	0/3	Bramble, Dog Rose, Hawthorn,
DW73	C	1.5m	1m	0	Intact, Dense, Flaied	0%	Yes	0/2	Ash, Blackthorn, Dog Rose, Elder, Field Maple, Hawthorn, Hazel, Sycamore
DW74	B	10m	3m	0	Intact, Dense (To West), Defunct, Straggly, Unmanaged	0%	Yes	1/2	Ash, Blackthorn, Bramble, Elder, Hawthorn, Hazel, Oak sp, Sycamore
DW75	C	12m	6m	0	Defunct, Straggly, Unmanaged	0%	Yes	0/3	Ash, Blackthorn, Bramble, Dog Rose, Hazel, Sycamore, Willow sp



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SS1	B	2m	1-1.5m	1-2	Intact, Dense, Flaied	0% (Just field access)	Yes	0/4	Ash, Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Ivy, Oak sp, Sycamore, Willow sp
SS2	D	4m	1m (base) 3-4m (canopy)	Semi mature tree line rather than hedge row	Defunct/Straggly/Unmanaged	50%	Yes	0/2	Ash, Blackthorn, Elder, Hawthorn, Hazel, Willow sp
SS3	C	1.6m	1m	0	Intact, Dense, Flaied	< 1 %, (field access only)	Yes	0/3	Blackthorn, Bramble, Elder, Hawthorn, Hazel
SS4	C	1.3m	1-1.5m	0	Intact, Dense, Flaied	< 1 %	Yes	0/3	Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Honeysuckle
SS5	C	1.6m	1m	1	Intact, Dense, Flaied	Field access and <1% due to sheep	Yes	0/3	Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Ivy
SS6	E	3-4m	< 0.5m		Defunct, Unmanaged	75% (fence with semi mature trees)	Yes	0/2	Hawthorn
SS7	C	1.2m	1.5m	0	Intact, Dense, Flaied (One Side)		Yes	0/2	Blackthorn, Crab Apple, Elder, Field Rose, Hawthorn
SS8	C	1.5m	1-1.2m	0	Intact, Dense, Flaied	field access only	Yes	0/4	Ash, Bramble, Elder, Field Rose, Hawthorn
SS9	C	1-1.2m	1m	1	Intact, Dense, Flaied	field access and c. 5%	Yes	0/2	Ash, Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel



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SS10	C	1.5m	1m	0	Intact, Dense, Flaied	field access and 4% though arch still present	Yes	0/3	Blackthorn, Bramble, Dogwood, Elder, Field Maple, Field Rose, Hawthorn, Hazel
SS11	C	1.2m	1m	0	Intact, Dense, Flaied	Overall c. 10% concentrated to South end	Yes	0/3	Blackthorn, Elder, Field Maple, Field Rose, Hawthorn
SS12	C	1.6m	1-1.5m	0	Intact, Dense, Flaied	Field access	Yes	0/5	Ash, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Sycamore
SS12a	B	1.6m	1-1.5m	0	Intact, Dense, Flaied	Field access	Yes	0/2	Ash, Beech, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Honeysuckle, Oak sp, Sycamore
SS12b	C	1.2m	0.5m	0	Intact, Dense, Flaied	Field and farm access	Yes	0/3	Ash, Beech, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Honeysuckle, Hornbeam, Ivy, Oak sp, Sweet Chestnut, Sycamore
SS13	C	1.2-1.5m	1m	0	Intact, Dense, Flaied	Field access and c. 10% East end	Yes	0/4	Ash, Beech, Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Honeysuckle, Sweet Chestnut, Sycamore



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SS13a	B	1.5m	1-1.2m	4 (wooded behind hedge)	Intact, Dense, Flaied	Field access	Yes	0/3	Ash, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Honeysuckle, Ivy, Oak sp
SS13b	C	1.5m	1m	0	Intact, Dense, Flaied	field access further along hedge	Yes	1/2	Ash, Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Sweet Chestnut, Willow sp
SS14	C	1.2m	1m	0 (but wood behind)		0%	Yes	0/3	Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel,
SS15	C	1.6m	1.2m	1	Intact, Dense, Flaied	odd trail beneath, sheep, connected over top < 5% large gap at end	Yes	0/2	Ash, Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Oak sp
SS16	C	1m	1m	0	Intact, Flaied	none but nettle growth may be covering	Yes	0/4	Blackthorn, Bramble, Field Rose, Hawthorn, Hazel, Willow sp
SS17	C	1.6m	1-1.3m	0		gap at East end, access few along , sheep access	Yes	0/2	Blackthorn, Bramble, Elder, Field Rose, Guelder Rose, Hawthorn, Hazel, Oak sp
SS18	C	3m	1.2m(bas e) 4m (canopy)	Treeline with understor ey, (hazel	Intact, Dense, Unmanaged, Flaied		Yes	0/2	Ash, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hazel, Ivy, Oak sp



				hedge North East)					
SS19	C	1.7m	1-1.2m	0		Field access + 5%	Yes	0/4	Blackthorn, Bramble, Elder, Field Rose, Hawthorn, Hazel, Oak sp
SS20	C	1m	1m	3	Intact, Dense, Flaied	some gaps beneath, runs through	Yes	0/2	Beech, Blackthorn, Bramble, Elder, Field Maple, Field Rose, Hawthorn, Hazel, Oak sp
SS21	C	4/5m	wooded bank rather than hedge						Blackthorn, Bramble, Elder, Field Rose, Gorse, Hawthorn, Hazel,
SS22	D	4m	1m, 4m (canopy)	2	Straggly, Unmanaged	30%	Yes	1/2	Blackthorn, Bramble, Field Rose, Hawthorn, Oak sp
SS23	E	10m	1m (base) 10m (canopy)	8 (Oak and Hawthorn)	Defunct, Unmanaged			N/A	Hawthorn, Oak sp

Habitat Assessment data: Woodlands

Woodland Name/ Number	Woodland Assessment	Size of Woodland in Hectares	Canopy Layer	Understorey/ Ground Layer	Woodland Type	Woodland Management	Woodland Likely to Flood?	Woodland Connectivity : Hedges/ Woodlands	How many of each kind	Species Present
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DW6	B	c 0.4 ha	Absent	Dense	Broadleaved, Mixed Plantation	Unmanaged (Railway Line side)	No				Blackthorn, Bramble, Dog Rose, Elder, Field Maple, Hawthorn, Hazel, Wild Cherry, Willow sp.
DW21	A		Sparse	Moderate	Broadleaved, Mixed Plantation, Semi-Natural	Unmanaged	No	Yes	4/0		Ash, Blackthorn, Bramble, Elder, Elm sp. Field Maple, Field Rose, Hawthorn, Hazel, Holly, Honeysuckle, Oak sp. Sycamore, Yew. Apple, Cherry, Rhododendron,
DW26	C		Dense	Absent	Broadleaved	Grazing	No	Yes	6/0		Ash, Blackthorn, Elder, Field Rose, Hawthorn, Oak sp, Rowan, Wild Plum
DW28	A		Dense (Where Present)	Sparse (In Absence of Canopy)	Broadleaved	Unmanaged	No	Yes	3/0		Ash, Blackthorn, Bramble, Elm sp. Field Rose, Hawthorn,



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										Hazel, Oak sp., Broom
DW39	C		Moderate	Absent	Mixed Plantation	Unmanaged, Grazing	No	No		Hawthorn, Hazel, Oak sp., Rowan, Larch
DW40	C	0.3ha	Moderate	Moderate	Broadleaved, Semi Natural	Unmanaged	No	Yes	2/0	Ash, Blackthorn, Bramble, Field Maple, Field Rose, Hawthorn, Hazel, Oak sp, Willow sp
DW45	A		Absent	Moderate	Broadleaved, Semi Natural	Unmanaged, Coppiced	No	Yes	4/0	Ash, Blackthorn, Bramble, Dog Rose, Elm sp, Field Rose, Hawthorn, Hazel, Holly, Honeysuckle, Oak sp, Sycamore, Willow sp, Rowan, Larch
DW47 (Around Stream)	C		Moderate	Moderate	Broadleaved, Mixed Plantation	Unmanaged	Yes	Yes	2/0	Alder, Ash, Bramble, Dog Rose, Hawthorn, Hazel, Sycamore,



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										Willow sp, Knotweed
DW50	B		Dense	Sparse	Broadleaved	Grazing	No	Yes	1/1	Ash, Birch sp, Bramble, Hazel, Holly, Honeysuckle, Oak sp, Rowan
DW51	B		Dense	Absent (Except for windbreaks/ ditches)	Coniferous, Mixed Plantation	Managed for timber	No	Yes	4/2	Alder, Ash, Birch sp, Bramble, Elm sp, Hazel, Holly, Honeysuckle, Oak sp, Willow sp, Rowan, Conifers
DW52- (Castell y Dail west of quarry)	A		Moderate	Moderate	Broadleaved, Coniferous, Plantation, Semi Natural	Unmanaged, Managed for timber	No	Yes	2/2	Ash, Blackthorn, Bramble, Elm sp, Hawthorn, Hazel, Holly, Honeysuckle, Oak sp, Sycamore, Rowan, Conifer
DW53	B		Dense	Sparse	Broadleaved, Semi Natural	Unmanaged	Yes (Central Section)	Yes	4/0	Alder, Ash, Birch sp, Blackthorn, Elder, Hawthorn, Hazel, Oak sp,



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										Sycamore, Willow sp.
DW59	A	0.3ha affected	Absent	Dense	Broadleaved, Semi Natural	Unmanaged (Roadside flailing only)	No	Yes	3/0	Ash, Bramble, Elm sp, Field Maple, Field Rose, Hawthorn, Honeysuckle, Sycamore, Willow sp
DW67	B		Moderate	Absent	Mixed Plantation	Unmanaged, Grazing (at Western end)	No	Yes	2/1	Beech, Hawthorn, Sycamore, Conifer, Cherry
DW69	B		Moderate	Moderate	Broadleaved, Mixed Plantation	Unmanaged	No	Yes	3/1	Ash, Bramble, Dog Rose, Hawthorn, Holly, Sycamore, Wild Cherry,
SS21	C		Moderate	Moderate (Sparse in places)	Broadleaved, Semi Natural	Grazing		Yes	1/0	Blackthorn, Bramble, Elder, Field Rose, Gorse, Hawthorn, Hazel

Appendix E.14

Dormouse Ghost Licence



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A483/A489 NEWTOWN BYPASS

Dormouse Ghost Licence

July 2014



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A483/A489 Newtown Bypass

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PROJECT: A483/A489 Newtown Bypass

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1. Introduction

1.1. Description of the Project

1.1.1. Why the Scheme is needed

The A483/A489 Trunk Roads at Newtown form part of the north-south and east-west transport corridors linking areas such as Mid Wales and the West Midlands in England. Newtown is a pinch point on the network and the junction of the A483(T) and A489(T) regularly suffers from traffic congestion. Further industrial development of Newtown is believed to be hampered by transport/ congestion issues.

Some of the main problems experienced in Newtown arise from low headroom/reduced width on the A483(T) Dolfor Road and A489(T) Nantoer Railway overbridges, congestion along A483(T) New Road and A483(T) Pool Road and conflicts between pedestrians and vehicles at the A483(T) Dolfor Road/ A489(T) Llanidloes Road junction.

To avoid the low headroom bridges high sided Heavy Goods Vehicles and high sided agricultural vehicles divert through the residential areas of Garth Owen and Treowen. This in turn compromises the safety of local residents, and in particular school children attending the Treowen and Cedewain Schools.

1.1.2. History of the Scheme

Historically, extensive work has been undertaken to identify traffic problems in Newtown, dating back to 1969 and a TR111 Preferred Route was announced in 1973. A study was commissioned by the Welsh Government to assess the transport issues associated with the A483(T) and A489(T) through Newtown in 2006. This resulted in a Preferred Route which was announced in 2010. Following further investigations a modified Preferred Route was announced in March 2014 which is the alignment referred to in the draft Orders and described in the ES.

1.2. Background

The Welsh Government commissioned Key Stage 2 (KS2) Study to investigate options to resolve the transport problems in Newtown in 2006. The study was conducted and options appraised in accordance with the Welsh Transport Planning and Appraisal Guidance (WelTAG), taking into account the numerous policies, plans and strategies including undertaking a Health Impact Assessment. The study placed specific emphasis on the social, economic and environmental impacts.

The Newtown Planning Objectives and Pre-Appraisal Report (February 2006) concluded it was unlikely that further traffic management measures, improvements in public transport or a combination of such measures, would have a significant impact on alleviating the problems. A road improvement or bypass option, which removes the low headroom restrictions and reduces congestion within the town, was likely to be the only acceptable solution.



In October 2010 the Deputy First Minister announced a TR111 Preferred Route which was protected for planning purposes. A revised TR111 was announced in March 2014, following design development work carried out by the AGC team.

1.3. The Project Objectives

1.3.1. Welsh Government Objective and Mission Statement

The Welsh Government's objective is to provide a bypass to the town of Newtown in accordance with the findings of the KS2 scheme, and to include the commitments made at the Public Consultation undertaken as part of this study. This is to be carried out through appointment of a design and build Contractor under an Early Contractor Involvement (ECI) contract to be managed following the principles of PRINCE2 project management system and to deliver the works to programme, budget, and with due regard to the Welsh Ministers policies.

The Welsh Government's mission is to:

"Promote the vision and transport strategy described in the Welsh Government's 'One Wales: Connecting the Nation', the Wales Transport Strategy, and the National and Regional Transport Plans".

1.3.2. Scheme / Planning Objectives

Seven specific Transport Planning Objectives (TPOs) have been identified for the scheme. These will be achieved by the successful ECI Contractor and several other stakeholders, namely Welsh Government (Objectives 2, 3, 6 and 7) and Powys County Council/TraCC (Objectives 1, 4 and 5). The objectives are detailed below:

Objective 1 – Maintain economic base

- Maintain economic base of Newtown measured by levels of local employment by the date in the local development plan (2025).

Objective 2 – Meeting relevant environmental targets

- Within Newtown settlement boundary limit and within 200m of the scheme;
- Meet targets and comply with appropriate environmental legislation and policies by 2018;
- Reduce greenhouse gas emissions along Pool Road and New Road by 3% from 2008 levels, by 2018 (in accordance with Wales Transport Strategy).

Objective 3 – Removing through traffic from local roads

- Reduce through traffic on Heol Treowen, Plantation Lane and Milford Road by 50% over 2008 levels by 2018;
- Reduce HGVs on Heol Treowen, Plantation Lane by 90% from 2008 levels, by 2018.



Objective 4 – Increasing level of usage for non-car forms of transport

- For travel with origin and destination within Newtown, achieve modal shift of 10% from car to non-car forms of transport (cycling, walking and public transport), over 2008 levels, by 2018;
- For travel with origin or destination within Newtown, achieve modal shift of 2% from car to public transport, over 2008 levels, by 2018.

Objective 5 – Integration of public transport

- Within Newtown limit interchange penalty linking bus services and train services to 20 minutes, by 2018;
- Within Newtown, during morning and evening peak hours (0700-0900 and 1600-1800) limit interchange penalty between bus services to 10 minutes, by 2018.

Objective 6 – Improve journey time consistency (North-South, East-West)

- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A470/A489 junction (Caersws) and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A483/B4389 junction (Aberbechan junction) by 10% by 2018;
- Reduce journey times during morning and evening peak hours (0800-0900 and 1615-1715) on A489/A483 between A483/unnamed C class Road at 'The Dingle', and A470/A489 junction (Caersws) by 10% by 2018.

Objective 7 – Reduction in accidents

- Within Newtown settlement boundary limit, reduce road traffic accidents on A483(T), A489(T), Heol Treowen, Plantation Lane and Milford Road by 25% by 2018.

1.4. Outline of the proposed Scheme

The Scheme would be 6.5km in length and would comprise 5.8km of Wide Single 2+1 Road. This would provide two lanes in one direction and one lane in the opposite direction, separated by double solid white lines, 1 metre apart, with cross hatching on red surfacing between the lines. In addition, the following single carriageway trunk roads would be provided: 0.3km at the western terminal; 0.1km at the eastern terminal; and 0.1km at Dolfor Road to connect the Scheme into the existing Trunk Road network.

Five at-grade roundabout junctions and 2.7km of single carriageway new and improved side roads would also be provided. Along the bypass only the roundabouts would be lit. New or diverted lengths of Public Rights of Way and Private Means of Access would replace those affected by the Scheme.

Road drainage would be provided through piped systems which would discharge into eight ponds along the Scheme. These ponds would attenuate and treat the collected surface water prior to discharging it into existing watercourses.



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The Scheme would commence at its western connection with the A489(T) 0.3km west of the new three-arm A489 Llanidloes Road Roundabout. The eastern roundabout arm would link into the existing Llanidloes Road leading to Newtown. The Scheme would continue south eastwards and pass through the Glandulas Holiday Home Park. An overbridge would be provided to access the western section of the Park and to carry a diverted bridleway.

The Scheme would enter a section of cutting up to 15m deep before passing over the Mochdre Brook on a clear span bridge. This structure would also cross Mochdre Lane and Upper Mochdre Lane. Two underpasses would be provided to the east of the Mochdre Bridge to facilitate access south of the Scheme for Coleg Powys. The eastern underpass would also accommodate a diverted bridleway.

The Scheme would then cross agricultural fields on embankment up to 16m high and in cutting as it traverses the undulating landform.

At Castell y Dail Wood there would be a cutting up to 28m deep on the southern side. This would lie to the north of the Iron Age fort and to the south of Castell y Dail House (Listed Structure). An eastbound lay-by would be provided east of Castell y Dail Wood.

The Scheme would continue to the south of Mochdre Industrial Estate to the new four-arm A483 Dolfor Road Roundabout located near Black Hall Farm. The northern arm of this roundabout would link to the new four-arm Lower Dolfor Roundabout. Access would be provided from this roundabout into the Mochdre Industrial Estate along Heol Ashley, into Newtown along the existing Dolfor Road and into Middle Dolfor Road.

East of the A483 Dolfor Road Roundabout, the Scheme would cross through an area of high ground in a cutting up to 23m deep prior to going over Middle Dolfor Road on a three span bridge. It would then pass under Upper Dolfor Road which would cross over the Scheme via an overbridge.

The Scheme would continue north-eastwards in cutting up to 21m deep through agricultural land and then on embankment 21m high crossing over Brimmon Farm Underpass and Brimmon Lane Underpass. These structures would accommodate a diverted public footpath and a bridleway. East of these structures the Scheme would pass in slight cutting prior to the new four-arm Kerry Road Roundabout located near Lower Brimmon Farm.

The roundabout would connect to the existing Kerry Road leading to Newtown to the north and with the existing A489 Kerry Road south to Kerry. The Scheme would continue north-eastwards in cutting passing under Wern Ddu Lane Overbridge. A westbound lay-by would be provided east of Wern Ddu Overbridge.

An embankment up to 13m high would take the Scheme over the Cambrian Railway via the Railway Underbridge. It would then curve eastwards crossing over Pool Road Underbridge before connecting into the three-arm A483 Pool Road Roundabout. The southern arm of this roundabout would curve westwards and connect with the existing Pool Road leading to Newtown. The 0.1km long eastern arm would connect into the existing A483(T) leading to Welshpool at the Scheme's eastern termination.



1.5. Purpose of this Report

This document has been prepared as the construction and operation of the Scheme is likely to affect breeding sites and resting places of dormice, which are protected under the Conservation of Habitats and Species Regulations 2010 (and 2011/2012 amendment regulations). A detailed explanation of the requirements of the legislation is provided in Section 1.6 below.

In accordance with these regulations a European Protected Species (EPS) Licence must be granted by the licencing authority, Natural Resources Wales (NRW) in order to construct the Scheme.

In the case of the Scheme, a licence may be granted by NRW as its construction and operation constitute *'imperative reasons of overriding public interest including those of a social or economic nature'* and *'there is no satisfactory alternative'* and *'the action authorised will not be in detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'*.

The prefix 'Ghost' is used in this document as the actual EPS licence would not normally be considered by NRW until the formal permission for a scheme or project had been granted. In the case of a trunk road, under the Highways Act, 1980 (as amended), this formal permission would be the Welsh Minister's Decision following a Public Inquiry (if one was required). Therefore, the Welsh Government advises that ghost licences be prepared during scheme development as a means to demonstrate that due consideration of mitigation measures for EPS species has been made and agreed with the NRW. Therefore the preparation of 'ghost' licences in tandem with the ES provide reference sources to inform the decision making process for the scheme during the statutory process leading up to the Minister's Decision.

This "ghost" licence application has been prepared in relation to hedgerows and woodland areas affected by the Scheme in which presence of dormice has been confirmed, and those which, based on survey findings nearby, are considered reasonably likely to support dormice. This document also sets out the proposed mitigation strategy for these impacts on dormice.

1.6. Requirements of the legislation

Under the Conservation (Natural Habitats &c.) Regulations 2010 (and 2011/2012 amendment regulations), Regulation 41(1): *'a person who:*

- a) Deliberately captures, injures or kills any wild animal of a European Protected Species,*
- b) Deliberately disturbs wild animal of any such species,*
- c) Deliberately takes or destroys the eggs of such an animal, or*
- d) Damages, destroys a breeding site, or resting place of such an animal.*

Is guilty of an offence'

However, under Regulation 53 (1 & 2), *'the relevant licencing body may grant a licence for the purposes specified'* below:



- a) *'Scientific or educational purposes;*
- b) *'Ringing or marking, or examining any ring or mark on, wild animals;*
- c) *'Conserving wild animals or wild plants or introducing them to particular areas;*
- d) *'Protecting any zoological or botanical collection;*
- e) *'Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*
- f) *'Preventing the spread of disease; or*
- g) *'Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property to fisheries'.*

Under Regulation 53(9) *'the relevant licensing body must not grant a licence under this regulation unless they are satisfied:*

- a) *'That there is no satisfactory alternative; and*
- b) *'That the action authorised will not be in detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.*

1.7. Guidance documents used

The contents of this Ghost Licence is based on the requirements for full licence applications from the licencing authority – NRW. This includes NRW's *'Information to be provided in European Protected Species Licence Application'* [1] and *'Application for a Licence – Dormouse Method Statement'* [2].

Guidance will also be sought from the English Nature's *Dormouse Conservation Handbook (2nd Ed.)* [3].

1.8. Detail of the work on site to be covered by the licence

The proposed works will involve the removal of hedgerows, scrub and some woodland areas within the footprint of the proposed Scheme. The extent of vegetation clearance to be covered by the licence is based on previous desktop records, survey data (in 2008, 2012 and 2013) and assessment of the suitability of hedgerows affected by the Scheme for dormice. Professional judgement has been used to determine whether it is reasonably likely that dormice will be present in hedgerows, based on the suitability of the hedgerows and their proximity to confirmed dormouse records.

Hedgerows, scrub and woodland areas require removal in order to facilitate construction of the Scheme. Clearance in some areas, for example around the Mochdre and Dolfor valleys, is a high priority as these are locations for key structures on the Scheme.

It is proposed that vegetation will be removed in autumn 2015, as soon as possible following commencement of works on the Scheme. This timing is partly to avoid seasonal ecological constraints on other species, such as nesting birds, partly to facilitate other ecological mitigation works, such as exclusion of badger setts (under licence), and partly due to the extensive earthworks required due to the complex topography of the Scheme.



2. Survey and Site Assessment

2.1. Existing information – dormice at the survey site

Surveys undertaken at earlier stages in the development of the Scheme comprised a desktop study and field surveys to find evidence of dormice (characteristically chewed hazelnuts) in spring 2008, and nest tube surveys in 2012.

Surveys in autumn 2008 identified dormice in three areas: south-west of the Glandulas Holiday Home Park (existing records and characteristically chewed hazelnuts found); south of the Scheme in the Mochdre Brook valley (existing records); and in woodland south of Penygelli, close to the eastern end of the Scheme (hazelnuts). Following on from these surveys, sixteen additional areas were searched in October 2008 for characteristically chewed hazelnuts indicating presence of dormice; this revealed evidence of dormice in an additional two locations: in the Dolfor valley on the route of the Scheme; and in an unnamed woodland to the west of Brimmon Wood and south-east of Upper Brimmon Farm.

Nest tube surveys were undertaken in 2012. Small numbers of nest tubes were installed in sixteen locations in hedgerows on the route of the Scheme between May and August 2012, and checked at intervals thereafter until November 2012. The surveys confirmed the presence of dormice, from nests constructed in the tubes, in roadside hedgerows on the A489 Kerry Road and on the A483 Pool Road close to the eastern end of the Scheme, but did not record evidence of dormice elsewhere.

2.2. Statutory sites notified for the species within 10km

There are no statutory sites designated for dormice within 10km of the Scheme.

2.3. Methodology

2.3.1. 2013 surveys

Additional nest tube surveys were undertaken in 2013. These targeted larger areas of habitat on and close to the route of the Scheme (i.e. areas suitable for installation of at least 50 nest tubes), in which either there was no evidence of dormice from previous surveys, or only old evidence from 2008. Results from these survey locations have been used to infer where dormice are reasonably likely to be present on the Scheme.

Nest tube survey sites comprised:

- Castell-y-Dail woodland (no records)
- Mochdre Brook and lane corridors (existing old records)
- Hedgerows north of Penygelli (no records)
- The Dingle (existing old records)
- South of Glandulas Farm (existing old records)



In parallel with nest tube surveys of these strategic locations, all hedgerows and woodland areas within the footprint of the proposed Scheme were assessed for their suitability to support dormice.

Nest tubes were installed in hedgerows and woodland areas on 13th to 15th May 2013, being fixed to horizontal or near horizontal branches using cable ties, at approximately 20m spacings. 60 tubes were installed at four of the five survey sites; the Mochdre Brook site was only large enough to install 20 tubes at the 20m spacing, however assessment of habitat links between this site and the Glandulas Farm survey site indicated that the two sites were connected by unbroken hedgerows and therefore confirmation of dormice in either would indicate that it was likely a dormouse population would be present in both.

Nest tubes were checked by a licensed surveyor on 15th to 18th July, 16th to 18th September, and 4th to 5th November 2013, following guidelines provided in the *Dormouse Conservation Handbook* [3] and Chanin & Woods (2003) [4]. Any dormice or dormouse nests were recorded. Nest tubes were collected in during the November 2013 check. Using the 'points' system, and further clarified in Natural England (2011)[5], each of the survey sites except the Mochdre Valley would achieve 24 points (the minimum required for reliable presence/absence surveys being 20 points in normal circumstances). The Mochdre Valley site would, if viewed in isolation from the adjoining Glandulas Farm site, score eight points. Nest tube survey locations are shown on Figure 1.

During the November 2013 nest tube check nut searches of the same survey sites were also undertaken, comprising up to five 20 minute searches of 10m by 10m areas below heavily fruiting hazels. Nut search survey effort was concentrated in survey locations where presence of dormice had not been confirmed using nest tubes.

In addition to the direct survey methods described above, the likely suitability of habitats on the route of the proposed Scheme for dormice was also investigated by assessing all hedgerows, woodlands and scrub within the footprint of the proposed Scheme. These surveys were undertaken in June 2013. The diversity of foodplant species, connectivity to other habitats, structure and management were recorded in order to assign each feature to one of the following categories:

- A – optimal habitat for dormice, with a high diversity of foodplants, sympathetic management, good structural complexity for creation of nest sites and links to other suitable habitats;
- B – suitable habitat for dormice, but with a lower diversity, poorer structure, less sympathetic (but not entirely adverse) management, or more isolated;
- C – sub-optimal habitat for dormice, lacking one or more of the optimal characteristics described above;
- D – suitable only for dispersal by dormice, due to low diversity or unsympathetic management, these features may be used by dormice dispersing from adjacent habitats but are unlikely to support resident dormice;
- E – unsuitable for dormice, comprising fences or ditches rather than hedgerow field boundaries.

Full details of survey methodologies in 2013 are provided in the ES Volume 3, Appendix E.13.



2.3.1.1. Constraints

An additional survey location in woodland west of Upper Brimmon Farm, close the route of the proposed Scheme and where there were no existing records had been proposed for surveys in 2013 but was found to have insufficient suitable habitat present for installation of nest tubes.

Unfortunately, insufficient heavily fruiting hazel was present to confirm presence or likely absence of dormice (the majority of hazelnuts present had been taken by grey squirrel (*Sciurus carolinensis*) prior to ripening) in any of the survey locations.

2.4. Survey Results

2.4.1. Nest tube surveys

Nest tube surveys recorded evidence of dormice (dormouse nests) in two survey locations: at the Glandulas Holiday Home Park (nest found 16th September), and at the hedgerows north of Penygelli (nests found 17th September and 5th November). None of the nests were occupied by dormice at the time they were found; the nest at Glandulas was occupied by a wood mouse, though was considered due to its structure and the nest materials used to be a dormouse nest.

The nest tube surveys therefore confirmed the continued presence of dormice in the Glandulas Holiday Home Park hedgerow network and identified the presence of dormice in the hedgerows north of Penygelli. No evidence of dormice was recorded during nest tube surveys at Mochdre Brook, Castell-y-Dail, or the Dolfor Valley.

2.4.2. Nut searches

Nut searches were attempted at Castell-y-Dail and the Dolfor Valley. However at both sites insufficient heavily fruiting hazel was found to allow a comprehensive survey to be undertaken. Of the hazelnuts found, none had been eaten by dormice.

2.4.3. Habitat assessment

A total of 107 hedgerows and woodlands on the route of the proposed Scheme were assessed for their potential to support dormice.

The majority of these features were considered to be at best sub-optimal for dormice:

- 13 features were considered optimal for dormice (Category A);
- 28 features were considered suitable for dormice (Category B);
- 55 features were considered sub-optimal for dormice (Category C);
- 9 features were considered suitable only as dispersal corridors (Category D);
- 2 features were considered unsuitable for dormice (category E).

A high proportion of the Category A and B sites were woodlands rather than hedgerows, or were unmanaged hedgerows bordering woodland sites. Consequently the Category A and B sites were located in discrete parts of the route, particularly at Glandulas, Mochdre Valley, Castell-y-Dail, the Dolfor Valley and around Penygelli. This comprehensive survey of the Scheme therefore also provides some support for the choice of strategic nest tube survey sites used.



For those features which were sub-optimal, the most common factor leading to this classification was regular management of hedgerows by tractor-mounted flail. It was evident that many of the hedgerows were regularly managed this way, which will tend to remove the growth of trees and shrubs on which the flowers and fruits are borne. Dormice nesting in hedgerows also often nest in the dense tangles of branches at the height where the hedge has previously been trimmed to, consequently hedgerow management during the summer months may also directly affect dormice.

A small number of features were considered suitable only as dispersal corridors, while two fencelines were considered unsuitable for dormice.

The distribution of features in each category and hedgerow survey data are provided in Volume 3 of the ES, Appendix E.13.

2.5. Interpretation/evaluation of survey results

Based on these survey findings it is considered that dormice are reasonably likely to be encountered in three broad areas on the Scheme:

- At the western end of the Scheme, between the A489 and Mochdre valley;
- The Dolfor Valley and adjoining hedgerow network;
- From close to the A489 Kerry Road to the eastern end of the Scheme.

Presence of dormice at the western and eastern ends of the Scheme has been confirmed by nest tube surveys in 2012 and 2013. Nest tube and nut search surveys in the Dolfor valley in 2013 failed to confirm the presence of dormice, however, given the presence of older records (from 2008) and the suitability of the habitat, it is considered reasonably likely that dormice are still present in this part of the Scheme.

Taking into account the results of the hedgerow suitability assessment within these three areas, the specific areas considered licensable are as follows.

At the western end of the Scheme, dormice are considered likely to be present in mature vegetation along the southern side of the A489, below Hafren View, and in hedgerows crossed by the Scheme between this point and the eastern side of the Mochdre valley (Ch 560).

In the centre of the Scheme, dormice are considered likely to be present in woodland in the Dolfor valley and adjoining hedgerows, between the Green Brook (Ch 2050) and hedgerows to the east of the Dolfor valley (Ch 2800).

At the eastern end of the Scheme, dormice are considered likely to be present in hedgerows from immediately west of the A489 Kerry Road (hedgerows crossed by the Scheme to the west of here being sub-optimal and not well connected to woodland areas) at Ch 4400, eastwards to the eastern end of the Scheme.

Given that the majority of hedgerows, even in these areas described above, are subject to regular management (mainly by tractor-mounted flail), it is considered likely that dormice are present at low density in these hedgerows and woodlands, and the low numbers of nests found during nest tube surveys support this assumption.



3. Impact Assessment

3.1. Short-term impacts: disturbance

The impact on dormice has been considered in the overall Ecological Impact Assessment that has been carried out for the entire scheme in accordance with DMRB (HA205/08) [6] and CIEEM [7] guidelines. The overall assessment is reported in Section 8, Nature Conservation of the ES, Volume 1, which provides information on the assigning values to the ecological receptors and magnitude and significance of impact (refer to ES Volume 1, Section 8.2.2).

Vegetation clearance required to allow construction of the Scheme is highly likely to result in disturbance to dormice, at whatever time of year it takes place, and could, in the absence of mitigation, result in the mortality of individual dormice. Dormice in retained habitats close to the Scheme could also be disturbed by construction activities, though this is considered less likely. This disturbance will however, in both cases, be limited to small numbers of animals on or very close to the footprint of the Scheme, and therefore to a small proportion of the overall dormouse population in these areas. The impacts are not reversible but temporary in nature.

The magnitude of this impact is assessed as 'minor negative' and its significance to be 'slight adverse' in the absence of mitigation.

3.2. Long-term impacts: habitat loss and modification

Vegetation clearance will result in permanent loss of habitat within the footprint of the Scheme, though again this is only a small proportion of the overall habitat available for dormice. This impact is not reversible. The magnitude of this impact is assessed as 'minor negative' and its significance to be 'slight adverse' in the absence of mitigation.

The proposals, even in the absence of mitigation, include provision of planting on cutting and embankment slopes, for visual screening purposes etc., and consequently even in the absence of mitigation it is considered that there will be a potential beneficial impact on dormice once this planting matures. This is considered a permanent impact, but once which is reversible depending on management of the planting, and has been assessed as of 'minor positive' magnitude and 'slight positive' significance.

3.3. Long-term impacts: habitat fragmentation

Habitat fragmentation as a result of the operational Scheme is considered as a potential impact even though recent research [8] has shown that dormice are capable of crossing road carriageways of the width of the Scheme, during seasonal dispersal movements. This is considered unlikely to occur, but if it did may have more impact on dormice in areas to the north of the Scheme (as these are smaller and less well-connected to other habitat) than to the south. This impact would not be reversible and would be ongoing during operation of the Scheme.

The magnitude of this impact is assessed as 'minor negative' and its significance to be 'slight adverse' in the absence of mitigation.



4. Mitigation, compensation and Monitoring

4.1. Site clearance methods

The proposed works affecting dormice comprise vegetation clearance at the initial stage of construction works on site. As construction works are programmed to commence in autumn 2015, it is proposed that vegetation within licensable areas will be cleared in September/October 2015 using a 'summer clearance' methodology.

In general, vegetation clearance will commence at or close to the northern edge of the Scheme footprint, so that dormice are displaced primarily into the more extensive network of retained habitat to the south of the Scheme. However dormice will be displaced northwards from any hedgerows which are unconnected to the south of the Scheme, in order to avoid displacing dormice into unsuitable areas.

Up to 20m of each hedgerow will be cleared per day, so that dormice are progressively displaced into retained habitat, rather than being immediately removed from their home ranges.

All hedgerows and planting will be inspected by an ecologist prior to vegetation clearance, in order to identify occupied dormouse nests. Where possible, these will be checked to confirm the absence of dependant young (late-born litters may still be present in September/October). Any nests containing active or torpid dormice that can be removed will be translocated into retained habitat on the same hedgerow close to the Scheme. In the event that dependant young are found, vegetation clearance on that hedgerow will be halted until the young are mobile enough for displacement to continue.

4.2. In-situ retention of habitat

It is anticipated that little or no habitat will be retained within the Scheme boundary, as land-take for the Scheme will be minimised.

4.3. Modification of existing habitat

N/A

4.4. New habitat creation

Extensive hedgerow and landscape planting will be provided on embankment and cutting slopes on the completed Scheme. These will be designed to re-connect severed ends of hedgerows on both the north and south sides of the Scheme, such that retained habitats outside the Scheme will be re-connected by the Scheme planting, and the planting will also itself provide suitable dormouse habitat, once mature. In doing so, it is anticipated that the populations will remain viable despite the loss of connectivity across the Scheme. Where possible the reconnection of severed hedgerow ends will be expedited by use of translocated material, which will establish more quickly than new planting.



Native species known to be of value for dormice will be used in the planting.

Dormouse boxes will be installed in any retained habitats under the control of the Scheme in the licensable areas, during construction. In addition, dormouse boxes will be installed (on posts, if necessary) in areas of new planting after three years when planting begins to become suitable for use by dormice.

4.5. Habitat losses and gains table

[To be included in final version of licence application].

4.6. Mechanisms for delivery

Under the terms of the contract, the AGC Team are required to produce and implement a Construction Environmental Management Plan (CEMP) [9] throughout the construction phase of the Scheme. Central to this is the Register of Commitments (ROC), which lists the obligations made in documents, such as this Ghost Licence and the overall ES (e.g. the measures listed above). The AGC Team's Environmental Coordinator and Environmental Clerk of Works, (who will be a full time member of staff onsite during construction) will be responsible for the implementation and monitoring of the CEMP and thus the obligations made in this Ghost Licence and the overall ES.

The AGC Team would monitor, measure and review the environmental performance against the commitments, objectives and targets/key performance indicators identified in the CEMP (contained in the ROC). The CEMP shall contain procedures for checking, auditing and corrective action.

4.7. Mitigation contingencies

Other than actions described above for discovery of dependant young dormice, none are envisaged to be necessary.

4.8. Biosecurity risk assessment

Hedgerow material will not be translocated from areas supporting invasive non-native plant species. As dormice are being displaced within the existing population areas, risk of spreading infections within these populations is considered to be very low.

Planting on the Scheme will be of UK grown native species.

4.9. Post development site safeguards

4.9.1. Habitat site management / maintenance

As part of the ECI Contract, there would be a 5-year post construction maintenance period, which would include management and monitoring of the effectiveness of mitigation measures detailed above.

Requirements during this post construction maintenance period would be set out in the '*Environmental Landscape and Ecology Aftercare and Management Plan*' (ELEAMP). This would be developed during the construction phase. The monitoring and



maintenance of other mitigation measures such as habitat replacement would also be addressed within the ELEAMP.

Following the five-year post construction maintenance period a Maintenance Environmental Management Plan (MEMP) would set out a proposed strategy for the future maintenance and management of all Environmental Areas (including landscape and ecological areas) for a 10-year period. This would be produced in consultation with NRW during the 5-year post construction maintenance period and would be implemented by the North and Mid-Wales Trunk Road Agency (NMWTRA), who have the long-term responsibility for the management and maintenance of the north and mid-Wales trunk road network.

4.9.2. Population and habitat monitoring

Dormouse boxes would be monitored for ten years from completion of the Scheme, comprising an autumn check of the boxes in years 2, 4, 6 and 10.

4.9.3. Post-development mitigation contingencies

These would be covered, if necessary, under the MEMP for the Scheme, as described above.

4.9.4. Mechanism for ensuring delivery

Delivery would be ensured through the CEMP during construction and the ELEAMP/MEMP post-construction as described above.



5. Programme of Work

A summary of current work programme in relation to this Ghost Licence application is provided below:

- | | |
|--|--|
| 1. Autumn 2015 | AGC take control of A483/A489 Newtown Bypass site |
| 2. Autumn 2015 | Vegetation clearance under the supervision of the Environmental Clerk of Works in accordance with the CEMP and the formal licence application. Installation of dormouse boxes in any retained habitat within the Scheme, in licensable areas. |
| 3. Winter 2017/2018 (end of construction) | Planting on Scheme embankments/cuttings in accordance with the CEMP, undertaken by the contractor (AGC) |
| 4. 5-year post construction maintenance period | Installation of additional dormouse boxes in new planting areas, in year 3. Monitoring of dormouse boxes in years 2 and 4 and reporting of their condition and use. Remedial measures to be undertaken as necessary in accordance with the ELEAMP, by the contractor (AGC) |
| 5. Long-term management (10-year) following post construction maintenance period | Monitoring, of dormouse boxes to be undertaken in years 1 and 5 accordance with MEMP, by the trunk road agent (NMWTRA) |

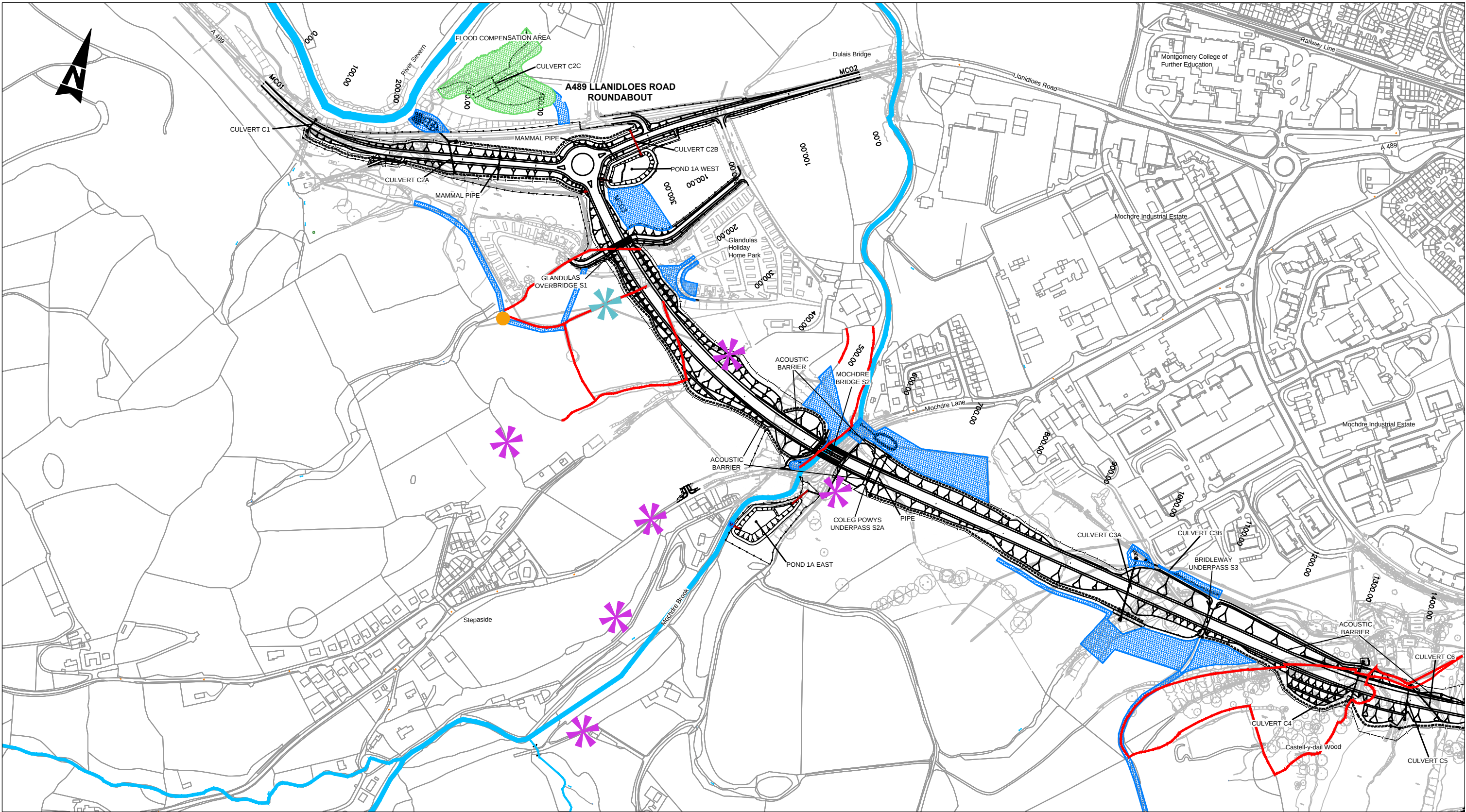


6. References

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- [2] NRW (2013). Application for a Licence – Dormouse Method Statement. Natural Resources Wales.
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- [7] IEEM (2006). Guidelines for Ecological Impact Assessment in the United Kingdom. Chartered Institute of Ecological and Environmental Management.
- [8] Chanin, P. & Gubert, L. (2012) Common dormouse (*Muscardinus avellanarius*) movements in a landscape fragmented by roads. *Lutra* 55 (1): 3-15.
- [9] Welsh Government Transport (2013). A483/A489 Newtown Bypass – ECI Design and Build Contract. Volume 2a – Works Information. Welsh Government.



Figures



KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

BIS records from 2008

Gnawed Hazelnuts 2008 - Spring

Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses

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Client/Team

Llywodraeth Cymru
Welsh Government

GRIFFITHS
civil engineering and construction

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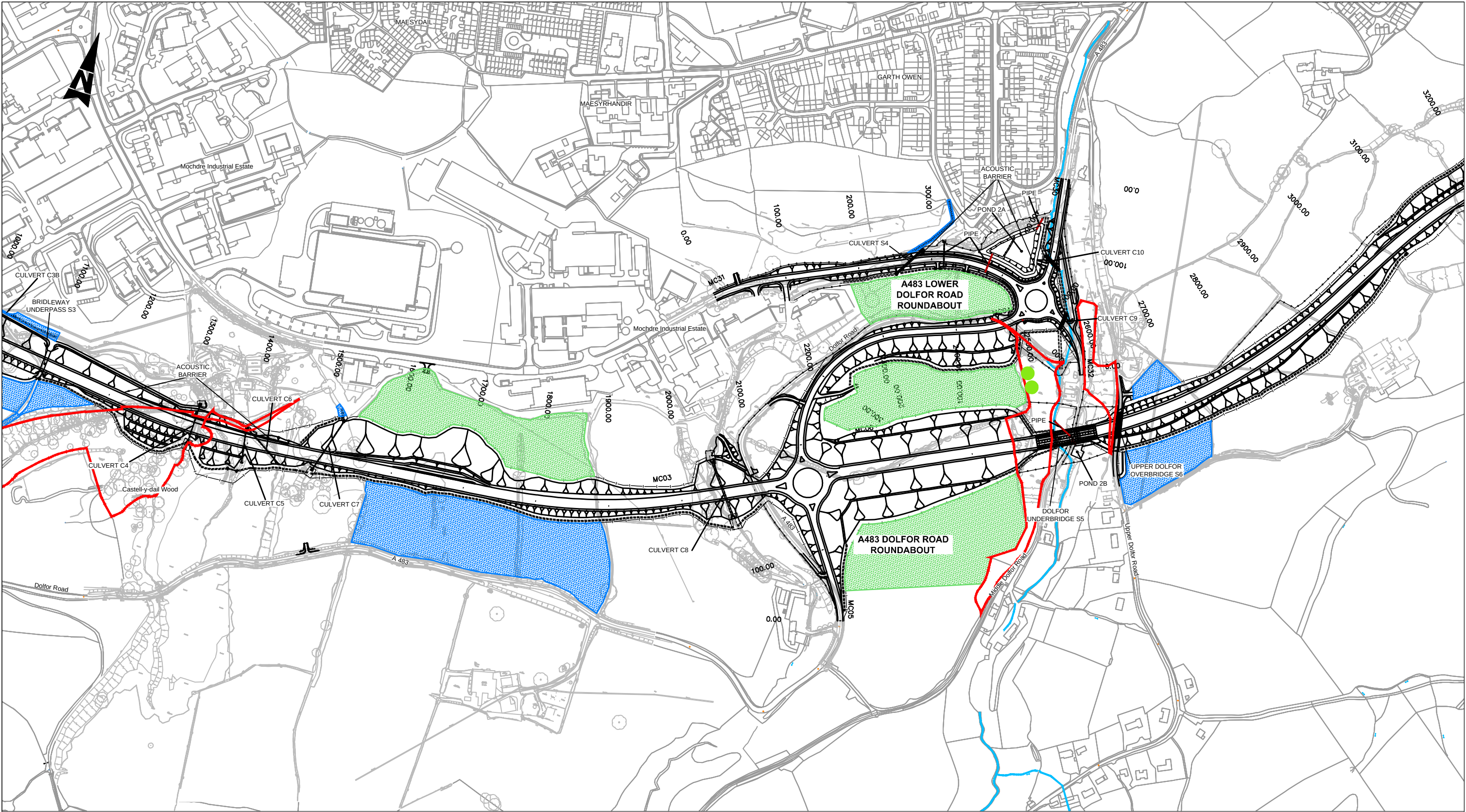
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Job Title
A483/A489
Newtown Bypass

Drawing Title
Dormouse Surveys 2013
Nest Tube Survey Locations

Sheet 1 of 4

Date	Sept 2014	Drawn by	FS
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KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

BIS records from 2008

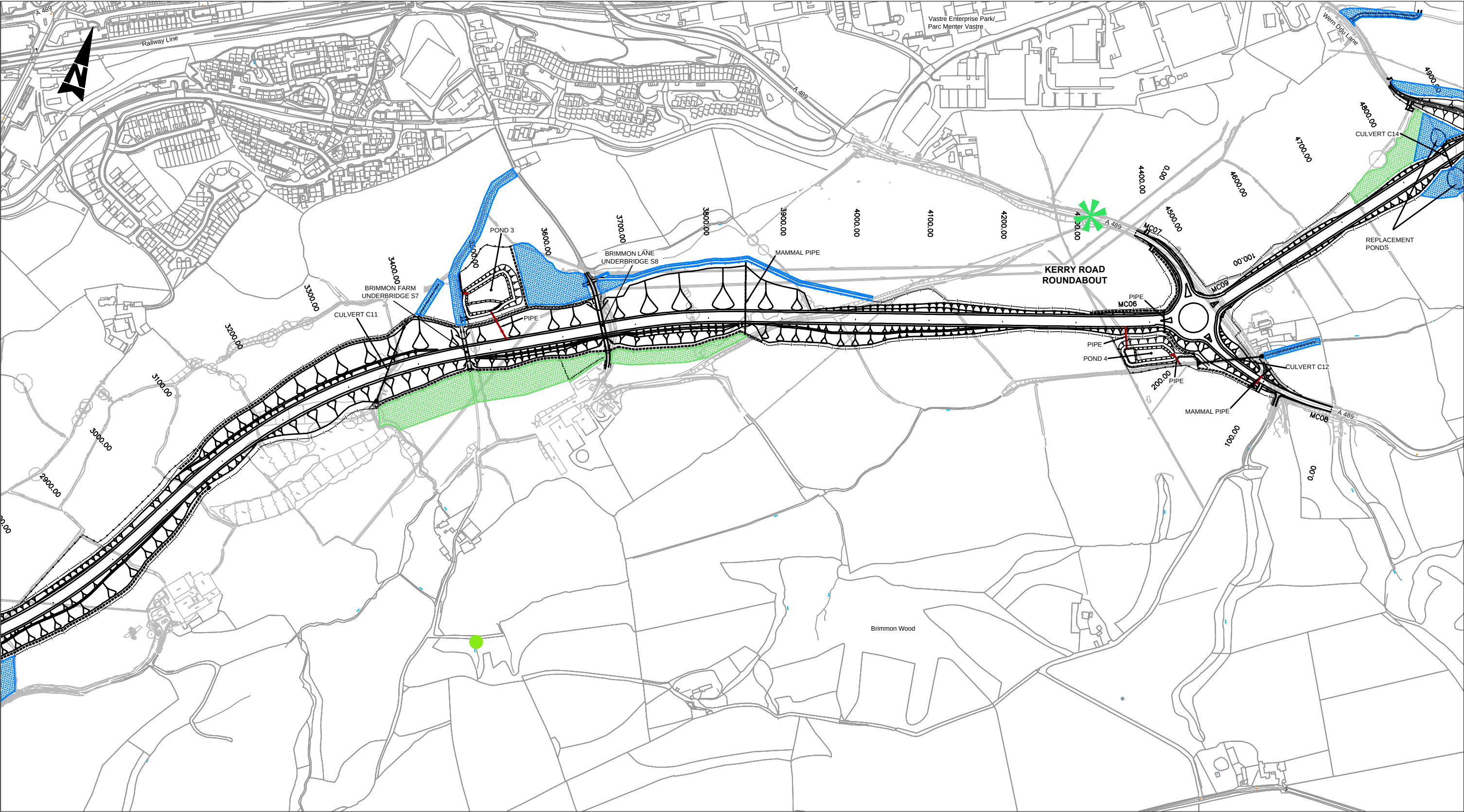
Gnawed Hazelnuts 2008 - Spring

Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses

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						Sheet 2 of 4						



KEY

Dormouse Nest Tube - survey locations 2013

Site Compound & Storage Areas

Re-profiled Areas

Dormouse Nests Found 2013

Dormouse Nests Found 2012

BIS records from 2008

Gnawed Hazelnuts 2008 - Spring

Gnawed Hazelnuts 2008 - Autumn

Attenuation Pond

Main Water Courses

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ATKINS

TACP

CORDEROY

CAPITA

Job Title

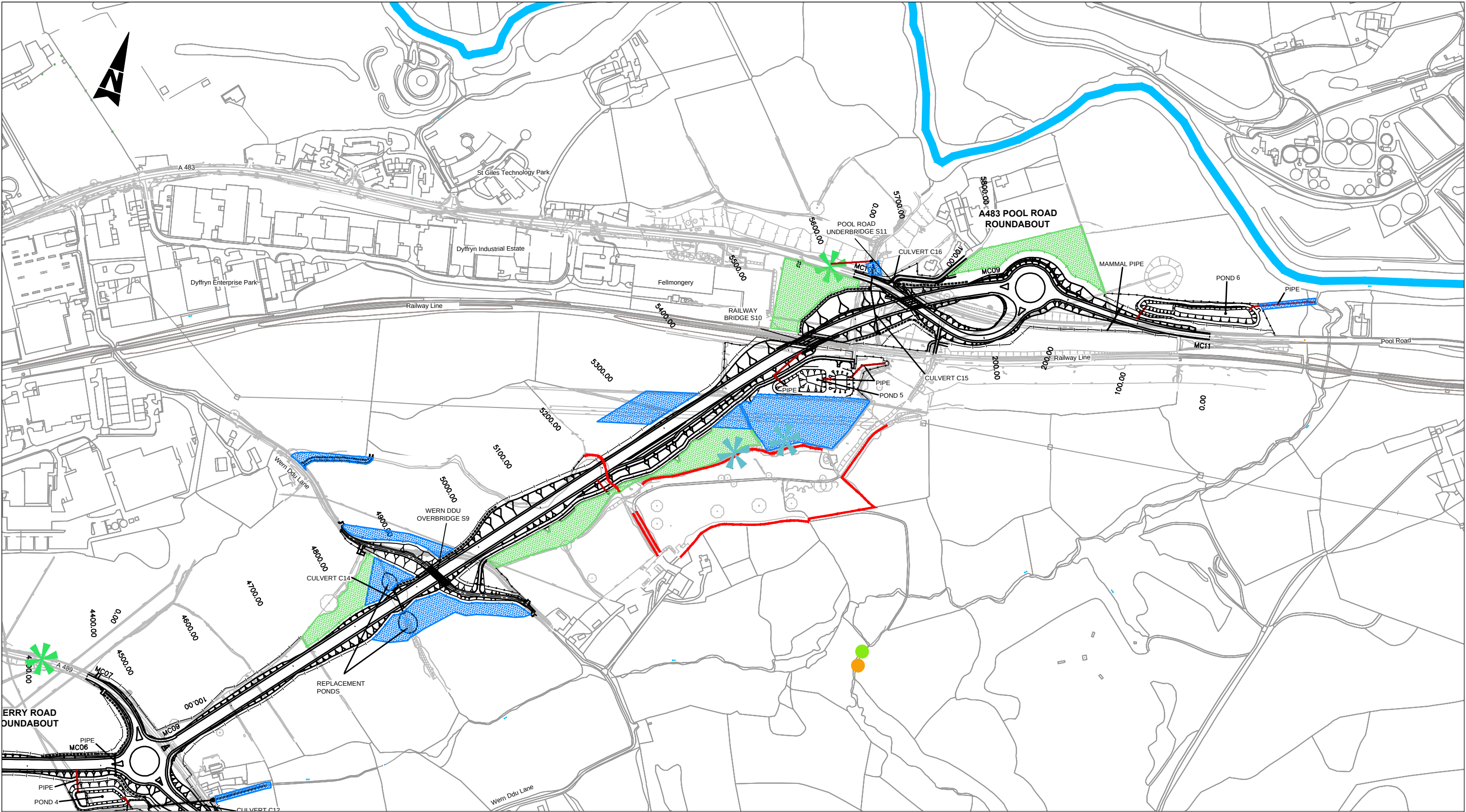
A483/A489
Newtown Bypass

Drawing Title

Dormouse Surveys 2013
Nest Tube Survey Locations

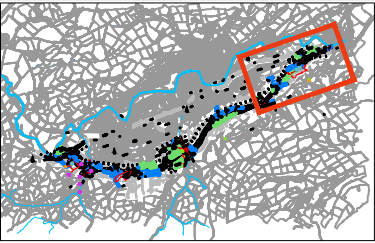
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		Approved	JW
		Issue	-



KEY

	Dormouse Nest Tube - survey locations 2013		Dormouse Nests Found 2013		BIS records from 2008		Attenuation Pond
	Site Compound & Storage Areas		Dormouse Nests Found 2012		Gnawed Hazelnuts 2008 - Spring		Main Water Courses
	Re-profiled Areas				Gnawed Hazelnuts 2008 - Autumn		



Appendix E.15
Otter Method Statement

A483-A489 Newtown Bypass - Otter Method Statement

Description of the Work

Aims and Objectives

This Method Statement outlines the approach to be adopted prior to the construction of the A483-A489 Newtown Bypass Road Scheme (hereinafter referred to as the 'Scheme') to confirm the presence / absence of otters within the zone of influence of the proposed development that may be affected by the scheme.

Scope

Mitigation measures for otters are set out in the Environmental Statement (ES) for the Scheme, published in September 2014. These mitigation measures will form part of a Register of Environmental Commitments, which will be included within the Construction Environmental Management Plan (CEMP). The environmental commitments which relate to otters set the scope of work for this method statement and are described in **Table 1.0** below. Any additional measures, such as further survey work or compliance with relevant guidance, are also described in **Table 1.0**.

Table 1.0 Environmental commitments relating to Otters (Method Statement Scope)

Commitment	Reason	Further measures required to inform further mitigation
Pre-construction mammal survey.	To ensure that no new otter holts are established within the scheme footprint prior to the onset of construction works.	Design Manual of Roads and Bridges (DMRB) Volume 10, Section 4, Part 4 (Nature Conservation Advice in Relation to Otters)
If an otter holt is discovered, a licence would be acquired from NRW for appropriate mitigation.	To ensure compliance with legislation and prevent loss of otters or their young.	Further information on the appropriate mitigation for otter holts under the footprint of road schemes will be taken from DMRB Vol. 10, Section 1, Part 9.
Limiting construction site lighting in sensitive areas.	To avoid disturbance to otters during the construction phase of the proposed development.	N/A
Positioning of site compounds / welfare units, generators for traffic management, etc. away from watercourses which may be used by otters.	To avoid disturbance to otters during the construction phase of the proposed development.	N/A - no site compounds will be located near water courses as is best practice
Provision of mammal-proof fencing along the length of the road scheme.	To prevent otters crossing the road which may lead to fatalities.	DMRB Vol. 10, Section 1, Part 9 (otters) and Volume 10, Section 4, Part 2 (badgers)
Provision of safe access/crossing points (eg underpasses and dry pipes) for otters.	To avoid fragmentation of otter habitats.	DMRB Vol. 10, Section 1, Part 9 (otters) and Volume 10, Section 1, Part 5 (badgers)

Post-construction monitoring.	To examine the effectiveness of mitigation measures.	Consultation with NRW.
Reporting: Should any potentially significant results, such as concerns over the effectiveness of mitigation measures / construction practices or road casualties be recorded then both WAG and NRW should be informed immediately. Appropriate steps should be taken to rectify these problems. These measures should be agreed with NRW.	To rectify any problems with mitigation.	Consultation with NRW.

Location of the Work

During the operational phase of the development, otters will be at risk of fragmentation of foraging habitat, or of road mortality, unless safe crossing points combined with mammal-resistant fencing are provided. In several places along the Scheme, structures are proposed that will also function as safe crossing points for otters, such as the Mochdre and Dolfor valley crossings, and overbridges/underpasses carrying access tracks, such as the Glandulas Overbridge. However, in order to maintain connectivity across the Scheme and to reduce the risk of otters attempting to undermine fencing along the Scheme, the following additional safe crossing points (indicated on **Figure 1.0**) are proposed:

- Culvert C2a: dry mammal pipe to be provided at Ch. 350W, approximately 50m east of the culvert;
- Culvert C2b: dry mammal pipe to be provided at Ch. 350E, approximately 30m west of the culvert;
- Culvert C3a: concrete arch structure (3m span) with a raised ledge;
- Culvert C4: box culvert (1200mm) with a raised ledge;
- Culvert C8: concrete arch structure (3m span) with a raised ledge;
- Culvert S4: box culvert (1.5m x 1m) with a raised ledge;
- Culvert C9: box culverts (2 No. 2m x 1.1m), one of which will have a raised ledge;
- Culvert C10: box culverts (2 No. 2m x 1.1m) one of which will have a raised ledge;
- Culvert C11: mammal underpass to be provided at Ch. 3650 (Brimmon Lane Underbridge);
- Culvert C12: Dry mammal pipe to be installed just south of culvert;
- Culvert C15: Dry mammal pipe to be installed to the east of A483 Pool Road Roundabout (Ch. 120)

Ledges and dry pipes will be positioned at or above the 1 in 100 year flood event level.

Mammal resistant fencing will be provided along the length of the Scheme; further detail on fencing is provided below.

Programme – Sequence of Events

- a) Surveys for mammal activity, including otters, were carried out in 2008, 2012, 2013 and 2014. These surveys involved walking the scheme footprint and surrounding area to search for any signs of mammals, with a particular focus on badger and otter.
- b) Further assessments of otter activity within and near the scheme footprint were carried out in 2014 using motion sensor cameras installed at points which were considered likely to have otter activity.
- c) A further pre-construction survey will be carried out prior to the commencement of construction works to determine level of usage of the scheme footprint by otters, and to identify any new holts which may be established prior to construction.
- d) If an otter holt is discovered within the footprint of the Scheme (considered unlikely), it will be necessary to obtain a licence from NRW to remove the holt with appropriate mitigation.
- e) All necessary components of operational stage mitigation works, i.e. mammal-proof fencing and provision of safe access points, must be in place **prior to the opening of the new road**.
- f) Post-construction monitoring to examine the effectiveness of otter mitigation measures will be carried out over a five-year period following the opening of the new road.

General Site Operations – Best Practice in Relation to Otters

The following best practice measures will be adhered to during general site operations, in order to reduce the likelihood of impacts to otters during the construction phase of the proposed development:

- a) During construction, construction site lighting will be limited to specific locations where it is absolutely necessary for public safety or security, and by avoiding light spill onto watercourses. Care will be taken to avoid positioning site compounds or welfare units, generators for traffic management etc, in close proximity to watercourses which may be used by otters.
- b) In order to prevent pollution of watercourses that may be used by otters, precautionary measures will be taken to prevent toxic or waste spillages during construction, e.g. bunding of fuel tanks and avoiding toxic chemicals on the construction site. Further information on pollution prevention is contained in a separate method statement.
- c) Should any temporary fencing be erected during the works, access for otters will be maintained at all times; this will comprise either a continuous gap or gaps at regular intervals along the fence. These gaps must be at least 9 inches high by 9 inches wide.
- d) Works near the river will operate during daylight hours only, ceasing operations within one hour of sunset and not commencing until one hour after sunrise, to minimise disturbance to otters moving along the river during the night.
- e) It is unlikely that excavations are likely to provide difficulties for otter movements, but if excavations in excess of 600mm deep will be left open at night, these shall have at least one gently sloping side, or will be provided with an escape route for otters by means of wooden ramp(s).

Detailed Method – Otter Safe Crossing Points

The crossings of Mochdre Brook and the Dolfor Valley will comprise clear span structures which will provide abundant safe crossing points for otters.

For the safe crossing points at other water courses (detailed above), ledges and dry pipes will be positioned at or above the 1 in 100 year flood event level. Where dry pipes are to be provided near culverts, channels and/or fencing will be provided leading from the culvert up to the pipe, in order to lead the animal towards the safe passage. Where appropriate, rocks or

other features will be laid down near the dry pipe entrances to encourage otters to spraint; this may be very useful for the assessment of mitigation measures during the five-year monitoring period.

Detailed Method – Mammal-resistant Fencing

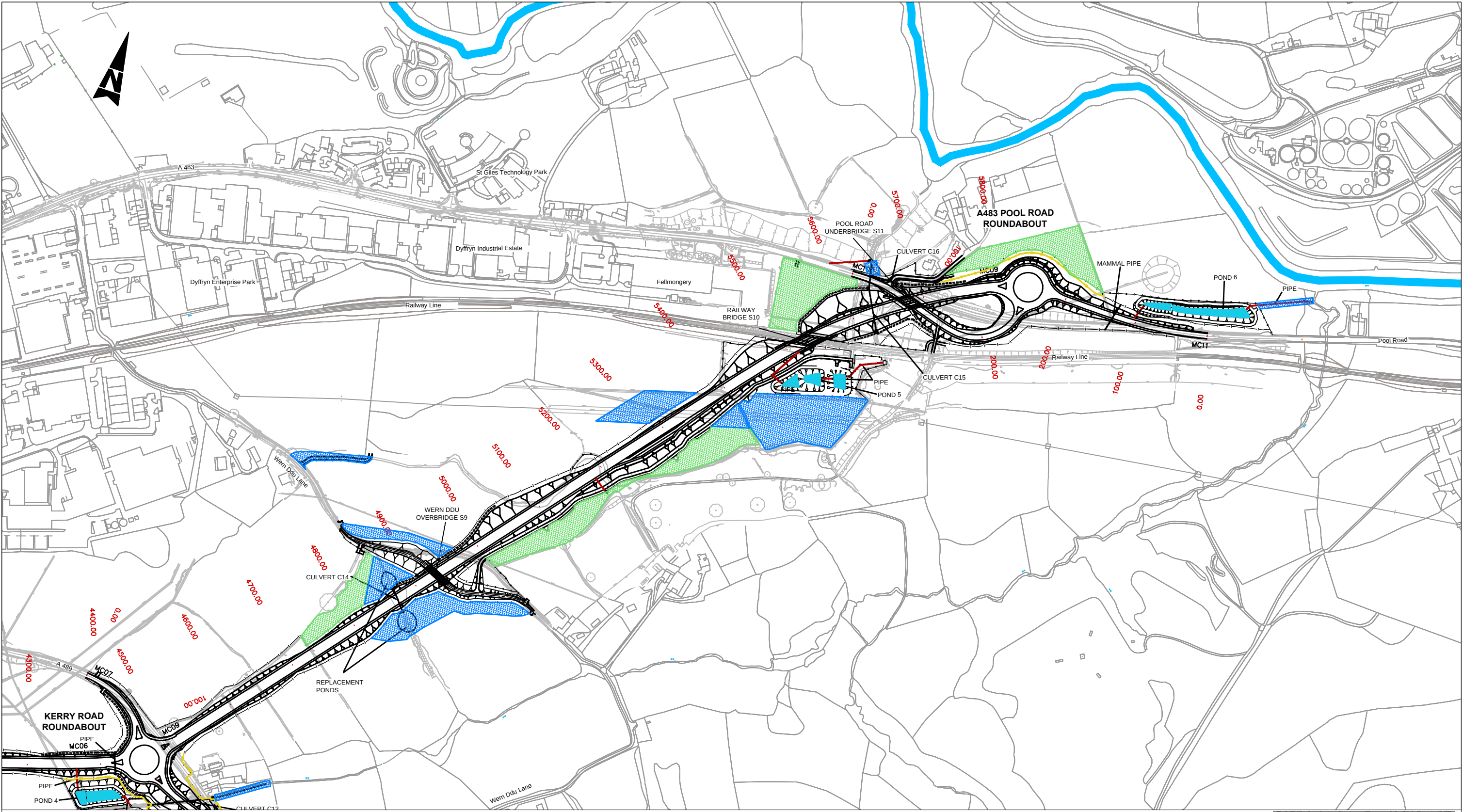
Mammal resistant fencing will be required along the length of the Scheme, with short sections to funnel otters towards safe crossing points, whilst also preventing access to crossing points by agricultural livestock (particularly lambs). Mammal resistant fencing proposals are shown in **Figure 1.0**. This fencing will comprise 1500mm high, post and wire square mesh. The diameter of the mesh is smaller at the bottom and will be buried to a depth of 500mm, with a buried turn towards the outside of the road.

At watercourse crossings, a wire mesh overhang angled at 45° facing towards the outside of the road will be provided at the top of the fence, to prevent otters from climbing over. This overhang will be installed on top of the fence for approximately 100m on either side of watercourse crossings, or as appropriate to the scheme.

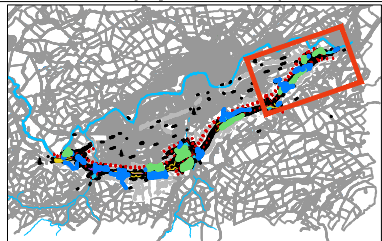
Fencing will be erected prior to the opening of the new road and will be subject to thorough inspection by the Environmental Liaison Group (ELG) at regular stages throughout the construction phase of the Scheme.

Figures:

Figure 1.0: Scheme Drawings Showing Mammal Mitigation



	Site Extents Boundary		False cutting		Attenuation Pond		Acoustic Barrier		Site Compound & Storage Areas
	On Embankment		Ditches		Mammal proof fencing with cranks		Re-profield Areas		
	In Cutting		Boundary fencing						



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Client/Team



Llywodraeth Cymru
Welsh Government



Job Title

A483/A489
Newtown Bypass

Drawing Title

Appendix E.15
Otter Method Statement
Mammal Mitigation
Sheet 4 of 4

Date

Sept 2014

Drawn by

FS

Scale at A3

1:5,000

Checked

JB

Drawing Status

FINAL

Approved

JW

Job No

60597

Figure No

1d

Issue

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