

10. Biodiversity

10.1. Introduction

- 10.1.1. Ecology Solutions (Manchester) Limited were commissioned by St. Modwen Properties in April 2020 to undertake Ecological Assessment work of land at Coed Darcy, Llandarcy, Skewen, Neath, (See Figure 10.1), hereafter referred to as 'the Site', and to undertake a detailed assessment of the Proposed Development.

Background

- 10.1.2. The Outline Planning Permission (OPP), alongside subsequent associated applications, included the completion of extensive previous assessment work over an extended period to 2018. It is moreover noted that additional agreed works were undertaken which predated the OPP. Regarding matters of nature conservation, assessment has included preparation of an Ecology and Nature Conservation Chapter for an Environmental Statement, including assessment of the proposals with regards to the tests now set out within the Conservation of Habitats and Species Regulations.
- 10.1.3. Previous assessment work undertaken in support of the consented OPP, as well as to facilitate subsequent construction works, has included for the completion of extensive ecological survey work over an extended period. Specific survey work in this regard has included for:
- Botanical surveys (Extended Phase 1, National Vegetation Classification, Lichens and Bryophytes);
 - Invertebrates;
 - Amphibians (Great Crested Newts *Triturus cristatus* [GCN]);
 - Reptiles;
 - Winter and breeding birds;
 - Bats (emergence and re-entry, activity transects);
 - Badger *Meles meles*; and
 - Otter Lutrinae and Water Vole *Arvicola amphibius*.
- 10.1.4. Subsequent to the grant of relevant planning consent in 2008, in addition to permit/licence consents, extensive Site wide remediation works have been undertaken at the Site (in addition to land within the wider consented OPP boundary). This work has included for the completion of translocation exercises for some faunal groups, including amphibians and reptiles.
- 10.1.5. The previous assessment work provides important historical and contextual information. A comprehensive review of this information has been undertaken to further inform potential effects, as well

as appropriate avoidance, mitigation, and enhancement opportunities, as detailed within this Biodiversity Chapter for the Site.

- 10.1.6. The Site, as part of a wider landholding, is allocated as a Strategic Regeneration Area within the Neath Port Talbot County Borough Council (NPTC) Local Development Plan (LDP) (2011 to 2026), within which a sustainable urban village is proposed.

Characteristics

- 10.1.7. The Site is located to the north of Llandarcy, Neath, and is approximately 126ha in size. The Site is bounded to the east by the current Coed Darcy built form (Phase 1), with the M4 beyond. The south of the Site is bounded by existing brownfield land (part of the wider Coed Darcy landholding), with localised areas of broad-leaved woodland, and the Coed Darcy GCN area Site of Importance for Nature Conservation (SINC) beyond. To the south-east of the Site lies an existing built form (Contractors Yard Industrial Estate), with Jersey Marine Woods SINC beyond. Much of the west of the Site is bounded by Crymlyn Bog Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), and Ramsar, with Crymlyn Bog and Pant-y-Sais National Nature Reserve (NNR) extending from the south-west boundary to the south-east beyond. The immediate north of the Site boundary is bounded by the North Site Reservoir, and areas of scrubby woodland, with existing residential development beyond.
- 10.1.8. Further to the west and south of the Site lies open countryside and agricultural fields, with existing built form further afield to the north, west and east of the Site. To the far south lies existing building with Crymlyn Burrows SSSI still further south, before Swansea Bay.
- 10.1.9. The Site itself comprises an area of previously developed land, the former site of the Llandarcy Oil Refinery, which has been subject to extensive remediation, re-profiling, and habitat clearance over an extended period. As a result of these works large areas of the Site comprise predominantly bare ground with very limited semi-natural habitats present. Where remediation works were completed less recently, substantial areas of the Site have recolonised with a range of early successional habitats. These early successional habitats are complemented by the Site's topographical variety as well as the presence of numerous ponds and mature vegetation such as scrub, tree belts, and woodland.

Study Area

- 10.1.10. The study area considered as part of this Biodiversity Chapter is focused on the Site itself (see Figure 10.1). Consideration is nonetheless also given to a wider zone of influence, as set out in Section 10.2 below.

10.2. **Assessment Criteria and Methodology**

Identifying the Zone of Influence

- 10.2.1. The potential ecological impacts of the development are largely focused on the Site and its immediate surroundings.
- 10.2.2. In addition, consideration has been given to the potential for the following significant effects which may spread beyond the Site:

- Disturbance to populations during the construction phase due to noise or vibration;
- Disruption to habitats/populations within receiving range of dust, other air quality considerations during the construction and operation phase;
- Disruption to the normal diurnal patterns for species during construction and operation due to lighting;
- Physical disturbance to habitats/populations by movements of people during the operation phase; and
- Pollution to watercourses during the construction and operation phases.

10.2.3. In identifying the above potential harm pathways, it is noted the Site is situated within a landscape where frequent statutory and non-statutory designated sites are present. Not least Crymlyn Bog SAC, Ramsar and SSSI which lies adjacent to the Site and the Coed Darcy GCN Area SINCE, which is partially within the Site. Potential ecological impacts of the Proposed Development upon these designated sites (see Figure 10.1) are considered in particular detail.

Survey Methodologies

10.2.4. The methodology utilised for the survey work can be split into three areas; namely desk survey, habitat survey, and faunal survey. These are discussed in more detail below.

10.2.5. The scope of survey methodologies undertaken was discussed and agreed in principle with NPTC Council.

Desk Survey

10.2.6. In order to compile background information on the Site and its immediate surroundings, Ecology Solutions contacted South East Wales Biodiversity Records Centre (SEWBRc) in February 2021. SEWBRc collate, manage, and make available detailed ecological information within South East Wales. Where relevant, this information is included within this Chapter.

10.2.7. Further information on designated sites from a wider search area was also obtained from the online Multi-Agency Geographic Information for the Countryside (MAGIC)¹ and Natural Resources Wales (NRW) Designated Sites database². This information is reproduced at Appendix 10.1 and where appropriate on Figure 10.1.

Habitat Survey

10.2.8. The Site has been subject to a number of ecological surveys by Ecology Solutions between June 2020 and September 2021, with these surveys including habitat work to ascertain the general ecological value

¹ MAGIC Database: <http://magic.defra.gov.uk/>

² NRW Database: <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en>

of the land contained within the boundaries of the Site, and to identify the main habitats and associated plant species, with notes on fauna utilising the Site.

- 10.2.9. Extended Phase 1 Habitat Survey. The Site was initially surveyed in June 2020, with the survey effort adopted based on an extended Phase 1 survey methodology³, as recommended by the Joint Nature Conservation Committee (JNCC), whereby the habitat types present were identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail.
- 10.2.10. Using the above method, the Site was classified into areas of similar botanical community types, with a representative sample of those species present at the time of the surveys being described.
- 10.2.11. Further habitat survey work was also undertaken at the Site in July 2021 in order to ascertain any significant baseline changes since 2020 surveys, and again followed the extended Phase 1 methodology set out above. These update surveys focused primarily on the recolonising vegetation and ephemeral/short perennial habitats within the Site, noting the potential for early successional habitats to develop or succeed in relatively short periods of time. Ad-hoc habitat survey work was further undertaken during the course of faunal surveys.
- 10.2.12. As detailed previously, a series of historic habitat surveys of the Site (as part of a wider study area), have been undertaken between 1998 and 2018. Notwithstanding that extensive remediation and re-profiling works have resulted in considerable changes to the baseline habitats documented in previous reporting, with the vast majority of the Site subject to extensive vegetation clearance between 2008 and 2016, this pre-existing data provides useful contextual information.
- 10.2.13. Of the previous work undertaken, the documentation obtained and reviewed by Ecology Solutions has included for the following, which are of particular pertinence:
- Coed Darcy ES Chapter 16, February 2005 (extracts) as prepared by Parsons Brinckerhoff Limited. This document included the results of ecological survey work undertaken between 2001 and 2005, whilst also giving regard to earlier survey work undertaken by Cresswell Associates in 1998. This document is provided at Appendix 10.3 of this ES.
 - Ecological Management Plan (April 2012 – Rev 8) as prepared by Atkins, with this including a summary of ecological findings and constraints from previous assessment work, details on mitigation works completed to date, and further detail on mitigation approaches to be adopted during on-going construction. This document is again provided at Appendix 10.3 of this ES.

Faunal Survey Methodology

- 10.2.14. General faunal activity, such as birds or mammals observed visually or by call during the course of the surveys, was recorded. Specific attention was paid to any potential use of the study area by protected

³ Joint Nature Conservation Committee (2010). Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. JNCC, Peterborough

species, Priority Species (also known as Biodiversity Action Plan (BAP) species), or other notable or rare species. In addition, specific surveys were undertaken for:

- Badgers (in June 2020 and July 2021);
- Hazel Dormice *Muscardinus avellanarius* (August 2020 to July 2021)
- Bats (between April 2020 and August 2021);
- Reptiles (between June and September 2021);
- Breeding birds (between April 2020 and July 2021);
- GCN (April to June 2021); and
- Invertebrates (between May and September 2020).

10.2.15. Surveys were undertaken by experienced and, where necessary, licensed ecologists, following established best practice and guidance. As detailed above, the scope of the above surveys was discussed and agreed with NPTC Council Officers.

10.2.16. It is pertinent to note the majority of faunal survey work undertaken extended beyond the Site boundary, including land within the wider Coed Darcy Site, as was consistent with the previous OPP for the wider site. In all instances, the survey work allowed for a comprehensive assessment of faunal assemblages within the Site itself.

Badgers

10.2.17. Specific surveys were undertaken to search for evidence of Badgers within the Site in June 2020 and July 2021.

10.2.18. The surveys comprise two main elements. The first of these is a thorough search for evidence of Badger setts. If any setts are encountered each sett entrance is noted and plotted, even if the entrance appears disused. The following information is recorded:

- The number and location of any well used or very active entrances; these are clear of any debris or vegetation, and are obviously in regular use and may, or may not, have been excavated recently.
- The number and location of any inactive entrances; these are not in regular use, and have debris, such as leaves and twigs, in the entrance, or plants growing in or around the edge of the entrance.
- The number of any disused entrances; these have not been in use for some time, are partly or completely blocked, and cannot be used without considerable clearance. If the entrance has been disused for some time all that may be visible is a depression in the ground where the hole once was, and the remains of the spoil heap.

10.2.19. Secondly, Badger activity such as well-worn paths and run-throughs, snagged hair, footprints, latrines, and foraging signs is recorded so as to build a picture of the use of the Site by Badgers.

- 10.2.20. Due regard was also had to Badgers during the completion of nocturnal survey work at the Site, with any additional evidence/activity recorded.

Hazel Dormice

- 10.2.21. The wider Coed Darcy survey area, including the Site, was subject to a suite of presence/absence (nest tube) surveys and footprint surveys. The methodology of these surveys accords with the guidance provided by the Mammal Society and Natural England (NE), and is as recommended in the Dormouse Conservation Handbook. A total of 315 tubes and 101 footprint tunnels were placed within suitable habitat (such as scrub and woodland), at 10m intervals, as shown in Figure 10.6. The nest tubes and footprint tunnels were attached with wire ties under suitably sturdy horizontal branches, and positioned, on average, approximately 1.5m above ground level.
- 10.2.22. Dormouse nesting tubes were initially deployed in late July 2020, and were subject to monthly checks in August, September, October and November 2020, as well as May, June, July and August 2021. Dormouse footprint tunnels were deployed in August 2020 and were subject to checks on the following dates:
- 21 August 2020
 - 3 September 2020
 - 29 September 2020
 - 5 October 2020
 - 15 October 2020
 - 21 October 2020
- 10.2.23. The nest tube survey has been scored for effort according to the method developed by the South West Dormouse Project (Chanin and Woods 2003). The system used provides an overall score that reflects the chances of Dormice being discovered if present, and thus provides an indicator of the 'thoroughness' of a survey. This score is calculated based on the number of tubes used and the number of months the tubes were in place.
- 10.2.24. The months of the year are weighted according to the likelihood of recording dormice as set out below in Table 10.1.

Table 10.1 – Monthly Score Weighting (Chanin & Woods 2003)

Month	Weighting
April	1
May	4
June	2

Month	Weighting
July	2
August	5
September	7
October	2
November	2

10.2.25. A score of 20 (or above) is deemed a thorough survey, and a score of 15 to 19 may be regarded as adequate where circumstances do not permit more time or more tubes (particularly if other survey methods have also proved negative).

10.2.26. The survey effort allowed for checks to be undertaken within each calendar month of the survey season, with the exception of April, allowing an overall score of 25 to be achieved.

Bats

10.2.27. Field surveys were undertaken with regard to best practice guidelines issued by NE⁴, the JNCC⁵ and the Bat Conservation Trust⁶.

Tree Assessment

10.2.28. Trees within and immediately adjacent to the Site were appraised in June 2020, and again in August 2021, for their likely potential to support bat roosts.

10.2.29. For a tree to be identified as having potential to support roosting bats it needs to exhibit one or more of the following characteristics:

- Frost cracks;
- Trunk and branch splits;
- Woodpecker *Picidae* sp. holes;
- Rot holes where branches have been removed;
- Hollow sections of trunk, branches, and roots;
- Loose bark;
- Cavities beneath old root buttresses and coppice stools;

⁴ Mitchell-Jones, A. J. (2004). Bat Mitigation Guidelines. English Nature, Peterborough

⁵ Mitchell-Jones, A.J. & McLeish, A.P. (Eds.) (2004). Bat Workers' Manual. 3rd edition. Joint Nature Conservation Committee, Peterborough

⁶ Bat Conservation Trust (2016). Bat Surveys – Good Practice Guidelines. Bat Conservation Trust, London

- Dense epicormic growth (growth originating from the centre of branches);
- Dense covering of Ivy *Hedera*; and
- Presence of bat or bird boxes.

10.2.30. In addition, noting the presence of potential roosting features, and its context within an area of Proposed Development, two trees (T1 and T2 – see Figure 10.3) within the Site were subject to a tree climbing survey in September 2021. The survey involved trained climbers accessing the tree with ropes, and using endoscopes and torches to search potential roosting features for past or present use by roosting bats.

10.2.31. No past or present evidence of roosting was recorded as part of this work, and the trees are not deemed to represent bat roosts.

External Building Surveys

10.2.32. All buildings within the Site were subject to external surveys between June 2020 and September 2021. The surveys utilised ladders, mirrors, endoscopes, torches, and binoculars where necessary. In addition, B1 (as shown in Figure 10.2) was subject to internal inspections in both August and September 2021.

10.2.33. Evidence of the presence of bats was searched for, with particular attention paid to the loft voids and gaps between rafters and beams. Specific searches were made for bat droppings, which can indicate present or past use, and extent of use, as well as other signs to indicate the possible presence of bats e.g. feeding remains, presence of stained areas, or areas that are cobweb free.

10.2.34. The probability of a building being used by bats as a summer roost site increases if it:

- Is largely undisturbed;
- Dates from pre-20th century;
- Has a large roof void with unobstructed flying spaces;
- Has access points for bats (though is not too draughty);
- Has wooden cladding or hanging tiles; and/or
- Is in a rural setting and close to woodland or water.

10.2.35. Conversely, the probability decreases if a building is of a modern or pre-fabricated design/construction, is in an urban setting, has small or cluttered roof voids, has few gaps at the eaves, or is a heavily disturbed premises.

10.2.36. The main requirements for a winter/hibernation roost site are it maintains a stable (cool) temperature and humidity. Sites commonly utilised by bats as winter roosts include cavities/holes in trees,

underground sites, and parts of buildings. Whilst different species may show a preference for one of these types of roost site, none are solely dependent on a single type.

Bat Emergence/Re-entry Surveys

- 10.2.37. The vast majority of buildings within the Site were deemed unsuitable to support roosting bats, or otherwise are to be retained unimpacted as a result of the Proposed Development.
- 10.2.38. However, four buildings within the Site (B3, B4, B5 and B6 as shown in Figure 10.2), identified to have at least low bat roosting potential, with the potential to be subject to adverse impacts as a result of the Proposed Development.
- 10.2.39. These buildings were each subject to emergence and re-entry surveys in August and September 2021. Surveyors were positioned at strategic vantage points to enable full building coverage. Emergence surveys commenced approximately 30 minutes before sunset, until 2 hours after sunset. Re-entry surveys commenced 90 minutes before sunrise, and extended for 15 minutes after sunrise. Surveyors were equipped with Echometer Touch 2 (EM2) bat detectors to record the data, which was subsequently analysed using Kaleidoscope software.
- 10.2.40. The timing and weather conditions of the survey is detailed in Table 10.2 below.

Table 10.2 – Dates, Timings and Weather Conditions for Bat Emergence/Re-entry Surveys at the Site

Survey Date	Building Number	Survey Start/Finish	Temperature and Weather Conditions
4 August 2021	B3	20:30 / 23:00	18C, dry, calm
19 August 2021	B4	20:15 / 22:30	17C, light drizzle between 20:55 to 21:50
20 August 2021	B5, B6	04:04 / 5:50	16C, drizzle for majority of survey
14 September 2021	B5, B6	19.24 / 21.00	16C, light breeze, light cloud cover
15 September 2021	B4	04.50 / 6.50	12C, light breeze and light cloud cover

Bat Activity Surveys

- 10.2.41. In addition to roost assessments, surveyors also undertook dusk and/or dawn transect surveys across the Site, on a monthly basis between April and September 2020. Surveyors were equipped with Echometer Touch 2 (EM2) bat detectors to record the data, which was subsequently analysed using Kaleidoscope software. Evening bat transect surveys commenced approximately 15 minutes before

sunset and continued for a minimum of 2 hours after sunset. Dawn activity surveys commenced approximately 2 hours before sunrise and continued until sunrise.

10.2.42. This survey method aimed to identify the level of foraging, and the species present foraging and commuting within the Site and, moreover, to identify any habitats/features of comparatively higher value to bats within the Site.

10.2.43. The dates, timing and weather conditions of surveys is detailed in Table 10.3 below.

Table 10.3 – Dates, Timings and Weather Conditions for Bat Activity Transect Surveys at the Site.

Survey Number	Survey Date	Survey Start/Finish	Temperature and Weather Conditions
1	24 June 2020 and 25 June 2020 (two transects per night)	21:24 / 23:47 21:23 / 23:25	25C, 0% cloud 22C, 40% cloud, heavy rain from 23.10
2	29 July 2020	20:53 / 23:08	16C, 85% cloud, dry, light breeze
3	21 August 2020	20:10 / 22:25	17C, 100% cloud, brief heavy rain, moderate wind
4	29 September 2020	18:53 / 20:57	13C, 30% cloud, dry, light breeze
5	15 October 2020	18:06 / 20:21	12C, 5% cloud, dry, light breeze

10.2.44. In addition to the completion of activity transects across the Site, static detectors (Song Meter 4 and Song Meter Mini detectors) were deployed at strategic locations across the Site for extended periods (minimum 5 nights). The locations of the detectors can be seen on Figure 10.3. The dates of deployment, as well as the prevailing weather conditions, are detailed in Table 10.4 below.

Table 10.4 – Detector Numbers, Deployment Periods and Prevailing Weather Conditions for Static Detector Surveys

Survey No	Number of Detectors Deployed	Deployment Period	Prevailing Weather Conditions
1	6	23 June 2020 to 1 July 2020	Dry, some cloud, light wind
2	6	29 July 2020 to 11 August 2020	Dry, light wind
3	8	20 August 2020 to 26 August 20	Dry, moderate wind
4	8	29 September 2020 to 6 October 20	Dry, light wind
5	8	14 October 2020 to 22 October 2020	Dry, light wind

Reptiles

- 10.2.45. Specific surveys to identify the presence or absence of reptiles were undertaken at the Site between June and September 2021. The methodology utilised principally derived from guidance given in the Herpetofauna Workers Manual⁷.
- 10.2.46. Following an initial assessment to identify areas of suitable reptile habitat within the wider site, refugia surveys were undertaken. It was considered, given the size of the site, that a complete tinning exercise would be impractical, on this basis a sampling survey was utilised, as was discussed and agreed in principle with NPTC Biodiversity Officers. A total of 375 'tins' (0.5 x 0.5 metre squares of heavy roofing felt which are often used as refuges by reptiles) were distributed within specific areas of suitable reptile habitat within the site, in order to provide a representative sample of the use of these habitats by reptiles. (see Figure 10.4).
- 10.2.47. The tins provide shelter, and heat up quicker than the surroundings in the morning, and can remain warmer than the surroundings in the late afternoon. Being ectothermic (cold blooded), reptiles use them to bask under and so raise their body temperature, which allows them to forage earlier and later in the day.
- 10.2.48. The dates, timing, weather conditions and findings of the surveys are detailed in Table 10.11 (see Section 10.3 below). A total of seven surveys were undertaken at the Site. All surveys were undertaken in optimal survey conditions. Tin locations are shown at Figure 10.4.

⁷ Herpetofauna Groups of Britain and Ireland. 1998. Evaluating Local Mitigation / Translocation Programmes: Maintaining Best Practice and Lawful Standards. HGBI Advisory Notes for Amphibian and Reptile Groups (ARGs)

Breeding Birds

- 10.2.49. Surveys were carried out with due regard to the Common Bird Census (CBC) technique. The CBC involves walking transect routes through the area being studied, and recording and plotting all bird species observed or heard, and their behaviour.
- 10.2.50. The transect route is chosen so the entire site is covered and all features likely to support breeding birds are surveyed. Routes and directions are varied between visits so there is no tendency to visit a particular part of the plot later or earlier in the day.
- 10.2.51. To ascertain the breeding status of birds using the Site, the following criteria was applied, following the methodology used in the 'Atlas' surveys of 1988 to 1991 (Gibbons et al, 1993). This accepts the following activities as denoting breeding (including those probably breeding, but without definite proof):
- Birds apparently holding territory, including courtship and display.
 - Nest building (including excavating a nest hole).
 - Distraction display or feigning injury.
 - Adult entering or leaving apparently occupied nest site.
 - Adult carrying faecal sac or food.
 - Nest with eggs or eggshells found, or bird sitting but not disturbed.
 - Nest with young; or recently fledged young, including downy young of ducks, game-birds, waders and other nidifugous species.
- 10.2.52. A full suite of three visits were carried out in April, May and June 2020, with these covering the Site as part of the wider Coed Darcy Site. Moreover, update check surveys, targeted at key ground nesting bird species (such as Little Ringed Plover *Charadrius dubius*, Ringed Plover *Charadrius hiaticula* and Lapwing *Vanellus vanellus*), were undertaken within the Site in April 2020 and July 2021. The dates and weather conditions of these surveys are detailed in Table 10.5 below.

Table 10.5 – Dates and Weather Conditions for Breeding Bird Surveys Undertaken at the Site

Survey Visit	Date	Weather Conditions
1	30 April 2020	8/8 cloud, wind SW2-3, 7oC, showers
2	17 May 2020	7/8 cloud, still, 10oC
3	14 June 2020	6-7/8 cloud, wind E1, 12oC
4	28 April 2021*	8/8 cloud, wind NE4, 9oC, drizzly

Survey Visit	Date	Weather Conditions
5	4 July 2021*	8/8 cloud, still, 9oC

*These represent targeted surveys for Lapwing, Ringed Plover and Little Ringed Plover.

Nightjar

- 10.2.53. A churring Nightjar *Caprimulgidae* was recorded during the course of a GCN survey on 8 June 2021, and seen in flight in the north-east corner of the Site. Nightjars are well known to wander during the summer and can turn up at random locations. The Coed Darcy Site does not appear to be particularly suitable for Nightjars, and none was recorded during previous surveys in May and June 2020, both of which started pre-dawn. Moreover, no other evidence of Nightjar was recorded during any other night time work undertaken by or on behalf of Ecology Solutions between 2020 and 2021.
- 10.2.54. Notwithstanding the above, and on a precautionary basis, a further specific Nightjar survey was undertaken in June 2021. This survey comprised a dusk and dawn transect of the Site. The dusk survey took place on the 22 June 2021, commencing at sunset (21:36) and ending at 22:50. The dawn survey on the 23 June 2021 commenced 90 minutes before sunrise and extended until sunrise (04:57). No further evidence of Nightjar was recorded and, as such, it was concluded the observation related to a random visit from a wandering male.

Great Crested Newts

- 10.2.55. The Site supports a large number of waterbodies, ranging from large areas of open water (such as South Site Reservoir) to small ponds created as a bi-product of previous Site remediation works. Whilst historic survey work indicated an absence of GCN from the vast majority of the Site, given the large numbers of GCN known in the wider area (with approximately 10,000 individuals previously translocated from the wider Coed Darcy Site), it was agreed, through liaison with NPTC Biodiversity Officers and NRW, that updated assessment work would be prudent. Initially it was agreed this survey work would take the form of Edna surveys of all accessible waterbodies, followed by the completion of partial population size class assessment work (two visits per waterbody).
- 10.2.56. However, following the observation of GCN in some waterbodies, it was subsequently agreed as appropriate to undertake a full suite of population size class assessment surveys (six visits) for all accessible waterbodies within the Site.
- 10.2.57. Site wide environmental DNA (eDNA) surveys were conducted on the 27 April 2021. Pond water sampling kits supplied by SureScreen Scientifics were utilised for the eDNA survey work, with the sampling methodology undertaken fully according with that recommended by the supplier. Water samples were subsequently sent to SureScreen Scientifics for laboratory analysis.
- 10.2.58. The locations of waterbodies subject to eDNA surveys are detailed on Figure 10.5.
- 10.2.59. Population Size Class Assessment surveys were undertaken between April and June 2021. All surveys were undertaken in suitable weather conditions in accordance with the best practice guidelines, primarily

as set out in English Nature's (now NE) GCN Mitigation Guidelines and as agreed with both NPTC Council and NRW. The dates and weather conditions for surveys are detailed in Table 10.6a to Table 10.6c below.

Table 10.6A – Dates and Weather Conditions of GCN Surveys Undertaken Within the North of the Site

Survey number	Date	Weather Conditions
1	27 April 2021	16c, Clear, sunny and still
2	5 May 2021	9c, Intermittent rain, overcast
3	11 May 2021	8c, Warm and dry
5	3 June 2021	14c, Light breeze, dry
6	7 June 2021	15c, dry and warm, light breeze

Table 10.6B – GCN survey Dates and Weather Conditions Undertaken within Coed Darcy GCN SINC Area

Survey number	Date	Weather Conditions
1	26 April 2021	23c, clear, still and sunny
2	6 May 2021	12c, Warm, clear and light breeze
3	10 May 2021	13c, warm sunny and light breeze
4	19 May 2021	14c, Warm, sunny and light cloud cover
5	2 June 2021	21c, warm, dry and overcast
6	6 June 2021	15c, still, warm and light cloud

Table 10.6C – GCN Survey Dates and Weather Conditions Undertaken in the Tip Area

Survey number	Date	Weather Conditions
1	10 May 2021	13c, warm sunny and light breeze
2	19 May 2021	14c, Warm, sunny and light cloud cover

3	20 May 2021	10c, Heavy rain and windy
4	2 June 2021	21c, warm, dry and overcast
5	3 June 2021	14c, Light breeze, dry
6	6 June 2021	15c, still, warm and light cloud

- 10.2.60. Surveys undertaken by Ecology Solutions utilised three methods per visit (torch survey, bottle-trapping, and egg searches), where possible. Given the nature of many waterbodies (many of which comprise near vertical excavations or flooded tanks remaining from the Site's refinery past), full access to each waterbody was not possible in some instances for reasons of health and safety. The locations of waterbodies and the types of survey method employed are detailed in Table 10.7 below.

Table 10.7 – Survey methods employed on waterbodies within the Site

Pond Number/Name	Survey Methods Employed	Limitations/Rational for Approach
P1, P4, P8, P13 & P17.	Egg search, torching, bottle trapping, refuge search	No limitations (minimum three survey methods adopted)
P3, P7, P9, P10, P11, P12, P14, P15, P16, P20, South Site Reservoir, PB, PC, PD, PE, West Bay, South Bay, Crymlyn Lagoon West & Crymlyn Lagoon East	Egg search, torching, refuge search	Bottle trapping not undertaken was not feasible on the grounds of accessibility/health and safety.
P2, P5, P6, P18, P19	N/A (ponds dry)	Dry throughout survey season
P21	N/A	No safe access for surveying

- 10.2.61. Suitable survey weather conditions are deemed to be those nights when the night air temperature is more than 5°C, with little or no wind, and no rain. Surveys are to be conducted during such conditions.
- 10.2.62. Torch counting involves the use of high powered torches to find and, if possible, count the number of adults of each amphibian species. As recommended in English Nature's guidance, the entire margin of each waterbody is to be walked once, slowly checking for GCNs.
- 10.2.63. Bottle-trapping involves setting traps, made from two litre plastic bottles, around the margin of each waterbody, and leaving the traps set overnight before checking them the following morning. A density of at least one trap per 2m of shoreline was utilised, where possible, as recommended in the guidance.

10.2.64. In addition, egg searches are undertaken of any aquatic vegetation, to search for any evidence of breeding GCN.

10.2.65. GCN surveys were undertaken with regard to appropriate biosecurity measures, as recommended by NRW.

Invertebrates

10.2.66. Specific invertebrate surveys were undertaken at the Site by Richard Wilson Ecology Limited, to assess the importance of the Site for a range of invertebrates. A total of nine surveys were undertaken in 2020, with this allowing for a majority seasonal coverage of the Site and wider study area. The dates of these surveys are shown in Table 10.8.

10.2.67. During the period April to early May 2020 surveys did not take place due to COVID19 restrictions. Whilst surveys in this period would inevitably identify additional species, and possibly more Key Species, it is not considered such findings would result in the overall value of the Site being altered (up or down) in regard its nature conservation interest.

Table 10.8 – Dates and Weather Conditions for Invertebrate Surveys

Date	Weather Conditions	Notes
19 May 2020	Cloud: 8/8; temperature: 15°C; wind speed: 1 (2) SW.	Scoping site
20 May 2020	Cloud: 0/8; temperature: 18oC to 28oC; wind speed: calm.	Very dry everywhere with ephemeral wetlands or shallow waterbodies dried out
21 May 2020	Cloud: 8/8; temperature: 16oC to 22oC; wind speed: 1.	
17 June 2020	Cloud: 7/8; temperature: 17.5oC; wind speed: 1.	Rain from 11:45 hrs. Installed pitfall traps
2 July 2020	Cloud: 8/8 clearing to 6/8; temperature: 14oC to 20oC; wind speed: 2 W to 1 SW	Light drizzle and intermittent showers until 13:00 hrs
21 July 2020	Cloud: 2/8 (high cloud); temperature: 22oC; wind speed: calm to 1 S.	
22 July 2020	Cloud: 4/8; temperature: 18oC to 23oC; wind speed: 1 (2) W to 2 (3) SW.	

Date	Weather Conditions	Notes
29 July 2020	Cloud: 6/8; temperature: 18oC; wind speed: calm.	
10 September 2020	Cloud: 8/8 to 7/8; temperature: 13oC to 17oC; wind speed: 1.	

10.2.68. The sampling methodology for invertebrate surveys is detailed at Appendix 10.2. In summary, a variety of techniques were used to sample invertebrates following Drake et al. (2007), including sweeping of vegetation and aerial netting, using a light-weight butterfly net and heavy duty sweep-net, for flying invertebrates. Vacuum sampling was undertaken by use of a modified, commercially available garden blow-van. Sieving of leaf-litter, searching under refugia, direct observations, and limited pitfall trapping was also undertaken.

10.2.69. Specific aquatic surveys were not deemed necessary to inform the planning proposals for the Site. In reaching this conclusion it is noted the only large waterbody likely to be impacted is South Site Reservoir. Given the size of this waterbody, its construction and likely profile (steep sides below water, lack of emergent vegetation), any aquatic fauna is probably of relatively limited interest. In any event, the South Site Reservoir is being proposed for enhancement and there could be the opportunity to reduce the embankment's inclines and create some shallow(er) areas. All of this would have benefits for aquatic invertebrates. The waterbodies associated with the 'model village' in the south-west are being retained, so surveys would not be informative for the purposes of a planning application.

Consultation

10.2.70. Ecology Solutions have sought to engage a range of ecology consultees during the master planning process, with this engagement including for emails, virtual meetings, and Site based meetings. In addition, a formal request for Scoping Opinion was issued in July 2021.

10.2.71. A summary of the dialogue and responses from ecology consultees is provided in Table 10.9 below. This includes for discussions with NRW, Buglife, Neath Port Talbot County Borough Council, The Amphibian and Reptile Conservation and the Wildlife Trust (WT) of South and West Wales.

10.2.72. These responses noted a number of considerations which relate to ecology, with these summarised individually in Table 10.9 below.

Table 10.9 – Summary of Responses to the Scoping Opinion for the Emerging Proposed Development

Consultee	Summary of Main Points Of Response	Confirmation of Where Matters are Addressed
Natural Resources Wales (NRW)	Agreement on scope of GCN surveys (alongside NPTC Biodiversity officers), with these to include eDNA surveys and population size class assessment of all accessible waterbodies within the Site. Ponds to the south of the red line boundary were not surveyed, and it was agreed, on a precautionary basis, these should be assumed to support GCN.	Further details on the methodology deployed are identified in the 'Faunal Methodology' section of this Chapter (see 10.2.57 onwards).
	NRW stated the importance of dedicated biodiversity management being secured in the long-term, not least for GCN, and recommended opportunities for this management be led by an experienced conservation body such as the Amphibian & Reptile Conservation Trust (ARC).	Further consideration is given to mitigation and enhancement opportunities in section 10.6 of this Chapter.
	In their formal scoping response, NRW provided comments on a range of matters, with these summarised below: • A Phase 1 Habitat Survey should be undertaken in the summer months. • Appropriate protected species surveys and assessment should be undertaken. • Request for specific consideration of the mitigation bat house (created to mitigate previous demolition works on Site) and reassurance that long-term maintenance will be secured for this building and its environs.	The surveys and methodologies employed are in accordance with best practice and are detailed in the <i>Survey Methodologies</i> 10.2 of this Chapter. Specific consideration has been given to the mitigation bat house in section 10.6 of this ES

Consultee	Summary of Main Points Of Response	Confirmation of Where Matters are Addressed
	- Request for particular consideration of GCN, including detailed impact assessment, details on compensation/mitigation and enhancement habitats, long-term management and mechanisms to secure said management. - A request for justification on why Winter Bird Surveys were not conducted. - Clarification on the design and use of the 'Dedicated Ecology Area', in particular in relation to recreational use.	Chapter (see in particular paragraph 10.6.93). Detailed consideration has been given to GCN in section 10.6 of this Chapter, with further details to be secured within the LEMP (see draft version at Appendix 10.7)
	Request for detailed consideration of potential impacts on the Crymlyn Bog SAC, including in respect of potential air quality impacts.	Information for HRA (iHRA) is submitted alongside this ES as part of the planning application.
Neath Port Talbot (NPTC) Biodiversity Officers	Broad agreement on the scope of ecological survey work undertaken in 2020 and 2021. Request for additional consideration to be given to potential wintering bird interest, with an agreement for this to take the form of a detailed desk study exercise.	Survey scope and methodologies are detailed in sections 10.2 and 10.3 of this ES. This includes specific consideration to wintering birds at paragraphs 10.3.242 – 10.3.252
	Extensive discussions were had in relation to the overarching principles which should guide ecological mitigation and enhancement at the Site. Guiding principles were agreed with NPTC Biodiversity Officers, albeit they retained reservations in relation to the quantum of green infrastructure proposed overall. The provision/retention and creation of high quality Open Mosaic Habitat (OMH) was identified as of particular importance for the Site. The establishment of a long-term, biodiversity led	Detailed consideration is given to ecological mitigation and enhancement opportunities at section 10.6 of this ES, with additional consideration provided in the draft LEMP at Appendix 10.7.

Consultee	Summary of Main Points Of Response	Confirmation of Where Matters are Addressed
	management regime for areas of green infrastructure was identified as an essential component of any successful mitigation strategy for the Site.	
Buglife	Initial conversations with Buglife were to share the emerging proposals for the Site, in addition to the findings of survey work undertaken in 2020. Buglife requested further clarity on the scope of survey work undertaken in 2020, including dialogue on the absence of early season survey work (April to early May), or dedicated aquatic surveys. Buglife were supportive of the guiding principles of habitat creation/restoration.	The survey methodologies, including justification of scope and rational, are provided within paragraphs 10.2.68 – 10.2.71 of this ES. Further consideration is given to mitigation and enhancement opportunities in section 10.6 of this ES.
Amphibian & Reptile Conservation Group (ARC)	A meeting was held with ARC to share the emerging proposals, detail the findings of ecological (including GCN) survey work undertaken in 2021, and to summarise the mitigation strategy proposed in respect of amphibians. ARC confirmed they were supportive of the emerging strategy, with this to include a wetland buffer, inclusive of a network of ponds, along the western boundary of the Site. Initial conversations were held in relation to future management, with ARC confirming an interest in long	Further details are provided on the amphibian and reptile mitigation strategies in section 10.6 of this ES.

Consultee	Summary of Main Points Of Response	Confirmation of Where Matters are Addressed
	term management if appropriate funds were made available.	
Wildlife Trust (WT) of South & West Wales	Whilst contact was sought with the Wildlife Trust of South and West Wales, no comments were received in relation to the Proposed Development.	-

10.2.73. Particular attention has been given to each of the above issues within this Chapter of the ES. Indeed, and as above, Ecology Solutions have consulted with several of the above consultees (NRW, Buglife, NPTC County Borough Council and ARC) as the proposals have developed, such that their views could be considered and, where appropriate, integrated into the Proposed Development.

Impact Assessment Methodology

10.2.74. The impact assessment has been made in relation to the parameter plans. The evaluation and impact assessment method gives due regard to the guidelines produced by the Chartered Institute of Ecology and Environmental Management (CIEEM)⁸, which avoids the provision of definitions as to how to assign habitats and species, different levels of value, and relies on an approach that involves professional judgement and the use of available guidance and information.

10.2.75. The value of each resource should be determined within a defined geographical context:

- International;
- UK; National (England/Northern Ireland/Scotland/Wales);
- Regional;
- County (or metropolitan – e.g. in London);
- District (or unitary authority, city or borough);
- Local or parish; or
- Within Zone of Influence only.

10.2.76. A number of other key considerations include:

- Designated sites and features (e.g. SPAs, SSSIs, Important Hedgerows etc.);
- Biodiversity value (Use of UK Post 2010 Biodiversity Framework, development plans and other published documents);

⁸ Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland.

- Potential value;
- Secondary or supporting value;
- Social or economic value; and
- Legal issues.

10.2.77. For example, NPTC's Biodiversity and Geodiversity SPG has been used to assist in valuing features and developing mitigation strategies, where necessary. Consideration has also been given to the policies contained within the adopted and emerging plan.

10.2.78. Having identified the ecologically important features likely to be affected by the development, the current guidance promotes a transparent approach in which an impact is determined to be significant or not, on the basis of a discussion about the factors that categorise it. This includes characterising the nature of the likely impacts on each important feature in terms of ecological structure and function, by considering the following parameters:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Reversibility; and
- Timing and frequency.

10.2.79. Where it was concluded there would be an impact (positive or negative and including cumulative impacts) on a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, it was described as significant in the following terms:

- Beneficial, negligible or adverse type of impact; and
- Minor, Moderate or Major scale of impact

Planning Policy

10.2.80. The planning policy framework relating to nature conservation in Llandarcy is issued at two main administrative levels; nationally through Planning Policy Wales, Future Wales (National Plan 2040), and Technical Advice Note 5; and at the local level through policies in the NPTC LDP (2011 to 2026).

National Policy

10.2.81. As above, national planning policy is set out through Planning Policy Wales, Future Wales (National Plan 2040) and Technical Advice Note 5.

National Planning Policy

- 10.2.82. Planning Policy Wales (Edition 11, February 2021) sets out guidance with regard to nature conservation in Chapter 6; 'Distinctive and Natural Places'. It provides guidance for local planning authorities, and relates to biodiversity and safeguarding statutory designated sites, non-statutory designated sites, and protected species and their habitats. It also recognises the importance of trees, woodlands, and hedgerows.
- 10.2.83. Planning Policy Wales (PPW) requires local authorities to fully consider the effect of planning decisions on natural heritage, inclusive of biodiversity and geological conservation in Wales, ensuring development 'contributes to meeting international responsibilities and obligations for biodiversity and habitats', and that appropriate weight is attached to statutory nature conservation designations, protected species, and biodiversity within the wider environment.
- 10.2.84. PPW also considers the potential biodiversity and geological conservation gains which can be secured within developments, including the use of planning obligations.
- 10.2.85. National policy therefore implicitly recognises the importance of biodiversity and that, with sensitive planning and design, development and conservation of the natural heritage can co-exist, and benefits can, in certain circumstances, be obtained.

Technical Advice Note 5: Nature Conservation and Planning

- 10.2.86. The Technical Advice Note (Wales) 5: Nature Conservation and Planning was produced to supplement the information provided in PPW, insofar as it relates to nature conservation.
- 10.2.87. Technical Advice Notes (Wales) 5 (TAN 5) reiterates biodiversity as a material consideration in the planning process, and advocates a step-wise approach to avoiding, mitigating, and compensating for biodiversity impacts.
- 10.2.88. It requires local planning authorities (LPAs) to fully consider the effect of planning decisions on biodiversity, and ensure appropriate weight is attached to statutory and non-statutory nature conservation designations, protected and notable (Priority) species, as well as biodiversity and geological interests within the wider environment. It also considers the potential biodiversity and geological conservation gains which can be secured within developments, including through the use of planning Conditions or obligations.

Future Wales (National Plan 2040)

- 10.2.89. Future Wales (National Plan 2040) is a framework which seeks to guide development in Wales up until 2040. Building upon the Well Being of Future Generations (Wales) Act 2015, sustainable development forms a guiding principle of the Plan, with Future Wales striving 'to find solutions which maximise our contribution to the goals and well-being objectives' whilst recognising that, in achieving sustainable development, 'a balance often has to be found between competing priorities'.
- 10.2.90. Regarding biodiversity and nature conservation; the Plan seeks to ensure development promotes ecological connectivity and resilience and reverses biodiversity declines.

- 10.2.91. A key policy aspiration (Policy 9) expands on these nature conservation ambitions and targets. Policy 9 requires 'action towards securing the maintenance and enhancement of biodiversity (to provide a net benefit), the resilience of ecosystems and green infrastructure assets must be demonstrated as part of Proposed Development through innovative, nature-based approaches to site planning and the design of the built environment'.
- 10.2.92. In particular, the Plan identifies the importance for 'large-scale resilient and functional ecological networks and green infrastructure' to be secured such that landscape scale networks exist 'to enable species and habitats to adapt to disturbance and change'. The Plan emphasises that potentially important components of ecological networks should be safeguarded such that their ecological functionality are not compromised. The Plan emphasises that 'safeguarding does not prohibit development, but sets out a requirement to consider both the long-term land needs of the habitats and species it is intended to protect and improve...'.
- 10.2.93. Future Wales further makes reference to ecological mapping resources produced by NRW, as well as Area Statements.
- 10.2.94. In summary, the Plan seeks opportunities to create, enhance and strengthen ecological networks on a national scale such that ecological functionality can be maximised, ecosystem services retained, and net benefits for biodiversity secured.

Local Policy

Neath Port Talbot County Borough Council Local Development Plan (2011-2026) (Adopted 2016)

- 10.2.95. Planning policy at the local level is detailed within NPTC LDP (2011 to 2026). The LDP was adopted on 27 January 2016, and includes for a number of policies of relevance to ecology and nature conservation.
- 10.2.96. Strategic Policy SP14 – The Countryside and the Undeveloped Coast is an overarching policy which seeks to protect open countryside and undeveloped coast through the control of inappropriate development. Amongst other matters it also relates to the designation and protection of Special Landscape areas and Green Wedges.
- 10.2.97. This strategic policy is underpinned by a series of detailed policies. Of relevance to biodiversity and nature conservation at the Site, Policy EN3 identifies designated Green Wedges, some of which (i.e. at Crymlyn Bog and Llandarcy), border the Site. Whilst primarily landscape designations, the opportunities for Green Wedges to support biodiversity are noted.
- 10.2.98. Strategic Policy SP15 – Biodiversity and Geodiversity is the primary overarching policy of relevance to biodiversity and nature conservation. It identifies the need to protect, conserve, enhance, and manage important habitats, species, and sites of geological interest through the identification of international, national, and county designated sites including SACs, Ramsar, SSSIs and NNRS. Also, through the identification and protection of sites of regional and local importance, and the protection of important natural heritage features.
- 10.2.99. This strategic policy is again underpinned by a series of more detailed policies. Those of relevance to biodiversity and nature conservation at the Site are considered below.

- 10.2.100. Policy EN6 – Important Biodiversity and Geodiversity Sites relates to Proposed Development that would affect Regionally Important Geodiversity Sites (RIGS), LNR's, SINC's, sites meeting SINC criteria, or sites supporting Local Biodiversity Action Plans (LBAP), and S42 habitats or species, and will only be permitted where they conserve and, where possible, enhance the natural heritage importance of the site. In addition, Proposed Development will only be permitted where the development could not reasonably be located elsewhere, and the benefits of the development outweigh the natural heritage importance of the site. It also states that mitigation and/or compensation measures will need to be agreed where adverse effects are unavoidable. It is noted that Policy EN6 relates to 'both identified SINC's and sites that meet SINC criteria' but which are not currently designated.
- 10.2.101. Policy EN7 – Important Natural Features relates to Proposed Development that would adversely affect ecologically or visually important natural features such as trees, woodlands, hedgerows/field boundaries, watercourses, or ponds, and which will only be permitted where full account has been taken of the relevant features in the design of the development, with measures put in place to ensure they are retained and protected wherever possible, or where the biodiversity value and role (function) of the relevant feature has been taken into account and, where removal is unavoidable, mitigation measures are agreed.
- 10.2.102. Policy EN8 – Pollution and Land Stability concerns pollution and land instability. Amongst other matters, it identifies that proposals likely to have an adverse impact on biodiversity, as a result of pollution or land instability, will not be permitted.
- 10.2.103. Policy BE1 – Design identifies that development schemes should be designed to a high quality, including with reference to retaining and enhancing biodiversity features and ecological connectivity.
- 10.2.104. Policy SRA1 specifically relates to the Site, identifying it as a Strategic Regeneration Area within which a sustainable urban village is proposed.

Biodiversity and Geodiversity Supplementary Planning Guidance (May 2018)

- 10.2.105. The LDP is additionally supported by a suite of supplementary planning guidance (SPG) which provide further clarity on the intentions of local policy. In particular, the Biodiversity and Geodiversity SPG (May 2018) is of relevance to biodiversity and nature conservation.
- 10.2.106. The SPG provides information and guidance setting out the expectations on all Proposed Development to protect, conserve, enhance, and manage important habitats, species, and sites of geological interest. The document focuses on the full range of biodiversity and geodiversity features and interests within Neath Port Talbot, and sets out the measures that will be taken through the planning system to meet the relevant objectives set out in the LDP; namely the Strategic Policy SP15, and policies EN6 and EN7 as described above.

10.3. **Baseline Environment**

Introduction

- 10.3.1. The objectives of establishing the ecological baseline are twofold:

- i. to describe aspects of the natural environment, and to identify important and protected habitats and species that could be adversely affected by the Proposed Development; and
- ii. to characterise features that could be positively enhanced, created, restored, or managed, by establishing the occurrence, distribution, and extent of ecological features on Site and in the surrounding area; and/or those species that could be positively managed to enhance their conservation status, distribution, and abundance.

Context

- 10.3.2. Natural and semi-natural habitats usually support the greatest diversity of wildlife. Important species are those protected by international or national legislation, those that have been identified in the UK Biodiversity Steering Group Volumes I to VI as priority species (Section 42), and those identified as locally distinctive in a local BAP (e.g. 'local keystone', 'flagship' and 'umbrella species').

Designated Sites

Statutory

- 10.3.3. There are no statutory designated sites of nature conservation interest within the Site. However, Crymlyn Bog SAC, Ramsar and SSSI is located adjacent to the south-west boundary of the Site (see Figure 10.1). Part of the Crymlyn Bog is further designated as Crymlyn Bog and Pant-y-Sais NNR.
- 10.3.4. Crymlyn Bog SAC is designated primarily for the Annex 1 habitats it supports including:
- 7140 transition mire and quaking bogs which supports Bottle Sedge *Carex rostrata* and Bogbean *Menyanthes trifoliata* with Common Cottongrass *Eriophorum angustifolium*, Water Horsetail *Equisetum fluviatile*, Star Sedge *Carex echinate* and locally rare Mud Sedge *Carex limosa*.
 - 7210 Calcareous fens with *Cladium mariscus* and species of *Caricion davallianae*, with the SAC supporting the largest area of *Cladium*-dominated vegetation in south Wales.
- 10.3.5. Additionally, the site supports the following Annex 1 habitat as a qualifying feature:
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
- 10.3.6. Crymlyn Bog Ramsar is designated under Ramsar Criterion 1, 2A and 2B on account of its diverse wetland habitats, with these identified to be of international importance. The site qualifies under Ramsar Criterion 1 on account of it supporting an extensive inter-estuarine complex, forming the largest valley floodplain mires in Wales. The site includes the adjacent Pant-y-Sais Fen and consists of a complex mosaic of vegetation communities that are characteristic of both nutrient-rich and nutrient-poor conditions. This Criterion recognises the diverse swamp, tall-herb fen, fen meadow, and carr communities present.

- 10.3.7. The Crymlyn Bog qualifies under Ramsar Criterion 2A on account of it supporting a substantial population of the nationally rare Slender Cottongrass *Eriophorum gracile* community, as well as for its rich invertebrate fauna, including nationally rare or highly localised species associated with mires.
- 10.3.8. The Crymlyn Bog qualifies under Ramsar Criterion 2B on account of the range of vascular plants it supports, including 199 species of which 17 are regionally uncommon, as well as notable summer populations of Reed Warblers *Acrocephalus scirpaceus* and Sedge Warblers *A. schoenobaenus*.
- 10.3.9. Similar to the SAC and Ramsar designations, Crymlyn Bog SSSI is designated for its fen communities, wet woodland, associated invertebrate assemblages, a substantial population of nationally rare Slender Cottongrass, and a population of the nationally scarce Hornet Robberfly *Asilus crabroniformis*. The site is also part of the large inter-estuarine complex including Pant-y-Sais SSSI and the Neath floodplain. The site supports a complex mosaic of vegetation types including communities of both rich and poor fen, swamp, Alder carr and acidic grassland, in addition to plant species and communities usually characteristic of East Anglian fens.
- 10.3.10. Crymlyn Bog and Pant-y-Sais NNR Is designated as one of the largest lowland fens in Wales, supporting a range of wetland plants, birds, and insects such as Cetti's Warbler *Cettia cetti*, Water Rail *Rallus aquaticus*, Royal Fern *Osmunda regalis* L., Yellow Iris *Iris pseudacorus* and Fen Raft Spider *Dolomedes fimbriatus*. Pant-y-Sais is of similar nature to Crymlyn Bog but on a much smaller scale.
- 10.3.11. It is noted the above referenced sites are subject to further consideration in the separate 'information for Habitat Regulations Assessment' (iHRA) which has been prepared in support of the Development Proposals, and is submitted alongside this ES.
- 10.3.12. Pant-y-Sais SSSI is located approximately 0.8km south-west of the Site at its closest point. It is designated as an area of predominantly lowland fen that supports a range of fenland communities including Sphagnum, *Molinia Caerulea* communities, swamp areas with abundant *Typha Latifolia*, and fen carr. The Tennant Canal section functions as a refuge for aquatic plants such as county rare Flowering Rush *Butomus umbellatus*.
- 10.3.13. Crymlyn Burrows SSSI is located approximately 1.8km south of the Site at its closest point. It is designated as one of the last sections of the Swansea Bay Coastline which has remained predominantly unmodified by surrounding industrial developments. It supports valuable sand dune habitats, dune slacks, and carr woodland. The habitats in turn support several plant species including Rock Sea Lavender *Limonium binervosum*, Dutch Rush *Equisetum hyemale*, Variegated Horsetail *Equisetum variegatum*, rare Fen Orchid *Liparis loeselii* and now widespread Sea Stock *Matthiola sinuate*. The site also supports rare Strandline Beetle *Eurynebria complanate*, and overwintering small waders.
- 10.3.14. All other statutory designated sites (as designated on nature conservation grounds) are well separated from the Site, with the next closest biological SSSI being Six Pit, Swansea Vale and White Rock SSSI, located approximately 2.6km to the west of the Site at its closest point. There are no other sites of European/international importance (also referred to as Habitat Sites) within a 10km radius of the Site.

Non-Statutory Designated Sites

- 10.3.15. A small area of the Site (approximately 4.25Ha), located in the south-west, adjacent to Crymlyn Bog SAC (as shown on Figure 10.1) is designated as Coed Darcy GCN Area SINC. This also extends further south into the wider study area. The site is designated on account of it supporting GCN, and was a receptor site for GCN translocation as part of the former Coed Darcy development, with a total of 9,560 GCN being translocated between 2011 and 2016. The site contains a number of varying sized ponds, mixed scrub, semi-improved grassland, acid grassland, fen, wet woodland and broadleaved woodland.
- 10.3.16. In addition, much of the Site is designated as NPTC Watercourses SINC, a designation for which no formal citation has been provided, and which appears to cover extensive areas of existing development, in addition to semi-natural habitats. It is understood the citation reflects the broad locations of watercourses in the borough.
- 10.3.17. Jersey Marine Woods SINC is located adjacent to the south-east Site boundary at its closest point (albeit the majority is well separated from the Site). It is designated on account of its native woodlands, scrub communities, hedgerows, lowland meadows, Purple Moor Grass *Molinia caerulea*, rush pasture, and other Bracken communities. The site is described as a mosaic of habitats located between the redevelopment footprint of the former Llandarcy Oil Refinery and the low-lying fen complex of Red Jacket Pill and Pant-y-Sais. The principal habitats include deciduous woodlands, including a small parcel of Ancient Woodland, Bracken *Pteridium* slopes, and some parcels of less improved pasture.
- 10.3.18. Llandarcy Village Green SINC is located approximately 0.2km east of the Site at its nearest point, and is designated as Purple Moor Grass and rush pastures. It is described as part of the Llandarcy Conservation Area which is largely managed as amenity grassland. Despite this, it is species rich, including areas of regular mowing. Important species include Bog Stitchwort *Stellaria alsine*, Meadow Vetchling *Lathyrus pratensis*, Southern Marsh Orchid *Dactylorhiza praetermissa*, Greater Birdsfoot Trefoil *Lotus Pedunculatus* and Yellow Iris. The habitat is considered suitable to support GCN.
- 10.3.19. An additional 10 SINC sites are located within 1km of the Site and are listed in Table 10.10 below. SINC's more than 1km from the Site have not been described as it is considered they are sufficiently spatially separated from the Proposed Development not to result in adverse impacts.

Table 10.10 – SINC's Within 1km of the Site

SINC Name	Distance from Site	Description of Designation
Crymlyn Quarry Wood	0.35KM West	Mosaic of habitats including acid heath, scrub mire and acid grassland. The site is described as a small broad-leaved woodland and meadow area.
Tennant Canal	0.55KM East	The Tennant Canal supports a range of aquatic and emergent flora as well as bankside vegetation including numerous Orchid species,

SINC Name	Distance from Site	Description of Designation
		Flag Iris <i>Iris pseudacorus</i> and Greater Spearwort <i>Ranunculus lingua</i> . Important species recorded utilising the site include Grass Snake <i>Natrix natrix</i> , Fen Raft Spider, Otter and Golden Ringed Dragonfly <i>Cordulegaster boltonii</i> .
Neath Estuary	0.65KM East	Coastal and floodplain grazing marsh, rivers, coastal salt marsh, and intertidal mudflats. Important species recorded utilising the site include Peregrine <i>Falco peregrinus</i> , Whimbrel <i>Numenius phaeopus</i> , Curlew <i>Numenius</i> , Skylark, Linnet and Otter.
Pentrefynnon	0.8KM North-east	Native woodland – mix of native tree species, lowland meadows, Purple Moor Grass, and rush pastures, and OMHs on previously developed land. Important species recorded utilising the site include Otter, Willow Warbler <i>Phylloscopus trochilus</i> , Linnet <i>Linaria cannabina</i> , Bullfinch <i>Pyrrhula pyrrhula</i> and Song Thrush <i>Turdus philomelos</i> .
Main Swansea – Fishguard Railway Line	0.8km North-east	No citation provided.
M4 corridor	0.8km North-east	No citation provided.
Pentredwr Grasslands	0.85KM West	No citation provided.
Junction 44 Heathlands	0.9KM North-east	No citation provided.
Red Jacket Fen	1KM South-east	Scrub communities, lowland fen, reedbeds and ponds. Important species include Fen Raft Spider, Otter, Cetti's Warbler, Dunnock <i>Prunella modularis</i> , Water Vole, Grass Snake, Lesser Water-plantain <i>Baldellia ranunculoides</i> , Fan-leaved Water-crowfoot <i>Ranunculus circinatus</i> and Greater Spearwort.

10.3.20. Both national and local policy recognise the value of SINC's based on their intrinsic ecological values with regards to the planning process. NPTC's LDP states; 'Any site that meets the criteria, but is yet to be designated as a SINC, will be considered by the council in the same way in the planning process as those already identified. This local guidance expands on the guidance set out in the 'Wildlife Sites Guidance Wales – A Guide to Develop Local Wildlife Sites System in Wales (2008)' in order to 'better reflect the local condition within the administrative boundary'. The criteria involves, for example, a certain number of protected or locally notable species, protected or locally notable habitats, or notable habitats likely to support rare or protected species.

10.3.21. An assessment of SINC criteria has been undertaken against both national (Welsh) and local guidance to determine if there are habitat, features, and/or species features within the Site that reach or exceed SINC ecological features.

Background and Historical Context

10.3.22. The Site has been subject to considerable historical habitat survey work over an extended period between 1998 and 2018. Initially this survey work was undertaken to inform previous (consented) planning proposals for the wider Coed Darcy masterplan site, within which the current Site lies. Following the grant of planning permission, the wider site was then subject to extensive further habitat survey work, with this undertaken to inform the implementation of that planning permission, as well as the substantial demolition and remediation works which have been undertaken to date across the Site.

10.3.23. Previous demolition and remediation work at the Site have resulted in substantial habitat clearance works, including the removal of the vast majority of pre-existing semi-natural habitats, leaving extensive areas of exposed bare ground and localised material stockpiles.

10.3.24. For clarity, these remediation works resulted in the loss of all pre-existing semi-natural habitats with the exception of the following:

- Areas of more mature woodland, including boundary woodland and localised areas of woodland within the Site.
- Two large existing waterbodies – South Site Reservoir and South Bay.
- Localised areas of grazed pasture at the north-eastern corner and western boundary of the Site.

10.3.25. Aside from those listed above, semi-natural habitats within the remainder of the Site are less than 10 years old, with some considerably younger. Indeed, some more recently worked areas of the Site remain substantially bare following previous construction related works.

10.3.26. The considerable remediation works undertaken have substantially altered the baseline habitats present within the Site. Nonetheless, in many instances recolonising habitats are comparable to the 'pre-development' baseline, within which a mosaic of disturbed and open habitats were recorded (and were sustained in part by the historic management and use of the wider site).

10.3.27. In undertaking habitat survey work to inform the revised Development Proposals for the Site due regard was given to the historical survey work and findings, as reported for the wider site. Reference is further

made to the results of these previous surveys where relevant, with the survey findings (ES extracts) provided at Appendix 10.3.

Existing Habitats Overview

- 10.3.28. As above, the Site comprises a large area of previously developed land which has been subject to extensive remediation, vegetation clearance, and reprofiling over an extended period. These previous works, undertaken in accordance with the consented OPP, have resulted in habitat clearance across the vast majority of the study site albeit localised mature habitats, such as areas of mature woodland, have remained.
- 10.3.29. The duration, extent, and timings of the previous remediation and reprofiling works have varied across the study Site, with some areas having been subject to works very recently, and other areas having been left undisturbed for several years. Resultantly, whilst a vast majority of the Site comprised bare ground as recently as 2016, the staggered cessation of construction related works has allowed for a range of early successional habitats to establish.
- 10.3.30. The structure and botanical composition of these habitats varies significantly across the study site, ranging from large areas of predominantly bare ground, to sparse ephemeral/perennial vegetation, closed sward dry grasslands, species-poor grazed grassland, wetland, ponds, scrub, and woodland.
- 10.3.31. In many instances, particularly for early successional habitats, the botanical communities are diverse and support a good range of grasses, sedges, and forbs. In particular, early successional terrestrial habitats to the north of the railway, and along the western boundary of the study area, typically support a more diverse floral assemblage. In contrast, large central areas of the study area support very limited vegetation and are dominated by bare ground, or include for vegetation more typical of disturbed ground and of a ruderal nature.
- 10.3.32. Whilst the intrinsic value of individual component habitat varies, it is acknowledged that collectively many of these habitats would classify as OMH, a habitat of noted intrinsic ecological value.
- 10.3.33. In describing, and later evaluating, the habitats present within the Site, consideration is given to both the value of component habitats, as well as the collective value as part of a wider habitat mosaic. Noting the ephemeral nature of many early successional habitats, particular consideration will be given to how management can retain a valuable OMH resource in perpetuity, as part of the emerging proposals.
- 10.3.34. The following main habitat/vegetation types were identified:
- Compacted clay soils with a mosaic of recolonising vegetation
 - Wet grassland and mixed scrub
 - Secondary woodland
 - Dense and scattered scrub
 - Waterbodies/ponds

- Rush pasture
- Exposed rock/cliff
- Railway embankment
- Tree belts/lines
- Amenity grass
- Amenity planting
- Buildings
- Hardstanding

10.3.35. The location of these habitats is shown on Figure 10.2 whilst example photographs of the habitats on Site are provided at Appendix 10.4.

10.3.36. Each habitat present is described below, with an account of the representative plant species present.

Compacted Clay Soils with a Mosaic of Recolonising Vegetation

10.3.37. The majority of the Site comprises compacted clay soils remaining from previous remediation, totalling 50.72 Ha. The extent of vegetative colonisation of this habitat varies considerably across the Site, with this a reflection of the extent and date of previous remediation works on Site. Broadly speaking, habitats to the north of the railway line, as well as in the west of the Site, are more established in nature and often support a diverse floral community. In contrast, those habitats in central areas of the Site, to the south of the railway, are frequently only sparsely vegetated and comprise predominantly bare ground, measuring a total of 42.45 Ha.

10.3.38. Whilst there is considerable variation within the Site, the recolonising vegetation all comprises early successional communities, with these ranging from large areas of predominantly bare ground, to sparse ephemeral/perennial vegetation, sparse dry grasslands and, locally, areas of rougher grassland and dense ruderal vegetation. As is typical with early successional habitats, the communities are typically a poor fit to 'recognised' plant communities (i.e. NVC) and indeed will vary significantly within a small number of years as a result of ecological succession.

10.3.39. Noting the variation, the areas of this habitat are described individually below, with reference made to Figure 10.2 where relevant.

10.3.40. Recolonising vegetation (RV) 1, comprises a significant component of the habitat mosaic present to the north of the railway line, as detailed on Figure 10.2. The area measurement for RV1 totals approximately 8.27 Ha.

10.3.41. Overall, this section of the Site supported the most structurally and botanically diverse examples of open habitat within the Site. Providing additional interest, the topography of the area includes for frequent

mounds and depressions, most of which appear to be remnants of previous remediation works, allowing for both dry and damp (seasonally inundated), habitats. It is understood the habitats in this area have remained largely undisturbed following the completion of substantial remediation works in 2015/16.

- 10.3.42. Reflecting the less recent vegetation clearance, areas of previously bare ground have re-colonised to support a mixture of sparse grassland and ephemeral/perennial vegetation which, in turn, support a good range of herbs, grasses, and sedges. For the most part the plant community was reflective of a sparse, nutrient poor sward, with calcareous tendencies, and significant areas that become drought stressed in the summer months.
- 10.3.43. Yorkshire Fog was *Holcus lanatus* by far the most frequently recorded of the grasses and was generally at least frequent across the habitat, albeit with areas where it was locally abundant. Occasionally recorded were Annual Meadow Grass *Poa annua*, Smooth Meadow Grass *Poa pratensis*, Crested Dog's-tail *Cynosurus cristatus*, Perennial Rye Grass *Lolium perenne*, and Italian Rye Grass *Lolium multiflorum*. Sweet Vernal Grass *Anthoxanthum odoratum* was frequent along the northern edges of RV1, adjoining areas of Gorse *Ulex* scrub. Other grass species were only rarely recorded, and included for Annual Beard Grass *Polypogon monspeliensis*, Fern Grass *Poaceae* and Cock's Foot *Dactylis*. In damper areas, Hard Rush *Juncus inflexus* was frequent, with Compact Rush *Juncus conglomeratus*, Common Club Rush *Schoenoplectus*, Toad Rush *Juncus bufonius* and Sharp-flowered Rush *Juncus acutiflorus* locally so. Oval Sedge *Carex leporine*, Glaucous Sedge *Carex flacca*, Hairy Sedge *Carex hirta*, and Remote Sedge *Carex remota* were occasional.
- 10.3.44. Forbs recorded within the sward included for frequent Coltsfoot *Tussilago farfara*, Bristly Oxtongue *Helminthotheca echioides*, Hop Trefoil *Trifolium campestre*, Lesser Trefoil *Trifolium dubium*, Common Fleabane *Pulicaria dysenterica*, Bird's-foot Trefoil *Lotus corniculatus*, Rough Hawksbeard *Crepis biennis*, Perforate St John's Wort *Hypericum perforatum* to the northern edge of this habitat parcel, adjoining areas of Gorse and Bramble *Rubus* scrub.
- 10.3.45. Occasionally recorded within the sward (albeit with localised areas of higher prevalence), were Yellow Wort *Blackstonia perfoliata*, Field Horsetail *Equisetum arvense*, White Clover *Trifolium repens*, Red Clover *Trifolium pratense*, Cut-leaved Crane's-bill *Geranium dissectum*, Common Vetch *Vicia sativa*, Yellow Bartsia *Parentucellia viscosa*, Curled Dock *Rumex crispus*, Creeping Thistle *Cirsium arvense*, Hemp Agrimony *Eupatorium cannabinum*, Common Mouse Ear *Cerastium fontanum*, Cat's Ear *Hypochaeris radicata*, Common Centaury *Centaureum erythraea*, Creeping Buttercup *Ranunculus repens*, Selfheal *Prunella vulgaris*, Western Clover *Trifolium occidentale*, Wild Carrot *Daucus carota*, Square Willowherb *Epilobium tetragonum*, Oxeye Daisy *Leucanthemum vulgare*, Scarlet Pimpernel *Anagallis arvensis*, Procumbent Pearlwort *Sagina procumbens*, and Melilot *Melilotus*.
- 10.3.46. Eyebright sp. *Euphrasia*, Fox and Cubs *Pilosella aurantiaca*, Zigzag Clover *Trifolium medium*, Mouse Ear Hawkweed *Pilosella officinarum*, and Common Cudweed *Filago vulgaris* were generally only rarely recorded.
- 10.3.47. As above, localised areas of damp or seasonally wet ground included for frequent rushes and sedges, as well as localised Horsetails *Equisetum*. The wettest elements supported occasional Charophyte sp., Broad-leaved Pondweed *Potamogeton natans*, and Water Plantain *Alisma plantago-aquatica*.

- 10.3.48. Otherwise, these areas typically supported a sub-set of the forbs recorded in drier habitats, albeit with a higher proportion of damp tolerant species such as Creeping Cinquefoil *Potentilla reptans*, Coltsfoot, and Marsh Thistle *Cirsium palustre*, whilst Southern Marsh Orchid was identified as locally rare.
- 10.3.49. **RV2** is located in the eastern most edge of the Site, to the immediate south and west of Darcy Business Park. Whilst the range of species recorded in this area was, for the most part, comparable to RV1, the composition varied significantly, with a notably higher component of ruderal species, and increasingly enclosed swards transitioning to damp grassland at the margins. The soils across much of the area are evidently more enriched in nature, particularly within many of the bunds which are now dominated by coarse grasses, and a small range of fast growing ruderal species typical of recolonising ground. Overall, it is approximated that 20% to 30% of the surface area in this part of the Site comprises bare ground.
- 10.3.50. Yorkshire Fog remained the most frequent grass species and was generally dominant, particularly in low lying and damper areas where the sward was enclosed. Creeping Bent *Agrostis stolonifera*, and Common Bent *Agrostis* were frequently recorded, whilst Meadow Foxtail *Alopecurus pratensis*, Crested Dog's-tail, False Oat Grass *Arrhenatherum elatius*, and Perennial Rye Grass were occasional alongside Soft Rush *Juncus effusus*, Timothy *Phleum pratense*, Tufted Hairgrass *Deschampsia cespitosa*, Cotton Grass *Eriophorum angustifolium*, and Bearded Couch *Elymus caninus*, which were all rarely recorded. Sedges were rarely recorded in the sward, and were typically localised to damp and seasonally inundated areas, including adjacent to seasonally wet drainage ditches. Species recorded included for False Fox-sedge *Carex otrubae*, Glaucous Sedge and, within the wettest areas, Remote Sedge. Common Reed *Phragmites australis* was locally abundant, as was Canary Reed Grass *Phalaris arundinacea*.
- 10.3.51. The forb component varied considerably across the area, again indicating localised areas with more enriched conditions. Creeping Thistle was locally dominant (particularly on bunds), whilst Bristly Oxtongue was generally abundant through-out. Frequent was Hop Trefoil, Weld *Reseda luteola*, Scentless Mayweed *Tripleurospermum inodorum*, Common Fleabane, Coltsfoot, White Clover, Rosebay Willowherb *Chamerion angustifolium* (locally so), Field Horsetail, Hedge Bindweed *Calystegia sepium*.
- 10.3.52. Occasionally recorded was Hieracium (Hawkweed) sp., Wild Parsnip *Pastinaca sativa*, Bird's-foot Trefoil, Perforate St John's Wort, Creeping Buttercup, Red Clover, Curled Dock, Tufted Vetch *Vicia cracca*, Common Ragwort *Jacobaea vulgaris*, Oxeye Daisy, Evening Primrose *Oenothera biennis*, Great Willowherb *Epilobium hirsutum*, Common Nettle *Urtica dioica*, Selfheal, Meadow Buttercup *Ranunculus acris*, Broad-leaved Dock *Rumex obtusifolius*, Typha, Silverweed *Potentilla anserina*, Broad-leaved Plantain *Plantago major*, Rough Hawkbit *Leontodon hispidus*, Marsh Thistle, and Lesser Trefoil. Generally rare within the sward was Dandelion *Taraxacum*, Spear Thistle *Cirsium vulgare*, Yarrow *Achillea millefolium*, Yellow Melilot *Melilotus officinalis*, Greater Birdsfoot Trefoil, Ribwort Plantain *Plantago lanceolata*, Viper's Bugloss *Echium vulgare*, Cat's Ear, Teasel *Dipsacus*, Alsike Clover *Trifolium hybridum*, Nipplewort *Lapsana communis*, Hedge Woundwort *Stachys sylvatica* (locally frequent), Great Mullein *Verbascum thapsus* and Common Mallow *Malva*. Kidney Vetch *Anthyllis vulneraria*, Meadow Vetchling, Common Restharrow *Ononis repens*, and Hare's-foot Clover *Trifolium arvense* were locally rare to the immediate south of the railway line.

- 10.3.53. As above, the majority of soil bunds supported dense ruderal vegetation and indeed the increased establishment of this was notable between surveys in 2020 and 2021, with bare ground significantly decreased. Within these ruderal bunds, species such as Bristly Oxtongue, Curled Dock, Coltsfoot, Yellow Melilot, Creeping Thistle, Common Nettle, Great Willowherb, Broad-leaved Dock, Rosebay Willowherb, and Black Mustard *Brassica nigra* dominated alongside young scrub such as Buddleia, Willows *Salix*, and Bramble. In contrast, a large, raised soil plateau in the eastern most edge of the Site was evidently comprised of less enriched soils and was predominantly bare in nature (approximately 60% bare ground), with vegetation largely limited to Coltsfoot, Common Fleabane, and Bristly Oxtongue.
- 10.3.54. RV3 is continuous with RV2 (as shown in Figure 10.2) and covers much of the central area of the Site. In contrast to RV1 and RV2, RV3 is notably less structurally and botanically diverse, with a substantially sparser sward reflective of the more recent disturbance to this area. Indeed, much of this area of the Site would most accurately be classified as bare ground.
- 10.3.55. Whilst localised topographical variety persists, a vast majority of this area is flat, level, and uniform in nature, comprising dry, compacted clay soils with an absence of bunds, mounds, or depressions. The sward cover was noted to become progressively sparse to central and western areas, ranging from approximately 60% bare ground in the east, to >80% bare ground in the western and central areas.
- 10.3.56. Botanically, the overall range of species within RV3 was comparable to RV2, albeit the community composition varied significantly, with most species only rarely recorded, and a small number of species dominating. Again, Yorkshire Fog was the most prevalent species, with frequent Bristly Oxtongue, Lucerne *Medicago sativa*, Yellow Melilot, Hard Rush, and Creeping Bent comprising the majority of the remaining vegetative cover, alongside occasional Kidney Vetch. Also apparent were Common Fleabane, Bird's-foot Trefoil, Rough Hawkbit, Hare's-foot Clover and Hop Trefoil, all of which were occasional to rare.
- 10.3.57. **RV4** is dominated by large soil and aggregate bunds remaining from previous remediation works, some of which have been subject to recent disturbance as part of on-going Site remediation. Bunds predominantly comprising soil typically supported species of a ruderal nature, comparable to RV2, including Hieracium (Hawkweed) sp., Spear Thistle, Pineapple Weed *Matricaria discoidea*, Rosebay Willowherb, Weld, Black Mustard, False Fox-sedge, Great Mullein, Tufted Vetch, Amercian Willowherb *Epilobium ciliatum*.
- 10.3.58. Vegetation within aggregate mounds was primarily limited to recolonising scrub within which Buddleia, Willows, and Birches *Betula* predominated, with Dog-rose *Rosa canina* and Gorse occasional. A stand of Japanese Knotweed *Reynoutria japonica* was also recorded within the Site (see Figure 10.2).
- 10.3.59. Between the mounds, the vegetation cover was frequently reflective of sparse, dry grassland of modest species diversity, including for regular Yorkshire Fog, Oxeye Daisy, Meadow Foxtail, Meadow Vetchling, Yarrow, Yorkshire Fog, Horsetail, Herb Robert *Geranium robertianum*, Bracken, Alsike Clover, Forget-me-not *Myosotis*, Viper's Bugloss, Hairy Tare *Vicia hirsuta*, Silverweed, Swine Cress *Lepidium coronopus*, Yellow Sedge *Carex demissa* and Kidney Vetch.
- 10.3.60. RV5 has established as an area of sparse, dry grassland on a south facing slope, located to the immediate south of the Phase 1 development. The sward is largely enclosed to its eastern edge,

becoming sparse to the south and west where bare ground accounts for 60% to 70% of the surface. Yorkshire Fog dominates, with Viper's Bugloss, Perforate St John's Wort, Bird's-foot Trefoil, Common Fleabane, and Hawkweeds frequent. Occasionally recorded were Foxglove *Digitalis*, Oxeye Daisy, Common Centaury, Ribwort Plantain, Wild Carrot, Red Clover, Common Daisy *Bellis perennis*, and Foxglove. Common Knapweed *Centaurea nigra* was rarely recorded.

Wet Grassland and Mixed Scrub

- 10.3.61. Several areas of rough, semi-improved, wet grassland have established on Site, interspersed within areas of dense and scattered scrub. The area measurement for wet grassland and mixed scrub totals 3.6 Ha. Frequently these areas of grassland are present on slopes or graded banks, with drier communities present at higher levels. With the exception of WG4, the composition of these grassland areas remains broadly comparable across much of the Site.
- 10.3.62. Whilst the wet grassland habitats within the Site would broadly fall into the category of 'recolonising vegetation' (detailed above), they typically support a more established and sufficiently distinct sward. As such, these communities are described individually below.
- 10.3.63. WG1. As elsewhere, Yorkshire Fog typically dominates the grass component of the sward, albeit with Hard and Soft Rush locally dominating. Also recorded was Purple Moor Grass, Common Bent, Creeping Bent, alongside occasional Tufted Hairgrass and, rarely, Common Cottongrass. The wettest elements included for an increased prevalence of species such as Remote Sedge, Hairy Sedge, Glaucous Sedge, Field Horsetail, Coltsfoot, localised Phragmites, Marsh Thistle, Marsh Bedstraw *Galium palustre*, Purple Loosestrife *Lythrum salicaria*, Sharp-flowered Rush, Water Mint *Mentha aquatica*, Yellow Loosestrife *Lysimachia vulgaris*, and Yellow Flag Iris *Iris pseudacorus*. Also recorded, primarily in drier elements, was Creeping Thistle, Ribwort Plantain, Wild Carrot, Wild Parsnip, Red Clover, Selfheal, Horseshoe Vetch *Hippocrepis comosa*, Common Fleabane, Spear Thistle, Wild Strawberry *Fragaria vesca*, Common Centaury, Purple Toadflax *Linaria purpurea*, Viper's Bugloss, Ragwort, Bush Vetch *Vicia sepium*, and Meadow Vetchling.
- 10.3.64. Frequently the sward tended towards a more ruderal composition, with frequent Hemp Agrimony, Spear Thistle, and Black Mustard. Scattered scrub included for those species listed in the Scrub Section (see below), with Gorse, Willows, Bramble, and Buddleia all frequent.
- 10.3.65. WG2 was comparable in composition to WG1, albeit with localised areas of abundant Pendulous Sedge *Carex pendula* and Rosebay Willowherb. This area of grassland also supported a higher proportion of scattered scrub, with this habitat evidently succeeding across much of the grassland area.
- 10.3.66. WG3 (The Tip) comprises an area of generally flat grassland, albeit with a central area which appears to be seasonally inundated, and includes for a high proportion of rushes, including Hard Rush, Soft Rush, and Sharp-flowered Rush, alongside frequent Common Reed Phragmites. There are regular areas of disturbed ground within which a range of early successional species are present, including Scarlet Pimpernel, Coltsfoot, Broad-leaved Everlasting Pea *Lathyrus latifolius*, Nipplewort, Lucerne, Evening Primrose, and Creeping Thistle. Otherwise, the sward component is comparable to other wet grassland habitats on Site.

10.3.67. WG4 comprises an area of sparse wet grassland colonising over level clay soil. Much of the sward appears likely to be seasonally inundated, with a high proportion of rushes and sedges, and localised emergent vegetation. Yorkshire Fog remained frequent, whilst Marsh Foxtail *Alopecurus geniculatus* was also well represented. Soft Rush and Hard Rush were prevalent in the sward, with Toad Rush, Jointed Rush *Juncus articulatus* and Sea Club-rush *Bolboschoenus maritimus* all well represented, at least locally. Sedge species recorded included for Common Yellow Sedge, Oval Sedge, Remote Sedge, and Pendulous Sedge. Localised examples of suspected Lesser Water-plantain were also recorded in the wettest areas. Other floral species, broadly comparable to those within WG1, were generally rarely recorded, if at all.

10.3.68. A series of large soil bunds extend across the area and are predominantly colonised by species of a ruderal nature (comparable to elsewhere on Site), such as Canadian Fleabane *Erigeron canadensis*, Broad-leaved Dock, Evening Primrose, Amercian Willowherb, Rosebay Willowherb, Wild Parsnip, Red Clover, Creeping Thistle, Perforate St Johns Wort, Yorkshire Fog, Creeping Bent, and Timothy.

Species-poor Semi-improved Grassland

10.3.69. Three separate areas of species poor grassland are present within the Site, each of which are described individually below.

10.3.70. G1 comprises two adjoining horse grazed fields, present in the north-east of the Site. The area measurement for G1 totals 3.73 Ha. The fields are poached in areas, with a generally short sward throughout. Extensive Bramble scrub is present, particularly within the northern field, with extensive Bracken also frequent at the boundaries.

10.3.71. The sward itself includes for abundant Perennial Rye Grass, Sweet Vernal Grass and Yorkshire Fog, with Crested Dog's-tail frequent, and Red Fescue *Festuca rubra*, Rough Meadow Grass *Poa trivialis*, and Italian Rye occasional. The herb component of the sward is generally suppressed through grazing, but includes for frequent Common Daisy, Ragwort, Meadow Buttercup, Cat's Ear, Red Clover, White Clover, Common Mouse Ear, and Creeping Buttercup. Occasionally recorded was Red Bartsia *Odontites verna*, Common Sorrel *Rumex acetosa*, Selfheal, Bracken, Smooth Hawksbeard *Crepis capillaris*, Broad-leaved Dock, Lesser Trefoil, Common Knapweed, Creeping Thistle, and Perforate St John's Wort.

10.3.72. G2 again comprises a horse grazed field, located at the western boundary of the Site, to the south of South Site Reservoir. The area measurement for G2 totals 0.68 Ha. It is broadly comparable to G1 above, comprising a close sward of abundant Perennial Rye Grass, Meadow Foxtail, and Common Bent, with frequent Crested Dog's-tail, and Italian Rye occasional. The herb component of the sward comprises frequent Ragwort, Bird's-foot Trefoil, frequent Common Knapweed, Meadow Buttercup, Common Dandelion, and Selfheal, with occasional Common Lesser Stitchwort *Stellaria graminea*, and rare Common Fleabane. The perimeter of the field is bounded by dense scrub comprising dominating Bramble and Bracken, with abundant Nettle and Foxglove.

10.3.73. G3 comprises an area of unmanaged, rough grassland, to the south of the existing Phase 1 development site. The area measurement for G3 totals 1.07 Ha. The sward is species poor and dominated by rough grasses and ruderal vegetation, including frequent pernicious weeds. Cock's-foot dominates, with False

Oat Grass abundant, and both Meadow Foxtail and Common Bent occasional. Broad-leaved Dock and Creeping Thistle were dominant amongst the forbs, with Curled Dock frequent, Oxeye Daisy, Common Knapweed, Ribwort Plantain, Hogweed *Heracleum*, and Selfheal occasional. Silverweed and Prickly Sowthistle *Sonchus asper* were rarely recorded. Bramble was noted as occasional within the sward.

Secondary Woodland

- 10.3.74. Two areas of existing, early mature woodland are present within the west of the Site, whilst significant areas of younger woodland are present at the northern and western Site boundaries. The total area measurement of secondary woodland is 17.99 Ha. Individual descriptions of the woodland habitats within the Site are provided below. Due to the dense vegetation growth and steep topography, significant areas of the woodland were not directly accessible.
- 10.3.75. From a review of historic maps and aerial imagery, the woodlands within the Site appear to have predominantly established post 1945. Indeed, it is noted the Site has undergone substantial transformation since this time, with large scale construction (and associated ground works) considered likely to have damaged or destroyed the vast majority of pre-existing habitats. For the most part, the woodland habitats appear to remain substantially unchanged from those described within previous ecological reporting for the Site.
- 10.3.76. Woodland W1 forms much of the western boundary of the Site, comprising a more or less continuous band of woody vegetation, albeit with regular intrusions such as access roads and tracks (most of which are now overgrown and largely inaccessible). For the most part this woodland is scrubby in nature, comprising a limited range of semi-mature and early mature trees and shrubs, much of which has colonised on steep banks which drop away from the main body of the Site. Canopy species recorded include for Pedunculate Oak *Quercus robur*, Silver Birch *Betula pendula*, Grey Willow *Salix cinerea*, Sycamore *Acer pseudoplatanus*, and Alder *Alnus*. The woodland edge is typically disturbed in nature, often abutting access tracks within the Site. These edge habitats typically support Gorse, Buddleia, and Broom *Cytisus scoparius*. For the most part, the boundary woodland generally lacks any distinct woodland ground flora, typically supporting a proportion of the ruderal vegetation species recorded elsewhere on Site, alongside Bramble and Ivy. The northern and eastern edge of the woodland, away from the embankment, supports localised areas of more mature Oak, alongside occasional Hazel *Corylus avellana* coppice.
- 10.3.77. A small section of the boundary woodland (W1A) is identified as Ancient Semi-Natural Woodland on the Ancient Woodland Inventory. Despite this designation the woodland at this location remains broadly comparable in structure and composition to that present elsewhere within W1, comprising Birch *Betula* sp., albeit occasional mature Oak *Quercus* trees are present, alongside occasional Hazel. It is noted this area of the Site has been subject to extensive disturbance and modification, with development in and adjacent to this area, including for the creation of South Site Reservoir, railway lines, and an oil interceptor located within the designated woodland. Noting this substantial historic disturbance, with resultant woodland clearance and loss/degradation of soils, it is not considered the Ancient Woodland designation of this area is a correct reflection of the extent of ancient woodland resource present, not least given the presence of existing built form.

- 10.3.78. W1B comprises an old line of mature Oak trees aligned along an earth bank, and with coppiced hazel evident. It runs adjacent to a mixed bare earth and compacted aggregate track. This area of woodland again falls within an area designated as Ancient Woodland.
- 10.3.79. The 'Crescent Woodland' (W2) comprises an area of relatively mature secondary woodland situated on a steep outcrop in the west of the Site. The woodland is densely vegetated, and largely inaccessible. Silver Birch and Grey Willow, the majority of which are early mature, dominate the canopy layer, with Downy Birch *Betula pubescens* also present and Pedunculate Oak occasional. Other species include Scots Pine *Pinus sylvestris*, Crack Willow *Salix fragilis*, Alder, and, rarely, Rowan *Sorbus subg. Sorbus*. The shrub layer includes for significant non-native vegetation including Buddleia (dominant), Cotoneaster, Rhododendron, Western Gorse *Ulex gallii*, Hawthorn *Crataegus*, Bramble, and Broom. The field layer comprises of Wild Strawberry, Wavy Hair Grass *Deschampsia flexuosa*, Ling Heather *Calluna*, Foxglove, Himalayan Honeysuckle *Leycesteria formosa*, Marsh Thistle, and Wood Sage *Teucrium scorodonia*. Stands of Ling Heather extend beyond the margins of the woodland, particularly to the south-west of W2 where it transitions into adjoining grassland and scrub.
- 10.3.80. W3 comprises a band of mature woodland located on a steep gradient which falls away towards 'The Tip' area of the Site. The canopy layer of the woodland includes for Pedunculate Oak, Silver Birch, Alder and Grey Willow, with Hawthorn and Blackthorn occasional in the shrub layer. The field layer is generally dominated by Bramble and Ivy, with Common Nettle, Bracken, and Pendulous Sedge occasional to frequent. Also occasional was Hart's-tongue Fern *Asplenium scolopendrium* and Broad Buckler Fern *Dryopteris dilatata*.
- 10.3.81. The woodland becomes increasingly scrubby in nature as it extends south and west, adjoining areas of dense and scattered scrub. Where the woodland becomes scrubbier in nature it is dominated by dense, leggy, semi-mature trees and shrubs within which Willows *Salix sp.*, Alder, Sycamore, Hawthorn, and Pedunculate Oak were recorded.
- 10.3.82. Woodland W4 forms part of the northern boundary of the Site and comprises a belt of semi mature trees and scrub, approximately 10m wide. It is dominated by mature Oak at its eastern end, with Grey Willow and Silver Birch increasing in frequency to the west, where the woodland becomes increasingly scrubby in nature. Hazel was recorded in the shrub layer, with the field layer comparable to TB4 (with which W4 is continuous).

Dense and Scattered Scrub

- 10.3.83. Extensive areas of scrub are present across the Site, both adjoining areas of established woodland and colonising within central areas of the Site. The area measurement for dense and scattered scrub totals 16.7 Ha. Scrub within the Site overwhelmingly comprises a limited range of common and widespread species, including frequent invasive species such as Buddleia.
- 10.3.84. The majority of scrub is of a similar age and structure, generally comprising early semi-mature woody vegetation, alongside frequent areas dominated by dense Bramble. Scrub succession is evident across the Site, with scrub encroachment evident in the majority of open, early successional habitats.

- 10.3.85. With the exception of where Bramble dominates, areas of scrub comprise a limited range of woody species, typically dominated by Silver Birch, Willows *Salix sp.*, within which Grey Willow dominates, Gorse and Buddleia. Also recorded, albeit less frequently, were Cotoneaster, Rhododendron, Rowan, Sycamore, Alder, Pedunculate Oak, Turkey Oak *Quercus cerris*, and Broom.
- 10.3.86. Ruderal vegetation fringes areas of denser scrub, particularly in the west of the Site, and includes for Horsetails, Bracken, Cock's Foot, Greater Willowherb *Epilobium hirsutum*, Hard Rush, Coltsfoot, Curled Dock, Foxglove and Phragmites,

Waterbodies/Ponds

- 10.3.87. The Site supports a large number of waterbodies, ranging from large reservoirs and lagoons to small ponds, the latter generally bi-products of previous ground investigation/remediation works within the Site. The area measurement for waterbodies/ponds totals at 4.75 Ha. The waterbodies present are described individually below.
- 10.3.88. Ponds P1 to P18 are located to the north of the railway and, with the exception of P9 and P10, comprise flooded and re-vegetating excavations arising from remediation related works undertaken up until 2015/2016.
- 10.3.89. P1 and 2 are small, shallow, adjacent dry basins, which support water on an ephemeral basis. Bare ground, predominated with Common Club Rush, Soft Rush, Water Plantain, and Common Spiked Rush *Eleocharis palustris* all sparsely recorded. Otherwise, this habitat supported communities comparable to recolonising ground within the Site.
- 10.3.90. P3 is a permanently wet, steep banked, square pond measuring approximately 10m x 10m. Aquatic vegetation includes for Water Plantain and Broad-leaved Pondweed.
- 10.3.91. P4 is a shallow, wet, rectangular pool measuring approximately 15m x 15m. It supports Typha, Common Club Rush, Water Plantain.
- 10.3.92. P5 is comparable to P1 and P2, comprising an ephemeral basin which remains dry for most of the year.
- 10.3.93. P6 is an ephemeral basin, with relatively steep banks, which dries in the early spring. On account of its ephemeral nature it is largely bare of vegetation.
- 10.3.94. P7 is an artificial, plastic lined pit which appears to receive run-off from an adjacent plastic lined (dry) basin. It is likely to support water on a permanent basis, with turbid water recorded as present during all Site visits. On account of its plastic lining, it supports no aquatic vegetation. It is bordered by scrub.
- 10.3.95. P8 comprises a 2m deep basin which appears to be seasonally wet but was dry in May 2020 and again in spring 2021. The basin primarily supported Water Plantain, Typha, Common Club Rush, Brooklime *Veronica beccabunga*, and Jointed Rush, alongside Hard and Soft Rush. Common Male Fern and Hart's-tongue were locally present in an associated walled bank. Additionally, scattered examples of Southern Marsh Orchid were present in the eastern edge of the basin, which is shallower in nature.

- 10.3.96. P9 and P10 comprise two large, identical concrete basins, each measuring approximately 2000m², and providing a former function as API interceptors for the off-site North Site Reservoir. These two basins are generally devoid of aquatic vegetation, albeit with some localised Bulrush *Schoenoplectus lacustris* present at the margins.
- 10.3.97. P11 is a small deep waterbody with almost vertical banks. Aquatic vegetation is limited to Broad-leaved Pondweed, with Bulrush and Hairy Sedge at the margins.
- 10.3.98. P12 lacks any discernible basin and comprises an area of low ground that remains inundated with a shallow depth of water (<10cm) throughout the early spring but is dry in summer months. It supports a modest range of rush and sedge species, as reflective of wetland habitats elsewhere on Site (see RG1 above).
- 10.3.99. P13 comprises a large, deep pond measuring approximately 1,500m². It is fringed by steep, scrubby banks, and supports limited aquatic vegetation, including for occasional Broad-leaved Pondweed and, rarely, charophytes.
- 10.3.100. P14, similar to P13, comprises a steep sided excavated pond measuring approximately 6m x 15m. It supports clear water to an approximate depth of 2m. Aquatic vegetation present included for Broad-leaved Pondweed and Water Plantain, allowing for approximately 30% vegetation cover. Bulrush was recorded at the margins.
- 10.3.101. P15 comprises a large, steep sided and turbid pond, measuring approximately 300m². It supports extensive Typha, with Coltsfoot, Soft Rush, Willows, Common Spike Rush at the margins, but no true aquatic vegetation present. The basin becomes shallow, dry and increasingly scrubby in nature as it extends west. At its dry, western end, the basin is continuous with P13, detailed separately above.
- 10.3.102. P16 is a small, excavated pit measuring approximately 2.5m x 4m, with a maximum depth of 1m. The pool is dominated by Thread Leaved Water Crowfoot *Ranunculus trichophyllus*.
- 10.3.103. P17 comprises a large, steep banked waterbody of unknown depth. It supported turbid water and limited aquatic or marginal vegetation, predominantly Typha.
- 10.3.104. P18 is a shallow, polluted depression, remaining from previous building demolition. It supports water on an ephemeral basis and is dry for much of the year. The basin is dominated by Typha, with invading scrub apparent.
- 10.3.105. P19 is an ephemeral depression which remains dry during a majority of the year and lacks any associated vegetation.
- 10.3.106. P20 is an artificial, concrete walled flood feature, remaining from the Site's previous use as an oil refinery, which has become flooded (unknown depth to several metres). It is unvegetated.
- 10.3.107. P21 comprises a series of interconnected, brick walled basins which are understood to have previously functioned as an oil interceptor. It supported vertical brick walls and turbid water, with no aquatic vegetation recorded.

- 10.3.108. South Site Reservoir comprises a large reservoir in the north-west of the Site. It has steep banks with dense boundary woodland and scrub generally restricting access. As a result of the steep bank gradients emergent vegetation is limited, with a narrow margin of Bulrush covering approximately 40% of the margins. Aquatic vegetation is limited to Broad-leaved Pondweed covering approximately 25% of the surface.
- 10.3.109. PA is off-site and located within the Crymlyn Bog SAC/Ramsar/SSSI. It is a shallow, seasonally inundated basin with approximately 20cm of standing water in the spring months. It has a surface area of approximately 220m².
- 10.3.110. PB is a steep sided, trench supporting clear water to a depth of approximately 2m. It has a surface of approximately 60m². It supports a modest range of aquatic vegetation, reflective of that recorded elsewhere within the Site.
- 10.3.111. PC is a steep sided, artificial ditch understood to be utilised in on-going Site remediation. It is comparable to PD below, with turbid, polluted water. It has a surface area of approximately 170m².
- 10.3.112. PD comprises a 4m wide, steep sided ditch which extends for approximately 240m in length. It is understood to provide a function in on-going Site remediation, and supports heavily polluted and turbid water, with oils and hydrocarbons evident. The ditch was largely devoid of vegetation, albeit occasional Typha and Common Reed was noted.
- 10.3.113. PE is an excavated pit utilised for remediation. It supports heavily contaminated and turbid water with no aquatic vegetation. It is approximately 380m² in surface area.

Coed Darcy Wetlands

- 10.3.114. South Bay comprises a large waterbody (approximately 4,200m²) of unknown depth. It is densely vegetated with scrub and trees at its perimeter. Aquatic vegetation including Broad-leaved Pondweed and Arrowhead *Sagittaria* accounts for approximately 20% of the surface area, with narrow margins colonised by Typha and Common Reed.
- 10.3.115. Crymlyn Lagoon East comprises a large waterbody (approximately 7,200m²) of unknown depth. It is densely vegetated with scrub and trees at much of its perimeter. Aquatic vegetation including Broad-leaved Pondweed accounts for approximately 25% of the surface area, with margins colonised by extensive emergent vegetation including *Typha latifolia*, *Scirpus* sp. and Common Reed.
- 10.3.116. Crymlyn Lagoon West comprises a large waterbody (approximately 11,000m²) of unknown depth, with aquatic and marginal vegetation as per to Crymlyn Lagoon East, with dense scrub and trees at much of its perimeter.
- 10.3.117. West Bay comprises a waterbody (approximately 1,400m²) of unknown depth, with aquatic and marginal vegetation as per to Crymlyn Lagoon East, with dense scrub and trees at much of its perimeter.

Ditches

- 10.3.118. Occasional wet ditches are present within the Site. The total measurements for ditches totals approximately 2.19 Km. For the most part these comprise narrow, steep banked features which are understood to have been excavated as part of previous remediation works. Most ditches appear to form a role in temporary surface water attenuation, holding seasonal flowing water and remaining dry for much of the year. In most instances, the ditches support vegetation comparable to that present in adjacent habitats, albeit with an increased prevalence of species tolerant of damp conditions.
- 10.3.119. Two ditches within the Site have established to support an assemblage of wetland plants and these are described individually below.
- 10.3.120. Ditch D1 is located to the west of the Site. It is understood to be seasonally wet, and was noted to be predominantly dry in June 2020, and again in July 2021. It is approximately 1m wide, and is overshadowed by scrub for the majority of its length. Species recorded as associated with this feature included frequent Great Willowherb, Typha, Bulrush, Hard Rush and Soft Rush. Locally recorded were Lesser Water-plantain, Water Horsetail, Club Rush sp., Horsetail sp., Common Spiked Rush. Ragged Robin *Silene flos-cuculi* and Southern Marsh Orchid were rarely recorded.
- 10.3.121. Ditch D2 runs along the south-western boundary of the Site and is considered likely to remain wet for a majority of the year, with flowing water recorded in July 2021. The ditch varies in width between 1m to 2m, and supports steep banks in excess of 1.5m for most of its length, albeit with lower banks to the west. Flora associated with this ditch was comparable to that within the adjacent wet grassland (see WG1 above), albeit with a higher proportion of the more damp tolerant species such as Phragmites, Typha, Purple Loosestrife, Sharp-flowered Rush, Yellow Loosestrife and Yellow Flag Iris.

Rush Pasture

- 10.3.122. An area of Rush pasture, dominated by Hard Rush and Yorkshire Fog is present to the north of RV3, adjoining the boundary cliff/rock face. The area measurement for Rush pasture totals 0.34 Ha. Also present in this area was frequent Horsetail and Common Fleabane, alongside occasional Common Spike Rush.

Exposed Rock/Cliff

- 10.3.123. Areas of exposed rock, both in the form of vertical cliff and horizontal plateaus are present to the south and east of the Phase 1 development. The area measurement for exposed rock/cliff totals 0.43 Ha. These habitats are generally unvegetated, with only occasional examples of Wild Strawberry, Bramble, sapling Willows *Salix* sp. Birch, Sycamore, and Buddleia present, alongside rare examples of Hart's-tongue Fern and Common Male Fern.
- 10.3.124. Localised areas of ruderal regrowth, comparable to the communities within RV3, are apparent where incidental areas of sub-soil have accumulated on ledges.

Railway Embankment

- 10.3.125. The Swansea District Line extends east-west across the Site, delineating the northern portion of the Site. The associated railway embankments sit primarily outside the Site boundary, save for a single point of proposed access.
- 10.3.126. The embankments comprise steep, well vegetated banks, within which semi-mature trees and mature shrubs dominate, alongside pockets of ruderal vegetation. Similar to boundary vegetation elsewhere on Site, Grey Willow, Sycamore and Birch typically dominate, with Buddleia also frequent. Occasionally recorded are Pedunculate Oak, Gorse, and Alder.
- 10.3.127. The composition of ruderal vegetation is comparable to that recorded in adjacent scrub and woodland habitats elsewhere within the Site.

Tree Belts/Lines

- 10.3.128. A series of four tree belts are present in the north of the Site, surrounding the grazed grassland fields. The total length of Tree Belts/Lines is 0.67 Km.
- 10.3.129. TB1 comprises a line of mature, well-spaced trees dominated by mature Pedunculate Oak. The southern half of the tree belt supports a shallow dry ditch and bank. Hazel is occasionally recorded in the form of old coppice stools, whilst Grey Willow, Silver Birch, and Hawthorn are present primarily to the western edge, and are associated primarily with adjacent scrub. The field layer of TB1 is dominated by Bracken, Bramble, and Native Bluebell are *Hyacinthoides non-scripta*, whilst Foxglove, Common Nettle, Cleavers *Galium aparine*, and Broad Buckler Fern are also occasionally present.
- 10.3.130. TB2 comprises a sparse line of mature Pedunculate Oak trees on a bank, with significant gaps between specimens. Mature Hawthorn is rarely recorded, with Bramble and Bracken frequent.
- 10.3.131. TB3 comprises a line of Hazel and Pedunculate Oak, with Common Nettle, Bramble, and Bracken frequent in the understorey.
- 10.3.132. TB4 is continuous with W4 and comprises a belt of predominantly Mature Oak trees on a raised bank at the northern boundary of the Site. Sycamore is occasional, with Ash *Fraxinus* rare. The shrub layer includes for occasional Hazel, Hawthorn, and Bramble. Broad Buckler Fern and Ivy form the field layer. An area of Rhododendron and Bramble scrub present to north of TB4 (off-site), with extensive Common Nettle present.

Amenity Grass

- 10.3.133. A well maintained bowls green is present in the north-east of the Site and appears to be in active use and actively managed. The area measurement for Amenity grass totals 7.7Km. It supports a small area of amenity grassland which is of no significant ecological value.

Amenity Planting

- 10.3.134. Several small pockets of amenity planting are present within the Site, primarily associated with existing built form such as the Bowls Green or the existing industrial/employment premises within Darcy Business Park.
- 10.3.135. Areas of amenity planting typically support a modest range of mixed native and ornamental shrubs, and are subject to routine management for amenity purposes. Species present in these areas include for Willows *Salix* sp., Birches *Betula* sp., *Escallonia* sp., Dogwood *Cornus*, Pampas Grass *Cortaderia selloana* and Tutsan *Hypericum androsaemum*.

Buildings

- 10.3.136. Significant areas of built form are present within the Site, including existing development associated with Darcy Business Park and Contractors Yard, as well as occasional individual buildings and structures within the main body of the Site. The area measurement for buildings totals 1.27 Ha. The buildings within the Site are of negligible intrinsic ecological value.

Descriptions of existing development are provided below and are listed in order from north to south.

- 10.3.137. B1 is a former air raid shelter located within close proximity to the Bowling Green in the north-east of Site. It is of concrete construction with a small slot like opening to allow for light ingress. The central part of the roof structure is collapsed, with dense scrub vegetation occurring in much of this area. A cavity within the shelter consists of smooth concrete and brick lined walls and ceilings. The door has since rotted and is permanently open, allowing light and wind internally.
- 10.3.138. B2 appears to function as a club house for the outdoor bowls club. It comprises a modern pebble dashed, single storey building with a flat, shallow pitched metal roof. It has windows and doors present in the north-eastern aspect, and is in good overall condition, with no apparent features of potential value to faunal species.
- 10.3.139. B3 was in residential occupation until recently, comprises a two storey building with a pitched machine cut tile roof, and is in good condition with no notable cracks, gaps, or damage which could provide potential opportunities for faunal species.
- 10.3.140. B4 comprises a two storey brick building with a partially pitched, flat topped clay tile roof. It is utilised as office space, with PVC windows and doors at all aspects, and is in good external condition, albeit with a small number of lifted/misaligned roof tiles noted.
- 10.3.141. B5 adjoins B4 to the south, and is of similar construction. It comprises a three storey brick building with tall, multi-pitched clay tile roof, and windows at all aspects. The building appeared unoccupied as of August 2020. Externally, the building is in a good state of repair. Two artificial bat boxes were noted to be fitted on the eastern aspect of the building.
- 10.3.142. Building B6 comprises a small complex of adjoining single storey brick buildings. A proportion of the building complex supports a pitched, or partially pitched, roof with clay roof tiles, whilst other areas

support a flat roof. The building supports PVC windows at all aspects, and appears to be in good external condition with the exception of occasional missing roof tiles on the south-western aspect

- 10.3.143. B7 comprises a vacant, two storey brick constructed building with a concrete flat roof. It is in good exterior condition with no obvious cracks, gaps, or damage, and windows and doors well fixed.

Contractors Yard

- 10.3.144. Contractors Yard comprises an industrial yard which supports a series of pre-fabricated buildings and structures, predominantly of brick and/or corrugated sheet metal construction. A description of the buildings/structures present is provided below.

- 10.3.145. B8 is a large, corrugated metal and brick building with an asbestos sheet roof. It is actively used as a workshop, and supports frosted glass walls and roof lights.

- 10.3.146. B9, B12, B14 to B19 and B21 to B24 each comprise corrugated metal shed structures of varying size.

- 10.3.147. B10 comprises a two storey porta cabin stack utilised as office space.

- 10.3.148. B11 and B13 comprise brick and sheet metal structures, with adjoining car park space.

- 10.3.149. B20 comprises a small, single storey, flat roofed brick structure with glass windows and no door. It is in poor condition, with previous fire damage and vandalism evident.

- 10.3.150. B21 comprises a cluster of adjoining wood panel and corrugated metal sheds, some of which are open sided, and others enclosed. Solar panelling is present on the roof space.

- 10.3.151. A mitigation bat house (B22), comprising a two storey building with rendered walls and no windows is present at the western boundary of the Site, within woodland W1. The house, which supports a pitched slate roof, was created as a mitigation roost to facilitate previous demolition works on Site, as part of the outline planning consent (bat licence ref: BAT/2234/WAG/IND). This building is to be retained unimpacted as part of the Development Proposals.

- 10.3.152. In addition to the buildings listed above, several temporary office/compounds are present in the form of port-a-cabins and/or metal shipping containers. These remain in active use as Site compounds for on-going remediation works and construction storage.

Sealed (Metalled) Hardstanding

- 10.3.153. Extensive areas of hardstanding are present across the Site, ranging from metalled road surfaces and car parking, such as associated with Llandarcy Business Park, to areas of crushed aggregate or tarmac, the latter forming the majority of vehicle tracks and car parking areas within the main body of the Site, as well as within Contractors Yard. The area measurement for Sealed (Metalled) Hardstanding totals 7.85 Ha.

- 10.3.154. Areas of sealed hardstanding are devoid of semi-natural vegetation.

Unsealed Hardstanding

- 10.3.155. As above, areas of crushed concrete/tarmac, as well as degraded hardstanding, are present within the Site, and generally support scant recolonising vegetation. The area measurement for Unsealed hardstanding totals 7.85 Ha.
- 10.3.156. Areas of hardstanding associated with active industrial and employment areas (Llandarcy Business Park and Contractors Yard) lack any significant vegetative growth and are of no ecological interest.
- 10.3.157. Equally, where areas of hardstanding are either degraded or unmetalled, these remain generally unvegetated. However, localised areas, subject to less recent or less intensive use, have become sparsely colonised with flora comparable to areas of recolonising vegetation described above. Typically, this assemblage includes for Ragwort, Oxeye Daisy, Horsetails. Lesser Trefoil, Wild Carrot, Evening Primrose, Red Clover, Common Fleabane, Tufted Vetch, Coltsfoot, Bird's-foot Trefoil, Creeping Thistle, Selfheal, Rough Hawksbit and Perforate St John's Wort. Occasional pockets of rougher grassland are present in marginal areas, with Cocksfoot, Yorkshire Fog, and False Oat Grass frequent, as well as scattered immature scrub comprising Willows, Birch, and Buddleia.

Notable Species

- 10.3.158. No Priority Species listed in Section 7 of the Environment (Wales) Act were recorded within the Site.

Invasive Species

- 10.3.159. A stand of Japanese Knotweed, a non-native species listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as Amended), was recorded within a recolonising rubble pile in the north-east of the Site. The location of this stand is identified on Figure 10.2.
- 10.3.160. Other non-native species recorded within the Site include for extensive Buddleia, localised Cotoneaster, Rhododendron, and Canadian Fleabane.

Desk Study

- 10.3.161. The desk study information collected from SEWBRc returned a total of 2,913 records for plants within a 2km radius of the Site boundary. A significant portion of these species are associated with Crymlyn Bog SSSI, situated adjacent to the west of the Site. Many LBAP species are recorded, such as Slender Cottongrass and Tufted Sedge *Carex elata* both recorded in Crymlyn Bog, approximately 730m from the Site boundary, in 2020.
- 10.3.162. Other species of note are Bee Orchids *Ophrys apifera*, the closest of which was recorded on Site in 2001, and most recently 1.4km away, in 2020. There are 7 records of notable species (LBAP or WCA Schedule 8) recorded on Site including Bluebell and Blunt-flowered Rush *Juncus subnodulosus*, all recorded in 2001.
- 10.3.163. Information received from SEWBRc returned 477 records of invasive species, including seven records within the Site. Three of these records relate to Rhododendron, and date from 2001. In addition, two records of Japanese Knotweed were returned, with the most recent dating from 2019, located in the

south-east of the Site within the Contractors Yard industrial estate. A single Himalayan Honeysuckle record was also returned from this location and date.

- 10.3.164. A single record of New Zealand Willowherb *Epilobium brunnescens* was returned and relates to a location in the north of the Site, and dates from 2006.

Wildlife Use of the Site

- 10.3.165. General observations were made during the surveys of any faunal use of the Site, with attention paid to the potential presence of protected faunal species. Ecology Solutions also undertook specific surveys with regard to Badgers, bats, reptiles, breeding birds, invertebrates, Dormouse and GCN.

Badger

- 10.3.166. Specific surveys for Badgers were undertaken as part of the habitat survey work by Ecology Solutions between 2020 and 2021.
- 10.3.167. No evidence of Badgers has been recorded during the extensive survey work undertaken at the Site between 2020 and 2021. However, suitable foraging and sett building habitat is present in the form of areas of woodland, scrub, and more established areas of grassland. It is noted that some areas of dense woodland and/or scrub which have colonised on steep gradients were inaccessible and could feasibly support unrecorded setts. Nonetheless, noting the lack of any Badger activity recorded during nocturnal survey work, as well as an absence of mammal paths, latrines, or foraging signs, it is deemed unlikely the Site is of potential significance to this faunal group.
- 10.3.168. Evidence of active Badger setts was recorded in the wider Coed Darcy Site, albeit at locations significantly distanced from the site boundary (>500m south) by both Ecology Solutions and Atkins.
- 10.3.169. Information received from SEWBRc returned 26 records of Badger dating from 1977 to 2016. A single record was returned for the Site, located in the north of the Site, close to North Site Reservoir, dating from 2002. A further five records of Badger were returned within the wider study area, predominantly within the Jersey Marine SINC woodland to the south-east, and date from 2002. A single record was returned relating to a location within the wider study area, located to the west of South Site Reservoir, dating from 2002. Two records were also returned for an area within the wider study area, they relate to a location in the far south of the wider study area, and date from 2004 and 2005. The most recent record relates to a location approximately 1.1km south-east of the Site at its closest point, and dates from 2017.

Bats

- 10.3.170. Roosting (Buildings). None of the buildings within the Site, which are likely to be subject to direct or indirect impacts, support roosting bats. Indeed, with the exception of B3 to B6 as well as the mitigation bat house (B22), the buildings within the Site are unsuitable to support roosting bats on account of their construction.
- 10.3.171. Regarding B1, the partial collapse of the roof has resulted in just a single enclosed internal space remaining. Moreover this 'room' supports an open (rotted) doorway resulting in significant exposure to the elements and fluctuating internal conditions. Moreover, internally the building supports smooth

concrete walls and ceiling surfaces, with no potential cracks or crevices which would offer potential roosting opportunities. On this basis, the building is assessed as being of very low value to roosting bats. Moreover, a full inspection of this building recorded no past or present evidence of roosting bats.

- 10.3.172. Building B3 is deemed to be of low roosting suitability, with no obvious cracks, gaps, or crevices noted, and the tile roof is in good condition. B4 to B6 are each considered to be of low to moderate suitability, primarily on account of supporting occasional slipped/damaged roof tiles. In addition, B5 was noted to support several externally fitted bat boxes, offering further roosting opportunities.
- 10.3.173. Noting their potential suitability, buildings B3 and B4 to B6 were subject to a suite of bat surveys in accordance with best practice methodologies. These surveys included for the completion of a single emergence survey of B3, in addition to two surveys (one dusk and one dawn) of buildings B4 to B6 (as detailed in Table 10.2 above).
- 10.3.174. No evidence of roosting bats was recorded during the course of these surveys and, as such, the buildings are not considered to support roosting bats.
- 10.3.175. For clarity, no evidence of roosting was recorded as associated with the bat boxes installed on B5. Given the height of these features, it was not possible to undertake additional bat box inspections.
- 10.3.176. Roosting (Trees). In addition, a vast majority of trees/woodland, with potential to be impacted by the emerging proposals, comprise generally semi-mature and early specimens which have not developed features of potential suitability for roosting bats. However, a small number of trees proposed for removal in the north-east of the Site are deemed to be suitable to support roosting bats. With the exception of T1 and T2, these trees were assessed (via a ground based inspection) as of low bat roosting potential on account of the presence of features such as exposed, open cracks in branched deadwood. Initial ground based assessment of these trees did not record any evidence of use by bats (such as staining, droppings or scratch marks).
- 10.3.177. Noting the presence of potentially higher value features, T1 and T2 were subject to further survey effort in the form of a tree climbing survey in September 2021.
- 10.3.178. T1 was identified to support a large open cavity in its trunk, with this significantly exposed and deemed of very low suitability for roosting bats. In addition, it supports two woodpecker *Picidae*/squirrel *Sciuridae* holes on its southern aspect, in addition to a small rot hole (callus roll). Whilst these latter three features were deemed suitable to support bats, no evidence of past or present roosting was identified.
- 10.3.179. Regarding T2, a single feature assessed of potential value at ground level (callus roll leading to potential cavity) was identified to be blunt ended and unsuitable for roosting through the internal inspection.
- 10.3.180. It is noted some areas of the woodland with the potential to be impacted, namely W1, are partially inaccessible on account of dense vegetation cover and steep banks/gradients. As above, these woodland areas support trees that are generally semi-mature or early mature in nature, with the woodland habitat overall deemed to be of low potential value for roosting. Moreover, no evidence of suitable bat roost features was confirmed during the completion of ground based inspections of accessible habitat areas between 2020 and 2021.

- 10.3.181. Notwithstanding this, it is proposed, on a precautionary basis, that where detailed design necessitates localised impacts to woodland, further inspections would be undertaken prior to their removal. If deemed appropriate, this would include for the completion of tree climbing surveys and/or emergence/re-entry surveys. This is considered in more detail in later Sections of this Chapter.
- 10.3.182. Suitable areas for foraging and commuting bats were identified within the Site and the wider study area during habitat survey works undertaken by Ecology Solutions in 2020. To ascertain the use of the Site by foraging and dispersing bats the Site was subject to activity transects and static automated surveys in accordance with survey guidelines (see Section 10.2 of this Chapter). These monthly surveys commenced in June 2020 and concluded in October 2020, the results of which are summarised below.
- 10.3.183. Transect surveys. The results of the transect surveys are summarised below. Although the exact route of each transect varied between surveys, it was ensured the entirety of the Site was covered during the course of the survey work, with this including all linear features. A representative route covered by the transect surveys is shown on Figure 10.3. It is noted, in accordance with the instruction at that time, these surveys assessed the wider Coed Darcy Site (including the Site), as opposed to the Site specifically. Given the comparable habitats present within the wider Coed Darcy Site, and their close proximity to the Site, this data is considered to provide useful context and so is included within this Assessment.
- 10.3.184. The transect surveys undertaken on 24 and 25 June 2020 recorded a low number of registrations, with the majority of registrations associated to Common Pipistrelle *Pipistrellus pipistrellus* (306 registrations) and Soprano Pipistrelle *Pipistrellus pygmaeus* (161 registrations), and the main activity focused along the north-east of the Site associated with the hedgerows and the treeline north of the railway. In addition, increased activity was associated with north-west and west boundaries in the wider study area. Heightened activity is primarily associated with linear features and substantial waterbodies such as the North and South Site Reservoirs. Bat activity was considerably lower in areas of bare ground. Other species recorded include Nathusius' Pipistrelle *Pipistrellus nathusii* (11 registrations), Noctule *Nyctalus noctula* species (56 registrations) and Myotis species (28 registrations), albeit at much lower numbers.
- 10.3.185. The transect surveys undertaken on 29 July 2020 recorded a low number of registrations, with the majority of registrations associated with Common Pipistrelle (290 registrations) and Soprano Pipistrelle (153 registrations), again with the main activity focused along the north-east of the Site associated with the hedgerows and treeline north of the railway. Increased activity was found within the wider study area, particularly to the south of the South Site Reservoir, and in the south-east of the wider study area associated with South Bay waterbody. Bat activity was again considerably lower in areas of bare ground. Other species recorded include Nathusius' Pipistrelle (1 registration), Noctule species (3 registrations), Myotis species (20 registrations), Brown Long-eared Bat *Plecotus auritus* (4 registrations), and Lesser Horseshoe Bat *Rhinolophus hipposideros* (1 registration).
- 10.3.186. The transect surveys undertaken on 21 August 2020 recorded a very low number of registrations, with a majority of registrations again associated with Common Pipistrelle (102 registrations) and Soprano Pipistrelle (88 registrations), and the majority of the activity focused in the north-west of the Site associated with the hedgerows to the north of the railway. A higher level of activity was also recorded along the main access route to the west of the wider study area. Bat activity was again considerably

lower in areas of bare ground. Other species recorded include Nathusius' Pipistrelle (1 registration), Serotine (1 registration), Noctule species (4 registrations) and Myotis species (8 registrations).

- 10.3.187. The transect surveys undertaken on 29 September 2020 recorded a low number of registrations, with a majority of registrations again associated with Common Pipistrelle (375 registrations) and Soprano Pipistrelle (144 registrations). Bat activity was focused in the north-west of the Site, associated with the linear vegetation to the north of the railway. A higher level of activity was also recorded around W2 in the south-west of the Site, and in the far south of the wider study area associated with hedgerows and woodland. Bat activity was again considerably lower in areas of bare ground. Other species recorded include Nathusius' Pipistrelle (1 registration), Noctule species (30 registrations), Myotis species (23 registrations) and Brown Long-eared Bat (2 registrations).
- 10.3.188. The final transect survey undertaken on 15 October 2020 recorded a very low number of registrations, with a majority of the registrations again associated with Common Pipistrelle (82 registrations) and Soprano Pipistrelle (80 registrations), and a majority of the activity focused in the north of the Site associated with scrub features to the south of the site reservoir, balancing ponds, and the railway bridge. A higher level of activity was also recorded around W2. Bat activity was again considerably lower in areas of bare ground. Other species recorded include Noctule species (1 registration), Myotis species (2 registrations) and Lesser Horseshoe Bat (1 registration).
- 10.3.189. Static surveys. As stated above, static detectors were deployed at strategic locations across the Site (as well as across the wider Coed Darcy Site) to supplement the results from the transect work, and to collect bat data over extended periods on an approximately monthly basis. Table 10.4 identifies weather conditions for the static surveys. The locations of static detectors are provided on Figure 10.3. A written summary of the findings is provided below.
- 10.3.190. Static survey: 24 June 2020 to 30 June 2020. Static detector SD1, located in the north-east of the Site, north of the railway, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (75 registrations) and Soprano Pipistrelle (18 registrations). Noctule species (9 registrations), and Myotis species (2 registrations) were all recorded in low numbers.
- 10.3.191. Static detector SD2 located in the north-west of the Site, just south of the railway, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (134 registrations) and Soprano Pipistrelle (29 registrations). Nathusius' Pipistrelle (1 registration), Noctule species (8 registrations), Myotis species (8 registrations) and Brown Long-eared Bat (6 registrations) were all recorded in low numbers.
- 10.3.192. Static detector SD3 located in the south-east of the Site, north of the Contractors Yard industrial estate, recorded a moderate level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread bat species. The highest levels of activity pertained to Common Pipistrelle (4639 registrations) and Soprano Pipistrelle (665 registrations). Nathusius' Pipistrelle (39 registrations), Noctule species (27 registrations), Myotis species (186 registrations), Brown Long-eared Bat (4 registrations), Lesser Horseshoe Bat (1 registration) and Serotine *Eptesicus serotinus* (1 registration) were all recorded in low numbers.

- 10.3.193. Static detector SD4 located in the south-west of the wider study area, to the west of South Bay, recorded a low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (303 registrations) and Soprano Pipistrelle (218 registrations). Nathusius' Pipistrelle (1 registration), Noctule species (85 registrations), Myotis species (16 registrations), and Brown Long-eared Bat (2 registrations) were all recorded in low numbers.
- 10.3.194. Static detector SD5 located in the far south of the wider study area recorded a moderate level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (712 registrations) and Soprano Pipistrelle (483 registrations). Nathusius' Pipistrelle (11 registration), Noctule species (17 registrations), Myotis species (68 registrations), Brown Long-eared Bat (39 registrations) and Serotine (1 registration) were all recorded in low numbers.
- 10.3.195. Static detector SD6 located south of the Site, within the wider study area, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (125 registrations) and Soprano Pipistrelle (58 registrations). Noctule species (16 registrations), Myotis species (4 registrations) and Brown Long-eared Bat (5 registrations) and Lesser Horseshoe Bat (1 registration) were all recorded in low numbers.
- 10.3.196. Static Survey 30 July 2020 to 6 August 2020. Static detector SD7, located in the north-east of the Site, just south of North Site Reservoir, recorded a moderate level of bat activity over the 9 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (854 registrations) and Soprano Pipistrelle (591 registrations). Noctule species (43 registrations), Myotis species (50 registrations) and Brown Long-eared Bat (1 registration) were all recorded in low numbers.
- 10.3.197. Due to a mechanical fault, static detector SD8 failed to record any data. This was deployed in the east of the Site, close to the railway.
- 10.3.198. Static detector SD9, located in the north-west of the Site, just south of the railway, recorded a very low level of bat activity over the 9 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (73 registrations) and Soprano Pipistrelle (63 registrations). Noctule species (18 registrations), Myotis species (1 registration) and Lesser Horseshoe Bat (2 registrations) were all recorded in low numbers.
- 10.3.199. Static detector SD10, located in the south-west of the Site, to the east of the Crescent Woodland, recorded a moderate level of bat activity over the 9 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (4225 registrations) and Soprano Pipistrelle (942 registrations) as well as Myotis species (302 registrations). Nathusius' Pipistrelle (63 registrations), Noctule species (8 registrations) and Brown Long-eared Bat (5 registrations) were all recorded in low numbers.
- 10.3.200. Due to a mechanical fault, static detector SD11 failed to record any data. This was deployed in the west of the Site.

- 10.3.201. Static detector SD12, located in the south-west of the wider study area, recorded a low level of bat activity over the 9 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (421 registrations) and Myotis species (491 registrations). Soprano Pipistrelle (70 registrations), Nathusius' Pipistrelle (2 registrations), Noctule species (24 registrations) and Brown Long-eared Bat (6 registrations) were all recorded in low numbers.
- 10.3.202. Static detector SD13, located in the east of the wider study area, just south of the off-site industrial estate, recorded a low level of bat activity over the 9 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Myotis species (469 registrations), Common Pipistrelle (375 registrations) and Soprano Pipistrelle (325 registrations). Nathusius' Pipistrelle (10 registrations), Noctule species (4 registrations) and Brown Long-eared Bat (27 registrations) were all recorded in low numbers.
- 10.3.203. Static detector SD14, located in the south-east of the wider study area, recorded a moderate level of bat activity over the 9 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (829 registrations), Myotis species (433 registrations) and Soprano Pipistrelle (290 registrations). Nathusius' Pipistrelle (1 registration), Noctule species (14 registrations) and Brown Long-eared Bat (38 registrations) were all recorded in low numbers.
- 10.3.204. Static Survey August 2020 to 26 August 2020. Static detector SD15, located in the north of the Site, just south of the North Site Reservoir recorded a low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (122 registrations) and Soprano Pipistrelle (353 registrations). Noctule species (58 registrations) and Myotis species (7 registrations) were all recorded in low numbers.
- 10.3.205. Static detector SD16, located in the north of the Site, just north of the railway, recorded a low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (75 registrations) and Soprano Pipistrelle (56 registrations). Noctule species (5 registrations), Myotis species (19 registrations) and Lesser Horseshoe Bat (5 registrations) were all recorded in low numbers.
- 10.3.206. Static detector SD17, located in the west of the wider study area, adjacent to the main western access route, recorded a high level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (4261 registrations) and Soprano Pipistrelle (4590 registrations) and Myotis species (3244 registrations). Nathusius' Pipistrelle (33 registrations), Noctule species (27 registrations), Brown Long-eared Bat (23 registrations) and Lesser Horseshoe Bat (1 registration) were all recorded in low numbers.
- 10.3.207. Static detector SD18 located in the south-west of the Site just north of Contractors Yard Industrial Estate, recorded a low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (146 registrations) and Soprano Pipistrelle (228 registrations). Noctule species (5

registrations), *Myotis* species (5 registrations) and Brown Long-eared Bat (1 registration) were all recorded in low numbers.

- 10.3.208. Static detector SD19, located in the south-west of the wider study area, just south of the model village, recorded a moderate level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (1568 registrations) and Soprano Pipistrelle (445 registrations). Noctule species (11 registrations), *Myotis* species (90 registrations), Brown Long-eared Bat (6 registrations) and Serotine (1 registration) were all recorded in low numbers.
- 10.3.209. Static detector SD20, located in the south-west of the wider study area, recorded a very low level of bat activity over the 6 day period. All species were recorded at low numbers, consisting Common Pipistrelle (8 registrations), Soprano Pipistrelle (9 registrations), Noctule species (5 registrations) and *Myotis* species (1 registration).
- 10.3.210. Static detector SD21, located in the south-east of the wider study area, just south of the off-site industrial estate on the woodland fringe, recorded a moderate level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (1216 registrations) and Soprano Pipistrelle (156 registrations). Nathusius' Pipistrelle (1 registration), Noctule species (9 registrations), *Myotis* species (41 registrations), and Brown Long-eared Bat (5 registrations) were all recorded in low numbers.
- 10.3.211. Static detector SD22, located in the south of the wider study area close to the north to south access route, recorded a very low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (23 registrations) and Brown Long-eared Bat (37 registrations). Soprano Pipistrelle (9 registrations), Noctule species (6 registrations) and *Myotis* species (8 registrations) were all recorded in low numbers.
- 10.3.212. Static Survey 29 September 2020 to 4 October 2020. Static detector SD23, located in the north of the Site, just south of P9 and P10, recorded a very low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All the species were recorded at low numbers, consisting of Common Pipistrelle (11 registrations), Soprano Pipistrelle (9 registrations), Noctule species (2 registrations) and *Myotis* species (5 registration).
- 10.3.213. Static detector SD24, located in the north-east of the Site, within a hedgerow, recorded a very low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (59 registrations) and Soprano Pipistrelle (75 registrations). Brown Long-eared Bat (1 registration), Noctule species (1 registration) and *Myotis* species (20 registrations) were all recorded in low numbers.
- 10.3.214. Static detector SD25, located in the north-west of the Site, south-east of the South Site Reservoir, recorded a very low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All species were recorded at low numbers, and consisted Soprano Pipistrelle (2 registrations), Noctule species (1 registration) and *Myotis* species (2 registration).

- 10.3.215. Static detector SD26, located in the west of the wider study area, north-east of 'The Tip' area, recorded a moderate level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (1002 registrations), Soprano Pipistrelle (1323 registrations) and Myotis species (503 registrations). Noctule species (2 registrations) was recorded in low numbers.
- 10.3.216. Static detector SD27, located at the southern edge of the Site, to the south-west of W2, recorded a very low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (79 registrations) and Soprano Pipistrelle (75 registrations). Nathusius' Pipistrelle (2 registration), Noctule species (2 registrations) and Myotis species (5 registrations) were all recorded in low numbers.
- 10.3.217. Static detector SD28, located in the south of the wider study area, recorded a very low level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All the species were recorded at low numbers, consisting of Common Pipistrelle (17 registrations), Soprano Pipistrelle (26 registrations), Noctule species (1 registration), Myotis species (11 registration) and Brown Long-eared Bat (1 registration).
- 10.3.218. Static detector SD29, located in the south-east of the Site, within a tree belt/woodland recorded a moderate level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (693 registrations) and Soprano Pipistrelle (520 registrations). Nathusius' Pipistrelle (1 registration), Noctule species (4 registrations), Myotis species (133 registrations), Brown Long-eared Bat (9 registrations) and Lesser Horseshoe Bat (1 registration) were all recorded in low numbers.
- 10.3.219. Static detector SD30, located in the far south of the wider study area, recorded a moderate level of bat activity over the 6 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (745 registrations), Soprano Pipistrelle (934 registrations) and Myotis species (302 registrations). Nathusius' Pipistrelle (2 registrations), Noctule species (3 registrations), Lesser Horseshoe Bat (6 registrations) were all recorded in low numbers.
- 10.3.220. Static Survey 15 October 2020 to 21 October 2020. Static detector SD31, located in the north of the Site, close to the balancing lakes, south of North Site Reservoir, recorded a low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (106 registrations) and Soprano Pipistrelle (115 registrations). Brown Long-eared Bat (1 registration), Noctule species (21 registrations) and Myotis species (17 registrations) were all recorded in low numbers.
- 10.3.221. Static detector SD32, located in the east of the Site, just north of the railway, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (69 registrations) and Soprano Pipistrelle (23 registrations). Myotis species (7 registrations) was recorded in low numbers

- 10.3.222. Static detector SD33, located in the west of the wider study area, close to the main access route, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (83 registrations) and Soprano Pipistrelle (72 registrations). Brown Long-eared Bat (2 registrations), Noctule species (17 registrations) and Myotis species (15 registrations) were all recorded in low numbers.
- 10.3.223. Static detector SD34, located in the south-west of the Site, close to W2, recorded a low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. The highest level of bat activity pertained to Common Pipistrelle (133 registrations) and Soprano Pipistrelle (123 registrations). Myotis species (30 registrations) was recorded in low numbers.
- 10.3.224. Static detector SD35, located in the west of the wider study area, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All species were recorded in low numbers, consisting of Common Pipistrelle (6 registrations), Soprano Pipistrelle (7 registrations), Brown Long-eared Bat (2 registrations), Noctule species (6 registrations) and Myotis species (10 registrations).
- 10.3.225. Static detector SD36, located in the south-west of the wider study area, also recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All species were recorded in low numbers, consisting of Common Pipistrelle (1 registration), Brown Long-eared Bat (1 registration), Noctule species (4 registrations) and Myotis species (4 registrations).
- 10.3.226. Static detector SD37, located in the south-east of the wider study area, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All species were recorded in low numbers, consisting of Common Pipistrelle (9 registrations), Soprano Pipistrelle (14 registrations), Brown Long-eared Bat (2 registrations), Noctule species (1 registration) and Myotis species (39 registrations).
- 10.3.227. Static detector SD38, located to the south of the wider study area, within a line of scrub, recorded a very low level of bat activity over the 7 day period. As per the transect surveys, bat activity was largely dominated by common and widespread species. All species were recorded in low numbers, consisting of Common Pipistrelle (2 registrations), Soprano Pipistrelle (2 registrations), Brown Long-eared Bat (1 registration), Noctule species (1 registration) and Myotis species (6 registrations).
- 10.3.228. Summary. No bat roosts were identified within the Site during the course of the survey work undertaken.
- 10.3.229. Bat activity surveys have confirmed the Site to be subject to a low level of activity, with this overwhelmingly pertaining to widespread and common bat species such as Common Pipistrelle and Soprano Pipistrelle.
- 10.3.230. Unsurprisingly relatively higher levels of bat activity are associated with linear features and woodland, including the Crescent Woodland, as well as within the larger waterbodies. Relatively higher levels of activity were also recorded along some of the wider study area's vegetated boundaries, particularly the

southern edge of the Site. Typically, low levels of bat activity were recorded within the sparser, open habitats elsewhere within the Site.

- 10.3.231. Information received from SEWBrEC returned several records of bat species within the Site. This includes a single record of a Long-eared bat species, an unknown bat species, and a Common Pipistrelle, relating to an area in the south of the Site, and dating between 2008 and 2009. In addition, a single record of Lesser Horseshoe Bat was returned, it relates to a location in the south of the Site, and dates from 2001. A record of a Common Pipistrelle was also returned from an area south of the North Site Reservoir, and dates from 2009. Within the wider study area a number of records were returned including Common Pipistrelle, Soprano Pipistrelle, an unknown bat species, Long-eared bat species, Noctule, Lesser Horseshoe, Daubenton's bat, Myotis species, and Brown Long-eared Bat, and date from 2001 to 2017. Notable is the record of a Lesser Horseshoe Bat roost located in the south-west of the wider study area, dating from 2001. These roosting features have since been demolished/mitigated for during previous works.

Reptiles

- 10.3.232. Extensive previous clearance works across the wider Coed Darcy Site (including the Site) resulted in the removal of a vast majority of suitable reptile habitat between 2008 and 2015. This clearance work (undertaken in support of the consented OPP) was supplemented by a considerable capture and translocation effort in regards reptiles (amongst other species). Noting this previous work, and whilst the Coed Darcy Site was previously known to support populations of all four common reptile species, it can be concluded the vast majority (if not all), of the Site was clear of reptiles as recently as 2015.
- 10.3.233. Subsequent to these works, suitable reptile habitat has gradually recolonised within the Site, namely within the south-western edge, in eastern areas, and to the north of the railway. This suitable habitat is considered recent in origin (with most habitats only attaining suitability within the last 3 to 4 years).
- 10.3.234. Given the on-going re-establishment of suitable habitat, and noting the potential for reptiles to re-colonise the Site from off-site habitats, (such as the railway embankment), or alternatively for potentially remnant (un-trapped) populations to re-establish, Ecology Solutions undertook reptile surveys from June 2021 to September 2021, in various locations (see Figure 10.4) within the Site and the wider study area, into the west of the Crescent Woodland. The results of the surveys can be seen in Table 10.11 below.

Table 10.11 – Dates, weather conditions and results for reptile surveys at the Site

Survey Number	Date	Temperature °C	Weather Conditions	Results*
1	22 June 2021	16	Clear	2UCL, 2MCL, 1FCL
2	30 June 2021	20**	50% Cloud	3UCL, 1FCL, 2JGS, 1UGS
3	13 July 2021	18	20% Cloud	2UCL, 4UGS

Survey Number	Date	Temperature °C	Weather Conditions	Results*
4	16 July 21	18	Clear	1UCL
5	12 August 21	14	75% Cloud	4UCL, 1JCL, 5UGS, 1JGS
6	31 August 2021	17	70% Cloud	7UCL, 8UGS, 3JGS
7	3 September 2021	16	10% Cloud	1UCL, 8UGS
8	15 September 2021	18	30% Cloud	8UCL, 1UGS
* MCL/FCL/JCL/UCL: Male/Female/Juvenile/Unsexed Common Lizard <i>Zootoca vivipara</i>. * MGS/FGS/JGS/UGS – Male / Female / Juvenile / Unsexed Grass Snake. ** Survey conditions sub-optimal				

- 10.3.235. As detailed in Table 10.11, the surveys undertaken have identified a peak count of 11 Grass Snakes and eight Common Lizard. No other reptile species have been recorded. It is noted, given the survey methodology utilised, these findings are reflective of a sample of the supported reptile populations associated with the habitats in question.
- 10.3.236. In order to ascertain the relative importance of common reptile populations recorded within the Site, the tinning density has been taken into account, alongside guidance and population size estimates set out by the Herpetofauna Groups of Britain and Ireland (HGBI). On this basis it can be concluded from the surveys that the population size for all reptiles found on Site is low.
- 10.3.237. The majority of Common Lizard observations were made adjacent the Crescent Woodland (W2) located in the south of the Site, and in close proximity to the north of the railway embankment (as shown on Figure 10.4) and adjacent to established scrub in the north of the Site. A majority of the Grass Snakes relate predominantly to the Crescent Woodland (W2), and the south of the railway embankment, located in the north-east of the Site. Three additional records of Grass Snake relate to north of the Site, west of the horse paddocks (G1). The results indicate populations may be re-establishing from pockets of retained (previously un-impacted) habitats within the Site, or otherwise from off-site habitats.
- 10.3.238. Information received from SEWBrEC returned no records of reptiles within the Site. Eight records of Grass Snake were returned from the far south of the wider study area, and date from 2004. The most recent record of a Grass Snake relates to a location approximately 2.3km south of the Site boundary at its closest point, and dates from 2018.
- 10.3.239. Three records of Common Lizard were returned within the far south of the wider study area, dating from 2004. The most recent record relates to a location approximately 1.3km south of the Site boundary, and dates from 2020.
- 10.3.240. A single record of an Adder *Vipera berus* was returned, relates to a location approximately 2.9km north of the Site boundary at its closest point, and dates from 2003. Three records of Slow Worm *Anguis fragilis* were returned. The closest record relates to a location approximately 0.6km north of the Site

boundary at its closest point, and dates from 2009. The most recent record relates to a location approximately 1.8km south-east of the Site boundary at its closest point, and dates from 2020.

- 10.3.241. It is noted that previous assessment work undertaken across the wider Coed Darcy landholding (including the Site) identified the presence of all four common reptile species.

Wintering Birds

- 10.3.242. Notwithstanding its size, the habitats present across a majority of the Site are deemed to be of low importance for wintering birds, and are considered unlikely to support populations of raised conservation significance. In addition, where areas of more suitable habitat are present (such as the South Site Reservoir, South Bay, and the larger waterbodies within the Coed Darcy GCN SINC), these are to be retained or (in the case of South Site Reservoir) modified to enhance their suitability for wintering assemblages.
- 10.3.243. In noting the Sites reduced suitability, regard is given to the high levels of disturbance experienced at the Site over a number of years, a lack of optimal foraging habitat and, moreover, the proximity of habitats of greater suitability in the immediate area. Reflecting the Site's low suitability, it was not deemed necessary for a suite of winter bird surveys to be undertaken.
- 10.3.244. Nonetheless, and at the request of NPTC Biodiversity Officers, a detailed desk based review has been undertaken in order supplement the above conclusion. Information was gathered from the following sources:
- Previous surveys undertaken by Parsons Brinckerhoff Limited at the Site in 2002;
 - Information collected from SEWBRcC.
- 10.3.245. In addition, efforts were made to obtain information from Barry Stewart (local WeBS recorder). However, no data was made available.
- 10.3.246. Previous specific wintering bird surveys were undertaken at the Site in 2002 by Parsons Brinckerhoff. During these surveys it was concluded there was potential for birds within the Site during the wintering period to be indirectly affected by the Proposed Development. It concluded the species recorded within the Site during these surveys spent the majority of their time outside the Site, within the adjacent Crymlyn Bog SAC/Ramsar/SSSI. The surveys concluded that, during the wintering period, species primarily utilised the Site for supplementary foraging areas. The surveys further concluded "*the refinery site is not of particular value as winter foraging habitat for important bird species from the cSAC [the Crymlyn Bog SAC]*". Where habitats were deemed of potentially heightened wintering interest, these were limited to wetland habitats. It is noted the larger existing waterbodies (i.e. of potentially heightened value for wintering birds) are to be retained or otherwise enhanced as part of the Proposed Development.
- 10.3.247. During the time these previous surveys were undertaken in 2002, the Site supported notably more established vegetation, not least extensive scrub, providing more substantial areas of suitable foraging habitat, particularly during the winter months. The extensive habitat clearance within intervening years resulted in the loss of a vast majority of semi-natural habitats and, whilst these are beginning to re-establish, these historic works have nonetheless tempered the Site's value for foraging birds during

winter periods. Noting the comparatively reduced value of the Site relative to historic surveys, and that those historic surveys in any event identified the Site to be of supplementary foraging value only, it is considered highly unlikely the Site is of any significant importance for wintering assemblages throughout the wintering months.

- 10.3.248. The desk study information collected from SEWBrEC returned a total of 1805 records of birds within a 2km radius of the site. Occasional records returned multiple numbers of birds attributed to the same record, therefore the total number of records returned does not necessarily indicate the full extent of the birds observed whilst collecting this data. This high number of records is no doubt a reflection of the considerable interest generated by the Coed Darcy Site over a number of years, with extensive on Site survey work undertaken. The number of records is further elevated by the Site's proximity to Crymlyn Bog designated sites complex.
- 10.3.249. Of the overall birds records, 409 of these were attributed to the winter months (November to February), with 154 of these recorded after 2010. Of these more recent records, four records were attributed to the site, these included three records of Kestrel *Falco tinnunculus* and one Lapwing, recorded in the northern section of the site.
- 10.3.250. A number of the 154 records post 2010 were associated with the Crymlyn Bog SAC, including one record each of Mistle Thrush *Turdus viscivorus*, Marsh Harrier *Circus aeruginosus*, Bittern *Botaurus lentiginosus* and Hen Harrier. With regards to these species, it is considered that the Site only supports suitable primary foraging and nesting habitat for Mistle Thrush. It is considered unlikely that the Site would be utilised by Marsh Harrier and Hen Harrier *Circus cyaneus* for anything other than occasional supplementary foraging, as the habitats within Crymlyn Bog are more suitable for these species primary foraging needs. With regards to Bittern, the habitats are sub-optimal for foraging and loafing and it is considered unlikely that this species utilises the Site.
- 10.3.251. Directly adjacent to the Site on the southern and eastern boundary exist single records of Cetti's Warbler, Green Woodpecker *Picus viridis* and Starling *Sturnus vulgaris* respectively. It is considered that the Site would offer a degree of suitable wintering habitat for these species, as it would for a range of scrub and woodland birds.
- 10.3.252. A range of additional species records were returned in the nearby area, including species which would likely make at least opportunistic use of the habitats within the Site. However, a review of these findings does not indicate the presence of assemblages or populations of note that would be reliant upon the Site, relative to other habitats in the local area.

Breeding Birds

- 10.3.253. Given the size of the Site and the presence of a range of habitats, a series of three breeding bird surveys were undertaken to assess the value of the Site. At the time of these surveys in 2020, Ecology Solutions was instructed to survey the wider Coed Darcy Site, as opposed to the Site specifically. As such, whilst specific consideration is given to the Site itself, the survey results for the wider area are provided for completeness. These surveys were undertaken in April, May and June 2020.

- 10.3.254. A total of 73 species of birds was recorded within the wider Coed Darcy Site during the three surveys, of which 53 were considered to be breeding or probably breeding (i.e. suitable habitat to support the species is present). The remaining 14 species were either breeding in adjacent habitats, recorded as migrants, flying over the Site, or were represented only by non-breeding individuals. Of the above species, 42 were considered to be breeding or probably breeding within the Site itself.
- 10.3.255. A summary of observations for each species is included in the systematic list in Table 10.12 below, whilst the distribution of breeding birds is shown in Figure 10.7.
- 10.3.256. These surveys confirmed both the Site and the wider Coed Darcy Site support a diverse breeding bird assemblage, primarily on account of their size and the range of habitats present.
- 10.3.257. The greatest interest was found across the open habitats where breeding species include good numbers of Lapwing, Ringed Plover, Little Ringed Plover, Skylark and Meadow Pipit *Anthus pratensis*, plus small numbers of Cuckoo *Cuculidae*, Tree Pipit *Anthus trivialis* and Linnet. With the exception of Little Ringed Plover (which is included in Schedule 1 of the 1981 Wildlife and Countryside Act) and the Amber listed Meadow Pipit, all these species are included on the RSPB Red List, having undergone major declines in their UK populations.
- 10.3.258. Most of these species occurred in the open grassland habitats in the south of the Coed Darcy area (predominantly beyond the Site boundary), with the noticeable exception of Ringed Plover which was nesting exclusively in the bare ground habitat of the cleared area of the Site. By its nature such habitat is ephemeral, and hence this species is taking advantage of conditions which are going to be relatively short-lived.
- 10.3.259. The woodland and scrub habitats across the wider Coed Darcy Site support a range of species typical of such habitat, including Red-listed Song Thrush, Mistle Thrush and Lesser Redpoll *Acanthis cabaret*, and Amber-listed Dunnock, Bullfinch and Willow Warbler, the latter occurring in notable abundance (and Garden Warbler *Sylvia borin* also relatively numerous). All these species remain generally common and widespread in both a local and national context.
- 10.3.260. The wetland habitats, located in the south-western edge of the Site (i.e. within Coed Darcy GCN SINC) also support an interesting assemblage, including Mallard *Anas platyrhynchos*, Tufted Duck *Aythya fuligula*, Little Grebe *Tachybaptus ruficollis*, Reed Bunting *Emberiza schoeniclus*, Cetti's Warbler, Sedge Warbler *Acrocephalus schoenobaenus* and Reed Warblers (with the Red-listed Grasshopper Warbler *Locustella naevia* just off-site). Mallard and Reed Bunting are Amber listed having undergone moderate declines, whilst Cetti's Warbler is a Schedule 1 species.
- 10.3.261. Species associated with buildings include Herring Gull *Larus argentatus*, Lesser Black-backed Gull *Larus fuscus*, House Martin *Delichon urbicum* and House Sparrow *Passer domesticus*, all of which are Red or Amber listed. Particularly pleasing was the thriving colony of House Martins on Llan Coed House, as so many breeding colonies have been lost.



Table 10.12 – Bird Species Recorded During Breeding Bird Surveys at Coed Darcy

Environmental Statement

Coed Darcy



Species and BTO species code	RSPB listed	Minimum No. pairs*	Notes
red-legged Partridge (RL) <i>Alectoris rufa</i>	Feral	3	In open habitats in the south.
Pheasant (PH) <i>Phasianus colchicus</i>	Feral	3	In the southern half.
Canada Goose (CG) <i>Branta canadensis</i>	Feral	1	On a pond in the south.
Greylag Goose (GJ) <i>Anser anser</i>	Feral	0	Flying over.
Mallard (MA) <i>Anas platyrhynchos</i>	Amber	0 to 2	On various waterbodies.
Tufted Duck (TU) <i>Aythya fuligula</i>		0 to 2	On the lake/pits.
Swift (SI) <i>Apus apus</i>	Amber	0	Flying over.
Cuckoo (CK) <i>Cuculus canorus</i>	Red	2	In the south.
Stock Dove (SD) <i>Columba oenas</i>	Amber	0	Recorded feeding in open areas.
Wood Pigeon (WP) <i>C. palumbus</i>		12	In woodland/scrub.
Collared Dove (CD) <i>Streptopelia decaocto</i>		2	Associated with buildings.
Moorhen (MH) <i>Gallinula chloropus</i>		1	On the lake.
Coot (CO) <i>Fulica atra</i>		2	On the lake/pits.

Environmental Statement

Coed Darcy



Species and BTO species code	RSPB listed	Minimum No. pairs*	Notes
Little Grebe (LG) <i>Tachybaptus ruficollis</i>		2	On the lake/pits.
Lapwing (L.) <i>Vanellus vanellus</i>	Red	5	In open habitats.
Ringed Plover (RP) <i>Charadrius hiaticula</i>	Red	6	All on bare ground in the northern half.
Little Ringed Plover (LP) <i>C. dubius</i>	Sch.1	4	In open habitats.
Herring Gull (HG) <i>Larus argentatus</i>	Red	1	On industrial buildings.
Lesser Black-backed Gull (LB)	Amber	6	On industrial buildings.
Cormorant (CA) <i>Phalacrocorax carbo</i>		0	Flying over.
Grey Heron (H.) <i>Ardea cinerea</i>		0	Flying over.
Buzzard (BZ) <i>Buteo buteo</i>		0-1	
Great Spotted Woodpecker (GS) <i>Dendrocopos major</i>		1	
Green Woodpecker (G.) <i>Picus viridis</i>		0-1	
Peregrine Falcon (PE)		0	One flew over in June.
Jay (J.) <i>Garrulus glandarius</i>		1	

Species and BTO species code	RSPB listed	Minimum No. pairs*	Notes
Magpie (MG) <i>Pica pica</i>		2	
Jackdaw (JD) <i>Corvus monedula</i>		0 to 1	In the industrial estate.
Carrion Crow (C.) <i>Corvus corone</i>		2	
Raven (RN) <i>Corvus corax</i>		0	Regularly flying over the southern area.
Coal Tit (CT) <i>Periparus ater</i>		0	Presumed dispersing bird, in June.
Blue Tit (BT) <i>Cyanistes caeruleus</i>		5	
Great Tit (GT) <i>Parus major</i>		2	
Skylark (S.)	Red	11	In open habitats.
Sand Martin (SM) <i>Riparia riparia</i>		0	Post-breeding birds, present in June.
Swallow (SL) <i>Hirundo rustica</i>		2	Associated with out-buildings.
House Martin (HM)	Amber	32	On Llan Coed House in the north-east.
Cetti's Warbler (CW)	Sch.1	6	Especially around the western wetland.
Long-tailed Tit (LT) <i>Aegithalos caudatus</i>		3	

Environmental Statement

Coed Darcy



Species and BTO species code	RSPB listed	Minimum No. pairs*	Notes
Willow Warbler (WW)	Amber	44	Abundant.
Chiffchaff (CC) <i>Phylloscopus collybita</i>		15	
Sedge Warbler (SW)		1	In the western wetland.
Reed Warbler (RW) A.		6	In the western wetland.
Grasshopper Warbler (GH)	Red	0	In the adjacent Crymlyn Bog.
Blackcap (BC) <i>Sylvia atricapilla</i>		15	In wooded areas.
Garden Warbler (GW) S.		10	In scrub throughout.
Lesser Whitethroat (LW) <i>Sylvia curruca</i>		0 to 3	Possibly migrants.
Whitethroat (WH) <i>Sylvia communis</i>		12	In scattered scrub.
Goldcrest (GC) <i>Regulus regulus</i>		3	
Wren (WR) <i>Troglodytes troglodytes</i>		23	In all vegetated areas.
Nuthatch (NH) <i>Sitta europaea</i>		1	In woodland.
Treecreeper (TC) <i>Certhia familiaris</i>		1	In woodland.
Starling (SG)	Red	0	Only recorded flying over.
Blackbird (B.) <i>Turdus merula</i>		11	

Species and BTO species code	RSPB listed	Minimum No. pairs*	Notes
Song Thrush (ST)	Red	11	
Mistle Thrush (M.)	Red	1	In the far south-east.
Robin (R.) <i>Erithacus rubecula</i>		11	
Stonechat (SC) <i>Saxicola rubicola</i>		4	In open or 'heathy' areas.
Wheatear (W.) <i>Oenanthe oenanthe</i>		0	Three migrants on the first visit.
House Sparrow (HS)	Red	2+	Associated with buildings.
Dunnock (D.)	Amber	17	
Pied Wagtail (PW) <i>Motacilla alba</i>		2	
Meadow Pipit (MP)	Amber	12	Numerous in open habitats.
Tree Pipit (TP) <i>A. trivialis</i>	Red	1 to 2	
Chaffinch (CH) <i>Fringilla coelebs</i>		3	All in peripheral woodland.
Bullfinch (BF) <i>Pyrrhula pyrrhula</i>	Amber	5	In scrub.
Greenfinch (GR) <i>Carduelis chloris</i>		4	
Linnet (LI)	Red	3	In open habitats in the south.
Lesser Redpoll (LR)	Red	2	In western scrub/woodland.

Species and BTO species code	RSPB listed	Minimum No. pairs*	Notes
Crossbill (CR) <i>Loxia curvirostra</i>	Sch.1	0	A party of eight flew over in June.
Goldfinch (GO) <i>Carduelis carduelis</i>		6	
Siskin (SK) <i>Spinus spinus</i>		0	A post-breeding bird in June.
Reed Bunting (RB) <i>Emberiza schoeniclus</i>	Amber	2	In wetland areas.

Sch.1 indicates a species included in Schedule 1 of the 1981 Wildlife and Countryside Act (as Amended).

* Estimated pairs relate to the wider Coed Darcy landholding

- 10.3.262. In addition to the surveys undertaken in 2020, during the course of survey work in 2021 due regard was given to ground nesting birds, with this including for the completion of two dawn transects within the Site, which served to specifically assess the continued use of the Site by ground nesting species. These updated surveys identified an additional Lapwing pair which were considered to be holding territory within the Site (two pairs in total). However, a reduced level of nesting activity was recorded for Ringed Plover, with only a single confirmed pair recorded. The breeding territories of ground nesting birds recorded in 2021 are detailed at Figure 10.8.
- 10.3.263. Of further note, a single Nightjar was recorded during the completion of the final GCN survey in June 2021. The bird was heard briefly 'churring' and seen in flight in the north-east of the Site. Noting the reduced suitability of the habitats present for this species, and that no Nightjar were recorded during previous surveys in May and June 2020, both of which started pre-dawn, (nor indeed during other nocturnal work), the observation was deemed likely to represent a roaming male as opposed to evidence of a breeding territory. Notwithstanding this initial conclusion, a further dedicated Nightjar visit was undertaken in the form of a dusk and dawn survey on the 22 and 23 June 2021. No further evidence of Nightjar was recorded and, as such, it was concluded the observation related to a random visit from a wandering male.
- 10.3.264. Information received from SEWBRc returned 76 records of protected or notable birds from within the Site, including Swallow, Kestrel, Lapwing, Linnet, Dunnock, Garden Warbler, Lesser Redpoll, Snipe *Gallinago gallinago*, Mistle Thrush, Ringed Plover, Skylark and Wheatear, dating from 2001 to 2020. Of these records, a confirmed nesting and/or breeding Swallow dating from 2001, and Lapwing dating from 2006 and 2020, relating to a location in the north-east of Site, south of the railway line. The record of the Lapwing dates from 2020 and relates to a location in the south-west of the Site, close to the Crescent

Woodland. The most recent record returned is of a Red Kite *Milvus milvus*, and relates to a location approximately 1.8km south-west of the Site boundary at its closest point, and dates from June 2020.

Invertebrates

- 10.3.265. Noting the diverse range of habitats present within the Site, much of which would qualify as OMH, Ecology Solutions commissioned Richard Wilson Ecology Limited to complete a suite of invertebrate surveys. As for other species, the instruction at the time of surveys was for the wider Coed Darcy Site to be surveyed. Noting the broad similarity of habitats present, and their continuity within the Site, analysis has included for an assessment of the wider assemblage within Coed Darcy, as opposed to the Site specifically.
- 10.3.266. The full survey report prepared by Richard Wilson is provided at Appendix 10.2, with a summary of the findings provided below.
- 10.3.267. A total of nine surveys for terrestrial invertebrates were undertaken during optimal weather conditions from mid-May to mid-September 2020. The surveys involved walking a series of transects within the specific habitat type, focusing on the collection of Diptera (flies) and aculeate Hymenoptera (primarily bees and wasps), also noting Coleoptera (beetles). Other identifiable taxa such as butterflies were also recorded. In addition, sampling surveys were undertaken in representative habitats across the study area, for ground-dwelling and arboreal fauna, by vacuum sampling the field layer and beating lower branches of trees and shrubs. Static pitfall trapping was also employed to supplement the active surveying methods.
- 10.3.268. The surveys recorded a total of 505 terrestrial species across the wider study area, with 380 species associated with the Site. This confirmed a good range of invertebrate species utilise the Site, including a number of notable species (i.e. species of conservation significance). A full list of the species recorded is detailed at Appendix 10.2. The key findings of the surveys are detailed below.
- 10.3.269. No invertebrate species which are afforded direct legal protection under any UK or European legislation were recorded during the surveys.
- 10.3.270. A total of 505 species were recorded throughout the study site, of which 30 (6% of the assemblage) are Key Species; those with a nature conservation status. These key species are detailed in Table 10.13 below.



Table 10.13 – List and Details of Key Invertebrate Species Recorded During Surveys in 2020

Species	Status	Sector Recorded	Ecology
<i>Pardosa tenuipes</i> <i>Araneae, Lycosidae</i>	Nationally scarce	Northern Southern	A wolf-spider associated with sparsely vegetated but humid (damp) environments such as dune slacks, floodplain meadows, and riparian vegetation. It is a southern species in Britain, with very scattered records within Wales. Recorded within damper hollows and edge of waterbodies where there are exposed substrates.
<i>Xerolycosa miniata</i> <i>Araneae, Lycosidae</i>	Nationally scarce	Southern	A contrastingly marked large wolf-spider of coastal environments, particularly fixed sand dunes. It is recorded throughout Britain but nowhere is it common; in Wales it is recorded along the Glamorgan and Pembrokeshire coast. A single individual recorded from the OMH just off Parc Amazon, at the extreme southern tip of the proposed Southern Access Route.
<i>Argenna subnigra</i> <i>Araneae, Dictynidae</i>	Nationally scarce	Northern	A ground-dwelling spider associated with sparsely vegetated open grasslands, including those characteristic of brownfield sites. A rare species in Wales with only a dozen known locations. It is more frequent in south-eastern England.

Species	Status	Sector Recorded	Ecology
<i>Cheiracanthium virescens</i> <i>Araneae, Cheiracanthiidae</i>	Nationally Scarce	Northern Southern	A ground-dwelling species associated with open habitat biotopes, including coastal grasslands, dunes, heathland, and OMH on brownfield sites. Away from south-east England, there are scattered records in the Midlands, becoming rare north of an imaginary line linking the Humber and the Mersey. Within Wales, it is a predominantly coastal species.
<i>Zodarion fuscum</i> <i>Araneae, Zodariidae</i>	Vulnerable; Nationally rare	Northern	A very rare species known from six locations (five hectads) in Britain, with only one previous record from Wales (Porthkerry Country Park, near Barry). It requires open habitats where the vegetation is either short or patchy, thus exposed to sunshine, creating a locally warmer microclimate, where it specialises in hunting ants (Hymenoptera, Formicidae). A single male was collected in a pitfall trap located on the west-facing slope near the centre of the Oil Refinery.

Species	Status	Sector Recorded	Ecology
<i>Marpissa nivoyi</i> <i>Araneae, Salticidae</i>	Nationally scarce	Northern	A characteristic jumping-spider associated with coastal semi-fixed dunes with Marram <i>Ammophila arenaria</i>. The single individual was collected in tall dry grassland, which presumably has a similar structure and environment. The species is restricted to coastal England, with only five other modern Welsh records, though it was previously recorded at Crymlyn Burrows SSSI in May 1991.
<i>Synageles venator</i> <i>Araneae, Salticidae</i>	Nationally scarce	Northern	An ant-mimicking jumping spider associated with coastal dunes and other dry habitats, including inland. Within Wales, it is only known from the coast around Swansea and Port Talbot, where it has previously been recorded at Crymlyn Burrows SSSI.
<i>Halplus mucronatus</i> <i>Coleoptera, Haliplidae</i>	Nationally scarce	Northern Southern	A small brown 'crawling water beetle', distinctive within the genus due to its bulky appearance. It has a rather disjunct distribution, with its core across the east and south-east regions of England, but another centre of distribution occurs in south Wales clockwise into Somerset. Its habitat is typically on clay, including natural subsidence ponds, but also in man-made stagnant water bodies. The species probably feeds on plant and/or algal matter.

Species	Status	Sector Recorded	Ecology
<i>Elaphrus parvulus</i> <i>Coleoptera</i> , <i>Carabidae</i>	Nationally scarce	Southern	This is a miniscule ground beetle, found on sandy and gravelly soils, but also in old walls and cracked paths, often in association with buildings. However, it can also occur next to water in gravel and sand pits, and other post-industrial habitats. The species is widely distributed throughout the south of England, the Midlands and Wales, and has recently been expanding its range. It has to date been found as far north as Cumbria.
<i>Paederus fuscipes</i> <i>Coleoptera</i> , <i>Staphylinidae</i>	Nationally scarce (Nb)	Northern Southern	This is a remarkably colourful species, as are all the members of the genus. It has striking metallic blue elytra, the remainder of the beetle being black and red. It is a predator, found in marshes and bogs, on the margins of ponds and dykes, and in permanently wet mires. It is also recorded in saltmarsh habitats. Its distribution is patchy throughout England and Wales, with most records from the coastal fringes. Adults have been recorded in most months of the year.

Species	Status	Sector Recorded	Ecology
<i>Meligethes fulvipes</i> and <i>Meligethes rotundicollis</i> <i>Coleoptera</i> , <i>Nitidulidae</i>	Nationally scarce	M.f. (Northern) M.r. (Southern)	<i>M. fulvipes</i> is a nondescript, brown pollen beetle, is very locally distributed in England and Wales, with a predominantly coastal stronghold (South Wales and south-east England), but also inland in several areas, including East Anglian Breckland. It feeds on brassicas, within which plant group it is certainly associated with Charlock <i>Sinapis arvensis</i>. <i>M. rotundicollis</i> is a small black, nondescript pollen beetle, primarily found in south-east England, but also known from Wales. It can be located in waste and disturbed ground habitats, including brownfield sites, and road verges. Its foodplant associations are with Charlock, Hedge Mustard <i>Sisymbrium officinale</i>, and possibly other plants in this family. Adults have been recorded in the field, mainly between April and August.

Species	Status	Sector Recorded	Ecology
<i>Sitona waterhousei</i> <i>Coleoptera,</i> <i>Curculionidae</i>	Nationally scarce (Nb)	Southern	This is a small weevil, with characteristic convex protruding eyes. It is found in England and Wales, although its distribution is predominantly coastal, with occurrences almost exclusively between Anglesey anticlockwise to the Thames Gateway in West Kent. There are a very few inland records, from post-industrial sites. Otherwise, habitats such as coastal undercliffs, coastal shingle, and coastal quarries are examples of its typical haunts. The species feeds on Common Bird's-foot Trefoil as both a larva and adult. Adults have been recorded between February and September.
<i>Bombylius canescens</i> <i>Diptera, Bombyliidae</i>	Nationally Scarce	Northern Southern	This small bee-fly is restricted to south-west England and southern Wales, where it is associated with sparsely vegetated sandy or base-rich substrates in grasslands, woodland edge or coastal soft-cliffs (Stubbs and Drake, 2014; Harvey, 2018). It is a parasite of smaller mining bees in the genus <i>Lasioglossum</i> which are frequent within the study site.
<i>Drymus pilicornis</i> <i>Hemiptera,</i> <i>Lygaeidae</i>	Nationally scarce	Southern	A small brown ground-bug. Sparsely distributed in southern England and Wales, where it is associated with short turf habitats, including chalk downland. Adults overwinter, mating in spring to give a new generation of adults by August. There is one generation a year. It most probably feeds on mosses at ground level, and possibly also fungi.

Species	Status	Sector Recorded	Ecology
<i>Andrena congruens</i> <i>Hymenoptera,</i> <i>Andrenidae</i>	Nationally scarce (Na)	Northern	This mining bee is associated with exposures of soils, sand, or chalk on sloping ground in southern England, with outlier populations associated with the region around the Forest of Dean and the Gower Peninsula in south Wales (Else & Edwards, 2018). It is identified as a threatened species in Wales (Olds et al., 2018). Several specimens were recorded within the former Oil Refinery, and it seems likely they are exploiting the various spoil heaps as nesting habitat.
<i>Bombus humilis</i> (brown-banded carder bee) <i>Hymenoptera,</i> <i>Apidae</i>	SoPI	Northern Southern	The brown-banded carder bee is a species of warm, dry sites with extensive flower-rich calcareous or coastal grasslands. Within Britain, it is largely restricted to coastal south-east, southern and south-west England, and in Wales to the coastal fringes of Gwynedd, Glamorgan and Pembrokeshire (Else & Edwards, 2018). It is identified as a threatened species in Wales (Olds et al., 2018).

Species	Status	Sector Recorded	Ecology
<i>Sphecodes reticulatus</i> <i>Hymenoptera</i> , <i>Halictidae</i>	[Nationally scarce (Nb)]	Northern	This blood-bee (so called, because of its partially red abdomen) is more-or-less restricted to south-east England where it is associated with sandy sites in open woodland or grassland: the extensive dry grasslands and scrub mosaics likely providing suitable habitat for the species in the study site. There are only three Welsh locations; one being in VC 41 near Merthyr Tydfil (Else & Edwards, 2018). Consequently, it is identified as a threatened species in Wales (Olds et al., 2018). It is a cuckoo of a few mining bees though its host range is poorly understood. A female was recorded in May 2020 at the western end of the study site.
<i>Erynnis tages</i> (Dingy skipper) <i>Lepidoptera</i> , <i>Hesperiidae</i>	Vulnerable; SoPI	Northern Southern	A declining butterfly which is generally associated with brownfield sites, colliery spoil heaps, and similar places where habitats support short swards where its food plant, Bird's-foot Trefoil occurs. Several individuals were recorded in late May 2020 at various locations within the OMH.
<i>Coenonympha pamphilus</i> (small heath) <i>Lepidoptera</i> , <i>Nymphalidae</i>	Near threatened; SoPI	Northern Southern	Although a widespread species in the UK, this otherwise common species has experienced a substantial decline in both abundance and occurrence (Fox et al., 2015), hence its classification as Near Threatened.

Species	Status	Sector Recorded	Ecology
<i>Hipparchia semele</i> (Grayling [butterfly]) <i>Lepidoptera</i> , <i>Nymphalidae</i>	Vulnerable, SoPI	Northern Southern	A butterfly of patchy grasslands, which has suffered a substantial decline in Britain such that it is now more or less restricted to coastal habitats such as sand dunes and grasslands; or in Wales, colliery spoil heaps. Individuals were observed in late June and mid-July across the dunes.

- 10.3.271. Of the 30 Key Species, three are Rare Key Species (a spider – *Zodarion fuscum*; and two butterflies: Dingy Skipper *Erynnis tages* and Grayling *Hipparchia semele*); all of which are associated with dry grasslands and bare ground. Three Welsh threatened bees *Andrena congruens*, *Sphecodes reticulatus* and Brown-banded Carder Bee *Bombus humilis* were recorded, in addition to several other species that are scarce or rare in the county/Wales. The Carder Bee and both butterflies are also included in the Welsh Biodiversity List as Species of Principal Importance.
- 10.3.272. Within the study site, 76 species are reliant on the vegetation communities present to complete their lifecycle, of which 57 species are present within the northern sector. Most are intrinsically linked with the OMH which represents a substantial resource in the context of the Swansea Bay National Landscape Character Area and South Wales.
- 10.3.273. The physical characteristics of the OMH share similar properties to nearby coastal dune systems such as at Crymlyn Burrows SSSI and Kenfig SSSI. The OMH supports an assemblage of invertebrates characteristic of dry, flower-rich grasslands on highly heterogeneous topography, of which coastal sand dune systems are interpreted as the natural equivalent. The study site is located within an ecological coastal landscape where there are several high quality protected sites such as at Crymlyn Burrows and Kenfig SSSIs, which are known to support important populations of individual Key Species.
- 10.3.274. The invertebrate assemblages associated with the Site have been evaluated to be of regional nature conservation value when considered as a component of the wider Coed Darcy Site. This is based on the relative quality and extent of the habitat resource present for invertebrates within the wider region, number of Key Species, and the proportion of stenotopic taxa (species dependent on restricted habitat conditions) recorded in specific assemblages, indicating favourable conservation status.

Amphibians (Great Crested Newts)

- 10.3.275. As set out above, historic survey work has recorded (and subsequently translocated) very large numbers of GCN, with approximately 10,000 individuals of all life cycle stages captured and relocated to facilitate previous remediation works across much of the wider Coed Darcy Site, including the Site. Captured amphibians were relocated to a dedicated GCN receptor site within and adjacent the wider Coed Darcy Site under several NRW licenses. This receptor site, which is delineated from the wider Coed Darcy Site by herpetofauna fencing, has since designated as the Coed Darcy GCN SINC.

- 10.3.276. Following the completion of extensive capture and relocation up until 2016, which facilitated the completion of Site wide habitat clearance, the wider Coed Darcy Site was assumed cleared of GCN. However, subsequent observations made by the ARC during the completion of habitat creation/management works, confirmed continued presence of GCN within the wider Coed Darcy Site (albeit outside the Site). Following further investigation by Atkins, it was concluded these observations reflected the presence of a small remnant GCN population that had evaded capture following previous translocation work. As such, a further NRW licence was granted to facilitate additional amphibian capture. Notwithstanding the grant of this licence, and despite the installation of additional fencing to facilitate an additional capture exercise, no further capture effort was completed. Noting that a localised population of GCN were present in the south of the Coed Darcy Site, partial update survey work was undertaken by Atkins in 2020, in the form of eDNA surveys. This survey effort included the completion of eDNA surveys across the wider Coed Darcy Site, including ponds within the Site. The surveys returned positive eDNA results for several ponds in the south of the Coed Darcy Site (outside the Site), as well as one waterbody (P20) within the Site (the latter observation comprising a visual sighting of an adult GCN within the waterbody). No evidence of GCN was recorded within the waterbodies to the north of the railway, with negative eDNA results obtained for eight ponds (P1, P8, P11, P13, P14, P15, P17, W30). Pond W30 is an Atkins reference, which was dry during the entirety of the 2021 surveys. It is noted eDNA records for two ponds (P3 and P10) were not made available to Ecology Solutions (identified as results pending within an informal interim report).
- 10.3.277. It is relevant to note the vast majority of GCN recorded (and/or translocated) through previous survey work were located in areas outside the Site, with this reflecting a dearth of waterbodies within the Site. Indeed, whilst the Site now supports a large number of ponds, these are mostly of recent origin, having been 'created' as bi-products following previous remediation works (likely around 2015).
- 10.3.278. Noting the relatively recent origin of most ponds within the Site, that these were within areas not previously known to support GCN, and that eDNA surveys by Atkins in 2020 did not return any positive results, it was deemed unlikely GCN would have colonised the waterbodies. In reaching this conclusion, consideration was also given to the terrestrial habitats, which remained primarily bare and inhospitable to amphibians as recently as 2018.
- 10.3.279. With the above in mind, a bespoke survey approach was agreed with both NRW and NPTC Biodiversity Officers in the first instance, whereby update eDNA and partial (two visits) Population Size Class Assessment work would be undertaken. However, following confirmation of GCN in some waterbodies, a full six visits were undertaken of all accessible ponds.
- 10.3.280. The eDNA surveys of the waterbodies within the Site were undertaken on the 27 April 2021. The returned eDNA results identified only a single waterbody (P14) with positive replicates for GCN. This, however, proved unreliable, as GCN were recorded in two additional waterbodies on the same evening, using traditional surveying techniques.
- 10.3.281. Due to this, six surveys were undertaken across all waterbodies within the Site on the 27 April 2021, 5 May 2021, 11 May 2021, 20 May 2021, 3 June 2021 and 8 June 2021. A summary of the results is provided Table 10.14 below. A full detailed list of the results is provided in Appendix 10.5. For clarity, with the exception of those ponds summarised in Table 10.14 below, no other waterbodies within the Site were confirmed to support GCN.

Table 10.14 – Summary of GCN Surveys Undertaken in 2021

Waterbody	Maximum count of GCN	Date of Maximum Count
P9	6	5 May 2021
P10	9	5 May 2021
P14	3	5 May 2021
P16	1	8 June 2021
P20	1	3 June 2021
POND B	35	19 May 2021

- 10.3.282. As above, only a sub-set of the ponds in the north of the Site were found to support GCN, collectively comprising a population that would be classed as a 'medium' population size class (low end of size class). Noting the apparent suitability of the ponds and (albeit to a lesser extent) terrestrial habitats in 2021, the smaller size of the population is considered a reflection of the recent origin and establishment of habitats. On the evidence available, and noting the western 'bias' to the findings, it is concluded GCN (and other amphibians) are likely to have only recently colonised this area of the Site, likely from suitable off-site habitat to the west of the Site.
- 10.3.283. In contrast to the high concentration of ponds north of the railway, a majority of the central areas of the Site are devoid of any permanent or sustained waterbodies and are, for the most part, notably less established. A majority of the Site is therefore unlikely to support GCN, nor provide any significant terrestrial opportunities for them.
- 10.3.284. The majority of the GCN were recorded in Pond B located in the south-west of the Site, with a peak count of 35 individuals, which was undertaken on survey visit two (19 May 2021). This observation is consistent with previous survey work (i.e. with the southern areas of Coed Darcy supporting a vast majority of amphibian populations), and moreover reflects the more established nature of habitats in this locality. It is unclear whether these populations of GCN have successfully colonised from off-site habitat or otherwise represent a remnant population re-establishing following previous capture effort.
- 10.3.285. Given the size of the study area, with ponds broadly located within two separate 'clusters' (north and south), it is deemed likely the Site supports two meta populations between which there is likely to be (at best) only limited dispersal.
- 10.3.286. Whilst specific update surveys were not undertaken of all ponds in the wider Coed Darcy Site (i.e. to the south of the Site), it is noted the majority of these ponds are reasonably well distanced from the Site, in excess of 200m at their closest points. Noting this, and given positive eDNA results in 2020 (see Figure 10.9), it was deemed appropriate to assume presence within these more distant ponds. Subsequent mitigation/enhancement opportunities, as identified later in this Chapter, are made on this basis.
- 10.3.287. Of relevance, the receptor ponds located south of the wider study area (within the Coed Darcy GCN SINC) were also surveyed for GCN using traditional methods in 2021, confirming a continued population of GCN within this area.

- 10.3.288. With the exception of those waterbodies identified above, no other suitable waterbodies are located within a 500m radius of the receptor site when considering barriers to dispersal (with the site being bordered by major roads to the north, south, east and west).
- 10.3.289. A number of common amphibians were also recorded during the course of the GCN surveys. These included Palmate Newts *Lissotriton helveticus*, Frogs *Anura* and Toads *Bufo bufo*. These are listed below in Table 10.15.



Table 10.15 – Common amphibian survey results from 2021 surveys

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Waterbody	Palmate Newt maximum counts	Common Toad maximum counts	Common Frog maximum counts
P1	5	0	0
P2	4	1	0
P3	8	1	0
P4	11	1	0
P5	3	0	0
P6	0	0	0
P7	15	0	0
P8	1	0	0
P9	12	0	0
P10	8	0	0
P11	3	2	1
P12	11	1	0
P13	17	0	0
P14	2	0	0
P15	0	0	0
P16	17	0	1
P17	0	0	0
P18	0	0	0
P19	0	0	0
P20	35	0	0
Crymlyn Lagoon East	1	0	0
Crymlyn Lagoon West	0	0	0
West Bay	0	0	0

Waterbody	Palmate Newt maximum counts	Common Toad maximum counts	Common Frog maximum counts
PB	5	0	0
PC	0	0	0
PD	0	0	0
PE	0	0	0
South Site Reservoir	6	3	0

- 10.3.290. Information received from SEWBrEC returned a total of 11 records of GCN. A single record relates to a location in the north-west of the Site, just east of the South Site Reservoir, and dates from 2020. This is assumed to be the record attained by Atkins. The remaining records of GCN relate to the wider study area, with a majority dating from 2018 to 2019.
- 10.3.291. In addition, a total of 63 common amphibian records were returned from SEWBrEC and 22 records of Common Frog were returned. The closest records are located within the Site, located in the South Site Reservoir and in the east of the Site, and date from 2001 and 2020 respectively. The most recent record relates to a location approximately 1.8 km west of the Site at its closest point, and dates from 2020.
- 10.3.292. A total of 16 records of Common Toad were returned. The closest record relates to a location approximately 0.1km south-west of the Site boundary at its closest point, and dates from 2015. The most recent record relates to a location approximately 2.5km south-west of the Site and dates from 2019.
- 10.3.293. A total of 21 records of Palmate Newt were returned. The closest and most recent record relates to a location approximately 0.1km south-west of the Site and dates from 2018.
- 10.3.294. A total of four records of Smooth Newt *Lissotriton vulgaris* were returned. The closest record relates to a location approximately 0.4km south-west of the Site and dates from between 1900 and 1989. The most recent record relates to a location approximately 1.8km north-east of the Site and dates from 2019.
- 10.3.295. Again, previous survey work at the Site, undertaken in support of the previously consented OPP, identified the presence of Common Frog, Common Toad and Palmate Newt within the Site.

Hazel Dormouse

- 10.3.296. Notwithstanding an absence of any historic records of Dormice within the wider Coed Darcy Site, noting the age of previous survey work (2009), an updated suite of Dormouse surveys was undertaken between August 2020 and August 2021.
- 10.3.297. The location of the Dormouse tubes is shown in Figure 10.6. A summary of the findings is detailed below in Table 10.16.

Table 10.16 – Summary of Dormice Surveys at Coed Darcy

Survey Number	Date	Temp' °C	Weather Conditions	Results
1	21 August 2020	18	Strong wind	No evidence of Dormouse recorded.
2*	3 September 2020	15	Slight rain for short period at the of start of survey	No evidence of Dormouse recorded.
3	29 September 2020	16	Sunny, clear	No evidence of Dormouse recorded.
4*	5 October 2020	11	Dry, cloudy.	No evidence of Dormouse recorded.
5	15 October 2020	13	Dry	No evidence of Dormouse recorded.
6*	21 October 2020		Dry	No evidence of Dormouse recorded.
7**	26 November 2020	8	Clear, sunny	No evidence of Dormouse recorded.
6**	30 June 2021	17	40% cloud, sunny, dry	No evidence of Dormouse recorded.
7**	16 July 2021	18	Still, sunny, clear	No evidence of Dormouse recorded.
8**	27 August 2021	18	Clear, light breeze	No evidence of Dormouse recorded.
* Footprint Check Only				
** Nest Tube Check Only				

10.3.298. On the basis the surveys followed the methodology as set out in Section 3, the survey effort allowed a score of 25 points, and noting historical surveys, it can be reasonably assumed Dormouse are absent from the Site. As such, no further consideration is given to this species as part of this assessment.

Otter & Water Vole

10.3.299. A vast majority of the Site, with an absence of larger waterbodies or suitable watercourses, is unsuitable to support Otter or Water Vole.

- 10.3.300. Where more suitable habitat is present, for example within Coed Darcy GCN SINC, these habitats are to be retained as part of the proposals. Regarding South Site Reservoir, whilst this could provide a degree of suitable foraging opportunities for Otter, its value is greatly tempered by its artificial nature, with significantly improved opportunities in the immediate area. The steep and artificial banks of the waterbody are highly sub-optimal to offer potential holt or burrowing opportunities to either species.
- 10.3.301. Regarding ditches within the Site, these are relatively recent in origin and, again, highly sub-optimal for Water Vole or Otter, for the most part supporting limited aquatic vegetation and ephemeral water, whilst offering no significant connectivity or dispersal opportunities. Whilst both D1 and D2 provide a degree of heightened suitability, no evidence of either Water Vole or Otter was recorded during detailed checks of both features during the completion of habitat survey work in 2020 and 2021. Equally, no evidence of either species was recorded during the completion of extensive GCN survey work across the Site.
- 10.3.302. Noting the above, it is not considered either species would be in any way reliant on the habitats present within the Site, nor that populations present in the wider area would have the potential to be adversely impacted by emerging Development Proposals.
- 10.3.303. The SEWBRc returned 41 records of Otter, none of which relate to the Site. The majority of records relate to the Tennant Canal. However, the closest and most recent record relates to a record approximately 0.7km east of the Site at its closest point, and dates from 2012.
- 10.3.304. The SEWBRc returned seven records of Water Vole, none of which relate to the Site. The majority of the records again relate to the Tennant Canal. However, the closest and most recent record relates to a location approximately 0.4km south-west of the Site, and dates from 2004.

Other Protected Species

- 10.3.305. No other evidence of protected or notable species has been recorded during the course of the extensive survey work undertaken at the Site. Noting this, and with regard to the extensive habitat clearance which has been undertaken across the Site, it is considered unlikely the Site will be of heightened value to any other protected or notable species.
- 10.3.306. Notwithstanding this conclusion, habitats within the Site are at least locally suitable to support a range of small mammal species such as European Hedgehog. The potential presence of a range of small mammals is given due regard as part of this Assessment.
- 10.3.307. SEWBRc returned a small number of records for Polecat (three records) and Hedgehog (14 records). Of these, the closest was a record of Hedgehog located approximately 190m to the east of the Site.

Summary of Ecological Baseline

- 10.3.308. Habitats. The Site supports a mosaic of predominantly early successional habitats, with these frequently complemented by areas of diverse structural topography. In addition, localised areas of mature vegetation are present, predominantly in the form of secondary woodland, with dense scrub and established waterbodies also present.

- 10.3.309. Some areas of recolonising vegetation, not least RV1, are of high ecological value, supporting a diverse floristic community with the topographical diversity contributing to a wide range of microhabitats. Elsewhere, such as RV3, the habitat community is sparse, and localised topographical diversity is largely absent, resulting in a habitat area of low ecological interest when assessed in isolation. Whilst the value of these areas is elevated by the wider 'open mosaic', they provide only a limited qualitative contribution to this mosaic.
- 10.3.310. Areas of wet grassland and mixed scrub are also deemed of heightened ecological interest, supporting a good range of grasses, sedges, and forbs. The prevalence of scrub, whilst offering localised interest, is generally concluded to detract from the overall interest and, indeed, on-going scrub succession will continue to result in losses to more valuable open habitats within the Site.
- 10.3.311. Areas of secondary woodland, whilst also considered of heightened value within the Site, predominantly comprise fast growing Willows and Birch, and include for frequent non-native vegetation such as Buddleia, with very limited woodland ground flora, somewhat tempering their overall interest. Regarding the designation of an area of on Site woodland as 'Ancient' (W1A), and noting the substantial historic disturbance at this location, with resultant woodland clearance and loss/degradation of soils, it is not considered the Ancient Woodland designation of this area is a correct reflection of the true extent of the resource present.
- 10.3.312. Also of heightened value are the tree belts in the north-east of the Site, in particular TB1 which supports a good number of mature Oak trees and occasional Hazel coppice.
- 10.3.313. The Site supports a large number of waterbodies, ranging from small ephemeral ponds to high quality wetlands and artificial reservoirs. Whilst the quality of these wetland habitats varies substantially the overall resource is deemed of value in both the context of the Site and local area.
- 10.3.314. As above, the Site supports extensive areas of scrub, with these habitats in turn supporting a good range of woody species. However, areas of scrub are frequently dominated by a small number of species, including non-native and/or undesirable specimens such as Buddleia. Moreover, areas of scrub appear to be encroaching on and outcompeting relatively higher value habitats within the Site, such as areas of wet grassland and floristically diverse recolonising vegetation. In this context, scrub is of reduced ecological value within the Site.
- 10.3.315. Other habitats within the Site typically support a reduced range of species or are otherwise widespread and common habitat types in both a national and local context. These are not deemed of heightened ecological interest in the context of the Site.
- 10.3.316. Species. In terms of faunal species, the Site is considered to provide opportunities for a range of species groups including invertebrates, amphibians, breeding birds, common reptiles and foraging and commuting bats.
- 10.3.317. The Site supports notable populations of terrestrial invertebrates, with a total of 505 species recorded throughout the study site, of which 30 (6% of the assemblage) are Key Species; those with a nature conservation status.

- 10.3.318. A diverse breeding bird assemblage was recorded within the wider Coed Darcy Site, with 76 species recorded across the wider Coed Darcy landholding, including 42 species within the Site. The greatest interest was found across the open habitats, not least on account of breeding Lapwing, Ringed Plover, Little Ringed Plover and Skylark, whilst good assemblages were also recorded in wetland and woodland areas.
- 10.3.319. GCN surveys confirmed the presence of a 'medium' population of GCN, alongside valuable populations of common amphibians, with these populations sustained within the north of the Site (north of the railway) as well as in the south-west of the Site.
- 10.3.320. Equally, small populations of two common reptile species; Grass Snake and Common Lizard, were recorded within the Site, with these locations consistent with areas of suitable off-site habitat, or otherwise habitat which avoided removal during previous Site remediation.
- 10.3.321. No evidence of roosting bats was recorded within the buildings on Site. Whilst significant areas of woodland are present, these are assessed overall as being of low bat roosting potential, being dominated by fast growing Willows and Birches. A small number of trees were identified to have low potential to support roosting bats, whilst two trees (T1 and T2) initially assessed as of moderate bat roost potential were subject to tree climbing. No evidence of past or present roosting was associated with any trees during either aerial or ground based inspections.
- 10.3.322. Bat activity surveys confirmed the Site to be subject to a generally low level of activity. Unsurprisingly, relatively higher levels of bat activity are associated with the larger waterbodies, in association with areas of woodland and along the Site's vegetated boundaries, particularly the southern edge of the Site. Typically, very low levels of bat activity were recorded across open habitats.
- 10.3.323. The Site is not considered likely to be of any significant value for other notable or protected species or assemblages.
- 10.4. **Inherent Design Mitigation**
- 10.4.1. The Proposed Development will deliver extensive areas of greenspace as an inherent design feature, not least to achieve requisite SuDS capacity, as well as open space provision for future residents.
- 10.4.2. The delivery of these semi-natural habitats would undoubtedly ensure that habitats of ecological value are present post-development. However, in the absence of informed, biodiversity led design, there would be no certainty on the type of habitat delivered, nor reassurance that these habitats would be subject to appropriate management such that any biodiversity value can be retained in the long-term. Equally, the suitability of these habitats to support protected or notable faunal species/assemblages would be uncertain.
- 10.4.3. On this basis, it is concluded that for the vast majority of ecological receptors, no significant reliance could be placed on appropriate mitigation measures being secured through 'inherent design mitigation'.
- 10.4.4. Noting this conclusion, no significant weight is afforded to inherent design mitigation when considering 'potential impacts/effects' in Section 10.5. Targeted avoidance, mitigation and enhancement measures are identified in Section 10.6 of this Chapter.

- 10.4.5. Regarding the Crymlyn Bog SAC/Ramsar/SSSI, it is noted the surface water drainage strategy would ensure inherent mitigation, ensuring any surface waters leaving the Site would be at greenfield rates, therefore preventing hydrological changes to the bog. As detailed below, the potential implications of development on Crymlyn Bog are considered in the separate information for Habitat Regulations Assessment (iHRA) as opposed to within this ES Chapter. This iHRA is submitted alongside this ES Chapter as part of the planning application.

10.5. Potential Environmental Impacts and Effects

- 10.5.1. This Section identifies all likely significant effects, both during construction and post construction (positive and negative); such that any required mitigation can be identified where necessary.

Features of Proposed Development Relevant to the Assessment

- 10.5.2. In ecological terms, given the Proposed Development involves the demolition and or/refurbishment of buildings (**B3 to B6**), habitat losses, substantial ground works, the construction of new buildings/structures, and provision of areas of green infrastructure, activities undertaken during the construction period could potentially affect ecological receptors, and as such are of relevance to this Assessment.
- 10.5.3. Provision of new development types, including new residential dwellings, as well as employment, education, and community uses within the Site could potentially affect ecological receptors post-construction, and as such are also of relevance to this Assessment.
- 10.5.4. Further details of the Proposed Development are included in Chapter 3 of this Environmental Statement.

The Principles of Site Evaluation

- 10.5.5. The methods and standards for site evaluation within the British Isles have remained those defined in 'A Nature Conservation Review' by Ratcliffe⁹. These are broadly used across the United Kingdom to rank sites, so priorities for nature conservation can be attained. Current SSSI designation maintains a system of data analysis that is roughly tested against Ratcliffe's criteria.
- 10.5.6. In general terms, these criteria are size, diversity, naturalness, rarity, and fragility, while additional secondary criteria of typicalness, potential value, intrinsic appeal, recorded history, and the position within ecological/geographical units are also incorporated into the ranking procedure.
- 10.5.7. Any assessment should not judge sites in isolation from others, since several habitats may combine to make it worthy of importance to nature conservation.
- 10.5.8. Further, relying on the national criteria would undoubtedly distort the local variation in assessment, and therefore additional factors need to be taken into account.

⁹ Ratcliffe, D A (1977). *A Nature Conservation Review: the Selection of Study areas of Biological National Importance to Nature Conservation in Britain*. Two Volumes. Cambridge University Press, Cambridge

10.5.9. In addition, habitats, features or species of local importance are often highlighted at a local level. The NPTC Biodiversity Duty Plan identifies biodiversity proprieties within the Borough. Where these are of relevance to the Site, they are highlighted below.

10.5.10. Levels of importance can be graded at the international, national, regional, county or local level and in terms of low, medium or high value.

Designated Sites

Statutory Wildlife Sites

10.5.11. There are no statutory designated sites of international importance or national importance such as SPAs, SACs or SSSIs within the Site boundary. Crymlyn Bog SAC, Ramsar and SSSI is located adjacent to the south-west boundary of the Site. Part of the Crymlyn Bog is further designated as Crymlyn Bog and Pant-y-Sais NNR, with a south-west section designated as Pant-y-Sais SSSI.

10.5.12. Other statutory sites in the local area include Crymlyn Burrows SSSI, located approximately 1.8km south of the Site at its closest point.

10.5.13. All other statutory designated sites are well distanced from the Site.

Impacts

10.5.14. The potential for adverse impacts to arise on European/internationally designated sites are considered in detail within the accompanying iHRA. The iHRA gives specific consideration to potential impacts upon the Crymlyn Bog SAC and Ramsar. That assessment includes for an assessment of all overlapping and underpinning statutory sites (i.e. the NNR and SSSI designations) of relevance to these sites. For completeness, and as detailed in the iHRA, the project when considered either alone or in combination would not give rise to adverse impacts on the integrity of the SAC/Ramsar site (in view of the Conservation Objectives), or adverse impacts on the constituent SSSIs. As such, the Development Proposals would by definition be acceptable, subject to securing the avoidance measure proposed. In those terms the competent authority could legally and safely grant consent for the proposed plan/project.

10.5.15. This current ecological assessment is therefore focussed on other statutory sites which are not further designated at the international/European level.

10.5.16. In relation to Crymlyn Burrows SSSI, given the significant separation of this SSSI from the Site, potential impacts are identified to be limited to:

- Loss of OMH resource of potential value to SSSI invertebrate communities; and
- Potential for recreational pressure (disturbance / degradation) during operation.

10.5.17. Prior to mitigation, potential effects on Crymlyn Burrows SSSI are assessed as adverse at the **national** level and are of **minor** significance.

- 10.5.18. Given the distance between any other statutory designated sites and the Site, with extensive areas of built form between, it is not considered there will be any potential effects as a result of the Proposed Development.

Non-Statutory Wildlife Sites

- 10.5.19. A small proportion of the Site is designated as Coed Darcy GCN Area SINC, a site designated on account of it supporting a large number of GCN (as a receptor site from previous translocation exercises associated with the Coed Darcy development).
- 10.5.20. In addition, much of the Site is designated as NPTC Watercourses SINC, a designation for which no formal citation has been provided, and which appears to cover extensive areas of existing development, in addition to semi-natural habitats. It is understood the citation reflects the broad locations of watercourses in the borough.
- 10.5.21. Jersey Marine Woods SINC, a large area of woodland, is located adjacent to the south-eastern corner of the Site at its closest point, albeit a majority of the designated site is well separated from the Site. It is designated on account of the habitats it supports, primarily areas of native woodland.
- 10.5.22. Llandarcy Village Green SINC is located approximately 0.2km to the east of the Site, being separated by built form and an existing road. It comprises an area of primarily amenity grassland which has retained good species-richness.
- 10.5.23. In addition to the above designated SINC sites, planning policy requires that sites/features which meet SINC criteria should be considered and assessed as formally designated SINC sites. On the basis of survey work undertaken between 2020 and 2021, the following habitats, features or assemblages within the Site are deemed likely to meet or exceed SINC criteria¹⁰¹¹:
- Invertebrate assemblages: with the wider Coed Darcy Site supporting four species of Principle Importance, 25 Nationally Scarce species (of which 20 are considered genuinely so), and species which are rare to Wales or the sub-county.
 - GCN populations (criterion S3/A.0.22): with a population size exceeding 10 or more GCN.
 - Breeding bird populations (criterion S2): on account of breeding populations of Lapwing, Ringed Plover, Little Ringed Plover and Cetti's Warbler.
 - The Open Mosaic Habitat: (Criterion H18): on account of the early successional habitats and their associated plant communities, including >20 indicator species.

¹⁰ Wildlife Sites Guidance Wales. A Guide to Develop Local Wildlife Systems in Wales. 2008.

¹¹ Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership. 2004

Impacts

- 10.5.24. Given the designation of Coed Darcy GCN Area SINC is based solely on the presence of GCN, potential impacts have been identified to be limited to:
- In-direct impacts during construction (e.g. dust, pollution);
 - Direct loss or degradation of supporting habitat/interest features during construction;
 - Direct loss or degradation of supporting habitat/interest features during the operational phase; and
 - Recreational/interference impacts during the operational phase.
- 10.5.25. Prior to mitigation, potential effects on Coed Darcy GCN Area SINC are adverse at the **borough** level and are of **moderate** significance.
- 10.5.26. In relation to Jersey Marine Woods SINC, the SINC is largely within private ownership, with the component closest to the Site being densely vegetated and largely inaccessible. With this in mind, and noting the SINC is designated specifically on account of its habitats, potential impacts are identified to be limited to:
- In-direct impacts during construction (primarily dust deposition).
- 10.5.27. Prior to mitigation, potential effects on Jersey Marine Woods SINC are adverse at the **borough** level and are of **negligible to minor** significance.
- 10.5.28. Regarding Llandarcy Village Green SINC, noting the separation of this SINC from the Site, potential impacts are identified to be limited to:
- Recreational/interference impacts during the operational phase.
- 10.5.29. Prior to mitigation, potential effects on Llandarcy Village Green SINC are adverse at the **borough** level and are of **negligible to minor** significance.
- 10.5.30. Regarding those features within the Site which meet SINC criteria, but which are not formally designated, potential impacts are assessed within the relevant 'Habitats' and 'Faunal Species' Sections below. However, for completeness, these potential impacts (in the absence of mitigation) are identified to include:
- Protected faunal species assemblages, including GCN, breeding bird and invertebrate populations;
 - In-direct impacts during construction (e.g. dust, pollution);
 - Direct loss or degradation of supporting habitat/interest features during construction;
 - Direct loss or degradation of supporting habitat/interest features during the operational phase; and
 - Recreational/disturbance/interference impacts during the construction and operational phases.

10.5.31. Notable habitats/floral communities:

- Indirect impacts during construction (e.g. dust, pollution);
- Direct loss or degradation during construction;
- Direct loss or degradation during the operational phase; and
- Recreational/interference impacts during the operational phase.

10.5.32. Given the separation of other non-statutory sites in the local area, potential impacts are considered limited to a minor increase in recreational pressure during the operational phase of the development. Such impacts are **adverse** at the **borough** level and are of **negligible** significance.

Impacts on Habitats

10.5.33. The following Section considers impacts that have the potential to arise on individual habitats as a result of the Proposed Development.

Compacted Clay Soils with a Mosaic of Recolonising Vegetation

10.5.34. Areas of recolonising ground comprise a somewhat ephemeral habitat resource, the quality and composition of which will vary significantly within a small number of years. Indeed, the speed of transition is evident through past survey work, with habitat surveys undertaken by Atkins identifying the majority of the Site to be substantially bare as recently as 2018. The establishment of higher quality early successional habitats, as recorded through survey work undertaken in 2020 and 2021, therefore represents a 'snapshot' of habitats undergoing ecological succession.

10.5.35. Reflecting the above, the composition of recolonising vegetation across the Site varies significantly. Broadly speaking, habitats to the north of the railway line, as well as in the west of the Site, are more established, with locally enclosed swards. In particular, the mosaic of recolonising communities associated with RV1 are botanically diverse, supporting a wide range of forbs indicative of neutral to calcareous conditions, including several notable species, over a varied topography. Elsewhere within the Site areas of recolonising vegetation were of varied qualitative interest. Whilst RV2, RV4 and RV5 support areas of localised interest comparable to RV1 (i.e. including diverse dry grassland with calcareous tendencies), significant areas supported ruderal vegetation and lush growth typical of more enriched conditions of significantly reduced botanical interest.

10.5.36. Notwithstanding these areas of recolonising vegetation are not of equal qualitative value across the Site, they collectively contribute to a structurally and floristically diverse early successional landscape, and are considered of value at the county level. In reaching this conclusion, it is noted the OMH supports a diverse range of species and features which are likely to reach the threshold of SINC status (supporting >20 indicator species identified in SINC guidance¹²).

¹² Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership. 2004.

- 10.5.37. The large, sparse areas of predominantly bare ground in the central area of the Site (RV3 and to a lesser extent RV4), and the structural uniformity of this habitat area, combined with the very limited and sparse vegetation cover, greatly temper the ecological interest, with extensive areas comprising little more than bare ground. Whilst the value of this habitat is elevated by its immediate surroundings (i.e. as part of a wider mosaic), it is nonetheless considered to be of reduced value at the Site level only.

Impacts

- 10.5.38. The Proposed Development will result in a net loss of recolonising vegetation within the Site. With the exception of a small area of RV3 (0.68 Ha) located in the industrial estate leading from Tank Farm road, all of the compacted clay soils with a mosaic of recolonising vegetation will be lost to development.

- Habitat loss during construction;
- Accidental damage to retained habitats during construction;
- Potential indirect impacts (e.g. dust) during construction;
- Recreational impacts of retained habitats during operation.

- 10.5.39. Prior to mitigation, potential effects on calcareous grassland are adverse at the **county** level and are of **major** significance.

Wet Grassland and Mixed Scrub

- 10.5.40. Whilst the wet grassland habitats within the Site would broadly fall into the category of 'recolonising vegetation' (see above), they typically support a more established and sufficiently distinct sward, being predominantly enclosed in nature. The extent of scrub (including significant non-native vegetation), detracts from the overall quality of wet grassland habitats, and the relatively rapid scrub succession within the Site can be expected to result in significant declines in the value of this habitat in the short to medium term. Nonetheless, the swards remain frequently diverse in nature, supporting a range of neutral and wet grassland indicator species, as well as localised wetland flora. On this basis, and again reflecting that this habitat forms a component of a wider OMH, it is assessed as being of value at the **local** level.

Impacts

- 10.5.41. Whilst significant areas of wet grassland will be retained or recreated as part of the proposals, there will be a net loss of wet grassland and mixed scrub within the Site. A total of 0.06 Ha of Wet Grassland and Mixed scrub will be lost within the main development area, with the remaining areas to be retaining with the ecology mitigation area.
- Habitat loss during construction;
 - Accidental damage to retained habitats during construction;
 - Potential in-direct impacts (e.g. dust) during construction;

- Recreational impacts of retained habitats during operation.

10.5.42. Prior to mitigation, potential effects on calcareous grassland are adverse at the **local** level and are of **moderate** significance.

Secondary Woodland

10.5.43. The relatively young age of a vast majority of the woodland within the Site, combined with the modest range of tree shrub and field layer species recorded, somewhat constrains the value of the woodland habitats within and adjacent to the Site, as does the invasion of a range of non-native species including Buddleia. Nonetheless, given the broad description of woodland qualifying habitats, the woodlands on Site are considered to comprise the BAP Habitat of Lowland Mixed Deciduous Woodland.

10.5.44. A small area of W1 (W1A and W1B) are identified on the Ancient Woodland inventory. Regarding W1A, whilst acknowledging the presence of localised mature Oak trees, the woodland here has clearly been subject to extensive damage and disturbance in the past. A study of historic maps and aerial imagery identifies substantial ground works around the woodland, relating both to the construction of railways (including the Swansea District Line and previous 'mineral railway' lines), South Site Reservoir and, indeed, infrastructure associated with the Site's former industrial use. Given the extensive ground works undertaken it is considered likely previous habitats (and associated soils), would have been heavily degraded and lost. Indeed, this conclusion is supported by the current condition of the woodland, with extensive dense Willow and Birch growth and no significant woodland ground flora apparent. Noting the above, it is not considered the current Ancient Woodland designation for this area is a correct reflection of the habitats and resource present, not least given it overlaps with extant built form and hardstanding.

10.5.45. W1B supports features indicative of older woodland, with a historic tree line broadly consistent with the area identified on the Ancient Woodland inventory.

10.5.46. Noting the above, and on the basis of their extent primarily, W1, including W1A, W2 and W3 are considered to be of value at the local level. W1B, whilst small in extent, appears to have avoided historic disturbance and destruction, and is therefore considered to be of interest at the borough level.

Impacts

10.5.47. In the absence of mitigation, the Proposed Development will result in localised losses to areas of W1. Subject to detailed design in due course, these losses may include for impacts on W1A albeit areas supporting mature Oak trees are anticipated to be retained.

10.5.48. At this stage, W1A, W1B and W2 to W4 are anticipated to be fully retained as part of the Proposed Development. In total, 0.89 Ha will be lost to development; from a baseline area measurement of 17.99 Ha to 17.1 Ha. As such, impacts which have the potential to arise in the absence of mitigation, include:

- Localised habitat loss;
- Accidental damage to retained habitats during construction;
- Potential indirect impacts (e.g. dust, laden run-off) during construction;

- Recreational pressure during operation.

10.5.49. Prior to mitigation, potential effects on woodland are adverse at the Site level and are of **minor** significance.

Dense and Scattered Scrub

10.5.50. For the most part, areas of scrub are of low intrinsic ecological value in the context of the Site, supporting large numbers of invasive species. In most instances areas of dense scrub are relatively uniform in structure, being of similar age and stature. Moreover, existing areas of scrub within the Site are outcompeting relatively richer ecological habitats within the Site, such as areas of recolonising vegetation, including floristically diverse, dry grassland, and wet grassland. As such, in the absence of appropriate management, scrub encroachment will continue to result in a decline in the ecological value of the Site overall. As such, scrub habitats are considered of low conservation value at the Site level.

Impacts

10.5.51. Large areas of dense scrub will be lost to the Proposed Development. In total, 12.69 Ha of dense scrub will be lost to development. However, scattered scrub will be retained. Impacts in the absence of mitigation are assessed as:

- Large areas of dense and scattered scrub to be lost (partly as a result of development and partly as a result of appropriate conservation management – see below);
- Accidental damage to retained habitats during construction; and
- Potential indirect impacts (e.g. dust) during construction.

10.5.52. Prior to mitigation, and noting the negative impact scrub encroachment is having on more valuable habitats within the Site, potential impacts are assessed as **adverse** at the **Site level** and are of **negligible to minor** significance.

Waterbodies/Ponds

10.5.53. The Site supports a large number of waterbodies, with these varying significantly in their qualitative value.

10.5.54. In most instances the smaller ponds within the Site comprise relatively recently excavated features, with steep or vertical banks preventing the establishment of any significant marginal vegetation. Notwithstanding this, those ponds which support permanent water have begun to establish with a modest range of aquatic flora. These younger, semi-natural features (P3, P4, P11, P13 to P17 and PB) are assessed as of local value.

10.5.55. Where waterbodies hold water only on an ephemeral basis, but nonetheless support a modest range of aquatic and marginal vegetation (P1, P2, P4, P8, P12), they are assessed as of value at the site level.

- 10.5.56. The remaining small waterbodies which are either ephemeral and unvegetated, or otherwise Typha dominated (P5, P6, P18, P19), are artificial in nature (P7, P9, P10, P20 and P21, or are heavily polluted, (PC to PE) and are of negligible ecological value.
- 10.5.57. The larger waterbodies (those within the Coed Darcy GCN SINC) which have established to support a good range and extent of aquatic or marginal flora are of relatively heightened value and are considered to again be of importance at borough level.
- 10.5.58. South Site Reservoir, on account of its engineered nature and the limited aquatic vegetation present, is deemed of value in the context of the Site only.

Impacts

- 10.5.59. The majority of smaller ponds within the Site will be lost to the Proposed Development. However, the larger waterbodies comprising the Coed Darcy Wetlands and South Bay Lagoon will be retained (the features of highest ecological value within the Site). In the absence of mitigation, potential impacts on the waterbodies within the Site include:
- Loss of smaller waterbodies (P1 to P21 and PA to PE);
 - Temporary loss (modification) of South Site Reservoir;
 - Accidental damage to retained habitats (physical impacts);
 - Indirect impacts to retained impacts, such as pollutants and dust during construction;
 - Pollution during the operational phase of the development.
- 10.5.60. Potential effects are considered to be **moderate** significance at the **local** level.

Ditches

- 10.5.61. The Site supports several ditches, the majority of which comprise steep banked excavations which are understood to provide a temporary role in surface water attenuation. The majority of ditches are of low to negligible conservation value in the context of the Site. However, D2 and, albeit to a lesser extent, D1 which support a modest range of emergent species are considered to be of conservation value in the context of the Site.

Impacts

- 10.5.62. Ditch D2, which lies at the southern boundary of the Site, is envisaged to be retained as part of the proposals, whilst remaining ditch habitat will be lost. In the absence of mitigation, potential impacts on the waterbodies within the Site include:
- Habitat loss;
 - Accidental damage to retained habitats (D2) during construction;

- Indirect impacts to retained impacts, such as pollutants and dust during construction; and
- Pollution during the operational phase of the development.

10.5.63. Potential effects are considered to be at Site level and of **minor** significance.

Rush Pasture

10.5.64. This habitat is of low value in the context of the Site.

Impacts

10.5.65. The following impacts are predicted:

- Rush pasture will be lost to the Proposed Development

10.5.66. Prior to mitigation, potential effects on this habitat type are adverse at the Site level and are of **minor to negligible** significance.

Exposed Rock/Cliff

10.5.67. This habitat is of negligible value in the context of the Site.

Impacts

10.5.68. The following impacts are predicted:

- Localised loss/modification of horizontal rock plateaus.

10.5.69. Prior to mitigation, potential effects on this habitat type are adverse at the Site level and are of **negligible** significance.

Railway Embankment

10.5.70. The railway embankment lies largely outside the Site boundary, with only a narrow section located within the Site boundary to facilitate access (bridge construction).

10.5.71. Notwithstanding this habitat/feature is likely to provide a valuable ecological corridor for faunal species, it supports a range of generally common and widespread habitats and species (predominantly semi-mature secondary woodland and scrub). Given the small extent located within the red line boundary, it is deemed to be of low value in the context of the Site.

Impacts

10.5.72. In the absence of mitigation, the following impacts have the potential to arise:

- Minor habitat loss;

- Accidental damage to retained habitats during construction;
- Potential in-direct impacts (e.g. dust) during construction.

10.5.73. Prior to mitigation, potential effects on this habitat type are **adverse** at the Site level and are of **minor** to **negligible** significance.

Tree Belts/Lines

10.5.74. Whilst relatively limited in extent, the tree belts within the Site support a number of substantially mature Oak trees, in particular TB1. Moreover, many of the tree belts support features such as banks, ditches, or evidence of coppicing, indicating the presence of older landscape features.

10.5.75. Noting the mature nature of the features, as well as the presence of notably mature Oak trees, the tree belts are considered to be of value at the local level.

Impacts

10.5.76. In the absence of mitigation, the following impacts have the potential to arise:

- Habitat loss (partial loss to TB1, losses of TB2 and TB3);
- Accidental damage to retained habitats during construction;
- Potential indirect impacts (e.g. dust) during construction;
- Recreational pressure during operation.

10.5.77. Prior to mitigation, potential effects on this habitat type are **adverse** at the local level and are of **minor** significance.

Amenity (Mown) Grassland

10.5.78. This habitat is of very low value in the context of the Site.

Impacts

- Loss

10.5.79. Prior to mitigation, impacts are predicted to be at the Site level and of **negligible** significance.

Amenity Planting

10.5.80. This habitat is of very low value in the context of the Site.

Impacts

- Loss

10.5.81. Prior to mitigation, impacts are predicted to be at the Site level and of **negligible** significance.

Buildings

10.5.82. The buildings on Site are of no intrinsic ecological value.

Impacts

10.5.83. A proportion of existing buildings will be lost to the Proposed Development however the mitigation bat house will be retained.

- Loss

10.5.84. No effects of any significance are predicted.

Unsealed Hardstanding (Compacted Aggregate/Crushed Tarmac Hardstanding)

10.5.85. This habitat is considered of negligible intrinsic ecological value. Whilst it is of some value in the context of a wider habitat mosaic, this value is significantly reduced by the heavily compacted nature of the ground, which ensures the absence of vegetation across large areas. This habitat type is therefore considered to be of very low value at the Site level only.

Impacts

- This habitat will be lost to the Proposed Development.

10.5.86. Prior to mitigation, potential effects on this habitat type are adverse at the Site level and of **negligible** significance.

Sealed Hardstanding Tracks

10.5.87. Areas of sealed hardstanding are of no ecological significance.

Impacts

- This habitat will be lost to the Proposed Development.

10.5.88. Prior to mitigation, potential effects on this habitat type are adverse at the Site level and of no significance.

Avoidance/Mitigation/Enhancements

- None required.

10.5.89. No potential effects of significance would be realised.

Open Mosaic Habitat (OMH)

- 10.5.90. As identified above, many of the individual habitats present within the Site form integral components of a wider open mosaic of habitats. Combined these habitats support a wide and varied floral community, alongside a diverse habitat structure, and are resultantly of enhanced value. Taken together, this habitat mosaic is deemed to be of value at the county level.

Impacts

- 10.5.91. In the absence of mitigation, potential impacts will include:
- Loss of habitat/interest features during construction;
 - Accidental damage to retained habitats during construction; and
 - Recreational impacts during operational phase.
- 10.5.92. Notwithstanding the OMH within the Site is relatively recent in origin (and indeed significant areas remain primarily bare), it is acknowledged that the wider Coed Darcy Site has nonetheless supported areas of OMH for an extended period. It is further acknowledged that OMH habitats are amongst the most susceptible to loss (through natural or artificial (i.e. development related) processes, making the continuity of a larger resource (such as is possible at Coed Darcy) of heightened importance. Noting this, prior to mitigation, potential effects are therefore considered to be adverse at the county level and of **moderate to major** significance.

Impacts on Protected Species (Fauna)

- 10.5.93. The following Section considers impacts with the potential to arise on faunal groups as a result of the Proposed Development.

Badgers

Legislation

- 10.5.94. The Protection of Badgers Act 1992 consolidates the previous Badgers Acts of 1973 and 1991. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain, with particularly high populations in the south.
- 10.5.95. As well as protecting the animal itself, the 1992 Act also makes the intentional or reckless destruction, damage, or obstruction of a Badger sett an offence. A sett is defined as “any structure or place which displays signs indicating current use by a Badger”.
- 10.5.96. In addition, the intentional elimination of a sufficient foraging area which supports a known social group of Badgers may, in certain circumstances, be construed as an offence by constituting ‘cruel ill treatment’ of a Badger.

- 10.5.97. Guidelines issued by NRW on the types of activity it considers should be licensed within certain distances of sett entrances states works that will disturb Badgers is illegal without a license, including the use of very heavy machinery within 30m of any entrance to an active sett, using lighter machinery within 20m, and light work such as hand digging or scrub clearance within 10m.
- 10.5.98. It is also states that some activities with the potential to cause disturbance from a greater distance, such as explosives or pile with 100m of a sett, may require a license. This is, however, dependent on the type and nature of the explosives and the surrounding geography.
- 10.5.99. Guidance on disturbance, as issued by NE is also considered of relevance. Guidance issued by NE in September 2007 specifically stated:
- “It is not illegal, and therefore a licence is not required, to carry out disturbing activities in the vicinity of a sett if no Badger is disturbed and the sett is not damaged or obstructed.”
- 10.5.100. More recent guidance produced by NE in 2009 states that Badgers are relatively tolerant of moderate levels of disturbance, and that low levels of disturbance at or near to Badger setts do not necessarily disturb the Badgers occupying those setts.

Site Usage

- 10.5.101. No evidence of Badgers has been recorded during the extensive survey work undertaken at the Site between 2020 and 2021. However, suitable foraging and sett building habitat is present in the form of areas of woodland, scrub, and more established areas of grassland. It is noted that some areas of dense woodland and/or scrub which have colonised on steep gradients were largely inaccessible and could feasibly support unrecorded setts. Nonetheless, noting the lack of any Badger activity recorded during nocturnal survey work, as well as an absence of mammal paths, latrines, or foraging signs, it is deemed unlikely the Site is of potential significance to this faunal group. Moreover, the majority of the dense vegetation is to be retained and incorporated into the proposed green infrastructure network.
- 10.5.102. Evidence of active Badger setts have been recorded in the wider Coed Darcy Site, albeit at locations significantly distanced from the Site boundary (>500m south).
- 10.5.103. Noting the above, the Site is considered to be of negligible importance for Badgers.

Impacts

- 10.5.104. On a highly precautionary basis, noting the present of dense and inaccessible vegetation within localised areas of the Site, the following impacts have the potential to arise in the absence of mitigation:
- Accidental damage or destruction of unidentified setts during construction (short term);
 - Injury or death of Badger during construction (short term);
 - Some loss of foraging habitats (short to long term).

- 10.5.105. In the absence of mitigation, impacts are predicted to be **adverse** at the Site level and of **negligible to minor** significance.

Bats

- 10.5.106. Legislation: All bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as Amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations"; as Amended). These include provisions making it an offence to:

- Deliberately kill, injure or take (capture) bats;
- Deliberately disturb bats in such a way as to:-
 - (i) be likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate or migrate; or
 - (ii) affect significantly the local distribution or abundance of the species to which they belong;
- Damage or destroy any breeding or resting place used by bats;
- Intentionally or recklessly to obstruct access to any place used by bats for shelter or protection (even if bats are not in residence).

- 10.5.107. The words 'deliberately' and 'intentionally' include actions where a court can infer the defendant knew the action taken would almost inevitably result in an offence, even if that was not the primary purpose of activity. The offence of damaging or destroying a breeding site or resting place (which can be interpreted as making it worse for the bat) is an absolute offence. Such actions do not have to be deliberate for an offence to be committed.

- 10.5.108. European Protected Species licenses are available from NRW in certain circumstances, and permit activities that would otherwise be considered an offence.

Site Usage

- 10.5.109. None of the buildings within the Site, which are likely to be subject to direct or indirect impacts, support roosting bats. Indeed, the vast majority of buildings within the Site are totally unsuitable to support roosting bats on account of their construction.

- 10.5.110. In reaching this conclusion, it is noted a vast majority of the Site is devoid of buildings or structures, with a large number of pre-existing features having been removed to facilitate previous remediation and construction works across the wider Coed Darcy Site. This included for a small number of buildings recorded to support roosting bats (and for which the mitigation bat house (B22) was constructed).

- 10.5.111. Whilst a large number of buildings are associated with Contractors Yard Industrial Estate, these are prefabricated in nature and resultantly of negligible suitability. In any event, these buildings are anticipated to be retained as part of the emerging Proposed Development.

- 10.5.112. In addition, the vast majority of trees/woodland areas proposed for removal comprise of generally semi-mature specimens which have not developed features of potential suitability for roosting bats. Noting the poor accessibility to much of the woodland (i.e. on account of gradient and dense boundary vegetation) a detailed ground based inspection of each tree has not been undertaken. Nonetheless, these woodland blocks would be classed as (at best) low suitability for bats overall, with no moderate or high potential trees recorded from boundary inspections of woodland.
- 10.5.113. Given the low roosting suitability of the woodland habitats overall, and given woodland impacts are likely to only result in localised removal, no further roost survey work has been undertaken on woodland blocks at this stage. Nonetheless, it is proposed for further detailed inspections (to be facilitated by localised vegetation clearance where required), of all impacted woodland, once the extent of any impacts has been identified through detailed design (i.e. at the Reserved Matters stage). This further survey work is anticipated to comprise ground based inspections of trees in the first instance. If deemed appropriate, this would include for the completion of tree climbing surveys and/or emergence/re-entry surveys.
- 10.5.114. In addition to the woodland trees, a small number of trees located within tree belt habitat proposed for removal in the north-east of the Site are deemed to be of low bat roosting potential on account of the presence of features such as exposed cracks in horizontal branches. Initial ground based assessment of these trees did not record any evidence of use by bats (such as staining, droppings or scratch marks). Where individual trees with moderate or high bat roosting potential have been identified for removal (T1 and T2), detailed tree climbing surveys have been undertaken and were sufficient to confirm the absence of roosting bats.
- 10.5.115. Bat activity surveys in the form of static and transect surveys confirmed the Site to have modest levels of bat activity overall. As would be expected, this activity was found to be concentrated within/adjacent to areas of established woody vegetation, with very limited activity recorded across extensive areas of open and sparsely vegetated land, particularly within central areas of the Site (which remains predominantly bare).
- 10.5.116. Bat activity was recorded to be locally high adjacent to several larger waterbodies within the Site, particularly within the south-west of the Site and over South Bay, where consistent foraging activity was recorded during the course of activity surveys.

Impacts

- 10.5.117. The Proposed Development will result in losses to habitats within the Site. However, the areas of heightened value to bats, including the majority of mature woodland, as well as the larger waterbodies, will be retained (and in some cases enhanced) as part of the Proposed Development.
- Lighting during construction (short term);
 - Some losses to foraging and commuting habitats (short to long-term);
 - Potential for adverse impacts on foraging bats as a result of installation of external lighting (street lights) (short to long-term);
 - Loss of potential roosting features (short to long-term).

- 10.5.118. On the basis of surveys to date, impacts in the absence of mitigation are considered to be **adverse** at the local level and of minor significance.

Reptiles

Legislation

- 10.5.119. All six British reptile species receive a degree of legislative protection that varies depending on their conservation importance.
- 10.5.120. Rare, endangered, or declining species receive 'full protection' under the Wildlife and Countryside Act 1981 (as Amended), as well as protection under the Conservation of Habitats and Species Regulations 2010 ("The Habitats Regulations"; as Amended). Species that are fully protected include Smooth Snake and Sand Lizard. These receive protection from:
- killing, injuring, taking;
 - possession or control (of live or dead animals, their parts or derivatives);
 - damage to, destruction of, obstruction of access to any structure or place used for shelter or protection;
 - disturbance of any animal occupying such a structure or place;
 - selling, offering for sale, possession, or transport for purposes of sale (live or dead animal, part or derivative).
- 10.5.121. By contrast, due to their abundance and more cosmopolitan habitat requirements in Britain, Common Lizard, Slow Worm, Grass Snake and Adder are only 'partially protected' under the Wildlife and Countryside Act 1981 (as Amended) and as such only receive protection from
- deliberate killing and injuring;
 - being sold or other forms of trading.

Site Usage

- 10.5.122. Extensive previous clearance works across the wider Coed Darcy Site (including the Site) resulted in the removal of a vast majority of suitable reptile habitat within the Site. This clearance work (undertaken in support of the consented OPP), was supplemented by considerable capture and translocation efforts in regards reptiles (amongst other species). Noting this previous work, it can be concluded a vast majority, if not all, of the Site was clear of reptiles as recently as 2015.
- 10.5.123. Subsequent to these works, suitable reptile habitat has gradually recolonised within the Site, namely within the south-western edge, in eastern areas, and to the north of the railway. This suitable habitat is considered recent in origin (with most habitats only attaining suitability within the last 3 to 4 years). The

recent origin of more suitable habitat is reflected by the generally low numbers of reptiles recorded, with only small populations of Grass Snake and Common Lizard recorded (relative to the size of the Site).

- 10.5.124. A majority of the Common Lizard observations were made adjacent to the Crescent Woodland (W2), in close proximity to the north of the railway embankment (as shown on Figure 10.4) and adjacent scrub habitat in the north of the Site. A majority of the Grass Snakes relate predominantly to W2, and the south of the railway embankment located in the north-east of the Site. Three additional records of Grass Snake relate to north of the Site; west of the horse paddocks (G1). The results indicate populations may be re-establishing from pockets of retained (previously un-impacted) habitats within the Site, or otherwise from off-site habitats.

Impacts

- 10.5.125. In the absence of mitigation, the following potential impacts may arise on common reptile species:
- Loss or degradation of habitat during construction (short to long-term);
 - Injury or death during construction/operation (short term); and
 - Disturbance during operational phase (long term).
- 10.5.126. In the absence of mitigation, impacts are considered **adverse** at the Site level and of **moderate** significance.

Wintering Birds

Site Usage

- 10.5.127. Notwithstanding its size, the habitats present across a majority of the Site are deemed to be of low importance for wintering birds. As such, the Site is not considered likely to support populations of raised conservation significance.
- 10.5.128. Where habitats of heightened value are present (for example the larger waterbodies associated with Coed Darcy GCN SINC), these are to be retained and unimpacted. Moreover, whilst temporary impacts will be realised to South Site Reservoir, this resource will be retained (and indeed enhanced) as a large wetland habitat.

Impacts

- 10.5.129. Prior to mitigation, potential impacts include:
- Some losses to wintering habitats (short to long term);
 - Disturbance during construction (short term);
 - Disturbance during operational phases (long term).

- 10.5.130. Given the limited use of the Site by wintering birds, impacts are considered to be **adverse** at the Site level and of negligible to **minor** significance.

Breeding Birds

Legislation

- 10.5.131. Section 1 of the Wildlife and Countryside Act 1981 (as Amended) is concerned with the protection of wild birds, whilst Schedule 1 lists species protected by special penalties. All species of birds receive general protection whilst nesting.
- 10.5.132. Breeding bird surveys have confirmed the presence of a diverse assemblage of breeding birds within the Coed Darcy Site. In particular, the open habitats support valuable breeding populations of ground nesting species, including for good numbers of Lapwing, Ringed Plover, Little Ringed Plover, and Skylark. Most of these species occurred in the open grassland habitats in the south of the Coed Darcy area (predominantly beyond the Site boundary), with the noticeable exception of Ringed Plover which was nesting exclusively in the bare ground habitat of the cleared area within the Site.
- 10.5.133. The wetland habitats, located in the south-western edge of the Site also support an interesting assemblage, as do woodland and scrub habitats.
- 10.5.134. Overall, the breeding bird assemblage within the Site is deemed to be of borough importance.

Impacts

- 10.5.135. Areas of suitable foraging and nesting habitat for birds will be lost as a consequence of the proposals, although significant areas will still remain:
- Losses to suitable nesting habitat during construction (short to long term);
 - Disturbance/destruction of nest sites during construction (short term);
 - Disturbance during operation (long term).
- 10.5.136. Given the diversity of species present, including several species of recognised conservation value (including Red List, Schedule 1 and/or local or National Priority Species), impacts in the absence of mitigation are considered **adverse** at the borough level and of **moderate** significance.

Invertebrates

- 10.5.137. The Site, as a component of the wider Coed Darcy Site, supports a notable population of terrestrial invertebrates. In total, surveys identified some 380 species associated with the northern sector (which roughly approximates to the Site extent). These surveys confirm a diverse assemblage of invertebrate species utilise the Site, with several different groups (i.e. beetles, bugs, spiders, flies, bees, butterflies and moths) well represented. Of the 380 species recorded, 25 species (6.6%) were recorded with a formal nature conservation status.

- 10.5.138. The most noteworthy invertebrate assemblages are largely associated with the early successional habitats present within the Site, in particular, drier OMH habitats which support flower-rich grasslands on highly heterogeneous topography. Such habitats share characteristics with coastal and sand dune habitats in the wider landscape, and indeed the invertebrate assemblage recorded within the Site includes several species noted within nearby protected sites such as at Crymlyn Burrows and Kenfig SSSIs.
- 10.5.139. Whilst noting the early successional habitats within the Site are not of equal qualitative value to invertebrates, it is nonetheless concluded it is the overall mosaic of habitats, and the combination of habitat characteristics, which attribute the Site its value, rather than the presence of specific high value features or localised habitat areas within the Site.
- 10.5.140. The invertebrate assemblages associated with the Site have been evaluated to be of regional nature conservation value when considered as a component of the wider Coed Darcy Site. This is based on the relative quality and extent of the habitat resource present for invertebrates within the wider region, number of Key Species, and the proportion of stenotopic taxa (species dependent on restricted habitat conditions), recorded in specific assemblages, indicating favourable conservation status.

Impacts

- 10.5.141. The Proposed Development will result in the loss of areas of OMH on previously developed land, including habitat of heightened importance for invertebrate assemblages. Significant areas will be retained:
- Losses of nesting and foraging habitats (short to long term);
 - Disturbance during operational phase (long term).
- 10.5.142. In the absence of mitigation, potential effects are adverse at the regional level and of **moderate** significance. In reaching this conclusion, regard is given to the fact a significant area of OMH will be retained unimpacted within the wider Coed Darcy Site (i.e. outside the Site boundary).

Amphibians (GCN)

Legislation

- 10.5.143. All British amphibian species receive a degree of protection under the Wildlife and Countryside Act 1981 (as Amended). The level of protection varies from protection from sale or trade only, as is the case with species such as Smooth Newt and Common Toad, to the more rigorous protection afforded to GCN.
- 10.5.144. GCN are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as Amended) and included on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as Amended). These include provisions making it an offence to:
- deliberately kill, injure or take (capture) GCN;
 - deliberately disturb GCN in such a way as to be likely-

- to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or to hibernate; or;
 - to affect significantly their local distribution or abundance.
 - deliberately take or destroy the eggs of GCN;
 - damage or destroy any breeding or resting place used by GCN;
 - intentionally or recklessly obstruct access to any place used by GCN for shelter or protection (even if the newts are not present at the time).
- 10.5.145. The words ‘deliberately’ and ‘intentionally’ include actions where a court can infer the defendant knew the action taken would almost inevitably result in an offence, even if that were not the primary purpose of the act. European Protected Species licences are available from NRW in certain circumstances, and permit activities that would otherwise be considered an offence.
- 10.5.146. The Site supports a large number of waterbodies, with these primarily concentrated in the north of the Site, north of the railway, and in the south-west of the Site. Extensive central areas of the Site lack any permanent or semi-permanent waterbodies.
- 10.5.147. Surveys undertaken in 2021 confirmed a sub-set of the ponds (five ponds P9, P10, P14, P16, P20) in the north of the Site were found to support GCN, collectively comprising a population that would be classed as a ‘medium’ population size class (low end of size class). Noting the apparent suitability of the ponds and, albeit to a lesser extent, terrestrial habitats in 2021, the smaller size of the population is considered to be a reflection of the recent origin and establishment of habitats. On the evidence available, and noting the western ‘bias’ to the findings, it is concluded that GCN (and other amphibians) are likely to have only recently colonised this area of the Site, likely from suitable off-site habitat to the west of the Site.
- 10.5.148. In addition, Pond B located in the south-west of the Site, was recorded to support a medium population of GCN. This observation is consistent with previous survey work (i.e. with the southern areas of Coed Darcy supporting the vast majority of amphibian populations), and moreover reflects the more established nature of habitats in this locality. It is unclear whether these populations of GCN have successfully colonised from off-site habitat or otherwise represent a remnant population re-establishing following previous capture effort.
- 10.5.149. Given the size of the Site, with ponds broadly located within two separate ‘clusters’ (north and south), it is deemed likely the Site supports two meta populations between which there is likely to be (at best) only limited dispersal.
- 10.5.150. Whilst specific update surveys were not undertaken of all ponds in the wider Coed Darcy Site (i.e. to the south of the Site), these ponds are reasonably well distanced from the Site (> 200m at their closest points). Noting this, and given positive eDNA results for several of these ponds in 2020, presence of breeding GCN (and common amphibians) has been assumed within these more distant ponds.
- 10.5.151. Overall, the breeding amphibian assemblage within the Site is deemed to be of **borough** importance, not least noting that populations attain a threshold suitable for SINC designation.

Impacts

- 10.5.152. The following impacts are predicted in the absence of mitigation:
- 10.5.153. Loss of or damage to existing ponds (P1 to P22, PA to PE);
- Loss of suitable terrestrial habitats (short to long term);
 - Accidental damage to retained habitats (physical impacts) (short term);
 - Indirect impacts to retained impacts, such as pollutants and dust during construction (short to medium term);
 - Pollution during the operational phase of the development (medium to long term);
 - Introduction of invasive species/predators in operational phase (e.g. fish) (medium to long term).
- 10.5.154. Impacts in the absence of mitigation are considered **adverse** at the borough level and of **moderate** significance.

Otter & Water Vole

Legislation

- 10.5.155. Otter is included on Schedule 5 of the Wildlife & Countryside Act 1981 (as Amended) and receives full protection under Section 9. Otter is also fully protected under the Conservation of Habitats and Species Regulations 2010. This makes it an offence to:
- Intentionally or recklessly kill, injure, take (capture), possess, or trade in Otters;
 - Intentionally or recklessly damage, destroy, or obstruct a place of shelter or protection; and
 - Intentionally or recklessly disturb Otters while occupying places used for shelter and protection.
- 10.5.156. The Water Vole is included on Schedule 5 of the Wildlife & Countryside Act 1981 (as Amended) but receives only partial protection in respect of Section 9(4). This Section of the Act protects Water Vole's places of shelter or protection, but does not protect the animals themselves, for example, from deliberate killing. This limited protection is recognition that habitat loss and destruction has played a much greater part in Water Vole decline rather than direct persecution.
- 10.5.157. Neither Otter nor Water Vole have been recorded within the Site. Moreover, those habitats of suitability to both species (i.e. the waterbodies associated with Coed Darcy GCN SINC) are to be retained.

Impacts.

- 10.5.158. None anticipated.

Other Species

- 10.5.159. The survey work undertaken between 2020 and 2021 has not identified the presence of any other notable or protected species within the Site. As such, and with reference to historic ecological survey work across the Coed Darcy Site, the Site is not considered likely to provide any significant opportunities for any other protected or notable species.
- 10.5.160. However, noting the presence of small mammals including Hedgehog *Erinaceinae*, in the local area (as confirmed through the desk study exercise), consideration is given to this species on a precautionary basis.
- 10.5.161. Impacts. In the absence of mitigation, and on a precautionary basis, the following potential impacts are identified:
- Habitat loss (short to long term);
 - Accidental injury/harm during construction (short term).
- 10.5.162. Impacts in the absence of mitigation are considered **adverse** at the Site level and of **minor** significance.

10.6. **Additional Mitigation, Compensation and Enhancement Measures**

- 10.6.1. This section details the additional measures which have been incorporated into the scheme such that potential effects on ecological receptors may be avoided or minimised, and enhancements sought. The measures have been developed with input from other technical consultants in the Design Team in order to ensure a viable scheme can be delivered, as well as with regard to discussions with relevant authorities (not least ecology consultees).

Designated Sites

Statutory Wildlife Sites

- 10.6.2. As set out in Section 10.5 above, detailed consideration is given to the Crymlyn Bog designated sites complex within the separate iHRA document prepared for the Proposed Development, submitted alongside this Environmental Statement. The iHRA includes for consideration all potential impact pathways, and identifies appropriate avoidance and mitigation measures as required. As concluded within the iHRA document, the adoption of identified avoidance and mitigation measures, as prescribed within the iHRA, will ensure potential impacts on integrity of the Crymlyn Bog (including all underpinning designations) will be avoided.
- 10.6.3. As such, the Proposed Development would, by definition, be acceptable subject to securing the avoidance measure proposed. In those terms the competent authority could legally and safely grant a habitats approval under the Habitats Regulations 2017 for the proposed plan/project.

Crymlyn Burrows

- 10.6.4. Noting the significant separation of this SSSI from the Site, potential impacts such as light, air, and noise can be scoped out, as can hydrological impacts. However, noting the affinity between invertebrate assemblages recorded within the Site to those within the Crymlyn Burrows SSSI, and on a highly precautionary basis, consideration is given to potential indirect effects through loss of potentially functionally comparable habitat, as well as through potential recreational pressure during operation.
- 10.6.5. Considering loss of comparable habitats in the first instance, it is noted the Site supports an extensive area of OMH, a majority of which is of relatively recent origin (<6 years old), and resultantly comprises early successional habitats which are frequently sparse in nature. The OMH vegetation community within the Site is distinct from the established habitats within Crymlyn Burrows SSSI and indeed other coastal SSSIs further afield. The relationship is down to the similar edaphic features which the Site and the SSSI share, such as the free-draining substrates that form a highly heterogeneous topography, in combination with the bare ground resource that support mosaics of flower-rich grasslands and scattered scrub that occur on spoil heaps, which mimic the dune systems and soft cliff exposures. The invertebrate assemblages recorded within the Site suggest the OMH is providing a supplementary resource to that present elsewhere within the coastal plain.
- 10.6.6. Whilst acknowledging potential ecological connectivity between OMH habitats within the Site and the habitats within Crymlyn Burrows SSSI (as well as other coastal and OMH habitats in the wider landscape), it is equally important to note the habitats within the Site are both relatively recently established and ephemeral in nature. Indeed, whilst OMH has been present (and regenerated) for an extended period, as the Site has undergone decommissioning and remediation, the nature and extent of the habitats currently present are relatively distinct from that recorded in the previous Environmental Statement Chapter (2005).
- 10.6.7. Moreover, in the absence of appropriate management interventions, these early successional habitats would be lost via ecological succession to less diverse habitats such as tall, species-poor grasslands, and/or scrub. The potential functional connectivity between the Site and Crymlyn Burrows SSSI should be viewed in this context, i.e. as a relatively ephemeral ecological link, rather than an ecological resource that has provided a long-standing supporting function for the SSSI. Indeed, in a no development scenario, the functional link between the Site and the SSSI would become significantly diminished and indeed lost in the medium term.
- 10.6.8. Notwithstanding the above, the retention and or replenishment of OMH habitat (with shared characteristics to coastal habitats), is recognised as important in retaining, bolstering, and improving ecosystem resilience, both in relation to Crymlyn Burrows SSSI and more broadly. In particular, for invertebrate assemblages, where synergistic pressures (such as ephemeral habitat losses and climate change), can lead to heightened risk of localised extinctions, the importance of retaining and enhancing landscape level dispersal opportunities is essential.
- 10.6.9. As such, careful consideration has been given to ensuring substantial areas of high quality OMH are retained within the Site in the long-term. The guiding principle of this habitat creation is to retain an OMH resource characteristic of that currently present, with extensive areas of dry, floristically diverse grassland, a structurally varied topography, and bare ground. In addition to providing substantial

opportunities for invertebrate communities within the Site, a key design consideration is to ensure the green infrastructure within the Site functions as a valuable stepping-stone habitat within the wider ecological landscape. Noting the above, and as detailed further in the Invertebrate Section of this ES Chapter (in addition to within the Landscape and Ecological Management Plan [LEMP] which accompanies this submission), the Proposed Development is guided by the following mitigation and enhancement principles:

- Retention/recreation of extensive areas of OMH, including those within dedicated ecology areas (with no public access), as well as within extensive multi-functional green infrastructure elsewhere on Site, which will be managed to provide abundant species-rich, dry grassland.
- The extent and layout of green infrastructure to function as a biodiversity corridor both within the wider Coed Darcy Site and the wider ecological landscape. This would concurrently provide an opportunity for the creation of a biodiverse corridor for pollinators that supports national pollinator policy in Wales.
- Phased habitat creation and removal, to ensure continued OMH provision throughout construction (further details of which to be provided within a LEMP/CEMP). This to be informed through discussions with the Ecological Clerk of Works (ECOW), as will be a stipulation of the CEMP / LEMP.
- Targeted habitat creation to ensure the valuable OMH characteristics associated with the existing resource, such as the rich flower resource and mosaics of bare ground, and varied topography are retained or recreated.
- In-perpetuity, biodiversity led habitat management to ensure high quality OMH can be secured in the long-term.

10.6.10. Regarding recreational pressure, and as also set out within the accompanying iHRA (in reference to the Crymlyn Bog) the Proposed Development will deliver extensive new accessible Green Infrastructure and accessible open space within the Site. The design and extent of this open space will include extensive formal and informal open space, including longer circular walks and suitable locations for dogs to be walked off-lead. The provision of extensive high quality open space, the detailed design of which will further be secured within a LEMP, would provide high quality recreational opportunities on the doorstep for new residents, as well as for existing residents. It is considered these opportunities will more than off-set any increase in recreational pressure on off-site receptors, including Crymlyn Burrows SSSI.

10.6.11. Subject to the above measures being secured, and noting that significant areas of OMH will remain unaffected in the wider Coed Darcy Site (to the immediate south of the Site), it is considered the emerging proposals would avoid any potential adverse impact on Crymlyn Burrows SSSI (i.e. as a result of impacts on potentially functionally linked land).

10.6.12. Following mitigation/enhancement measures, potential effects on Crymlyn Burrows SSSI are assessed as, at worst, **neutral** at the national level (i.e. no impact predicted). It is noted the retention and

safeguarding of significant OMH within the Site in the long-term will safeguard and bolster ecological resilience of the landscape. This is likely to be of benefit to a range of nature conservation sites.

Non-Statutory Wildlife Sites

Mitigation

- 10.6.13. On the basis that Coed Darcy GCN Area SINC is designated solely on account of the population of GCN it supports, appropriate mitigation would comprise safeguarding existing populations of this species and ensuring their retention on Site in the long-term.
- 10.6.14. At this stage, it is anticipated the Coed Darcy GCN Area SINC is to be fully retained as part of the emerging proposals, with no direct impacts upon habitats within the red line. Moreover, it is noted a majority of the SINC is excluded from the Site by herpetofauna fencing, with only a small easternmost section of the SINC boundary (surrounding South Bay), being 'open' to the wider Site. Moreover, the section of the SINC which is continuous with the wider Site, is not understood to have formed a receptor location for previous GCN translocations.
- 10.6.15. Noting the above, it is not considered the emerging Proposed Development for the Site would have the potential to result in adverse direct impacts on GCN populations within the Coed Darcy GCN Area SINC, even in the absence of mitigation.
- 10.6.16. Of relevance, additional GCN populations are present within the Site (outside of the Coed Darcy GCN Area SINC), and, indeed, the emerging proposals have given careful consideration to a mitigation strategy which would safeguard GCN populations within the Site overall, and would be complementary to the SINC designation. This mitigation strategy, which will give due regard to previous work and NRW licensing commitments for the wider Coed Darcy Site, seeks to create extensive additional GCN habitat along the western boundary of the Site, effectively extending the suitable habitat currently present within the SINC and enhancing landscape connectivity for both GCN and common amphibian species. At this stage, it is considered a minimum of 20 new dedicated waterbodies, alongside extensive terrestrial habitat will be made available to GCN as part of the proposals. The indicative location of new habitat is detailed on the Green Infrastructure Plan at Appendix 10.6.
- 10.6.17. Further detail is provided on the proposed habitat creation and management of new GCN habitat in the Amphibian Section of this Environmental Statement Chapter, as well as within a draft LEMP as is provided at Appendix 10.7. This LEMP, which will prescribe detailed avoidance mitigation and enhancement measures for both habitats and fauna (including targeted conservation plans), is submitted as a formal draft document.
- 10.6.18. It is proposed a final version of the LEMP be secured by way of a planning Condition to any granted consent. This will allow a final version to incorporate consultation comments/input from ecology consultees
- 10.6.19. A summary setting out the sequence of the works proposed as part of this Site wide mitigation strategy is provided below, with further detail provided at Appendix 10.7:

- At this stage, it is anticipated an initial receptor site for GCN (and other herpetofauna), will be created in the south-west corner of the Site. The indicative extent of the proposed area is detailed on Figure 10.7. This area, which will be continuous with the existing Coed Darcy GCN SINC, will form part of a wider dedicated ecology area that will be bought forward for GCN as part of the proposals.
- Initial enhancements to the receptor area will include the excavation of four additional waterbodies suitable for breeding GCN and appropriate terrestrial habitat enhancements (including hibernacula creation).
- Additional herpetofauna fencing will be erected to delineate this receptor area from the wider Site during construction, whilst ensuring the receptor area is continuous with both the previous receptor site (i.e. the Coed Darcy GCN Area SINC) and suitable off-site habitats.
- Herpetofauna translocations, as required within the Site, will commence following the appropriate creation and establishment of receptor site habitats.
- Additional green infrastructure will be sequentially created during the early construction phase, with this habitat being made available to GCN through sequential removal or realignment of GCN fencing.
- This will allow for the expansion of the Coed Darcy GCN Area SINC in the longer term, whilst ensuring improved connectivity between local GCN metapopulations and retaining/enhancing the Favourable Conservation Status (FCS) of the local meta-population(s) in-perpetuity.
- Commencement/continuation of long-term habitat management of receptor habitats (including within the Coed Darcy GCN Area SINC), to ensure high quality habitat is retained in the long-term. Management to be undertaken by an appropriately experienced conservation management body (for example ARC).

10.6.20. In regards construction related impacts, the adoption of appropriate safeguards (in accordance with best practice measures and legislation), will be secured within a revised CEMP for the Site; a document which may, again, be secured via a suitably worded planning Condition. At this stage it is anticipated the CEMP will secure comparable safeguards as were deemed appropriate for the extant OPP for the Coed Darcy Site, including for an ECoW. The instigation of appropriate measures will minimise/avoid potential construction related impacts on SINC habitats (or features), not least as a result of dust, laden silts, or surface water run-off.

10.6.21. In light of the above, and subject to the adoption of the measures set out, it is considered the value of Coed Darcy GCN Area SINC may be fully retained and, indeed, enhanced as a result of the Proposed Development.

10.6.22. In regards Jersey Marine Woods SINC, this site lies outside of the Site boundary and will not be subject to any direct impacts (i.e. land take/damage). The adoption of appropriate construction safeguards, as detailed within a CEMP, will ensure the potential for indirect impacts on this SINC are also minimised/avoided through the adoption of appropriate measures, in line with best practice and adopted guidance. Given the SINC is designated specifically on account of its habitats, the CEMP will give

particular regard to potential impacts arising from dust or surface water run-off (although noting the gradient change between the Site and the SINC, hydrological impacts are deemed unlikely to arise).

- 10.6.23. In regards Llandarcy Village Green SINC, noting the amenity management of this site, minor additional recreational use is not deemed likely to result in any adverse impacts of significance. In any event, it is noted the emerging proposals will deliver extensive new formal and informal open space within the Site, providing on the doorstep opportunities for new residents and minimising/avoiding a net increase in recreational pressure beyond the Site boundary.
- 10.6.24. As detailed above, the Site contains various habitats, assemblages or features which are not formally designated as SINC sites, but are considered likely to meet the threshold of SINC designation. Planning policy requires sites/features which meet SINC criteria should be assessed as formally designated SINC sites. Impacts and mitigation of relevance to these features are considered where relevant in the appropriate Habitat and Faunal Sections below. To avoid repetition, these measures are not detailed here; suffice to say the following broad principles are proposed:
- Extensive site wide green infrastructure, including dedicated ecology areas and extensive OMH and dry grassland;
 - Extensive open areas with no formal public access (including an area in the former Tip of >8ha) to provide optimal breeding and wintering habitat for a range of ground nesting birds and waders;
 - Dedicated wetland habitat, including a wildlife buffer to the western boundary of the Site, which will include for a high number of new ponds, and which will facilitate a continuous wetland corridor across the wider Coed Darcy Site and beyond, to enhance local opportunities for a range of herpetofauna;
 - Species specific mitigation strategies to be adopted during construction and operational phases;
 - The instigation of a high quality, biodiversity led management regime for new green infrastructure, with this to be secured in perpetuity through the Proposed Development.
- 10.6.25. Following mitigation/enhancement measures, potential effects on Coed Darcy GCN Area SINC are positive at the borough level and are of **moderate** significance.
- 10.6.26. Impacts on all other SINC sites, including Jersey Marine Woods SINC and Llandarcy Village Green SINC are **neutral** at the borough level.
- 10.6.27. As above, potential effects (following mitigation) for non-designated habitats, features and species/assemblages are assessed in the appropriate 'Habitat' and 'Faunal' Sections below.

Habitats (Avoidance/Mitigation/Enhancements)

Compacted Clay Soils with a Mosaic of Recolonising Vegetation

- 10.6.28. As set out above, the Proposed Development includes for the delivery of an extensive green infrastructure network, including dedicated ecology areas and SuDS, with this to be managed in perpetuity for the purposes of nature conservation.
- 10.6.29. Indeed, careful consideration will be given during the detailed design of proposed green infrastructure (as well as semi-natural habitats in the wider site), to ensuring substantial areas of OMH can be either created, reinstated, or retained in the long-term as part of the Proposed Development. This is key to retaining the invertebrate interest of the Site long term.
- 10.6.30. New green infrastructure will include for a wide range of early successional habitats, ranging from extensive areas of species-rich dry grassland over a diverse topography, to areas of bare and scarcely colonised ground in the form of unsurfaced footpaths and periodically scarified land.
- 10.6.31. Furthermore, habitats within the wider Site will also be created and managed such that they deliver additional areas of early successional habitat. Measures in this regard will include for the creation of extensive living roof habitat within the main development footprint, not least upon the proposed school, as well as living wall habitat and/or sparsely vegetated embankments, particularly in the west of the Site, where substantial level changes offer opportunities to create invertebrate banks, cliff habitat, and nesting walls.
- 10.6.32. The extent and proposed management of these habitats, which will include for both passive measures (such as low level recreational disturbance), and active measures (such as scarification), will ensure the continuation of a range of successional habitats in the long-term.
- 10.6.33. The creation and management of extensive areas of OMH will go some considerable way to mitigating for losses to existing habitat during the construction phase. Moreover, it should be noted a significant proportion of the proposed OMH will come forward in the initial development phase, ensuring these habitats are established in advance of wider construction related works.
- 10.6.34. Further details on the principle guiding habitat creation and management are detailed within the draft LEMP document provided at Appendix 10.7. Amongst other measures, the following are considered within this document:
- Construction phasing to ensure continued representation of early successional habitat during the construction and operational phases (recognising also that substantial OMH will be retained unimpacted to the south of the Site);
 - The retention, safe storage, and re-distribution of site soils and materials (including the seed bank), to ensure new habitats retain a genetically local and diverse seed bank;
 - Design principles guiding dry grassland and OMH creation, as well as localised wet grassland;
 - Guiding principles for 'living roof habitat' and 'living wall', including target locations and quantum;

- Guiding principles for in-perpetuity management, to be secure by the Proposed Development.

- 10.6.35. The provision of extensive new high quality areas of OMH, alongside the implementation of a sensitive management strategy, will ensure significant new OMH of high qualitative value, in turn ensuring optimal opportunities for invertebrate populations. Whilst it is acknowledged there would be a net quantitative loss of OMH relevant to the 2021 baseline, this quantitative loss must be viewed in the context of the ephemeral nature of the resource, most of which is less than 6 years old and, in the absence of suitable management regime, would likely be lost (or significantly depleted) in the medium term. The emerging Proposed Development would provide long-term security as to the retention of the early successional habitats, contrary to a non-development scenario, preventing long-term declines as a result of unchecked ecological succession, and securing (in-perpetuity) OMH as part of a valuable component of the wider landscape.
- 10.6.36. Securing a legacy of biodiversity led management regime, not least for extensive areas of OMH, is therefore assessed as a substantial benefit. Indeed, it is only through the instigation of such management that early successional habitat can be expected to be retained in the medium term. Retaining or recreating substantial OMH within the Site will contribute positively to long-term ecological resilience in the local area, safeguarding a resource that is not only of high quality in its own right, but which also functions as an essential dispersal corridor (both as seed banks and for faunal species) within the landscape and which, in future years, will provide a vital role in species movement as OMH in the wider landscape is fluctuates in extent and quality (be it through succession or anthropogenic pressures).
- 10.6.37. Following mitigation/enhancement measures, potential effects on compacted clay soils with a mosaic of recolonising vegetation would be assessed initially as negative at the county level and of **minor to negligible** significance. However, as new OMH establishes and, indeed, is sustained through management, and noting the trend of decline which would result in a non-development scenario, this impact is considered to become **neutral to positive** (minor significance) in the short to medium term.

Wet Grassland and Mixed Scrub

- 10.6.38. Extensive areas of wet grassland will be retained, enhanced and/or created as part of the proposals, including within dedicated ecology areas. Post-development, these wet grassland and mixed scrub habitats are to be managed in perpetuity for the purposes of nature conservation.
- 10.6.39. Where habitats are to be retained, appropriate safeguards will be implemented to avoid or minimise the risk of direct or indirect impacts. These measures, which will be detailed within the CEMP for the Site, will include the provision of protective fencing where required, in addition to the adoption of appropriate measures to minimise/avoid potential construction related impacts, such as a result of dust, laden silts, or surface water run-off.
- 10.6.40. In regards habitat creation, enhancement, and management, the proposals will be supported by a dedicated LEMP, a draft version of which is provided alongside this Environmental Statement. The draft LEMP identifies the guiding principles, suggested to ensure the value of wet grassland habitats are retained within the Site in the long-term. Amongst other matters, these principles include for:

- Retention and safeguarding of existing habitats wherever possible;
- Phasing of habitat impacts/creation to retain representation throughout the construction phase;
- Wet grassland and OMH creation, including ponds, scrapes, and ditches;
- The conversion of South Site Reservoir from an artificial waterbody with engineered banks to an extensive wetland habitat, including a large area of shallow water, a variety of bankside gradients, and extensive drawdown zones, alongside localised marginal planting (although self-seeding will be encouraged);
- In-perpetuity management of new and retained habitats, not least including management to prevent scrub succession.

10.6.41. Following mitigation/enhancement measures, potential effects on Wet Grassland and Mixed Scrub within the Site are positive at the local level and are of **minor** significance.

Secondary Woodland

10.6.42. A majority of woodland will be retained as part of the Proposed Development, with losses largely limited to areas of early mature Birch and Willow dominated woodland at the western boundaries of the Site. For clarity, no areas of woodland identified on the Ancient Woodland Inventory will be lost, with both W1A and W1B to be retained and safeguarded. Moreover, no built form is proposed within 15m of these habitats.

10.6.43. All retained trees and woodland will be protected in accordance with British Standard BS 5837:2012, Trees in relation to design, demolition, and construction – Recommendations. The use of protective fencing will act to protect roots from compaction, and to prevent any encroachment by machinery or personnel. Fences should remain in place until construction work is complete within the vicinity of the retained trees. No development should occur underneath the canopy of any retained trees, or within an immediate area around the trees, unless agreed with the LPA.

10.6.44. As for other habitats, a CEMP will be prepared for the scheme, with this to include for mapped locations of the habitats to be safeguarded during construction, the requirements for a tool-box talk, and the proposals for protective fencing.

10.6.45. In order to mitigate for losses to existing woodland, the following measures are proposed, with further details on the design principles provided within the LEMP at Appendix 10.7:

- New native woodland, shrub and tree planting proposed within areas of green infrastructure;
- Implementation of in-perpetuity management for new and retained woodland habitats including:
 - Small scale planting of broad-leaved woodland;
 - Rotational tree clearance regime to open up the woodland and encourage growth;
 - Ring barking and retention of standing deadwood;
 - Coppicing (of suitable deciduous stock);

- Woodland edge management (shrub retention);
- Small-scale glade and ride creation;
- Provision of log and brash piles; and
- Invasive species control.

10.6.46. The retention and enhancement of a vast majority of woodland, alongside new habitat creation, and instigation of a biodiversity led management regime, will allow for qualitative enhancements over the existing situation, and the restoration of a more naturalistic woodland. Moreover, the proposals will allow for the creation of a gradation of habitat structure within adjacent woodland, creating edge habitat of value to a faunal and floral species.

10.6.47. Following mitigation/enhancement measures, potential effects on woodland within the Site are positive at the Site level and are of **moderate** significance.

Dense and Scattered Scrub

10.6.48. The establishment of an extensive green infrastructure within the Site, to comprise a mosaic of early successional habitats with interspersed scrub, alongside areas of mature woodland, will more than mitigate for losses to scrub. The draft LEMP at Appendix 10.7 includes for a suite of measures to manage scrub as an important component habitat within the Site. Scrub will be managed both as a valued minority component within grassland and early successional communities, providing valuable edge habitat which will facilitate warmer micro-climates (particularly within south-facing areas).

10.6.49. Following mitigation/enhancement measures, potential effects on compacted areas of scrub are positive at the Site level and of **minor to moderate** significance.

Waterbodies/Ponds

10.6.50. As set out above in relation to other habitats within the Site, it is proposed for a CEMP to be secured by way of planning Condition. These documents will clearly outline the measures to be implemented to ensure adverse impacts are avoided on retained wetlands (not least Coed Darcy Wetlands and South Bay), including measures for dust suppression, storage of chemicals/contaminants, and control of surface water flows.

10.6.51. As for other habitats, the creation of extensive new habitat creation, the principles and design aspirations for which are detailed within the LEMP at Appendix 10.7, seek to mitigate for impacts through extensive, high quality habitat creation as well as the instigation of in-perpetuity management.

- Creation of extensive new blue infrastructure (SuDS), including a ribbon of ponds and wetland along the western boundary, ensuring no net loss of permanent, semi-natural ponds;
- Replacement of artificial features with semi-natural ponds;
- Enhancement to South Site Reservoir to create an extensive area of wetland;
- In-perpetuity management, with an aspiration for management responsibilities to be adopted by an appropriate conservation body such as ARC (and funded by the Proposed Development).

10.6.52. Subject to the adoption of an appropriately designed surface water and waste water scheme, with this to include a management and monitoring regime of new SuDS infrastructure, no adverse pollution impacts would be predicted in the operational phase. In any event, the monitoring of new habitats would form part of long-term management and would allow for any such events to be recorded and remedial measures undertaken. Such monitoring and management would include for regular litter picking and removal.

10.6.53. Following mitigation/enhancement measures, potential effects on waterbodies within the Site are **positive** at the local level and are of **minor to moderate** significance.

Ditches

10.6.54. As set out above in relation to other habitats within the Site, it is proposed for a CEMP to be secured by way of planning condition. This will clearly outline the measures to be implemented to ensure adverse impacts are avoided on retained habitat, including measures for dust suppression, storage of chemicals/contaminants and control of surface water flows.

10.6.55. As for ponds, above, the creation of extensive new wetland habitat, the principles and design aspirations for which are detailed within the LEMP at Appendix 10.7, will more than mitigate any losses and, indeed, will allow for enhancements relative to the existing situation. It is envisaged significant wet ditch and swale habitat will be created as part of the proposed landscaping regime.

10.6.56. Following mitigation/enhancement measures, potential effects on ditches within the Site are positive at the Site level and are of **moderate** significance.

Rush Pasture

10.6.57. Given the low ecological value of this habitat, it is not considered any specific ecological mitigation would be required. In any event, the creation and management of an extensive area of green infrastructure, to include a mosaic of semi-natural habitats (including extensive wetland), would more than mitigate the proposed losses.

10.6.58. Following mitigation/enhancement measures, potential effects on compacted areas of ruderal vegetation are positive at the Site level and of **minor** significance.

Exposed Rock/Cliff

10.6.59. Given the negligible value of the habitat, no avoidance/mitigation/enhancements are required.

10.6.60. No potential effects of significance would be realised.

Railway Embankment

10.6.61. Noting the minor losses proposed, no specific mitigation would be required in respect of this habitat type, indeed, it is considered the habitat measures proposed elsewhere within the Site (see for example 'Secondary Woodland' and 'Tree Belts') will more than mitigate for any minor harm.

10.6.62. As for other habitats, a CEMP will be prepared for the scheme, with this to include for mapped locations of the habitats to be safeguarded during construction, the requirements for a tool-box talk, and proposals for protective fencing.

10.6.63. Following mitigation/enhancement measures, potential effects on the railway embankment are **neutral** at the Site level.

Tree Belts/Lines

10.6.64. As for other habitats, the preparation of a CEMP, to include for mapped locations of the habitats to be safeguarded during construction, the requirement for a tool-box talk, and proposals for protective fencing, will ensure adverse impacts are avoided on retained habitats during construction.

10.6.65. All retained trees and woodland will be protected in accordance with British Standard BS 5837:2012, Trees in relation to design, demolition, and construction – Recommendations. The use of protective fencing will act to protect roots from compaction and to prevent any encroachment by machinery or personnel. Fences should remain in place until construction work is complete within the vicinity of the retained trees. No development should occur underneath the canopy of any retained trees, or within an immediate area around the trees, unless agreed with the LPA.

10.6.66. In order to mitigate for losses to tree belts, as detailed for woodland above, the proposals will include for the following measures:

- Extensive new woodland, tree, and linear planting;
- Retained features to be bolster planted where appropriate to improve structure and diversity;
- Long term management of new and retained habitats, as set out within the LEMP at Appendix 10.7. Among other matters this will include the adoption of traditional methodologies including coppicing and (where appropriate) pollarding of existing stock within new and retained tree belts.

10.6.67. Following mitigation/enhancement measures, potential effects on compacted areas of ruderal vegetation are **positive** at the local level and of **minor** significance.

Amenity (Mown) Grassland

10.6.68. No specific measures are required. New landscaping, including extensive formal habitat creation within the development will more than mitigate any losses.

10.6.69. Following mitigation/enhancement measures, potential effects are **neutral** at the Site level.

Amenity Planting

10.6.70. No specific measures are required. New landscaping, including extensive formal habitat creation within the development will more than mitigate any losses.

10.6.71. Following mitigation/enhancement measures, potential effects are **neutral** at the Site level.

Buildings

- 10.6.72. No mitigation required.

Unsealed Hardstanding (Compacted Aggregate/Crushed Tarmac Hardstanding)

- 10.6.73. Given the low value of the habitat to be lost, it is not considered any specific mitigation would be required. Nonetheless, it should be noted, emerging proposals for the scheme will include for the creation of living roofs and living wall habitat (including on the proposed school), both of which will include for elements of compacted stone/gravel and ephemeral vegetation as part of their design. This will ensure areas of compacted gravel remain as a component of the OMH post development.
- 10.6.74. Following mitigation/enhancement measures, potential effects on compacted gravel/hardstanding are **positive** at the Site level and of minor significance.

Open Mosaic Habitat

- 10.6.75. As detailed above in relation to individual component habitats (as well as with reference to designated sites), careful consideration has been afforded OMH habitats and the importance of ensuring a continued and high quality resource is sustained within the Site. Reflecting this, the following avoidance, mitigation, and enhancement measures are proposed:
- Careful consideration of phasing to ensure a continuation of OMH during construction, with a dedicated construction phasing plan to be secured for the Site.
 - Large scale habitat creation including for extensive open semi-natural habitats which will be created and managed primarily for biodiversity, including in excess of 27ha of dry, species rich grassland.
 - In-perpetuity habitat management to control ecological succession and ensure retention/replenishment of OMH resource during operation phase (see LEMP at Appendix 10.7)
- 10.6.76. As detailed above in respect of recolonising vegetation, the provision of extensive new high quality areas of OMH, alongside the implementation of a sensitive management strategy, will ensure significant areas OMH of high qualitative value, within the Site. This, in turn, will secure optimal opportunities for invertebrate populations. The net quantitative loss of OMH relevant to the 2021 baseline must be viewed in the context of the ephemeral nature of the resource, most of which is less than 6 years old and, in the absence of suitable management regime, would likely be lost in the medium term. The Proposed Development would provide long-term security as to the retention of the early successional habitats, contrary to a non-development scenario, preventing long-term declines as a result of unchecked ecological succession and securing (in-perpetuity) OMH as part of a valuable component of the wider landscape.
- 10.6.77. Following mitigation/enhancement measures, potential effects on the Site wide OMH would be assessed initially as negative at the borough level and of minor significance. However, as new OMH establishes and, indeed, is sustained in the long-term through management (in contrast to a trend of decline which would result in a non-development scenario), this impact is considered to become neutral to positive (minor significance) in the short to medium term.

Faunal Species (Avoidance/Mitigation/Enhancements)

Badger

- 10.6.78. Given the mobile nature of Badgers, and their ability to rapidly excavate new setts, it is recommended an updated Badger survey is undertaken prior to works on Site commencing. This survey will be sufficient to identify the presence of any new Badger activity within the Site, and moreover to inform the extent of avoidance or mitigation measures that would be required (if any). Should these surveys identify any active setts which will be impacted by the Proposed Development, relevant works will need to be agreed with NRW in a detailed licence application.
- 10.6.79. As above, surveys at the Site have not identified the presence of any Badger setts and, as such, it is not considered at this stage that works would need to proceed under a NRW Badger licence. In reaching this conclusion, it is noted the majority of dense vegetated habitat (i.e. woodland) is to be retained unimpacted as part of the Proposed Development.
- 10.6.80. Nonetheless, where areas of dense vegetation are to be removed a precautionary approach to habitat clearance is proposed, the principles of which are summarised below:
- Clearance of dense scrub to be preceded by a Badger survey of accessible areas, by an ECoW.
 - Following an initial check survey (and assuming no evidence of setts is recorded), vegetation clearance to commence on a staggered basis under the instruction of the ECoW. The ECoW will instruct clearance to cease at regular intervals to allow for further checks of previously inaccessible vegetation/areas, before allowing works to resume.
 - In the event any suspected Badger sett entrances are uncovered, works within that area will cease whilst they are being surveyed by the ECoW, and will be subject to further monitoring if deemed appropriate. Works will only re-commence following confirmation from the ECoW that Badgers are absent.
 - In the unlikely event an active Badger sett is recorded, works in that area will cease and NRW will be contacted to agree next steps. It is likely further works would then proceed under a NRW Badger licence.
- 10.6.81. In addition, the following measures will also be implemented during the construction phase of the proposals:
- All Site personnel should attend a tool-box talk, such that they can be made aware of the potential presence of Badgers within the Site, and the implications this will have on their working methodology.
 - Wherever possible, new excavations (such as trenches) will not be left open overnight. Should excavations be required, they should preferably be covered overnight. If this is not feasible, scaffolding board (or similar) will be left within the feature, or otherwise a graded bank will be retained, in order to provide a means of escape for any animals which may become trapped.

- Where soil bunds (or similar) cannot be avoided, it is recommended these features are subject to regular checks by Site staff (daily where possible), to identify any areas of digging. Any new excavations will be filled in before a full sett is excavated, wherever possible.

10.6.82. The above measures would be secured by way of a revised CEMP for the Site, the production of which would be a Condition of a successful planning application.

10.6.83. Losses to foraging habitat as a result of the Proposed Development are considered to be of no significance to local Badger groups, given the extent of more suitable habitats that are to be retained within new green infrastructure (and given the absence of any evidence of Badgers utilising the Site). Moreover, extensive foraging opportunities will also remain in the local area (and will remain directly accessible to any Badgers which may also access the Site).

10.6.84. Regardless, the provision of a new green infrastructure network, including for extensive new landscape planting within the main development footprints, which will utilise native fruiting species (e.g. those which provide nuts, berries), will provide significantly enhanced foraging opportunities for any Badgers present in the long-term. An indicative green infrastructure masterplan, identifying the guiding principles for habitat creation and management is provided at Appendix 10.6, with further detail provided within the LEMP at Appendix 10.7.

10.6.85. As such, following mitigation and enhancements, potential effects are **positive** at the Site level and of minor significance.

Bats

10.6.86. The adoption of a sensitive lighting scheme during the construction phase, to include the avoidance of lighting within waterbodies, woodland, and linear habitats (including the entirety of the proposed ecology area), and the avoidance of after dark lighting wherever possible, will ensure adverse impacts on foraging and commuting bats are avoided. The following measures/principles would be secured for the proposals:

- Construction to be limited to daytime hours wherever possible. Should night-time working be required, the types and locations of construction lighting would be agreed with an ecologist.
- The design of any lighting to give due regard to the Bats and Artificial Lighting in the UK (Guidance Note 08/18) as issued by the Bat Conservation Trust. Measures in this regard will include:
 - The adoption of a sensitive lighting configuration to avoid light spill onto areas of woodland/linear features. Additionally, accessories (such as baffles, hoods or louvres) will be utilised to further minimise light spillage and direct light below the horizontal plane to where it is required (limiting light to an angle of 70 degrees or below wherever possible).
 - Lighting to comprise LED luminaires with no UV content and a colour temp of <3000K;
 - Height, spacing and orientation of luminaires to be designed to provide appropriate lighting levels to within built form whilst minimising light spill to semi-natural habitats.

Architectural design and landscaping to further minimise potential light spill from new development into ambient environment.

- 10.6.87. Where lighting is unavoidable; adjacent sensitive receptors, this to instead be particularly low key, for example comprising low level bollard luminaires which act as way finders without resulting in any significant illumination or light spill, and wall mounted baffled luminaires to highlight entrances, which limit light spill and produce zero upward light.
- 10.6.88. It is proposed the above measures are further detailed within a suitably designed lighting strategy for the proposals. Such a document may be secured through a suitably worded Condition.
- 10.6.89. Specific emergence surveys of buildings have not identified any of the buildings being impacted as supporting roosting bats. Regarding B5, it is noted these support several external bat boxes, as installed under previous NRW licences. At this stage, it is anticipated these boxes will be retained in-situ as part of the proposals, with no adverse impacts anticipated. Should potential impacts be identified at a detailed design stage, further surveys in the form of bat box checks will be undertaken in the first instance in order to inform any necessary mitigation – which can be secured via condition - with NRW also consulted.
- 10.6.90. Where trees with bat roosting potential are to be removed, removal of these will adopt a soft-fell methodology as recommended in best practice guidance. This methodology would comprise the following:
- Felling to be undertaken within appropriate weather conditions, i.e. avoiding periods of heavy rain or with temperatures <5C.
 - Limbs and trunk to be cut and carefully lowered to the ground under an ecological watching brief.
 - Any features within the limbs/trunks to be inspected upon being lowered to the ground. As a further precaution, they will then be left open (i.e. uncovered) overnight, allowing bats to disperse (in the highly unlikely event they are present but remain undetected).
- 10.6.91. Equally, and notwithstanding the absence of any evidence of roosting bats, removal of T1 and T2 is also proposed to follow the above soft-fell methodology.
- 10.6.92. Should any trees with moderate or high bat roosting potential be subject to arboriculture works in the operational phase of the development (i.e. for reasons of health and safety), these will first be subject to additional survey effort (tree climbing surveys and/or emergence/re-entry surveys as required) to ascertain their use by bats – which can be secured via condition. In the event a bat roost is present, relevant works would proceed under a NRW bat licence.
- 10.6.93. As a further benefit, the Proposed Development will secure long-term management of the existing bat house which is located in the west of the Site. Appropriate management in this regard will include for both maintenance of the building, in addition to maintenance of surrounding habitat, such that flight lines and access routes can be maintained. This will ensure this mitigation roost can be retained as an optimal roosting site for a range of bat species.

- 10.6.94. Whilst large areas of semi-natural habitats would be lost to the Proposed Development, the majority of these habitats are sparse in nature and offer, at best, sub-optimal foraging and commuting habitats. In contrast, a majority of higher quality habitats are to be retained and incorporated into the wider proposed green infrastructure network. Whilst some areas of woodland will be lost, semi-natural habitats will be retained in these locations, primarily in the form of a mosaic of wet and dry grasslands, pools, and localised sparse ground. Indeed, the emerging proposals overall seek to create a high quality network of habitats, ensuring a continuous semi-natural buffer to the boundaries of the Site. This habitat creation will ensure the retention and/or creation of linear wooded habitats, ensuring a continued commuting/navigational resource in the long-term and avoiding any potential habitat fragmentation. Moreover, the creation of extensive areas to be managed as species rich grassland, alongside substantial areas of new wetland habitat, will ensure a valuable foraging resource for local populations, supplementing that offered by the adjacent Crymlyn Bog.
- 10.6.95. Management of new and retained habitats will give due regard to bats, allowing a gradation of habitats from mature woodland, to mixed scrub, open water and herb-rich short perennial, and ephemeral habitat, with this providing optimal bat foraging habitat. Elsewhere, such as at the Site boundaries, management will seek to enhance the structure of linear features, maximising their value as commuting corridors.
- 10.6.96. The adoption of these measures will ensure opportunities for foraging and commuting bats are safeguarded as a result of the Proposed Development.
- 10.6.97. To realise a significant enhancement for bats, it is proposed 10% of new buildings within the Site will support integrated bat roosting features, proposed designs and locations of which are detailed at Appendix 10.8. The location and orientation of these features will be such that all roosting features will be located close to semi-natural habitats and away from artificial lighting.
- 10.6.98. In addition, it is proposed for a total of 100 bat boxes to be installed on suitable retained trees within the green infrastructure and/or boundary habitats. A range of suitable bat box designs, suitable for the species recorded on Site, as well as suggested locations for these, are provided at Appendix 10.8.
- 10.6.99. The above measures would further be secured within a LEMP for the Site, with this to include targeted conservation measures (i.e. a Conservation Plan) for bats, amongst other relevant species.
- 10.6.100. In summary, the retention of extensive areas of semi-natural habitat and its enhancement within a dedicated green infrastructure network will ensure continued and, indeed, enhanced foraging and commuting opportunities for bats within the local area. The adoption of a sensitive lighting strategy will further ensure light spill is avoided in new and retained habitats. The provision of extensive new roosting opportunities, to include integrated roosting features within new built form and the provision of bat boxes upon retained trees, will ensure a significant increase in roosting opportunities for bats.
- 10.6.101. As such, following mitigation and enhancements, potential effects are **positive** at the local level and of **minor to moderate** significance.

Reptiles

- 10.6.102. Noting the presence of reptiles within the Site, the clearance of suitable habitat will be preceded by the completion of a proportionate level of trapping and/or habitat manipulation. This 'weighted' approach to capture effort will accord with that previously approved for the wider Coed Darcy Site and secured within the package of documents that formed the CEMP. For clarity, this will comprise the following approach:
- High suitability habitats to be subject to full reptile translocation in accordance with best practice methodologies;
 - Moderate to low quality habitats to be subject to a varied approach comprising habitat manipulation and hand searches. Isolated habitats (i.e. where reptiles could not otherwise disperse to safety) would still be subject to translocation.
- 10.6.103. At this stage it is anticipated captured reptiles will be relocated to the dedicated receptor location to be delivered in respect of GCN (see relevant Section below). This receptor area is located within an area to be created and retained in the long-term as a dedicated ecology habitat, is continuous with suitable off-site habitat (including previous herpetofauna receptor areas), and will be safeguarded in the long-term.
- 10.6.104. Prior to the reptile translocation commencing, any necessary habitat enhancement measures will be undertaken within the receptor location, including the provision of hibernacula and ponds. Works in this regard will be undertaken under ecological supervision and will be sensitive to the potential presence of reptiles. These measures should be undertaken in appropriate weather conditions and with care taken to minimise potential harm to the reptiles present. The completion of necessary habitat enhancement works will both enhance the carrying capacity of the holding area as well as deliver botanical enhancements.
- 10.6.105. Once these habitat works are complete, the receptor area will be delineated from the wider Site by herpetofauna fencing, such that the translocation exercise can commence. Any fencing will ensure translocated reptiles can disperse into suitable off-site areas, including the Coed Darcy GCN Area SINC. Where necessary, additional fencing will also be installed to ensure reptiles within the wider area are excluded from active construction areas, as well as to compartmentalise areas of the Site (to improve translocation efficiency).
- 10.6.106. The completion of a suitable reptile translocation, alongside appropriate habitat manipulation exercises and the active exclusion of reptiles from work areas during construction will ensure reptiles are safeguarded during the construction phase of the proposals.
- 10.6.107. The delivery of an extensive green infrastructure network, including SuDS, directly connected to suitable off-site habitats (including the Coed Darcy GCN SINC and Crymlyn Bog) will moreover ensure opportunities for reptiles are retained and enhanced in the long-term. The long-term management proposals for new green infrastructure, as detailed in the draft LEMP (Appendix 10.7), will moreover ensure habitat for reptiles is maintained and enhanced in the long-term. New habitat creation, alongside long-term management, will ensure significant betterment for reptiles in the long-term, securing substantial areas of suitable habitat in perpetuity.

- 10.6.108. The Proposed Development does not include for any substantive road infrastructure to be delivered within areas of green infrastructure. However, it is noted that, in due course, development in the wider Coed Darcy Site may require the delivery of a new link road. Whilst any such infrastructure would be part of a separate planning application, consideration has nonetheless been given to this potential future scenario at this stage. Should road infrastructure be required, and in order to ensure connectivity across the proposed green infrastructure network, this would include for herpetofauna friendly crossings to be provided at intervals along the proposed road. These crossings will comprise ACO Climate Tunnels (KT500) (or similar). The provision of low-height guide walls will ensure reptiles (and amphibians) are directed towards these tunnels whilst excluding them from the road, thereby preventing mortality in this regard.
- 10.6.109. The above measures would further be secured within a LEMP for the Site, with this to include targeted conservation measures (i.e. a Conservation Plan) for reptiles, amongst other relevant species.
- 10.6.110. In summary, it is considered the implementation of a suitable reptile mitigation strategy during construction, to include habitat manipulation and targeted translocation exercises, the delivery and appropriate management of an extensive green infrastructure network and, if necessary, the delivery of appropriate hard landscaping (tunnels) will ensure reptiles are not only safeguarded within the Site during construction, but that opportunities for this faunal group are significantly enhanced within the Site in the long-term. Indeed, it is noted the measures detailed within this Environmental Statement Chapter are consistent with those previously approved for construction related works associated with the extent OPP for the wider Coed Darcy Site.
- 10.6.111. As such, following mitigation and enhancements, potential effects are **positive** at the local level and of **minor** significance.

Wintering Birds

- 10.6.112. Whilst South Site Reservoir will be subject to significant modification, these works seek to create a naturalistic waterbody, replacing the somewhat artificial and steep banked feature currently present. The overall surface area of the waterbody will remain broadly unchanged. However, the emerging proposals include for a reduction in waterbody depth (allowing it to be de-registered as a reservoir), and the removal of the concrete/aggregate lined banks, replacing these with gradual natural banks providing a wide draw down zone. Moreover, an island will be created within the centre of the reservoir, providing optimal winter and breeding refuge, as well as foraging opportunities.
- 10.6.113. In addition, the proposals would include for a dedicated ecology area measuring approximately 12ha, within which no formal public access will be permitted. The provision and retention of this dedicated ecology area, which adjoins the larger waterbodies within the Coed Darcy GCN SINC (and significant wetland), will ensure optimal wintering opportunities for a range of bird species. The retention of a resource within which disturbance is avoided in the long-term will moreover provide an enhancement relative to a baseline situation where extensive (if not irregular) disturbance has occurred over several years.
- 10.6.114. The adoption of a long-term management regime, to include marginal habitat creation and wetland habitat within the South Site Reservoir, meadow management, OMH 're-generation' and waterbody

management will further secure qualitative enhancement for wintering assemblages. The provision of retention/re-instatement of large areas of open grassland, to include for sensitive scrub removal, will provide loafing habitat for waders, as well as foraging opportunities for flocks of Finches, whilst extensive areas of woodland and scrub will be retained for the benefit of Thrushes.

- 10.6.115. The retention and/or enhancement of large areas of open water, as well as extensive terrestrial habitat creation within the proposed green infrastructure network, will retain existing opportunities for wintering birds, with these to be further secured in the long-term through the establishment of appropriate management.
- 10.6.116. The above measures would further be secured within a LEMP for the Site, with this to include targeted conservation measures (i.e. a Conservation Plan) for birds, amongst other relevant species.
- 10.6.117. As such, following mitigation and enhancements, potential effects are **positive** at the Site level and of **minor** significance.

Breeding Birds

- 10.6.118. The proposals are envisaged to result in losses to much of the open habitats present within the Site, including habitat recorded to support 1 or 2 pairs of breeding Lapwing, as well as up to six pairs of Ringed Plover. Losses to these habitats are proposed to be mitigated for through the creation of dedicated ground nesting bird breeding habitat in the south-west of the Site. It is noted this proposal aligns with the mitigation/enhancement strategy proposed in support of the extant OPP permission for the wider Coed Darcy Site.
- 10.6.119. This mitigation habitat, which measures approximately 12ha, currently comprises an area of recolonising wet grassland with extensive scrub and young woodland growth, and lies adjacent to existing semi-natural habitat, including both the Coed Darcy GCN SINC as well as the Crymlyn Bog. The area in question is proposed to be retained as dedicated ecology habitat in the long-term, with no public access proposed and, indeed, existing boundary woodland (W3) maintained to ensure a vegetative screen to minimise the risk of disturbance during construction. Early enhancements to this area, specifically targeted at enhancing its value for ground nesting birds, will include for scrub and tree removal to maximise the extent of open habitats, whilst removing predator perches that may otherwise deter ground nesting species (or temper breeding success). Noting that Lapwing are deemed to typically hold breeding territories of between 0.4 to 0.8ha, the creation of approximately 12ha of suitable habitat is considered more than sufficient to safeguard the population using the Site.
- 10.6.120. Securing a substantial area of dedicated breeding habitat, with this to be free from future disturbance, and moreover subject to in-perpetuity management, will offer significant long-term enhancements for a range of ground nesting species in the long-term, not least Lapwing and Ringed Plover. In particular, management to retain open grassland and early successional habitats will be of particular importance for these species, maintaining a resource which is otherwise susceptible to ecological succession. An absence of such management (as would be the case in a no-development scenario), would otherwise result in gradual declines in the extent of suitable habitats, in particular for Ringed Plover.

- 10.6.121. In addition to the dedicated ecology area, the emerging green infrastructure proposals will moreover include for extensive additional open habitats, in addition to the creation of a substantial area of shallow water and wetland habitat within the footprint of the South Site Reservoir. These habitats will provide significantly improved opportunities for a range of waders and waterfowl.
- 10.6.122. Notwithstanding that new habitat creation will deliver significant enhancements in the longer term, it is noted short term disturbance (during construction) has the potential to result in temporary adverse impacts. Noting this, careful consideration will be given to the phasing of construction (including preparatory and ground works) to ensure continued breeding opportunities for ground nesting birds.
- 10.6.123. In this regard, it is anticipated a subset of the proposed ecology area (1.5ha) will be delivered upfront to ensure some immediate habitat opportunities for ground nesting bird species. The expansion of this ecology area, whilst constrained by a requirement for on-going remediation (proceeding under existing permits), will, nonetheless, take place in the early construction phase, in order to maximise the availability of replacement breeding habitat.
- 10.6.124. Moreover, it is also important to note that extensive areas of suitable nesting habitat for ground nesting birds will be retained within the wider Coed Darcy Site (to the south of the Site). Whilst there are no current details on future Proposed Development for the wider site (these would form a separate planning application), the commencement of any future development would be staggered relative to the current Proposed Development. This would provide a further safeguard to minimise potential impacts during construction.
- 10.6.125. Further information on phasing, in addition to further construction safeguards for ground nesting birds, will be detailed within the proposed CEMP for the Site, as is proposed to be secured by planning condition.
- 10.6.126. The wetland habitats associated with Coed Darcy GCN SINC are to be retained and unimpacted as part of the emerging proposals, thereby avoiding any direct impacts on wetland assemblages reliant on these habitats. Moreover, these areas are to be supplemented by the creation of new open grassland, OMH, and wetland habitat, including the dedicated ecology area within which there will be no formal public access (see above). As for open habitats, above, details on construction safeguards will be further secured within the CEMP, as is proposed to be secured by planning condition.
- 10.6.127. Regarding woodland habitat, a majority of the habitats present within the Site are anticipated to be retained, with losses limited to localised areas as required to deliver a viable drainage strategy, as well as localised access. The retention of the majority of this habitat, alongside new planting and the instigation of a sensitive management regime, will, in the long-term, avoid any adverse impacts on woodland populations.
- 10.6.128. Regarding scrub nesting birds, it is acknowledged the proposals will result in a net reduction of breeding opportunities. However, these losses must be viewed in the context of the negative impact of scrub succession on relatively more valuable habitats on Site, as well as the value of these early successional habitats for species such as ground nesting birds and invertebrates. Moreover, significant areas of scrub will be retained as a valuable component of the wider habitat mosaics to be delivered within green infrastructure.

- 10.6.129. To provide an enhancement for nesting birds, the proposals will deliver a Sand Martin tower within the South Site Reservoir on Site. This tower, which will be situated in an area away from recreational use, will provide new nesting habitat for a species not previously recorded on Site. Should Sand Martin not colonise in the short-term, the design of the tower will be equally suitable for other tunnel nesting birds, such as Kingfisher *Alcedo atthis*.
- 10.6.130. In addition, the proposals for an island within the South Site Reservoir (as detailed above), will provide improved nesting opportunities for a range of waders, allowing a safe haven within which recreational disturbance will be avoided, and the likelihood of predation (i.e. from terrestrial mammals) minimised. The value of the South Site Reservoir will be further enhanced through the creation of new marginal and reed-bed habitat for example, ensuring new high quality habitat of value to a range of nesting water fowl.
- 10.6.131. As a further enhancement for nesting birds, it is proposed 10% of new buildings within the Site will support integrated bird nesting features. Suggested designs of these features are detailed at Appendix 10.9 and will include for features suitable to support Swifts, House Sparrow, and House Martin (species well suited to more urban environments). Bird boxes will be orientated to have a south-west to south-east facing aspect, and will be located close to semi-natural habitats.
- 10.6.132. The provision of living roofs within the Site, to include areas of gravel, pebbles, areas of sparse vegetation, and grassland, will moreover provide potential nesting opportunities for Black Redstarts *Phoenicurus ochruros*, a RSPB Red List species with less than 100 breeding pairs in the UK.
- 10.6.133. In addition, it is proposed for a total of 100 bird boxes to be installed on suitable retained trees within new green infrastructure and/or boundary habitats. Suggested designs for bird boxes are provided at Appendix 10.9.
- 10.6.134. The above measures would further be secured within a LEMP for the Site, with this to include targeted conservation measures (i.e. a Conservation Plan) for birds, amongst other relevant species.
- 10.6.135. As above, works during construction, not least habitat clearance, will be guided by appropriate avoidance and mitigation measures as will be secured within a CEMP for the Site. Wherever possible this will include for vegetation clearance to be avoided during the main nesting season (March to August inclusive) unless prior checks of potential nesting areas are undertaken by an ecologist to ensure no nesting birds are present. Should nests be present, they will be protected until it can be confirmed that fledglings have left the nest.
- 10.6.136. In addition to vegetation clearance, careful consideration will also be given to potential impacts on open habitats which may provide suitable opportunities for ground nesting species such as Ringed Plover. Specific regard will be had to these species, with pre-commencement nesting bird checks undertaken and appropriate safeguards (or preventative measures) identified as required.
- 10.6.137. The adoption of best engineering practice during the construction period (i.e. in relation to noise suppression or timing of noisier works), will further mitigate for any potential adverse effects on nesting birds off-site.
- 10.6.138. The Proposed Development will deliver an extensive green infrastructure network, including a dedicated ecology area in the south-west of the Site, and extensive wetland and open habitat creation. These

habitats will be complemented by the retention of existing higher value wetland (within the Coed Darcy GCN SINCC), as well as extensive areas of woodland, ensuring a diverse mosaic of habitats for breeding bird assemblages. The establishment and on-going management of on Site habitats will realise significant long-term enhancements for nesting and foraging birds.

- 10.6.139. Further enhancements for nesting birds will be delivered through the provision of new nesting features, to include a dedicated Sand Martin tower, integrated nesting boxes for a range of urban birds (such as Swifts, House Martin, and House Sparrows), and a large number of bird boxes within areas of open space.
- 10.6.140. As such, following mitigation and enhancements, potential effects are **positive** at the borough level and of **minor** significance.

Invertebrates

- 10.6.141. The invertebrate populations within the Site, and the habitats upon which they are reliant, have been a primary driving factor behind the evolving masterplan for the overall scheme. Indeed, and as set out in the Designated Sites Section above (see Crymlyn Burrows), the guiding principle of habitat creation is to retain an OMH resource characteristic of that currently present, with extensive areas of dry, floristically diverse grassland, a structurally varied topography, and bare ground. In addition to providing substantial opportunities for invertebrate communities within the Site, a key design consideration is to ensure the green infrastructure within the Site functions as a valuable stepping-stone habitat within the wider ecological landscape.
- 10.6.142. Whilst further consideration is given to the detailed design and management principles within the LEMP at Appendix 10.7, the following mitigation and enhancement principles are proposed:
- Retention of extensive areas of OMH, including within a dedicated ecology area (with no public access), as well as within extensive multi-functional green infrastructure elsewhere on Site, which will be managed to provide abundant species-rich, dry grassland.
 - Extensive early successional habitat to be retained or recreated, including approximately 27ha of dry OMH (ranging from species-rich grassland to sparse ephemeral vegetation with exposed bare ground), and approximately 7ha of species-rich wet grassland, alongside and seasonal wetland pools.
 - The extent and layout of green infrastructure to function as a biodiversity corridor both within the wider Coed Darcy Site and the wider ecological landscape. This would concurrently provide an opportunity for the creation of a biodiverse corridor for pollinators that supports national pollinator policy in Wales.
 - Careful consideration will be given to invertebrates (and their supporting habitat), during the construction phase, with detailed measures secured within a CEMP. These measures to consider:
 - Construction phasing to ensure continued representation of early successional habitat during the construction and operational phases (recognising also that substantial OMH will be retained unimpacted to the south of the Site);

- Construction phasing to further allow the retention, safe storage and re-distribution of site soils and materials (including the seed bank), to ensure new habitats retain a genetically local and diverse seed bank.
 - Targeted habitat creation to ensure the valuable OMH characteristics associated with the existing resource, such as the rich flower resource and mosaics of bare ground and varied topography, are retained or recreated.
 - In-perpetuity, biodiversity led habitat management to ensure high quality OMH can be secured in the long-term.
 - Creation of an 'invertebrate garden' within the centre of the Site, with this to comprise a series of raised beds, each supporting a distinct vegetation community reflective of those habitats to be retained or delivered in the wider Site. Whilst also providing localised habitat diversity, this area will function as an educational resource with interpretation boards and signage to explain the importance of the Site for invertebrates, and identify key species and their ecology.
 - New habitat creation within built form, to include the creation of extensive living roof habitat on the proposed school. Opportunities will also be sought to deliver living roof habitat on suitable structures within the Site. Opportunities in this regard may include for on bus stops, cycle shelters and apartment buildings.
 - The design of living roofs is to be informed by Buglife's 'Creating Green Roofs for Invertebrates' guidance document.
 - The creation of extensive vertical or banked habitats to include 'living walls' and vegetated slopes, bunds and embankments, with these designed to support a diversity of gradients and orientations, and be planted (or allowed to recolonise) with a range of locally desirable and pollen rich wildflowers.
 - Integration of invertebrate nesting features (bee bricks) within 10% of new built form.
- 10.6.143. The provision of extensive new high quality areas of OMH, alongside the implementation of a sensitive management strategy will ensure significant new OMH of high qualitative value, in turn ensuring optimal opportunities for invertebrate populations.
- 10.6.144. As detailed in the Habitats Section above, it is acknowledged there would be a net quantitative loss of OMH relevant to the 2021 baseline. However, this quantitative loss must be viewed in the context of the ephemeral nature of the resource, most of which is less than 6 years old and, in the absence of suitable management regime, would likely be lost (or at least sufficiently degraded) in the short to medium term, in turn resulting in the loss of an important functional component of the wider landscape (in regards invertebrates).
- 10.6.145. The emerging Proposed Development would provide long-term security as to the retention of the early successional habitats, contrary to a non-development scenario, preventing long-term declines as a result of unchecked ecological succession, and securing (in-perpetuity) OMH as part of a valuable component of the wider landscape.

- 10.6.146. The above measures would further be secured within a LEMP for the Site, with this to include targeted conservation measures (i.e. a Conservation Plan) for invertebrate assemblages.
- 10.6.147. Following mitigation/enhancement measures, potential effects on *invertebrates* would be assessed initially as **negative** at the regional level and of **minor** significance. However, as new OMH establishes and, indeed, is sustained through management, and noting a trend of decline which would result in a non-development scenario, this impact is considered to become **neutral to positive** (minor significance) in the short to medium term.
- 10.6.148. In summary, the Proposed Development will result in losses of areas of OMH which are of regional invertebrates, in particular for communities reliant on topographically diverse, and floristically rich dry grassland. The presence of this habitat resource has been a primary consideration, guiding emerging proposals for green infrastructure, ensuring extensive areas of high quality habitat mosaic can be retained or otherwise created. The instigation of an appropriate habitat management regime will secure this resource in perpetuity, a significant enhancement relative to a no-development scenario. The phasing of habitat losses will serve to minimise short term habitat losses, allowing a continuity of resource as new habitats become established (noting also that substantial OMH will be unaffected in the wider Coed Darcy site). The integration of nesting and foraging opportunities within proposed built form (such as living roof, wall, and nest bricks) will offer further opportunities, whilst an invertebrate garden will offer a valuable educational resource for new residents. These measures will ensure harm to invertebrate assemblages can be avoided in the medium to longer term.
- 10.6.149. Importantly, the Development Proposals will secure a legacy of habitat creation and management for the Site, safeguarding a valuable and sizeable habitat mosaic in perpetuity. The retention/creation of extensive OMH, including for both north-south and east-west corridors will positively contribute to ecosystem resilience in the long-term, not only providing valuable habitat in and of itself but also securing wildlife corridors and stepping stone habitats that are essential to sustaining invertebrate assemblages in the wider landscape. Such corridors are of particular importance for assemblages which are reliant on frequently ephemeral habitat resources and where dispersal, at least at the local level, is essential in responding to habitat change (be it damage, destruction or succession).

Amphibians (GCN)

- 10.6.150. Noting the presence of GCN and common amphibians, a targeted translocation exercise will be undertaken within the Site. This exercise will be completed in accordance with adopted best practice guidance, and any specific measures as may be required through an NRW licence. Given the concentrations of ponds in the northern, western and south-western sections of the Site, it is anticipated, at this stage, that trapping and translocation will be undertaken selectively, with trapping effort proportionate to the populations recorded locally, in addition to the suitability of habitats present. For clarity, it is anticipated confirmed GCN ponds in the north of the Site (which collectively support a medium population), will be subject to a minimum 60 day translocation, as will habitats within a proximity of PB in the south-west of the Site. Where GCN have only been recorded in low numbers (such as in P20, where a single GCN was recorded in 2020 but not in 2021), it is anticipated a 30 day translocation would apply. In contrast, given an absence of ponds in central areas, as well the presence of predominantly sub-optimal habitats, no capture effort would be proposed.

- 10.6.151. No construction will be permitted within any GCN zones until a sufficient capture effort has been completed. Broadly speaking these GCN zones will comprise suitable GCN habitat within 250m of breeding ponds, as well as high suitability habitats between 250m and 500m. GCN and common amphibians will be relocated from these zones to dedicated receptor habitat within the wider Site.
- 10.6.152. As detailed within the Designated Sites Section above (see 'Coed Darcy GCN SINC'), it is proposed for an initial receptor area to be delivered (and sufficiently established) upfront in the south-west corner of the Site. This receptor area, which will be enhanced to support new ponds and high quality terrestrial habitat, will be continuous with the existing Coed Darcy GCN SINC, as well as suitable off-site habitats.
- 10.6.153. Herpetofauna fencing will be erected to delineate this receptor area from the wider Site during construction, whilst ensuring the receptor area is continuous with both the previous receptor site (i.e. the Coed Darcy GCN Area SINC) and suitable off-site habitats. Herpetofauna translocations, as required within the Site, will commence following the appropriate creation and establishment of receptor site habitats.
- 10.6.154. Additional green infrastructure will be sequentially created during the early construction phase, with this habitat being made available to GCN through sequential removal or realignment of GCN fencing.
- 10.6.155. The phasing of subsequent habitat creation will give due regard to the phasing of the herpetofauna translocation(s) and habitat removal, ensuring sufficient habitat is provided to sustain translocated populations in both the short and longer term. The design and extent of new habitats have been carefully informed by both current and historic amphibian populations within the Coed Darcy Site. Specifically, the proposals seek to create a dedicated wildlife corridor along the Site's western boundary, with this supporting a necklace of new ponds, with at least one dedicated GCN pond every 250m to maximise dispersal. In addition, clusters of 2 to 3 ponds will be provided within this western corridor to ensure localised breeding hotspots for a range of amphibians. New pond creation will allow for a net gain in GCN breeding ponds relative to the 2021 baseline situation, with a minimum of 20 new ponds to be created.
- 10.6.156. The creation of a large number of new ponds, in addition to extensive high quality terrestrial habitats, will both secure long-term breeding and foraging enhancements for GCN within the Site, whilst importantly establishing a high quality dispersal corridor to enhance landscape level connectivity and to improve connectivity between meta-populations within the Site and local area which are likely to partially fragmented through the Site's previous use.
- 10.6.157. Commencement/continuation of long-term habitat management of new habitats (as well as retained habitats within the Coed Darcy GCN Area SINC), will ensure high quality habitat is retained in the long-term. At this stage it is proposed for management to be undertaken by an appropriately experienced conservation management body (for example ARC, with whom talks are ongoing).
- 10.6.158. As detailed in relation to reptiles above, the Proposed Development does not include for any substantive road infrastructure to be delivered within areas of green infrastructure. However, it is noted that, in due course, development in the wider Coed Darcy Site may require the delivery of a new link road. Whilst any such infrastructure would be as part of a separate planning application, consideration has nonetheless been given to this potential future scenario at this stage. Should road infrastructure be

required, and in order to ensure connectivity across the proposed green infrastructure network, this would include for herpetofauna friendly crossings to be provided at intervals along the proposed road. These crossings will comprise ACO Climate Tunnels (KT500) (or similar). The provision of low-height guide walls will ensure reptiles (and amphibians) are directed towards these tunnels whilst excluding them from the road, thereby preventing mortality in this regard.

- 10.6.159. As a further safeguard within areas of built form and hard landscaping, careful consideration will be given to the proposed drainage strategy for the Site. In particular, this will include for the inclusion of amphibian friendly drainage features such that accidental entrapment of amphibians can be avoided. At this stage, such features are anticipated to include wildlife kerbs and amphibian ladders. These measures will both minimise the risk of entrapment and moreover provide a means of escape in the unlikely scenario that amphibians fall into gulley pots.
- 10.6.160. The above measures would further be detailed within a LEMP for the Site (a draft of which is provided at Appendix 10.7), with this to include targeted conservation measures (i.e. a Conservation Plan) for GCN, amongst other relevant species. It is noted, detailed prescriptions will also be agreed with NRW as part of a GCN licence process.
- 10.6.161. In regards construction related impacts, the adoption of appropriate safeguards (in accordance with best practice measures and legislation), will be secured within a revised CEMP for the Site. At this stage it is anticipated the CEMP will secure comparable safeguards, as were deemed appropriate for the extant OPP for the Coed Darcy Site. The instigation of appropriate measures will minimise/avoid potential construction related impacts on supporting habitats, not least as a result of dust, laden silts, or surface water run-off.
- 10.6.162. **Summary.** The Proposed Development will deliver an extensive green infrastructure network, including a dedicated ecology area in the south-west of the Site and extensive wetland and open habitat creation. These habitats will be complemented by the retention of existing higher value wetland (within the Coed Darcy GCN SINC) and will together ensure substantial wetland corridor along the Site's western boundary, providing high quality amphibian habitat which will be retained in perpetuity through biodiversity led management.
- 10.6.163. New habitat creation will deliver habitats of comparative quality to those within the Coed Darcy GCN Area SINC, effectively allowing for the expansion of this designated site. Moreover, the proposals will ensure improved connectivity between local GCN metapopulations. Collectively, these measures will retain and enhance the FCS of the local meta-population(s) in-perpetuity.
- 10.6.164. As such, following mitigation and enhancements, potential effects are **positive** at the borough level and of **minor to moderate** significance.

Otter and Water Vole

- 10.6.165. On a precautionary basis, it is proposed for updated inspections of habitats to be undertaken prior to construction works commencing.
- 10.6.166. As detailed above, the emerging proposals seek to create or enhance extensive wetland habitats within the Site, not least the conversion of South Site Reservoir to an extensive naturalistic wetland. The

measures, set out elsewhere within this ES Chapter, would deliver optimal habitat opportunities for amphibious mammals post development, should they colonise the Site from the local area.

- 10.6.167. As such, following mitigation and enhancements, potential effects are **positive** at the Site level and of **moderate** significance.

Other Species

Mitigation and Enhancements

- 10.6.168. Any clearance of suitable Hedgehog habitat should be undertaken in a sensitive manner so as to minimise the potential for harm or disturbance. Where areas of long grass or dense ground vegetation, including amenity planting, ruderal vegetation, and scrub, are to be removed, these will be cleared under a suitable methodology, such as that set out below:
- 10.6.169. Two stage clearance: Initial clearance of vegetation to a height of no less than 20cm, with a second cut to ground level following a check of ground vegetation;
- Vegetation clearance to be directional, avoiding the creation of islands of suitable habitat;
 - Any observed Hedgehogs ideally to be left to disperse on their own accord. If this is not possible, individuals should be relocated to suitable retained habitat (such as areas of woodland).
- 10.6.170. The retention and enhancement of existing habitats, as well as the provision of new habitats (all of which will be detailed within the LEMP), will represent an enhancement for a range of faunal groups, not least small mammals. Indeed, these measures may attract a number of species to the Site which are not currently present, helping to increase biodiversity post-development.
- 10.6.171. As an enhancement, it is proposed for new boundary features to include for hedgehog highways, thus allowing for the Site to be porous for this species post-development. Hedgehog tunnels will comprise small (13cm x 13cm) openings in the base of garden fences and boundary walls, providing a means for this species to migrate between gardens and open space in the Site.
- 10.6.172. It is proposed for one Hedgehog tunnel to be provided at each aspect of adjoining residential gardens (i.e. up to 3 in total per garden), as well as within any boundary walls. This will ensure Hedgehogs are able to disperse throughout residential parcels.
- 10.6.173. As such, following mitigation and enhancements, potential effects are **positive** at the Site level and of **minor** significance.

10.7. Residual Environment Impacts and Effects

Designated Sites

Statutory Wildlife Sites

Crymlyn Bog SAC/Ramsar/SSSI and Pant-y-Sais SSSI

10.7.1. As detailed in Section 10.5 above, detailed consideration is given to the Crymlyn Bog designated sites complex within the separate iHRA document prepared for the Proposed Development, and submitted alongside this ES. The iHRA concluded, subject to the adoption of identified avoidance and mitigation measures, potential impacts on integrity of the Crymlyn Bog (including all underpinning designations) will be avoided.

10.7.2. As such, there are predicted to be no significant residual effects on the above statutory designated sites.

Crymlyn Burrows

10.7.3. There are predicted to be no significant residual effects on Crymlyn Burrows SSSI nor any other statutory designated sites.

Non-Statutory Wildlife Sites

Coed Darcy GCN Area SINC

10.7.4. Residual effects will be positive at the borough level and are of minor significance.

Other SINC Sites

10.7.5. Residual effects will be neutral at the borough level.

Habitats

Compacted Clay Soils with a Mosaic of Recolonising Vegetation

10.7.6. Whilst there would initially be negative impacts of minor to negligible significance at the county level, the instigation of measures detailed within this Chapter (not least long-term management and the ability to sustain extensive areas of OMH post-development) will ensure residual impacts are neutral to positive (minor significance) in the short to medium term.

Wet Grassland and Mixed Scrub

10.7.7. Residual effects will be positive at the local level and of minor significance.

Secondary Woodland

10.7.8. Residual effects will be positive at the Site level and of moderate significance.

Dense and Scattered Scrub

- 10.7.9. Residual effects will be positive at the Site level and of minor to moderate significance.

Waterbodies/Ponds

- 10.7.10. Residual effects will be positive at the local level and of minor to moderate significance.

Ditches

- 10.7.11. Residual effects will be positive at the Site level and of minor significance.

Rush Pasture

- 10.7.12. Residual effects will be positive at the Site level and of minor significance.

Exposed Rock/Cliff

- 10.7.13. No residual impacts of any significance are predicted.

Railway Embankment

- 10.7.14. Residual effects will be neutral at the Site level.

Tree Belts/Lines

- 10.7.15. Residual effects will be positive at the local level and of minor significance.

Amenity (Mown) Grass

- 10.7.16. Residual effects will be neutral at the Site level.

Amenity Planting

- 10.7.17. Residual effects will be neutral at the Site level.

Buildings

- 10.7.18. No residual impacts of any significance are predicted.

Unsealed Hardstanding (Compacted Aggregate/Crushed Tarmac Hardstanding)

- 10.7.19. Residual effects will be positive at the local level and of minor significance.

Open Mosaic Habitat

- 10.7.20. Whilst there would initially be negative impacts of minor to negligible significance at the county level, the instigation of measures detailed within this Chapter (not least long-term management and the ability to

sustain extensive areas of OMH post-development), will ensure residual impacts are neutral to positive (minor significance) in the short to medium term.

Faunal Species

Badger

10.7.21. Residual impacts will be positive at the Site level and of minor significance.

Bats

10.7.22. Residual impacts will be positive at the local level and of minor significance.

Reptiles

10.7.23. Residual impacts will be positive at the Site level and of minor significance.

Wintering Birds

10.7.24. Residual impacts will be positive at the Site level and of minor significance.

Breeding Birds

10.7.25. Residual impacts will be positive at the borough level and of minor significance.

Invertebrates

10.7.26. Whilst there would initially be negative impacts of minor significance at the regional level, the instigation of measures detailed within this Chapter (not least long-term management and the ability to sustain extensive areas of OMH post-development), will ensure residual impacts are neutral to positive (minor significance) in the short to medium term.

Amphibians

10.7.27. Residual impacts will be positive at the borough level and of minor to moderate significance.

Otter and Water Vole

10.7.28. Residual impacts will be positive at the Site level and of moderate significance.

Other Species

10.7.29. Residual impacts will be positive at the Site level and of minor significance

10.8. Cumulative Effects

10.8.1. No plans or projects have been identified which are considered to have the potential to contribute to potential cumulative impacts upon the receptors identified within this ES Chapter.

- 10.8.2. In any event, the retention and creation of a diverse mosaic of habitats as part of the Proposed Development and the implementation of long-term, biodiversity led management for the Site's green infrastructure, will ensure significant qualitative enhancements for biodiversity in the long-term. Indeed, the adoption of the measures set out in this ES Chapter will ensure any residual impacts will be, at worst, neutral, with no adverse residual impacts predicted for any ecological receptors.
- 10.8.3. As such, no adverse cumulative impacts have the potential to arise and, indeed, the proposals would contribute positively to various biodiversity and nature conservation objectives in the local area, as is clearly desired by relevant legislation and planning policy.
- 10.9. **Assessment Summary**
- 10.9.1. The ecological assessment is based on results from field surveys undertaken by Ecology Solutions in 2020 and 2021, alongside historic survey data collected in support of the previous OPP consent. Specific surveys for invertebrates were led by Richard Wilson Ecology Limited in 2020. Habitat surveys were undertaken to ascertain the general ecological value of the land contained within the boundaries of the Site, and to identify the main habitats and associated plant species.
- 10.9.2. Specific protected species surveys have been undertaken for Badgers, bats, reptiles, GCN (and common amphibians), breeding birds, Dormouse, Otter and Water Vole, and invertebrates. Further information has been obtained through consultation with the recognised bodies involved in nature conservation in the local area.
- 10.9.3. The Site supports a diverse range of habitats including secondary woodland, waterbodies, and a mosaic of early successional habitats which include for substantial sparse and dry grassland. Together, these habitats form a valuable open mosaic within the Site (see Figure 10.2).
- 10.9.4. The value of the ecological features identified through both field surveys and desk-top studies have been interpreted within the context of recognised methodologies, and also within the planning policy context, both on a regional and local level.
- 10.9.5. The potential ecological impacts of the Proposed Development are largely focused on the Site and its immediate surroundings. However, given the Site's location within a wider network of green space (including a number of statutory and non-statutory sites) consideration has also been given to the potential impacts and opportunities that arise at a landscape scale.
- 10.9.6. Following the employment of mitigation and enhancement measures as set out in this ES Chapter, there are predicted to be no significant adverse impacts on any statutory and/or non-statutory sites, either alone or in combination with any other plans or projects. Indeed, the provision of new educational resources will offer a mechanism through which potential new residents can positively interact with the wider green space network within which the Site sits, providing ecological connectivity in the long-term.
- 10.9.7. Habitats of relatively higher ecological value within the context of the Site include the early successional re-colonising vegetation, localised areas of wet grassland, secondary woodland, waterbodies and tree belt TB1. In addition, and notwithstanding that many of the individual component habitats are of very limited value in isolation, the mosaic of early successional habitats on Site would qualify as the BAP habitat of OMH on previously developed land.

- 10.9.8. The Site supports several protected and notable faunal species/groups.
- 10.9.9. A small number of trees associated with the woodland in the west of the Site support features of potential value to roosting bats, albeit no evidence of roosting has been recorded within the Site (including through specific climbing surveys). Bat activity surveys confirmed the Site to be subject to a generally low level of activity. Unsurprisingly, relatively higher levels of bat activity are associated with the larger waterbodies, in association with areas of woodland and along the Site's vegetated boundaries, particularly the southern edge of the Site. Typically, very low levels of bat activity were recorded across open habitats. Activity was found to be dominated by Pipistrelle bats (these including for the UK's most common bat species).
- 10.9.10. Small populations of two common reptile species are also present within the Site, with this including for Common Lizard (peak count of eight individuals) and Grass Snake (peak count of 11 individuals). The locations of findings indicate populations may be re-establishing from pockets of retained (previously un-impacted) habitats within the Site, or otherwise from off-site habitats.
- 10.9.11. Breeding bird surveys confirmed the Site to support a diverse breeding bird assemblage, with 76 species recorded across the wider Coed Darcy landholding, including 42 species within the Site. The greatest interest was found across the open habitats, not least on account of breeding Lapwing, Ringed Plover, Little Ringed Plover and Skylark, whilst good assemblages were also recorded in wetland and woodland areas.
- 10.9.12. GCN surveys confirmed the presence of a 'medium' population of GCN, alongside valuable populations of common amphibians, with these populations sustained within the north of the Site (north of the railway) as well as in the south-west of the Site. Regarding the ponds to the north of the railway, noting their apparent suitability for GCN, the smaller size of the population is considered a reflection of the recent origin and establishment of habitats. On the evidence available, and noting the western 'bias' to the findings, it is concluded GCN (and other amphibians) are likely to have only recently colonised this area of the Site, likely from suitable off-site habitat to the west of the Site.
- 10.9.13. Specific surveys for invertebrates confirmed the Site to be of regional importance for terrestrial invertebrates, with 380 species recorded, 6.6% of which are Key Species. The habitats within the Site identified to be of the highest value to invertebrate assemblages include short sward and bare ground habitats (particularly those with dry soils, varied topography, and diverse floral communities). Whilst noting the early successional habitats within the Site are not of equal qualitative value to invertebrates, it is nonetheless concluded it is the overall mosaic of habitats, and the combination of habitat characteristics, which attribute the Site its value, rather than the presence of specific high value features or localised habitat areas within the Site.
- 10.9.14. Specific surveys found no evidence for the presence of Dormouse, Water Vole, Otter or Badger within the Site.
- 10.9.15. Given the location of the Site, the habitats present, and their presence in data search information, the Site is considered likely to provide a degree of suitable opportunities for small mammal species including Hedgehog. However, there is nothing to indicate the Site as being of heightened significance for this or any other mammal species.

- 10.9.16. The proposals include for the establishment of an extensive green infrastructure network, including for a significant area (approximately 12ha) to be set aside specifically for biodiversity, and with no formal public access permitted. In addition, further habitat creation is to be delivered within the main development footprint, not least including for the provision of extensive living roof habitat on the proposed school.
- 10.9.17. The provision of the Site wide green infrastructure will seek to retain, enhance and create an extensive and diverse mosaic of habitats during the construction and operational phase of the proposals, with careful consideration to be given to early construction phasing (in order to ensure retention of OMH resource).
- 10.9.18. Of particular importance, the proposals will secure the establishment of appropriate, biodiversity led management across the Nature Park (and other areas of green infrastructure within the Site) in the long-term. This management will seek to control ecological succession within the Site, ensuring the structural and botanical diversity of habitats is enhanced in the long-term. A draft LEMP is provided as an Appendix to this ES Chapter and it is proposed for a final version of this document to be secured by an appropriately worded planning Condition, should the scheme be successful.
- 10.9.19. Careful consideration has been given to the potential for adverse impacts to arise on protected and notable faunal species (or assemblages) and appropriate avoidance, mitigation, and enhancement measures are identified within this ES Chapter. Further details on mitigation, including for detailed conservation strategies, are proposed to be secured by Condition, including within the proposed LEMP.
- 10.9.20. The retention and creation of a diverse mosaic of habitats as part of the proposals and the implementation of long-term, biodiversity led management for the Site's green infrastructure, will ensure significant qualitative enhancements for biodiversity in the long-term. Indeed, the adoption of the measures set out in this ES Chapter will ensure any residual impacts will be positive, with no adverse residual impacts predicted for any ecological receptors.
- 10.9.21. Indeed, securing a legacy of biodiversity led management regime, not least for extensive areas of OMH, is assessed as a significant benefit. It is only through the instigation of such management that semi-natural habitats can be expected to retain or attain good ecological condition in the medium to long term. For early successional habitats and OMH, the timeframes for loss and/or decline can be particularly short-term and therefore the benefit of management all the more stark.
- 10.9.22. Retaining or recreating substantial OMH within the Site will contribute positively to long-term ecological resilience in the local area, safeguarding a resource that is not only of high quality in its own right, but which also functions as an essential dispersal corridor (both as seed banks and for faunal species) within the landscape and which, in future years, will provide a vital role in species movement as OMH in the wider landscape is fluctuates in extent and quality (be it through succession or anthropogenic pressures). Similar benefits to resilience can be expected through creation of other habitats, not least ponds and wetland habitats which can equally be vulnerable to succession and which are often of high value to faunal species.

- 10.9.23. As such, no adverse cumulative impacts have the potential to arise and, indeed, the proposals would contribute positively to biodiversity and nature conservation objectives in the local area, as is clearly desired by relevant legislation and planning policy.

Table 10.17 – Assessment Summary

Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
Crymlyn Bog SAC/SSSI/ Ramsar, Pant-y-Sais SSSI	CEMP, proposed SuDS design, proposed foul drainage strategy	Yes	Yes		10.62 and 10.63 see also separate iHRA	Site to be monitored by construction personnel during construction. Operation, management and maintenance plan required through SAB process.
Crymlyn Burrows SSSI	Dedicated green infrastructure design and habitat creation and management. Provision of CEMP and LEMP	No	Yes (LEMP/ CEMP)		10.6.9 to 10.6.11	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Non-statutory designated sites.	CEMP/LEMP	No	Yes		10.6.14 to 10.6.24	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.

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Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
Compacted Clay Soils with a Mosaic of Recolonising Vegetation	Dedicated green infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.28 to 10.6.36	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Wet Grassland and Mixed Scrub	Dedicated green infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.38 to 10.6.40	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Secondary Woodland	Dedicated Green Infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.42 to 10.6.46	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Dense and Scattered Scrub	Dedicated green infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.48	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.

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Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
Waterbodies / Ponds	Dedicated Green Infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.50 to 10.6.52	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Ditches	Dedicated Green Infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.54 to 10.6.55	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Rush Pasture	Dedicated Green Infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.57	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Exposed Rock / Cliff	None required					

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Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
Railway Embankment	Dedicated green infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.61 to 10.6.62	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Tree Belts / Lines	Dedicated green infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.64 to 10.6.66	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Amenity (Mown) Grass	None required					
Amenity Planting	None required					
Buildings	None required					

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Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
Unsealed Hardstanding (Compacted Aggregate/ Crushed Tarmac Hardstanding)	None required					
Open Mosaic Habitat	Dedicated green infrastructure design and, habitat creation and management. Provision of CEMP and LEMP	No	Yes		10.6.75 to 10.6.76	Construction monitoring by site personnel and ECoW. Long term monitoring to be secured in LEMP and undertaken by adopted management body.
Badger	Construction safeguards within CEMP. Dedicated Green Infrastructure design and, habitat creation and management. Provision of LEMP.	No	Yes		10.6.78 to 10.6.84	Construction monitoring by site personnel and ECoW. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.

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Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
Bats	Construction safeguards within CEMP. Precautionary approach to tree felling. Dedicated Green Infrastructure design and, habitat creation and management. Provision of LEMP.	No	Yes		10.6.86 to 10.6.100	Construction monitoring by site personnel/ecological oversight of relevant activities by ECoW. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.
Reptiles	Construction safeguards within CEMP. Dedicated green infrastructure design and, habitat creation and management. Provision of LEMP.	No	Yes		10.6.102 to 10.6.110	Construction monitoring by site personnel/ecological oversight of relevant activities by ECoW. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.
Wintering Birds	Construction safeguards within CEMP.	No	Yes		10.6.112 to 10.6.116	Construction monitoring by site personnel/ecological oversight of relevant activities by ECoW. Long term habitat

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	Dedicated Green Infrastructure design and, habitat creation and management. Provision of LEMP.					monitoring to be secured in LEMP and undertaken by adopted management body.
Breeding Birds	Construction safeguards within CEMP. Precautionary approach to habitat clearance. Dedicated green infrastructure design and, habitat creation and management. Provision of LEMP.	No	Yes		10.6.118 to 8.6.139	Construction monitoring by site personnel/ecological oversight of relevant activities by ECoW. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.
Invertebrates	Construction safeguards within CEMP. Dedicated Green Infrastructure design	No	Yes		10.6.141 to 10.6.149	Construction monitoring by site personnel/ecological oversight of relevant activities by ECoW. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.

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Topic	Mitigation Measures	Designed into the Proposed Development	Delivery via Condition (Outline/RM)	Delivery via Legal Obligation	Paragraph Reference in the ES	Proposed Monitoring Arrangement
	and, habitat creation and management. Provision of LEMP.					
Amphibians	Construction safeguards within CEMP. Dedicated green infrastructure design and, habitat creation and management. Provision of LEMP. NRW licence(s) to be secured in due course.	No	Yes	Yes. Requirement for certain works to proceed under GCN licence (Habitat Regulations 2017)	10.6.150 to 10.6.163	Construction monitoring by site personnel/ecological oversight of relevant activities by ECoW. Long term habitat and species monitoring to be secured in LEMP (and NRW licences) and undertaken by adopted management body.
Otter and Water Vole	Pre-commencement surveys prior to works commencing. Dedicated green infrastructure design and, habitat creation and management.	No	Yes		10.6.165 to 10.6.166	Construction monitoring by site personnel. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.

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	Provision of LEMP.					
Other Species	Construction safeguards within CEMP. Dedicated green infrastructure design and, habitat creation and management. Provision of LEMP.	No	Yes		10.6.168 to 10.6.172	Construction monitoring by site personnel. Long term habitat monitoring to be secured in LEMP and undertaken by adopted management body.