Project No.: AABP103 / 001 / 002

August 2014

Proposed Solar Farm, Barry Docks, Wales

Desk Study and Extended Phase 1 Habitat Survey

For

Associated British Ports

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Contents

1. Summary and Main Recommendations

1.1 Summary

1.1.1 Associated British Ports (ABP) is proposing to construct a solar farm on a brownfield site in Barry Docks, South Wales. The brief was to undertake a preliminary ecological assessment of the site and to determine the presence of invasive plant species. To that end, a desk study and Phase 1 habitat survey were undertaken to gather baseline ecological data for the site and the locations of invasive species were recorded.

1.1.2 The main findings of the desk study were that two Sites of Special Scientific Interest (SSSI), both designated for geological reasons, are within 2 km of the site. In addition, six locally designated Sites of Importance for Nature Conservation (SINC) were recorded within 2 km; these have been designated as they support a range of priority habitats. The desk study also provided records of protected species, species of principal importance and species of conservation concern within 1 km of the site, including a protected, rare, annual plant Childing pink, recorded in a different area of Barry Docks in 2008.

1.1.3 During the field survey, the site was found to support plantation broadleaved and coniferous woodland, scattered broadleaved trees, dense scrub, dense scrub and scattered scrub mosaic, scattered scrub, semi-improved neutral grassland; tall-ruderal, ephemeral/short perennial, bare ground and other habitats. There were also buildings, fences and hard standing.

1.1.4 Large areas of the site are considered to meet the criteria for Open Mosaic Habitat on Previously Developed Land (OMH), which is a habitat of principal importance. A number of common invertebrates and bird species were recorded during the survey and a rabbit burrow was identified.

1.1.5 The development should not have a significant effect on any of the statutory or non-statutory designated sites within 2 km. Under current proposals habitat for breeding birds and rabbits will be lost. The mitigation proposals set out below should ensure that the development is compliant with the law and planning policy on these with respect to these issues. There is also habitat on site that is suitable for reptiles and bats, protected species and plants and invertebrates of conservation concern; however, further survey is required to determine whether these species groups are present and would be affected by the development.

1.2 Main Recommendations

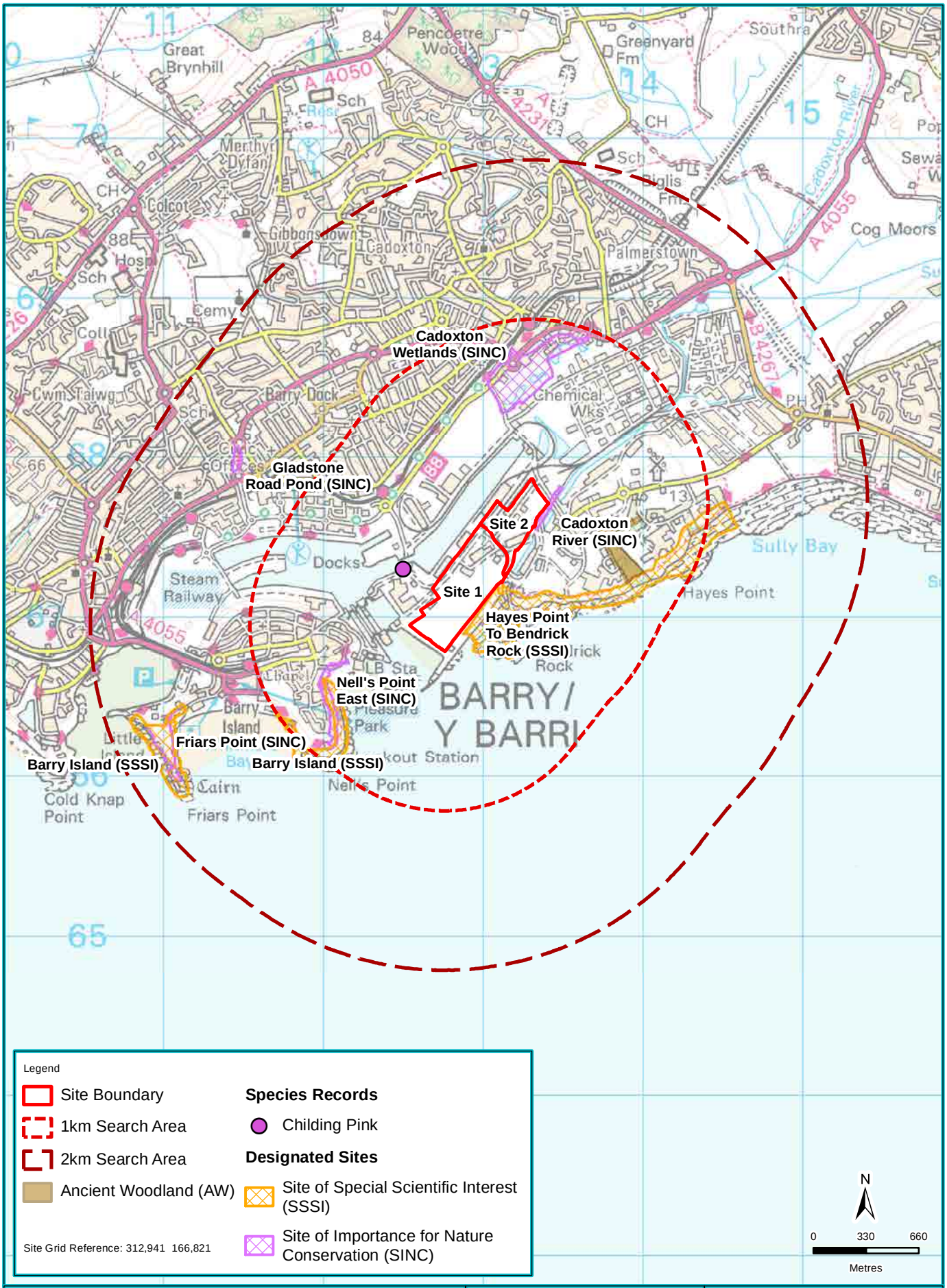
1.2.1 The following measures are recommended for the development to comply with relevant biodiversity legislation and policy:

- Necessary clearance of trees and shrubs undertaken outside the bird breeding season;
- Destruction on the rabbit burrow with hand tools or mini-digger to allow any rabbits present to escape; and
- Remediation of Japanese knotweed from the site.

1.2.2 Further surveys are recommended for the following species/taxa:

- Botanical (scarce plant survey);

- Invertebrates;
- Reptiles; and
- Bats.



Legend

- Site Boundary
- 1km Search Area
- 2km Search Area
- Ancient Woodland (AW)

Species Records

- Childing Pink

Designated Sites

- Site of Special Scientific Interest (SSSI)
- Site of Importance for Nature Conservation (SINC)

Site Grid Reference: 312,941 166,821

N

0 330 660

Metres

Client: Associated British Ports		Drawing Ref: AABP103/15059/1	
Figure Number: 1		Scale at A4: 1:32,500	
Figure Title: Site Location, Search Area and Desk Study Results		Drawn: KM	Checked: NS
		Date: 18/08/2014	Date: 18/08/2014

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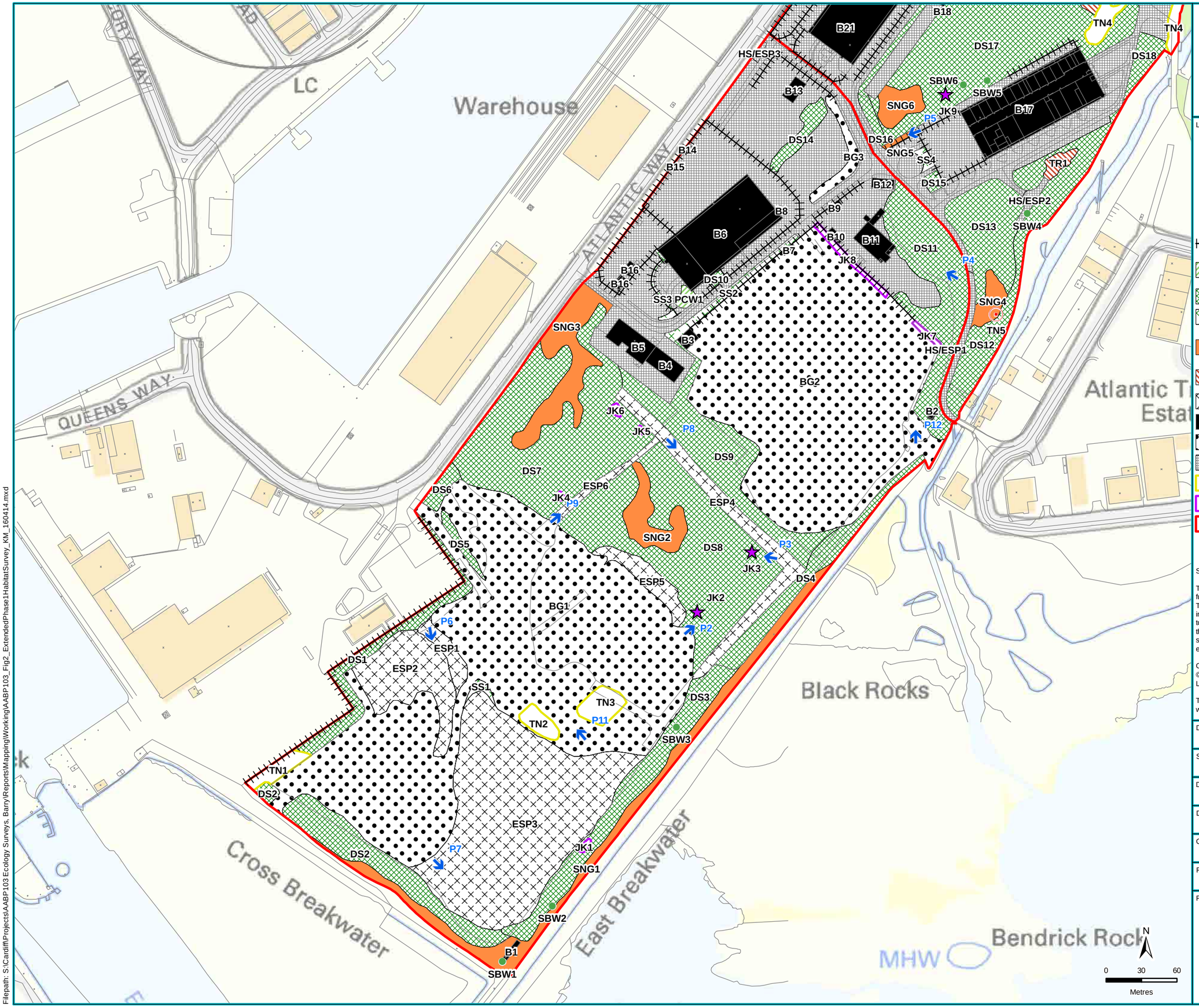

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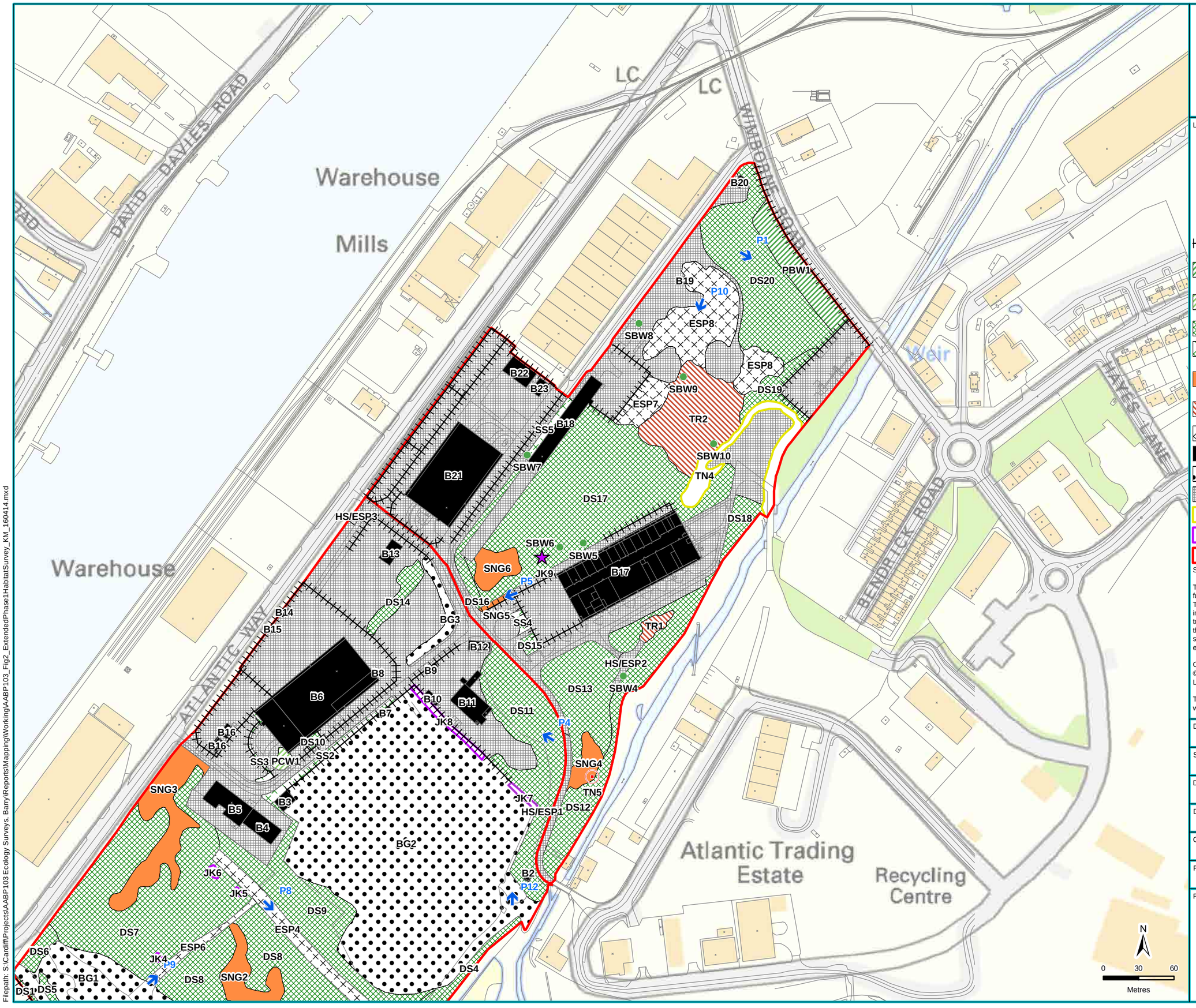
Legend

- Photograph Location and Direction
- Scattered Broadleaved Trees
- Target Note
- Japanese Knotweed
- Fence
- Plantation Coniferous Woodland
- Dense Scrub
- Scattered Scrub
- Semi-Improved Neutral Grassland
- Tall Ruderal
- Ephemeral/Short Perennial
- Building
- Bare Ground
- Hard Standing
- Target Note
- Japanese Knotweed
- Site Boundary

Site Grid Reference: 312,844 167,185

This map has been drawn at a sufficient level of accuracy to fulfil the requirements of a Phase 1 baseline habitat survey. The level of accuracy depends on both the size of the area involved and the base mapping. Every effort has been made to create a map that is as accurate as possible. However, this map is not intended to represent a scaled landscape survey so should not be used to pin-point accurate engineering work or as a basis for detailed site planning.

Drawing Ref	AABP103/15045/1
Scale at A3	1:3,000
Drawn: KM	Checked: NS
Date: 18/08/2014	Date: 18/08/2014
Client	Associated British Ports
Figure Number	2a
Figure Title	Extended Phase 1 Habitat Survey Map Site 1



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Legend

- Photograph Location and Direction
- Scattered Broadleaved Trees
- Target Note
- Japanese Knotweed
- Fence
- Semi-natural Plantation Broadleaved Woodland
- Plantation Coniferous Woodland
- Dense Scrub
- Scattered Scrub
- Semi-Improved Neutral Grassland
- Tall Ruderal
- Ephemeral/Short Perennial
- Building
- Bare Ground
- Hard Standing
- Target Note
- Japanese Knotweed
- Site Boundary

Site Grid Reference: 313,184 167,576

This map has been drawn at a sufficient level of accuracy to fulfil the requirements of a Phase 1 baseline habitat survey. The level of accuracy depends on both the size of the area involved and the base mapping. Every effort has been made to create a map that is as accurate as possible. However, this map is not intended to represent a scaled landscape survey so should not be used to pin-point accurate engineering work or as a basis for detailed site planning.

Drawing Ref	AABP103/15046/1
Scale at A3	1:3,000
Drawn: KM	Checked: NS
Date: 18/08/2014	Date: 18/08/2014
Client	Associated British Ports
Figure Number	2b
Figure Title	Extended Phase 1 Habitat Survey Map Site 2

Photograph 1:
Dense scrub (DS20) with planted broadleaved woodland (PBW1) behind.

Photograph 2:
Dense scrub (DS8) with stand of dead stems of Japanese knotweed visible on the left.

Photograph 3:
Extensive area of Japanese knotweed within DS8.

Photograph 4:
Habitat dominated by hawthorn trees with open understorey (DS11).

Photograph 5:
Grassy sward (SNG5) on disused track.

Photograph 6:
Ephemeral/short perennial habitat; ESP1 in the foreground with ESP2 in the middle distance (greener sward).

Client: Associated British Ports		Drawing Ref: AABP103/15063/1	
Figure Number: 3a		Scale at A4: Not applicable	
Figure Title: Site Photographs		Drawn: KM	Checked: NS
		Date: 18/08/2014	Date: 18/08/2014

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Photograph 7:
Disturbed ground of ESP3 showing machine tracks with pooled water.

Photograph 8:
Raised 'track' between dense scrub supporting ephemeral/short perennial (ESP4) habitat.

Photograph 9:
Habitat parcel ESP6 with wet area supporting rushes (central) and Japanese knotweed on the left.

Photograph 10:
Ephemeral/short perennial (ESP8) with high levels of fly tipping.

Photograph 11:
Mounds of rubble on bare ground (BG1) with vegetation soil heap (Target Note 3) on the right.

Photograph 12:
Disused area of bare ground (BG2) previously used for coal storage.

Client: Associated British Ports		Drawing Ref: AABP103/15064/1	thomson ecology
Figure Number: 3b		Scale at A4: Not applicable	
Figure Title: Site Photographs	Drawn: KM	Checked: NS	www.thomsonecology.com enquiries@thomsonecology.com
	Date: 18/08/2014	Date: 18/08/2014	

2. Introduction

2.1 Development Background

2.1.1 Associated British Ports (ABP) propose to construct a solar farm on previously developed land at Barry Docks, there are no definitive plans to date, but all habitats and buildings on the sites will be cleared to allow for construction.

2.1.2 The proposals described above are hereafter referred to collectively as 'the development'.

2.1.3 The development will be located on two adjacent sites within Barry Docks; Site 1 (central grid reference ST128671) is 21.44 ha and Site 2 (central grid reference ST132675) is 9.81 ha. The two sites combined and total area affected by the development is hereafter referred to as 'the sites'.

2.2 The Brief and Objectives

2.2.1 ABP Marine Environmental Research Limited on behalf of ABP commissioned Thomson Ecology on 4th April 2014 to undertake a preliminary ecological assessment of the development site. The brief was to:

- Carry out an extended Phase 1 habitat survey of Site 1 and Site 2 at Barry Docks (as indicated by the amended red line boundary provided);
- Carry out an ecological desk study;
- Carry out a survey of Site 1 and Site 2 for locations of invasive non-native plant species mapped using a GPS mobile mapper;
- Provide a combined report including an introduction, methodology and results of the surveys, a discussion of any relevant legal and planning policy issues, and our recommendations as to how these may be overcome; and
- Provide appropriate digitised mapping.

2.3 Limitations

2.3.1 The species data collated during the desk study is mainly derived from records submitted by members of the public and ad hoc surveys undertaken by volunteers. Therefore, it should not be taken as a definitive list of the protected species and other species of conservation concern that occur in the local area.

2.3.2 Whilst every effort has been made to map all stands of invasive plant species, the dense scrub restricted access to some areas. These were assessed from a high vantage point to locate invasive species, including dead stems of Japanese knotweed (*Fallopia japonica*), however small patches may have been missed.

2.3.3 The survey was undertaken on 10th and 11th April 2014 which is early in the flowering season and protected or notable plant species may have been overlooked. It is, however, an appropriate time of year for extended Phase 1 habitat survey. It is also the beginning of the

growth phase of Japanese knotweed so areas affected could be identified both by new stem growth and the presence of old stems.

3. Methodology

3.1 Desk Study

3.1.1 A search area was defined that encompasses the site and all land within 2 km of the perimeter of the site, see Figure 1. South East Wales Biodiversity Records Centre (SEWBReC) was contacted on 4th April 2014 and asked to provide up to date information on sites designated for their nature conservation value, local nature reserves, records of protected species and other species of conservation concern, invasive plant species and any other information that they considered relevant. Records of designated sites were sought for the full search area, whereas records for species were sought for part of the study area encompassing the site and within 1km of the perimeter of the site. In addition, the following documents were consulted:

- Vale of Glamorgan Proposed Deposit Local Development Plan 2011-2026; and
- Vale of Glamorgan Council Identification of Sites of Importance for Nature Conservation (SINCs) and Priority Habitats (2010).

3.2 Field Survey

3.2.1 A survey area was defined that encompassed the site boundary, see Figures 2a and 2b.

3.2.2 An extended Phase 1 habitat survey (JNCC, 2010; IEA, 1995) was conducted throughout the survey area. Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. For this survey, the technique was modified (or extended) to provide more detail over a smaller area, and give further consideration to fauna. The standard habitat definitions were used with an additional category of coarse grassland for unmanaged, secondary grasslands that are species poor.

3.2.3 The dominant and readily identified species of higher plant species from each habitat type within the survey area were recorded and their abundance was assessed on the DAFOR scale:

D Dominant

A Abundant

F Frequent

O Occasional

R Rare

3.2.4 These scores represent the abundance within the defined area only and do not reflect national or regional abundances. In addition the code 'L' for Locally within the habitat was used. Plant species nomenclature follows Stace (2010).

3.2.5 During the extended Phase 1 habitat survey, the location of all invasive plant species were recorded using a hand-held, GPS enabled mapping device.

3.2.6 Incidental records of fauna were also made during the survey and the habitats identified were evaluated for their potential to support protected species and other species of conservation

concern, including species of principal importance. However, no specific faunal surveys were undertaken.

3.2.7 The survey was conducted on 10th and 11th April 2014 by ecologist Sali Palmer MSc BSc (Hons) MCIEEM.

4. Results

4.1 Background

4.1.1 The contents of the results section are the results of the desk study and extended Phase 1 habitat survey. Excluded from this section is an assessment of the site to support species of conservation concern not recorded during the survey. Potential further ecological issues are discussed in Section 6.

4.2 Desk Study

4.2.1 A response was received from SEWBReC on 14th April 2014. The results are summarised in Table 1 with the locations of designated sites, ancient woodland and a protected plant species is shown on Figure 1.

Designated Sites

4.2.2 No statutory or non-statutory sites designated for nature conservation exist within the site boundary. Two nationally statutory designated sites within 2 km of the site; Barry Island Site of Special Scientific Interest (SSSI) and Hayes Point to Bendrick Rock SSSI, are both designated for geological reasons. Hayes Point to Bendrick SSSI is situated adjacent to the south-west boundary of the site.

4.2.3 There are also six non-statutory locally designated sites within 2 km of the site; all designated as Sites of Importance for Nature Conservation (SINC). Cadoxton River SINC is situated immediately adjacent to the boundary in the north-east of the site.

Table 1: Designated sites within 2km of the site

Site Designation	Grid Reference	Area (ha)	Distance to site (km)	Description
National Sites (SSSIs)				
Hayes Point to Bendrick Rock SSSI	ST138671	29.5	0	Designated for geological reasons.
Barry Island SSSI	ST120664	16	0.6	Designated for geological reasons.
County and Local Sites (SINCs, LNRs, etc)				
Cadoxton River SINC	ST134676	0.7	0	Small section of tidal canalised river supporting large stands of reedbed.

Site Designation	Grid Reference	Area (ha)	Distance to site (km)	Description
Cadoxton Wetlands SINC	ST132685	11.9	0.4	A mosaic of habitats including, ponds, reedbeds, tall herb swamp, grassland, scrub and scattered trees and supports a range priority species including S42 species bittern (*Botaurus stellaris*).
Nell's Point East SINC	ST120664	2.5	0.4	Maritime cliff and slope supporting coastal neutral to calcareous grassland.
North of North Road SINC	ST143690	4.8	1.3	Large stands of reedbed, scrub and scattered trees.
Gladstone Road Pond SINC	ST114679	0.6	1.4	Pond supporting a breeding population of smooth newts.
Friars Point SINC	ST110662	2.9	1.5	Maritime cliff and slope supporting coastal calcareous and neutral grassland.

Habitats of Principal Importance

4.2.4 The locally designated SINCs (listed in Table 1) likely to support the following types of priority habitats:

- Lowland meadows;
- Lowland calcareous grassland;
- Reedbeds;
- Ponds; and
- Maritime cliffs and slopes.

Ancient Woodland

4.2.5 No Ancient woodland above 2 ha is located within the site, but one parcel of restored ancient woodland is located approximately 350 m east of the site.

Protected Species and Other Species of Conservation Concern

4.2.6 Records of protected species and species of conversation concern derived from the desk study are shown in Table 2 and the location of Schedule 8 protected plant species, Childing Pink (*Petrorhagia nanteuilii*) is shown on Figure 1. Only records from the last ten years have been included. If multiple records for one species exist, then the nearest, most recent record has been given. Where a four-figure grid reference was provided by the records centre and an accurate distance from the site can not be calculated, the distance has been omitted.

Invasive Species

4.2.7 Records of invasive species derived from the desk study are shown in Table 3. Only records from the last ten years have been included. If multiple records for one species exist, then the nearest, most recent record has been given.

Table 2: Records of Protected and Other Species of Conservation Concern derived from the desk study

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Plants								
Pyramidal orchid	*Anacamptis pyramidalis*					LI	ST1368	-
Black horehound	*Ballota nigra*					LI	ST1266	-
Yellow-wort	*Blackstonia perfoliata*					LI	ST122677	0
Greater knapweed	*Centaurea scabiosa*					LI	ST122677	0
Perennial wall-rocket	*Diplotaxis tenuifolia*					LI	ST127666	0
Viper's-bugloss	*Echium vulgare*					LI	ST122677	0
Dropwort	*Filipendula vulgaris*					LI	ST133671	0
Round-leaved crane's-bill	*Geranium rotundifolium*					LI	ST1266	-
Common rock-rose	*Helianthemum nummularium*					LI	ST1266	-
Stinking hellebore	*Helleborus foetidus*					LI, NS	ST1266	-

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Tree-mallow	*Lavatera arborea*					LI	ST120662	908
Lyme-grass	*Leymus arenarius*					LI	ST1266	-
Pale flax	*Linum bienne*					LI	ST122677	515
Early forget-me-not	*Myosotis ramosissima*					LI	ST1266	-
Bee orchid	*Ophrys apifera*					LI	ST131685	910
Common broomrape	*Orobanche minor*					LI	ST122677	515
Childing pink	*Petrorhagia nanteuilii*		Sch 8		✓	VU	ST125673	275
Hawkweed oxtongue	*Picris hieracioides*					LI	ST122677	515
Hoary plantain	*Plantago media*					LI	ST122677	515
Small scabious	*Scabiosa columbaria*					LI, WVP(VU)	ST122677	755
Bladder campion	*Silene vulgaris*					WVP(NT)	ST1266	755
Charlock	*Sinapis arvensis*					WVP(VU)	ST1266	-

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Greater sea-spurrey	*Spergularia media*					LI	ST1266	-
Autumn lady's-tresses	*Spiranthes spiralis*					LI, NT	ST128668	0
Rough clover	*Trifolium scabrum*					LI	ST1266	-
Sea clover	*Trifolium squamosum*				✓	LI, NS	ST127667	0
Invertebrates								
Brown-banded carder-bee	*Bombus humilis*			✓	✓		ST135671	281
Moss carder-bee	*Bombus muscorum*			✓	✓		ST131683	595
Red-shanked carder-bee	*Bombus ruderarius*			✓	✓		ST131683	595
A bush-cricket	*Conocephalus fuscus*					LI	ST133685	910
Small blue	*Cupido minimus*			✓	✓	LI , NT	ST131683	595
Grayling	*Hipparchia semele*			✓	✓	LI, NT	ST135671	406

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Speckled bush-cricket	*Leptophyes punctatissima*					LI	ST122677	515
Black-tailed skimmer	*Orthetrum cancellatum*					LI	ST132684	595
Keeled skimmer	*Orthetrum coerulescens*					LI	ST131683	595
Ruddy darter	*Sympetrum sanguineum*					LI	ST133685	910
Amphibians								
Common toad	*Bufo bufo*			✓	✓		ST131683	595
Common frog	*Rana temporaria*						ST131683	595
Palmate newt	*Lissotriton helveticus*						ST131683	701
Reptiles								
Slow worm	*Anguis fragilis*			✓	✓		ST120670	755

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority Species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Birds								
Sandpiper	*Actitis hypoleucos*					, WBAm, UKBAm	ST1368	788
Long-tailed tit	*Aegithalos caudatus*					WBAm	ST1266	380
Skylark	*Alauda arvensis*			✓	✓	WBAm, UKBR	ST1368	405
Mallard	*Anas platyrhynchos*					, WBAm, UKBAm	ST1368	701
Gadwall	*Anas strepera*					, WBAm, UKBAm	ST1366	755
Meadow pipit	*Anthus pratensis*					WBAm, UKBAm	ST1266	380
Swift	*Apus apus*				✓	WBAm, UKBAm	ST1368	-
Ruddy turnstone	*Arenaria interpres*					WBAm, UKBAm	ST1366	755
Tufted duck	*Aythya fuligula*				✓	, WBAm, UKBAm	ST1167	788
Great bittern	*Botaurus stellaris*		Sch 1	✓	✓	WBAm, UKBR	ST1368	-
Purple sandpiper	*Calidris maritima*		Sch 1		✓	UKBAm	ST1266	-
Lesser redpoll	*Carduelis cabaret*			✓	✓	WBR, UKBR	ST1266	380
Common linnet	*Carduelis cannabina*			✓	✓	WBR, UKBR	ST1266	-

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority Species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Cetti's warbler	*Cettia cetti*		Sch 1		✓		ST133685	788
Ringed plover	*Charadrius hiaticula*			✓	✓	WBAm	St1366	-
Black-headed gull	*Chroicocephalus ridibundus*			✓	✓	WBR, UKBAm	ST1368	-
House martin	*Delichon urbicum*				✓	WBAm, UKBAm	ST1266	-
Little egret	*Egretta garzetta*					CITES, RD2, UKBAm	ST1368	-
Reed bunting	*Emberiza schoeniclus*			✓	✓	WBAm, UKBR, UKAm	ST1368	-
Peregrine falcon	*Falco peregrinus*		Sch 1		✓	UKBAm	ST1266	-
Kestrel	*Falco tinnunculus*			✓	✓	WBR, UKBAm	ST122677	755
Brambling	*Fringilla montifringilla*		Sch 1				ST1266	-
Great northern diver	*Gavia immer*		Sch 1			WBAm, UKBAm	ST128674	127
Oystercatcher	*Haematopus ostralegus*					UKBAm	ST1366	-

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority Species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Swallow	*Hirundo rustica*				✓	WBAm, UKBAm	ST1266	-
Storm-petrel	*Hydrobates pelagicus*					WBAm, UKBAm	ST1266	-
Little gull	*Hydrocoloeus minutus*		Sch 1			WBAm, UKBAm	ST1266	-
Lesser black-backed gull	*Larus fuscus*					WBAm, UKBAm	ST131683	595
Mediterranean gull	*Larus melanocephalus*		Sch 1			WBAm, UKBAm	ST1266	-
Yellow wagtail	*Motacilla flava*			✓	✓	WBR, UKBR, UKBAm	ST1266	-
Wheatear	*Oenanthe oenanthe*					WBAm, UKBAm	ST1266	-
Tree sparrow	*Passer montanus*			✓	✓	WBR, UKBR	ST1266	-
Cormorant	*Phalacrocorax carbo*					WBAm, UKBAm	ST1267	-
Black redstart	*Phoenicurus ochruros*		Sch 1		✓	WBAm, UKBAm	ST1266	-
Willow warbler	*Phylloscopus trochilus*					WBR, UKBAm	ST1266	-

Common Name	*Scientific Name*	HR Sch 2 or 4	WCA Sch1, 5 or 8	Priority Species	Local BAP species	Other	Grid Ref.	Distance from site (m)
Dunnock	*Prunella modularis*			✓	✓	RD2, UKBAM	ST1368	-
Water rail	*Raluus aquaticus*					RD2, UKBAm	ST133685	799
Stonechat	*Saxicola torquata*					RD2, UKBAm	ST119661	790
Whitethroat	*Sylvia communis*					WBAm, UKBAm	ST1266	-
Wood sandpiper	*Tringa glareola*		Sch 1			UKBAm	ST1266	-
Song thrush	*Turdus philomelos*			✓	✓	RD2, WBAm, UKBR	ST1368	-
Mammals								
Common porpoise	*Phocoena phocoena*	Sch 2	Sch 5	✓	✓	, CITES	ST1266	-
Noctule bat	*Nyctalus noctula*	Sch 2	Sch 5	✓	✓		ST131683	595
Common pipistrelle	*Pipistrellus pipistrellus*	Sch 2	Sch 5	✓	✓		ST131683	690
Hedgehog	*Erinaceus europaeus*			✓	✓		ST131684	695

HR = Conservation of Habitats and Species Regulations 2010

WCA = Wildlife and Countryside Act 1981, as amended

Priority Species = Priority species for conservation under the Section 42 List (NERC Act, 2006)

RD2 = UK Red Data Book Species not based on IUCN guidelines

VU = Vulnerable Red Listing based on IUCN 2001 guidelines

NT = Near Threatened based on IUCN 2001 guidelines

NR = Nationally Rare not based on IUCN guidelines

NS = Nationally Scarce not based on IUCN guidelines

WBR = RSPB Welsh Red listed birds

WBAm = RSPB Welsh Amber listed birds

UKBR = RSPB UK Red listed birds

UKBAm = RSPB UK Amber listed birds

WVP(VU) = Vulnerable IUCN Threat Listing of Welsh Vascular Plants

WVP(NT) = Near Threatened IUCN Threat Listing of Welsh Vascular Plants

LI = Locally Important as identified by local specialists

Table 3: Records of invasive non-native species derived from the desk study

Common Name	Scientific Name	Other	Grid Ref.	Distance from site (m)
Plants				
Spanish bluebell	*Hyacinthoides hispanica*	INNS	ST1266	-
Invertebrates				
Pacific oyster	*Crassostrea gigas*	INNS	ST141672	-
A barnacle	*Elminius modestus*	INNS	ST130670	27

INNS = Invasive non-native species

4.3 Field Survey

Habitats and Flora

4.3.1 The following Phase 1 habitat types were identified:

- Semi-natural plantation broadleaved woodland;
- Planted coniferous woodland;
- Dense scrub;
- Scattered scrub;
- Scattered broadleaved trees;
- Semi-improved neutral grassland;
- Tall ruderal;
- Ephemeral/short perennial;
- Ephemeral/short perennial and hard standing mosaic;
- Fence;
- Bare ground;
- Other habitat;
- Buildings; and
- Hard standing.

4.3.2 These habitats are described below and their distribution is given on Figure 2a and 2b. The species lists are given in Appendix 1.

Planted Broadleaved Woodland

4.3.3 A small stand (approximately 0.2 ha) of planted broadleaved woodland (PBW1 on Figure 2b, Photograph 1 on Figure 3a) is located along the north-east boundary of the site. It is dominated by grey poplar (*Populus canescens*) with occasional Scots pine (*Pinus sylvestris*) and a dense understorey of hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus* agg.).

Planted Coniferous Woodland

4.3.4 A small area (less than 0.1 ha) of Cypress trees (*Cupressus* sp.) (PCW1 on Figure 2b) is located on the southern corner of Building 6 (B6 on Figure 2b).

Dense Scrub

4.3.5 There are 20 distinct parcels of dense scrub around the site (DS1 to DS20 on Figure 2a and 2b). The boundary of the southern part of the Site 1 (DS1, DS2, DS3, DS4, DS5 and DS6 on Figure 2a) scrub comprises varying amounts of butterfly-bush (*Buddleja davidii*) and bramble, with

hawthorn being an important component in DS2 and gorse (*Ulex europaeus)* present in DS3. Habitat parcel DS2 has some areas of less dense bramble where grasses are prominent.

4.3.6 The central portion of Site 1 consists of a large area totalling approximately 2.6 ha of dense scrub labelled DS7 and DS8 on Figure 2a (Photograph 2 on Figure 3a) and comprises of hawthorn and blackthorn (*Prunus spinosa*) with dense bramble cover between and stands of Japanese knotweed (*Fallopia japonica*, Photograph 3 on Figure 3a). Habitat parcel DS8 is denser than DS7 and is mostly impenetrable, mostly comprising bramble with butterfly-bush on the banks of the surrounding track.

4.3.7 Habitat parcel DS9 (see Figure 2a), is separated from habitat parcel DS8 by a track supporting ephemeral/short perennial vegetation (see ESP4 description in Section 4.3.22) and is located on a bank surrounding bare ground (BG2 on Figure 2a). It comprises tall butterfly-bush with bramble scrambling through and rarely occurring herb plants associated with woodlands including bluebell (*Hyacinthoides non-scripta*) and herb-robert (*Geranium robertianum*).

4.3.8 On the boundary of Site 1, a parcel of dense scrub (DS11 on Figure 2a and 2b, Photograph 4 on Figure 3a) approximately 0.7 ha in size comprises hawthorn trees approximately 5 m in height; this area mostly has an open understorey and ground flora comprising ivy (*Hedera helix*) and lords-and-ladies (*Arum maculatum*), but towards the south of the parcel (around Building 2 on Figure 2a) a dense understorey of bramble is present.

4.3.9 On the opposite side of the track to DS11, within Site 2, habitat parcel DS12 (see Figure 2b) comprises of tall hawthorn with a very dense understorey of bramble and occasional goat willow (*Salix caprea*.) but habitat DS13 (see Figure 2b) comprises shorter hawthorn trees, spaced relatively far apart with grass and woodland plants including cowslip (*Primula veris*).

4.3.10 Habitat parcel DS16 is a bank covered with dense bramble and butterfly-bush, surrounding an area approximately 1.4 ha comprising bramble (DS17 on Figure 2b) which comprises low growing bramble with occasional hawthorn and butterfly-bush.

4.3.11 There is another stand of tall hawthorn trees (DS18 on Figure 2b) of the eastern boundary of Site 2, which extends off site. Here there is an understorey of bramble and ivy. In the north of the site, habitat parcel DS19 is located between the bank of Target Note 4 (see Section 4.3.29) and the perimeter fence. It is dominated by goat willow and there are several clumps of pampas grass (*Cortaderia selloana*).

4.3.12 Habitat parcel DS20 is an area in the north-east of Site 2 approximately 0.8 ha of continuous scrub, with large 'mounds' of dense bramble with less dense areas of where grass or bare ground is present below sparse bramble.

4.3.13 Habitat parcels DS10, DS14 and DS15 on Figure 2b are small patches of butterfly-bush and bramble located near buildings on Site 2.

Scattered Scrub

4.3.14 There are five small patches of scattered scrub around the site (SS1 to SS5 on Figure 2a to 2b). All consist of butterfly-bush with varying amounts of bramble or herb species. Habitat parcel SS1 (see Figure 2a) is located at the junction of tracks in the southern half of the site which is used for material storage. Habitat parcel SS2 (see Figure 2b) is the verge between an access road and fence which comprises grasses and moderate size butterfly-bushes with occasional

bramble. Habitat parcels SS3, SS4 and SS5 (see Figure 2b) are encroaching on neglected areas of hard-standing around buildings.

Scattered Broadleaved Trees

4.3.15 Scattered broadleaved trees are located at 10 locations around the site (SBW1 to SBW10 on Figure 2a and 2b), including goat willow (*Salix caprea*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*) and apple (*Malus domestica*).

Semi-improved Neutral Grassland

4.3.16 The south and south-east boundary of Site 1 supports a strip of semi-improved neutral grassland (SNG1 on Figure 2a). This forms a footpath along this section of the site and in addition to grasses comprises herb species such as yarrow (*Achillea millefolium*), a vetch (*Vicia* sp.) and imperforate St John's-wort (*Hypericum maculatum*). This habitat is exposed to the coast; however no indicator species of coastal grassland were recorded.

4.3.17 In the centre of Site 1, surrounded by dense scrub were two areas of semi-improved neutral grassland (SNG1 and SNG3 on Figure 2a) with a total area of less than 0.1 ha. Two areas of grassland were also found in a clearing of dense scrub near the boundary between Site 1 and Site 2 (SNG4 and SNG6 on Figure 2b) with a total area of less than 0.2 ha. Species in these areas included field wood-rush (*Luzula campestris*) and a high component of moss.

4.3.18 A further area of semi-improved neutral grassland (SNG5 on Figure 2b, Photograph 5 on Figure 3a) is located along an old access track near to Building 17.

Tall Ruderal

4.3.19 There are two parcels of tall ruderal vegetation in Site 2; one small patch (TR1 on Figure 2b) amongst dense scrub to the south of B17, and a larger area to the north of B17 (TR2 on Figure 2b). Both areas were dominated by broadleaved dock (*Rumex obtusifolium*) and common knapweed (*Centaurea nigra*).

Ephemeral/Short Perennial

4.3.20 There are eight parcels of ephemeral/short perennial vegetation on site (ESP1 to ESP8 on Figures 2a and 2b).

4.3.21 The southern section of Site 1 is used for storage of materials such as rubble or soil. Large areas of this are unused and ephemeral/short perennial vegetation is present with varying degrees of establishment. Habitat parcels ESP1 and ESP2 on Figure 2a (see Photograph 6 on Figure 3a) total approximately 1.2 ha and are less disturbed than the larger expanse of habitat parcel ESP3 (area nearly 2 ha). Vehicles have 'cut-up' the ground of habitat parcel ESP3 and water had collected in the tracks (Photograph 7 on Figure 3b).

4.3.22 Habitat parcel ESP4 (see Figure 2a, Photograph 8 on Figure 3b) is a raised track, surrounded on all sides by dense scrub. Here the vegetation is almost a closed community with very little substrate visible; notable species include biting stonecrop (*Sedum acre*) and barren strawberry (*Potentilla sterilis*).

4.3.23 Habitat parcel ESP6 (see Figure 2a, Photograph 9 on Figure 3b) is a track through dense scrub and floristically similar to habitat parcel ESP4, although not being raised there the ground is wetter, there is a higher moss component and a clump of rushes (*Juncus* sp.).

4.3.24 Habitat parcels ESP7 and ESP8 (see Figure 2b) within Site 2 floristically very similar to ESP1 and 2 in the southern section, however as the surrounding buildings are occupied there are piles of fly-tipped rubbish (see Photograph 10 on Figure 3b).

Ephemeral/Short Perennial and Hard Standing Mosaic

4.3.25 There were three locations across the site where areas of hard standing (concrete or tarmac) were becoming colonised by vegetation through cracks in the substrate (HS/ESP1 to HS/ESP3 on Figure 2a and 2b).

Bare Ground

4.3.26 There are three main areas of bare ground; BG1 in the south-west of the site (see Figure 2a, Photograph 11 on Figure 3b) is utilised by a company for the storage of materials such as soil and building rubble, the mounds are in a constant state of flux. Several mounds which have been untouched for awhile establish some pioneer vegetation, two soil mounds in particular which have been target noted (see 'Other Habitat' in Section 4.3.29).

4.3.27 The central area of the site (BG2 on Figures 2a and 2b, Photograph 12 on Figure 3b) was once used for storage of coal; it is now unused but the area and surrounding bunds are black with left over coal dust.

4.3.28 The bund around one business has been recently cleared and re-profiled, leaving a high bund of bare ground (B3 on Figures 2a and 2b).

Other Habitat

4.3.29 There are several habitat parcels which do not fit in to the standard Phase 1 habitat survey descriptions. These have been marked with a target note on Figure 2a and 2b and described here.

- Target Note 1 (see Figure 2a) is a north facing bank on the boundary of the site and is dominated by colt's-foot (*Tussilago farfara*);
- Target Notes 2 and 3 (see Figure 2a, Photograph 11 on Figure 3b) are soil mounds which have established pioneer vegetation including bristly oxtongue (*Helminthotheca echioides*), charlock (*Sinapis arvensis*) and sun spurge (*Euphorbia helioscopia*); and
- Target Note 4 (see Figure 2b) marks a bund of soil and rubble surrounding hard standing in the northern section of the site, with a similar floristic composition to Target Notes 2 and 3.

Buildings

4.3.30 Twenty-three buildings or groups of buildings (B1 to B23 on Figure 2a and 2b) were identified during the extended Phase 1 habitat survey. Building 1 was a half-buried brick structure with a flat roof. Building 2 was a stone building with an arched brick roof, overgrown with ivy. Building

12 was a single storey, pitched roof office building. Buildings 14, 15, 19 and 20 were brick built, with either flat or pitched roof; all were unused and in an advanced state of disrepair. All remaining buildings were either large, steel framed warehouse style buildings or smaller, portable-style buildings.

Fauna

4.3.31 In addition to a seven-spot ladybird (Coccinella 7-punctata) and several species of bee (*Bombus* spp.), the following invertebrate butterfly species were identified across the site;

- Peacock (*Inachis io*);
- Small tortoiseshell (*Aglais urticae*);
- Orange-tip (*Anthocharis cardamines*);
- Speckled wood (*Pararge aegeria*);
- Large white (*Pieris brassicae*); and
- Red admiral (*Vanessa atalanta*).

4.3.32 The following bird species were recorded during the survey;

- Lesser black-backed gull (*Larus fuscus*);
- Herring gull (*Larus argentatus*);
- Woodpigeon (*Columba palumbus*);
- Magpie (*Pica pica*);
- Carrion crow (*Corvus corone*);
- Blue tit (*Cyanistes caeruleus*);
- Great tit (*Parus major*);
- Blackcap (*Sylvia atricapilla*);
- Wren (*Troglodytes troglodytes*);
- Blackbird (*Turdus merula*);
- Robin (*Erithacus rubecula*);
- Dunnock (*Prunella modularis*);
- Chaffinch (*Fringilla coelebs*); and
- Greenfinch (*Chloris chloris*).

4.3.33 The two gull species were observed in the southern section of the Site 1, around pooled water in tracks across in ESP3 (see Figure 2a, Photograph 7 on Figure 3b). The passerine species listed above were either observed or heard singing in areas of dense scrub across the site.

4.3.34 A rabbit (*Oryctolagus cuniculus*) burrow was recorded at Target Note 5 (see Figure 2b) in the spur in the south-east of Site 2, and a rabbit was seen near to Building 14 on Site 1.

Invasive species

4.3.35 Japanese knotweed was recorded in nine locations across the site which were recorded using the mobile mapping device. The locations are provided in Table 4 and shown on Figures 2a and 2b.

4.3.36 Where it was possible to walk around the stand the area is provided in metres squared. Where it was not possible the length and width of the stand was estimated.

Table 4: Japanese knotweed locations

Parcel ID	Grid Reference	Area	Description
JK1	ST1282866895	65 m^2	Young growth on top of soil bund
JK2	ST1292367093	*4 m x 4 m*	Established area within dense scrub
JK3	ST1297067144	*30 m x 10 m*	Established area within dense scrub
JK4	ST1280867191	*5 m x 5 m*	Established area within dense scrub
JK5	ST1287667247	*10 m x 3 m*	Established area within dense scrub
JK6	ST1285467264	*3 m x 3 m*	Established area within dense scrub
JK7	ST1311867327	125 m^2	Young growth on top of spoil bund
JK8	ST1305167392	342 m^2	Established area along fenced boundary, growing through hard standing
JK9	ST1313367531	*6 m x 3 m*	Established area within dense scrub

5. Legislation and Planning Policy Issues

5.1 Background

5.1.1 The content of the legislation and planning policy section is the legislation and planning policy issues that we know are relevant based on this desk study and extended Phase 1 habitat survey. The legislation and policy issues that might arise following further surveys are excluded. Potential further ecological issues are discussed in Section 6. A detailed description of the method for this section is given in Appendix 2.

5.2 Designated Sites

Statutory sites

5.2.1 There are two SSSIs within 2km of the site which are strictly protected by UK legislation and planning policy. The nearest statutory site, Hayes Point to Bendrick Rock SSSI is immediately adjacent to the site boundary, and the nearest point of Barry Island SSSI is located 0.6 km south-west across water. Both sites are notified for geological reasons which would not be impacted by the proposed development. The development proposals should therefore be compliant with the relevant legislation and policy with respect to nature conservation and statutory designated sites.

Non-statutory sites

5.2.2 Six Sites of Interest for Nature Conservation (SINCs) are located within 2km of the site boundary. SINCs receive some protection through Technical Advice Note 5 - TAN5 (paragraph 6.5.1) and from the Vale of Glamorgan Deposit Local Development Plan (LDP) policy MG19 which states: *"Development will not be permitted where it would have an unacceptable impact upon the particular features for which a SINC has been identified".*

5.2.3 The nearest SINC is located adjacent to the site boundary; Cadoxton River flows into the Bristol Channel, a small section of this is designated for reedbeds. The remaining five SINCs are located over 0.4 km away from the site.

5.2.4 The proposals are unlikely to have an effect on these non-statutory designated sites and their important attributes for the following reasons:

- The development will be restricted to the site boundary;
- The development will be separated from five of the non-statutory sites by existing roads and urban infrastructure;
- Waste water from the development will be treated to national standards before discharge into the river system; and
- Pollution will be controlled during construction works in accordance with Environment Agency pollution prevention guidelines.

5.3 Habitats of Principal Importance

5.3.1 Parts of the site which support ephemeral/short perennial (ESP1 to ESP6 on Figure 2a and 2b) and bare ground (BG1 on Figure 2a) have characteristics of Open Mosaic Habitat on Previously Developed Land (OMH). OMH is a habitat of principal importance for the conservation of biodiversity as listed under Section 42 of the NERC Act, (2006). Technical Advice Note 5, Nature conservation and planning (TAN5) requires the '*protection and, where possible, enhancements of species and their habitats, especially those with legal protection and those of principal importance for biodiversity conservation in Wales*'.

5.3.2 Recommendations for further survey are made in Section 7 to determine whether the site meets the criteria of the OMH type and the quality of the habitats present to ensure that appropriate measures can be taken to meet relevant policies.

5.4 Ancient Woodland

5.4.1 No ancient woodland was recorded on site and one parcel of ancient woodland is located 350m to the east of the site. Ancient woodlands are protected under Planning Policy Wales (PPW), which states that "*Ancient and semi-natural woodlands are irreplaceable habitats of high biodiversity value which should be protected from development that would result in significant damage.*''

5.4.2 The proposed development is unlikely to have a significant negative effect on the area of ancient woodland to the east of the site and its important attributes because:

- The proposed development is confined to the site boundary; and
- The proposed development is separated by physical barriers, including roads and buildings.

5.4.3 The development proposals should therefore be compliant with the relevant legislation and policy with respect to ancient woodland.

5.5 Protected Species

5.5.1 A number of common bird species were recorded on the site, some of which are most likely to breed on the site as suitable habitat is present. All birds, eggs and nests are protected from damage and destruction under the Wildlife and Countryside Act (WCA) 1981, as amended.

5.5.2 A rabbit burrow is present in the south-east corner of Site 2 (at Target Note 5, Figure 2b). Rabbits receive some protection under the Wild Mammals (Protection) Act 1996. This makes it an offence to intentionally cause this species unnecessary suffering by certain methods, including crushing and asphyxiation, which could occur during site clearance.

5.5.3 PPW states that "*the presence of a species protected under European or UK legislation is a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat.*"

5.5.4 The mitigation measures set out in Section 7 should ensure that the development proposals are compliant with the law and PPW with respect to birds and rabbits. It should be noted however that other protected species may be present as set out in Section 6.

5.6 Species of Principal Importance

5.6.1 Two bird species that are listed under Section 42 of the NERC Act (2006) were recorded on site. Dunnock (*Prunella modularis*) was heard singing in dense scrub (DS6 and DS7 on Figure 2a) and would most likely find suitable breeding habitat in these areas. Herring gull (*Larus argentatus*) was observed flying over the southern parts of the site and using pools of water in habitat parcel ESP3 (see Figure 2a). Herring gull may find suitable breeding locations on some of the larger buildings (e.g. Buildings 6, 17 and 21).

5.6.2 Section 40 of the NERC Act (2006) places a duty on every public authority, in exercising its functions, to "*have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*".

5.6.3 In line with this policy, the mitigation proposals set out in Section 7 should ensure that the proposed development is compliant with relevant policy and legislation.

5.7 Other Species of Conservation Concern

5.7.1 Lesser black-backed gull (*Larus fuscus*) was also observed flying over the site. This species is on the amber list for birds of conservation concern however it receives no specific legal or policy protection over and above the general protection of all birds by the WCA (1981), as amended.

5.8 Invasive Plant Species

5.8.1 Japanese knotweed occurs in at least nine locations across the site (JK1 to JK9 on Figure 2a and 2b). Under the WCA (1981), as amended, it is an offence to plant or otherwise cause this species to grow in the wild. Measures are therefore proposed in Section 7 for the eradication of this species from the site in advance of development.

5.8.2 One other invasive plant species recorded in the data search was not recorded on site. Spanish bluebell (*Hyacinthoides hispanica*) could be present on site, as suitable habitat is present and it could be transported there through the rubble and fly-tipping present. There is no legislation that applies to this species.

5.9 Ecological Enhancement

5.9.1 Central and local government policy now points towards ecological enhancement on development sites. One of the key points of Policy MD10 of the Deposit LDP of the Vale of Glamorgan states "*Incorporating new biodiversity features either on or off site to enable a net gain in biodiversity interest*". PPW 5.5.2 states that *"Authorities should seek to… where practicable, enhance features of conservation importance"*.

5.9.2 Recommendations for ecological enhancement are included in Section 7.

6. Potential Further Ecological Issues

6.1 Background

6.1.1 The potential further ecological issues section sets out our assessment of the potential of the site to support protected species and other species of conservation concern which were not detected during the extended Phase 1 habitat survey, either because their presence is seasonal or because specialist survey techniques are required. Further survey work or appropriate mitigation is likely to be required before these issues can be addressed. Further information on the methods of assessment is given in Appendix 2.

6.2 Flora

6.2.1 A record for Childing pink, protected under Schedule 8 of the Wildlife and Countryside Act (1981), as amended, exists 275m from the site. Childing pink (*Petrorhagia nanteuilii*) was recorded during 2008 surveys for the Barry Waterfront development. This is a nationally rare annual plant that's natural habitat is thinly vegetated, stabilised shingle but is sometimes recorded in dockland habitat. It is a Vale of Glamorgan Local Biodiversity Action Plan (BAP) species and there could be potential habitat on site to support this species.

6.2.2 A further 23 species that are 'Locally Important' have been recorded within the search area. Several species were recorded on the boundary of the site including autumn lady's-tresses (*Spiranthes spiralis*) and sea clover (*Trifolium squamosum*), the latter of which is also a Local BAP species. Three species that were returned in the data search are listed on the IUCN List of Welsh Vascular Plants; bladder campion (*Silene vulgaris*) is listed as 'near threatened' and small scabious (*Scabiosa columbaria*) and charlock (*Sinapis arvensis*) both listed as 'vulnerable'. There is habitat on site with the potential to support locally important species of plants. Further surveys are recommended in Section 7 to establish if protected or notable plant species are present on site.

6.3 Invertebrates

6.3.1 Five invertebrate species of principal importance were returned in the data search, including small blue (*Cupido minimus*), grayling (*Hipparchia semele*) and three species of carder-bee. Bees were recorded during the field survey although the species were not identified, and suitable habitat for small heath was recorded on site.

6.3.2 The OMH habitat type is noted for its importance for invertebrate species. Habitats present on site could potentially support a high diversity of invertebrate species including protected species. Recommendations are made in Section 7 to ensure that the development is compliant with relevant policy and legislation.

6.4 Amphibians

6.4.1 Three common amphibian species, common toad (*Bufo bufo*), common frog (*Rana temporaria*) and palmate newt (*Lissotriton helveticus*) have been recorded within 1 km of the site. There are no known suitable water-bodies on or near to the site that would support amphibian species.

6.5 Reptiles

6.5.1 One common reptile species has been recorded within 1 km of the site; slow worm (*Anguis fragilis*). There is suitable foraging habitat present for this species in areas of ephemeral/short perennial (ESP1 to ESP9 on Figure 2a and 2b) and semi-natural neutral grassland (SNG1 to SNG6 on Figure 2a and 2b). Many of these areas also have rubble piles within them or adjacent to them which could provide hibernacula.

6.5.2 All reptiles receive protection under the WCA (1981), as amended, and are protected from intentional killing and injury. As a species of principal importance for the Conservation of Biodiversity, the local authority has a duty to consider the conservation of these species.

6.5.3 Recommendations for further survey in Section 7 should be followed to determine if reptiles are present or likely to be absent on the site.

6.6 Bats

6.6.1 The desk study identified records of both common pipistrelle and noctule bats within 1km of the site. The site could offer potential foraging and roosting habitat for bats and the many buildings on site may offer potential roosting opportunities.

6.6.2 All bats and their roosts are protected under the Wildlife and Countryside Act 1981, as amended and the Conservation of Habitats and Species Regulations (2010) as well as planning policy.

6.6.3 Recommendations for further survey in Section 7 are made to establish whether bats are present on the site.

7. Recommendations

7.1 Mitigation

7.1.1 The recommendations for mitigation (including avoidance, mitigation and compensation) measures given in this section are based on the findings of the desk study and extended Phase 1 habitat survey. It may include precautionary mitigation measures for some species which could occur on the site but excludes discussion of the mitigation measures that may be required following the results of the further surveys recommended in Section 7.3.

Protected Species

7.1.2 Site clearance should be undertaken outside the breeding bird season, i.e. site clearance should be undertaken in the period September to February inclusive.

7.1.3 The activity at the rabbit burrow should be assessed by soft-stopping the holes with grass to see if the entrances are in use. If it is possible to show that the burrow is not in use then the burrow can be destroyed without any fear of causing harm, however it may be necessary to destroy the burrow by hand or using a mini-digger under an ecological watching brief to ensure that no rabbits are harmed. No licence will be required.

Invasive Plant Species

7.1.4 Any stands of Japanese knotweed that are unlikely to be disturbed or affected by the development should be subject to a rigorous herbicide spraying programme, consisting of several treatments each year over a minimum period of three years.

7.1.5 Any stands of Japanese knotweed and their rhizomes that will be disturbed during construction should be excavated under supervision of a Clerk of Works to be treated in a designated location on site.

7.1.6 All appropriate measures should be taken to ensure that plant fragments can not be transported off site during site clearance and all contractors should receive toolbox talks on how to prevent spread and contamination of Japanese knotweed.

7.2 Ecological Enhancements

7.2.1 The proposed development will result in the loss of habitats suitable for supporting invertebrate species, breeding birds, common reptile species and foraging bats. Appropriate recommendations for ecological enhancements can be made after the completion of the recommended surveys (see Section 7.3). However, the following suggestions could be implemented to enhance biodiversity within the site:

- Creation or retention of ephemeral/short perennial habitat within the site to provide high quality habitat for invertebrates;
- Creation of habitat piles to provide refugia opportunities for reptiles; and

- Creation or retention of woodland or scrub areas within the site to provide suitable nesting habitat for breeding bird species.

7.3 Further Survey

Habitats and Flora

7.3.1 It is considered that areas of the site could be included in the Open Mosaic Habitat on Previously Developed Land (OMH) habitat of principal importance and a legally protected species of plant as well as other species of plant of conservation concern have been recorded in similar habitat close to the site. Therefore, we recommend carrying out a scarce plant survey in order to identify if these species are present or likely to be present. In addition to this the habitats present should be assessed against the criteria for OMH.

7.3.2 If the survey indicates that the site does not qualify as OMH and no legally protected plants or plants of conservation concern are recorded then no further recommendations for mitigation are likely to be required. If the surveys confirmed OMH plants that receive legal protection or are of conservation concern then the results would inform the appropriate levels of mitigation required. For the species likely to be recorded on site, the further botanical survey should be undertaken between May and July.

Terrestrial Invertebrates

7.3.3 The site could support important assemblages of terrestrial invertebrate species or protected species of invertebrate. Surveys for invertebrates would highlight any potential issues to ensure that appropriate mitigation measures can be implemented. In order to get an initial assessment of the importance of the site for invertebrates, invertebrate surveys should comprise a minimum of three survey visits and should be undertaken spread out between April and October.

Reptiles

7.3.4 Areas of the site provide suitable habitat for reptiles. Further surveys should be carried out in order to determine the presence or likely absence of reptiles on the site. This would involve seven survey visits from March to October, with the optimal survey months being April, May or September.

Bats

7.3.5 The development could have the potential to cause disturbance or harm to roosting bats during construction and operation phases. Therefore internal and external inspections of the buildings for bats are recommended to assess the level of potential for roosting bats. Further surveys may be required, dependant upon the results of the internal and external inspections.

8. Conclusion

8.1.1 The sites could classify as the habitat of principal importance Open Mosaic Habitat on Previously Developed Land. It is recommended that botanical surveys are undertaken to establish if priority habitats are present on site and record the presence of protected plant species. if present then appropriate mitigation measures will be proposed.

8.1.2 The site has potential to support protected species of invertebrates and common reptile species. Further surveys are recommended to establish the presence or likely absence of these species. Buildings on site could offer potential roosting opportunities for bats; an internal and external inspection of the buildings is recommended to further inform recommendations with regards to bat species.

9. References

9.1.1 Environment Agency (2001a) Code of Practice for the Management, Destruction and Disposal of Japanese Knotweed.

9.1.2 Environment Agency (2001b) Japanese Knotweed: How to Control it and prevent its spread.

9.1.3 Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment. E & FN Spon, London.

9.1.4 JNCC (1993) Handbook for Phase 1 habitat survey: A technique for environmental audit. Joint Nature Conservancy Committee, Peterborough.

9.1.5 Lush MJ, Kirby P and Shepherd P (2013) Open mosaic habitat survey handbook. exeGesIS SDM Ltd.

9.1.6 Riding A, Critchley N, Wilson L and Parker J (2010) Definition and mapping of open mosaic habitats on previously developed land: Phase 1. DEFRA.

9.1.7 Stace C (2010) New Flora of the British Isles (third edition). Cambridge University Press, Cambridge.

9.1.8 Vale of Glamorgan (2002) Local Biodiversity Action Plan.

9.1.9 Vale of Glamorgan (2013 Deposit Plan, Local Development Plan 2011-2026.

10. Appendix 1: Phase 1 Habitat Survey Species Lists

10.1.1 The abundance of each species was assessed using the DAFOR scale:

- D Dominant
- A Abundant
- F Frequent
- O Occasional
- R Rare

10.1.2 These scores represent the abundance within the defined area only and do not reflect national or regional abundances. In addition the code 'L' for Locally within the habitat was used. Plant species nomenclature follows Stace (2010).

Planted broadleaved woodland (PBW1)

Common name	Scientific name	Abundance
Hawthorn	*Crataegus monogyna*	A
Scots pine	*Pinus sylvestris*	O
Grey poplar	*Populus alba* x *tremula*	D
Bramble	*Rubus fruticosus* agg.	A

Planted coniferous woodland (PCW1)

Common name	Scientific name	Abundance
A cypress	*Cupressus* sp.	D

Dense scrub

Common name	Scientific name	DS1	DS2	DS3	DS4	DS5	DS6	DS7	DS8	DS9	DS10	DS11	DS12	DS13	DS14	DS15	DS16	DS17	DS18	DS19	DS20
Sycamore	*Acer pseudoplatanus*			R																	
Cow parsley	*Anthriscus sylvestris*			O					O	R				O			F				
Lords-and-ladies	*Arum maculatum*			R					R	R		F	R	R			R				
Hart's-tongue	*Asplenium scolopendrium*													R							
Daisy	*Bellis perennis*								R				R	R			R				
Butterfly-bush	*Buddleja davidii*	D	O/ LF	A/ LD	F	F	D	R	A	D	D		R		A	D	F/ LA	F			R
A sedge	*Carex* sp.		R																		
Chamomile	*Chamaemelum nobile*			R		O			R												
Pampas grass	*Cortaderia selloana*																			R	
Hawthorn	*Crataegus monogyna*			O	O			F	O	O		D	D	D			O		D	R	F
Wild teasel	*Dipsacus fullonum*	R	F					O	R								R				O
A horsetail	*Equisetum* sp.					R															
Lesser celandine	*Ficaria verna*	R		R					R				R	O			R				
Herb-robert	*Geranium robertianum*		O	R				O	R			O		R			R				O
Ivy	*Hedera helix*			LF					R			LA	F	R			R			O	
Bristly oxtongue	*Helminthotheca echioides*		F		O			F	O					R			O				O

Common name	Scientific name	DS1	DS2	DS3	DS4	DS5	DS6	DS7	DS8	DS9	DS10	DS11	DS12	DS13	DS14	DS15	DS16	DS17	DS18	DS19	DS20
Bluebell	*Hyacinthoides non-scripta*							R						O			R				
Perennial rye-grass	*Lolium perenne*	F	F/ LD					F	R								F				A
Ribwort plantain	*Plantago lanceolata*	O		O					O	R											
Creeping cinquefoil	*Potentilla reptans*	O							R	R				R							
Cowslip	*Primula veris*													O							
Selfheal	*Prunella modularis*								O								O				
Blackthorn	*Prunus spinosa*			R				R	O	R			O	R							R
Creeping buttercup	*Ranunculus repens*	R							O	R			O	R			O				
A mignonette	*Reseda* sp.		O																		
A rose	*Rosa* sp.			R	R				R	R			R	R			R				
Bramble	*Rubus fruticosus* agg.	A	F/ LA	A/ LD	F	F			A	A	F		O	R	A		A/ LD	D	O		F/ LD
Broad-leaved dock	*Rumex obtusifolius*		F																		F
Wood dock	*Rumex sanguineus*																R				
Goat willow	*Salix caprea*			R					R				O				R			D	
Elder	*Sambucus nigra*			R					R												
Common ragwort	*Senecio jacobaea*			O					O	R							O				
A nightshade	*Solanum* sp.		R					R													
Dandelion	*Taraxacum officinale* agg.	O							R								O				

Common name	Scientific name	DS1	DS2	DS3	DS4	DS5	DS6	DS7	DS8	DS9	DS10	DS11	DS12	DS13	DS14	DS15	DS16	DS17	DS18	DS19	DS20
White clover	*Trifolium repens*								O								O				
Colt's-foot	*Tussilago farfara*			O					R								R				
Gorse	*Ulex europaeus*			R	A				R								R				
Common nettle	*Urtica dioica*	R		O		O			R	R			F	R			F				
Germander speedwell	*Veronica chamaedrys*								O								R				

Scattered scrub

Common name	Scientific name	SS1	SS2	SS3	SS4
Cow parsley	*Anthriscus sylvestris*		O		O
Butterfly-bush	*Buddleja davidii*		O	A	F
Creeping thistle	*Cirsium arvense*		O		
Viper's bugloss	*Echium vulgare*	O			
Herb-robert	*Geranium robertianum*				O
A St John's-wort	*Hypericum* sp.				O
A forget-me-not	*Myosotis* sp,		O		O
Bramble	*Rubus fruticosus* agg.	A	O		F
Dandelion	*Taraxacum officinale*		O		O

Semi-improved neutral grassland

Common name	Scientific name	SNG1	SNG2	SNG3	SNG4	SNG5	SNG6
Yarrow	*Achillea millefolium*	O	F	O	F	O	O
Cow parsley	*Anthriscus sylvestris*	R			O		O
Hairy bitter-cress	*Cardamine hirsuta*	R	R		O	R	
Common knapweed	*Centaurea nigra*						F
Common mouse-ear	*Cerastium fontanum*	O	R	O	O	O	O
Creeping thistle	*Cirsium arvense*		R		R		O
A horsetail	*Equisetum* sp.	R			F		
A fescue	*Festuca* sp.	F	F	F	F	O	F
A crane's-bill	*Geranium* sp.	R		O	R		O
Ivy	*Hedera helix*				O		
Yorkshire-fog	*Holcus lanatus*	F			F		F
Bird's-foot trefoil	*Lotus corniculatus*	F	F	O	O	F	O
Field wood-rush	*Luzula multiflora*		O	F	F	R	
A moss	Moss sp.		A	O	O	F	
A forget-me-not	*Myosotis* sp.	O	F	F	F	O	O
Ribwort plantain	*Plantago lanceolata*	R	O	R	O	R	
Greater plantain	*Plantago major*	R			F	R	
A meadow-grass	*Poa* sp.	F			F	O	
Silverweed	*Potentilla anserina*	R	F		O		

Common name	Scientific name	SNG1	SNG2	SNG3	SNG4	SNG5	SNG6
Cowslip	*Primula veris*				R		
Selfheal	*Prunella modularis*	O	F	F	O	F	
A mignonette	*Reseda* sp.	O	F				
Bramble	*Rubus fruticosus* agg.	O	O		O		F
Dandelion	*Taraxacum officinale* agg.	R	R		R		O
A vetch	*Vicia* sp.	R	O		O	O	O

Tall ruderal

Common name	Scientific name	TR1	TR2
Cow parsley	*Anthriscus sylvestris*	O	F
Common knapweed	*Centaurea nigra*	A	A
Rosebay willowherb	*Chamerion angustifolium*	O	
Hawthorn	*Crataegus monogyna*	R	R
Wild teasel	*Dipsacus fullonum*	O	O
A fescue	*Festuca* sp.	F	F
Bird's-foot trefoil	*Lotus corniculatus*	O	
A mignonette	*Reseda* sp.	F	F
Bramble	*Rubus fruticosus* agg.	R	R
Broad-leaved dock	*Rumex obtusifolius*	O	A

Ephemeral/short perennial

Common name	Scientific name	ESP1	ESP2	ESP3	ESP4	ESP5	ESP6	ESP7	ESP8
Daisy	*Bellis perennis*	R	O		R		O		
Hairy bitter-cress	*Cardamine hirsuta*	O		R	O		O	F	O
A sedge	*Carex* sp.				R	R	C		
Common mouse-ear	*Cerastium fontanum*	R	R	R	R		O		O
Chamomile	*Chamaemelum nobile*	R	O	R	O	O	O	F	
Creeping thistle	*Cirsium arvense*		O						
Spear thistle	*Cirsium vulgare*				R		R		
Wild teasel	*Dipsacus fullonum*		O		R				
Viper's bugloss	*Echium vulgare*		R		R				
Lesser celandine	*Ficaria verna*				O				
Cleavers	*Galium aparine*				O				
Herb-robert	*Geranium robertianum*			R	R				
Bristly oxtongue	*Helminthotheca echioides*	O	O	O	R		R	F	
Imperforate St. John's-wort	*Hypericum maculatum*		R	R	O		F		R
Smooth cat's-ear	*Hypochaeris glabra*	F	F	O	O	O	O		
Soft rush	*Juncus effusus*			C					
A rush	*Juncus* sp.		R		C		C		
Bird's-foot trefoil	*Lotus corniculatus*		R	O	F	R	F		
Black medick	*Medicago lupulina*	R	R		R				R

A forget-me-not	*Myosotis* sp.	O	O	O	F	R	F	O	O
Ribwort plantain	*Plantago lanceolata*				R				
Creeping cinquefoil	*Potentilla reptans*				R		O		
Barren strawberry	*Potentilla sterilis*				LA				
Selfheal	*Prunella modularis*			O	R	R	O		
Creeping buttercup	*Ranunculus repens*				R	R	R		R
A mignonette	*Reseda* sp.								
Broad-leaved dock	*Rumex obtusifolius*			R	R			F	
Biting stonecrop	*Sedum acre*				LA				
Common ragwort	*Senecio jacobaea*	R	R		R	R	R		O
A goldenrod	*Solidago* sp.				R				
Dandelion	*Taraxacum officinale* agg.		R		R	R	R		
Hop trefoil	*Trifolium campestre*		R		O				
White clover	*Trifolium repens*				R				O
Germander speedwell	*Veronica chamaedrys*		O		O		R		
Common dog-violet	*Viola riviniana*				R		C		

Ephemeral/short perennial and hard standing mosaic

Common name	Scientific name	HS/ESP1	HS/ESP2	HS/ESP3
Daisy	*Bellis perennis*	O		O
Creeping thistle	*Cirsium arvense*		O	
Ivy	*Hedera helix*	F		
Bristly oxtongue	*Helminthotheca echioides*		O	O
Perennial rye-grass	*Lolium perenne*	O		O
Creeping cinquefoil	*Potentilla reptans*			O
Biting stonecrop	*Sedum acre*		F	
Dandelion	*Taraxacum officinale* agg.	O	O	O

Other habitat - Target note 1

Common name	Scientific name	Abundance
Colt's-foot	*Tussilago farfara*	D

Other habitat - Target note 2 and 3

Common name	Scientific name	Abundance
Yarrow	*Achillea millefolium*	O
Daisy	*Bellis perennis*	R
Hairy bitter-cress	*Cardamine hirsuta*	O
Sun spurge	*Euphorbia helioscopia*	O
A crane's-bill	*Geranium robertianum*	O
Bristly oxtongue	*Helminthotheca echioides*	F
A forget-me-not	*Myosotis* sp.	O
A primrose	*Primula* sp.	R
Selfheal	*Prunella modularis*	F
Charlock	*Sinapis flexuosa*	F
Colt's foot	*Tussilago farfara*	O
Germander speedwell	*Veronica chamaedrys*	R

Other habitat - Target note 4

Common name	Scientific name	Abundance
Yarrow	*Achillea millefolium*	O
Common knapweed	*Centaurea nigra*	A
Bristly oxtongue	*Helminthotheca echioides*	O
Selfheal	*Prunella modularis*	R
Broad-leaved dock	*Rumex obtusifolius*	A
Charlock	*Sinapis flexuosa*	R
Germander speedwell	*Veronica chamaedrys*	R

11. Appendix 2: Legal and Planning Policy and Potential Further Ecological Issues

11.1 Identification of Legal and Planning Policy Issues in Wales

Scope of Assessment

11.1.1 The first step is to identify any biodiversity features found on the site that are subject to legal or policy controls, as follows:

Designated Sites

11.1.2 The location of the site is compared to the distribution of sites with a statutory or non-statutory nature conservation designation using information derived from the desk study. Consideration is given to designated sites that could be affected directly or indirectly by the proposed development.

Habitats outside Designated Sites

11.1.3 The habitats known to occur on the site are compared to those which receive some protection, in law or policy, outside of designated sites i.e. hedgerows, uncultivated land and semi-natural areas, habitats listed as Habitats of Principal Importance for the Conservation of Biodiversity by the National Assembly for Wales under Section 42 of the NERC Act (2006).

Ancient Woodland

11.1.4 The ancient woodland inventory is checked to determine whether any known ancient woodland occurs either on the site or nearby.

Protected Species

11.1.5 The species known to occur on the site as a result of the desk study and Phase 1 habitat survey are compared with those listed in nature conservation legislation i.e. the Wildlife and Countryside Act 1981, as amended, the Conservation (Habitats &c) Regulations 1994.

11.1.6 In addition, the species known to occur on the site as a result of the desk study and Phase 1 habitat survey are compared with those listed in animal welfare legislation, i.e. the Badgers Act 1992 and the Wild Mammals (Protection) Act 1996.

Species of Principal Importance

11.1.7 The species known to occur on the site are compared with those listed as Species of Principal Importance for the Conservation of Biodiversity under Section 42 of the NERC Act 2006 or requiring action in the Local Biodiversity Action Plan.

Other Species of Conservation Concern

11.1.8 The species known to occur on the site are compared with other nature conservation listings, such as red data books.

Invasive Plant Species

11.1.9 The species of plant present on the site are compared with those listed by government agencies as invasive non-natives, with particular attention given to those listed in the Wildlife and Countryside Act.

Review of Legislation and Policy

11.1.10 If any of the above are found to occur on or near the site and are likely to be affected by the development in any way, the relevant legislation and planning policy (including national, regional, county and borough policies) are examined to determine whether the proposed development is compliant.

Ecological Enhancement

11.1.11 Planning policy generally requires new developments to be enhanced for biodiversity. The existing proposals are considered to determine whether biodiversity enhancements are offered and whether they are adequate to meet the policy requirements. Again, national, regional, county and borough policies are considered.

11.2 Identification of Potential Further Ecological Issues

11.2.1 Further ecological issues are those which can not be resolved during the desk study and extended Phase 1 habitat survey for any reason, including the following:

- The development is near a designated site and consultation with the relevant regulator is required in order to determine whether further assessment is required;
- Suitable habitat is present on or near the site for a protected species/species of conservation concern and specialist survey techniques are required for their detection;
- Suitable habitat is present on or near the site for a protected species/species of conservation concern and the extended Phase 1 habitat survey was not undertaken at a suitable time of year for their detection; and
- A protected species/species of conservation concern was found on or near the site but further information on population size or distribution is required in order to resolve any legal and planning policy issues (such as obtaining licences).

11.2.2 Discussion of issues raised by 3rd parties, e.g. reports of protected species from the site by local people, may also be discussed under this heading.

11.2.3 The desk study is used as a guide to the protected species/species of conservation in the local area, however, the list is not taken to be exhaustive and it is borne in mind that some species may no longer occur in the locality.

11.2.4 No attempt is made to evaluate the importance of the site for species not yet confirmed to be on or near the site, nor to discuss the implications for the development if the species were to be found on the site.