AVONMOUTH SEVERNSIDE ENTERPRISE AREA (ASEA) ECOLOGY MITIGATION AND FLOOD DEFENCE SCHEME

Stockpile at Northwick Landfill-Ecological Impact Assessment

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
P01	30/10/2019	M Hemmings	D Robinson T Crabb C Postlethwaite	M Secker	First draft for comment
P02	03/12/2019	E Haggett P Bointon	R Booley D Robinson C Postlethwaite	M Secker	Updated to amend EA & SGC comments

Document reference: ENVIMSW002194-BMM-XX-A10-RP-EY-0301009

EA file naming and file metadata

BS1192 file name	ENVIMSW002194-BMM-XX-A10-RP-EY-0301009
BS1192 suitability	S8 – Shared for Client review, comment and/or acceptance
Revision	P02
EA deliverable reference	C0100_9
EA work stage	EA4
Level of Development	LOD4
Title	Stockpile at land off A403 at Northwick -Ecological Impact Assessment

Information class: **Standard**

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1 Introduction

1.1 Background to the project

The Avonmouth and Severnside Enterprise Area (ASEA) Ecological Mitigation and Flood Defence Scheme (referred to as 'the ASEA scheme') is designed to enable continued economic growth in Bristol and South Gloucestershire. The ASEA scheme was commissioned by South Gloucestershire Council (SGC), Bristol City Council (BCC) and the Environment Agency. The ASEA scheme is located between Ordnance Survey Grid References ST 673 832 and ST 519 766 and involves the improvement of the flood defences along the Severn Estuary. As well as providing flood defences for the ASEA (and other areas), the project includes the creation of two areas of ecological mitigation in the form of wet grassland and ponds, required to mitigate for the loss of those habitats (coastal floodplain) likely to result from the development.

In order to construct earth embankments for the ASEA scheme, suitable material (soil) will be imported from an off-site location and stored for a minimum 18 months until the end of the ASEA scheme's construction during which it will be transported to the working area for incorporation within the earth embankments along Area 1. An area located off the A403 at Northwick, referred to as the proposed stockpile, has been proposed as the location for this storage. In addition to the stockpile, a temporary haulage road will be constructed through part of the proposed site to enable the construction of the stockpile itself.

1.2 Site details

The proposed stockpile location is adjacent to Area 1 of the ASEA scheme, as shown in Figure 1.1 and drawing number ENVIMSW002194-BMM-XX-A10-DR-EY-0301011 (Appendix A), centred at grid reference ST5574 8756 approximately 500m north of Northwick.

The proposed stockpile will be approximately 20ha in area, on the site of a historic landfill that is now used for grazing. A defunct hedgerow runs east-west through the middle of the site, with other hedges with trees surrounding the site. The A403 forms the eastern boundary and the surrounding fields are also used for grazing.

The western boundary of the site consists of a 15m strip of broadleaved woodland and dense scrub which follows the Severn Way path being a raised earth bund running north-east to south-west and the Severn Estuary with its associated mudflats and grassland embankments.

1.3 Proposed Development

In order to construct the earth embankments in Area 1, suitable material (soil) will be imported from an off-site location into the area of proposed stockpile location (hereafter referred to as the 'Site') and stored for a minimum of 18 months until the end of the ASEA scheme's construction, before being transported to the working area for incorporation within the earth embankments along Area 1.

The soil will be classed as '2C Stoney Cohesive', in accordance with the Design Manual for Roads and Bridges (DMRB) and will be utilised throughout the ASEA scheme, wherever there is a need for material to construct an earthwork embankment. This will predominantly be in Areas 1, 3a and 3b.

Approximately 150,000 m^3 will be stored, to a maximum of 2m in height, although this may be lower due to conditions on Site when the stockpile is imported and it is intended that the stockpile levels would be kept below the level of the hedges round the former landfill site, to minimise the potential

for visual impacts. As the stockpile will be in place for an extended period of time, it will be seeded to prevent windblown dust and sediment within surface water run-off.

Approximately 150,000m3 of soil will be imported to the proposed stockpile, of which approximately 80,000m3 will come from external sources and the remaining 70,000m3 will be surplus soil from Area 4. Approximately 30,000m3 of the 80,000m3 from external sources will come from a local quarry, where the material is surplus to requirements. The source of the remaining 50,000m3 from external sources is to be determined, but it will be imported using 8-wheel lorries (approx. 32 tonnes gross weight). The soil will be moved between the stockpile and the construction site using a combination of 8-wheel road lorries and 25/30 tonne articulated dump trucks, dependent on where it is needed. The proposed stockpile will be located on a former landfill, as shown below in Figure 1.1. The landfill is capped and a geotextile membrane will form a barrier between the cap and the proposed stockpile to ensure the cap is protected. Prior to the installation of the geotextile membrane, the topsoil layer will be removed and stored. The proposed stockpile activity will commence in March or April 2020 and conclude after the completion of the ASEA scheme's construction. Once the stockpile has been removed, the topsoil layer will be reinstated and reseeded, and the Site will be restored to its original condition.

The entrance point will use the existing gateway from the A403. A satellite compound, storage area and wheel wash, if necessary, will also be positioned at the entrance. A temporary haul road will be constructed within the stockpile area to enable movement within the Site. As lorries will access the proposed stockpile directly from the A403, this haul road will be constructed to ensure mud is not trafficked onto the road as this could pose a skid hazard to traffic on the A403. Road sweepers, rumble strips or wheel washing facilities may also be utilised, as required. The haul road will be removed once the stockpiling is completed and the fields will be restored to their existing condition.

The proposed stockpile and haul road will be kept 20m from the existing boundary hedgerows, which will therefore not be affected by the works. A section of the defunct hedgerow that runs between the fields will be cut through (approximately 10m wide) to permit the access of vehicles between the fields. A diagram of the proposed works can be seen in Appendix C (drawing number ENVIMSW002194-BMM-XX-A10-DR-T-0202448).

Figure 1.1: Location of the Site

Source: Esri, Intermap, NASA, NGA, USGS | Esri UK, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS | DigitalGlobe, Microsoft
The redline boundary shows the location of the Site and not the exact site boundary.

1.4 Aims and Objectives of this Report

The aim of this report is to provide an Ecological Impact Assessment (EcIA) of the protected and/or notable habitats and species which occur or have the potential to occur on or near the proposed stockpile that could be affected by the proposed stockpile. The report also details any environmental enhancement opportunities. The report follows the 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018).
The objectives are to:

- Identify any designated sites for nature conservation and habitats on, near and adjacent to the proposed stockpile;
- Identify any notable and/or protected plant or animal species of conservation value, which may occur on or near the proposed stockpile;
- Identify the presence of any invasive plant species on or adjacent to the proposed stockpile;
- Provide a habitat map with target notes of ecological features as identified above;
- Undertake a preliminary assessment of the potential impacts on any ecological receptors of conservation value identified on, near or adjacent to the proposed stockpile; and

- Recommend further surveys, mitigation, offsetting opportunities on site and enhancement measures as appropriate.

1.5 Legislative Framework

The key legislation relating to ecology and the environment is the Wildlife and Countryside Act 1981 as amended (WCA). The WCA is complemented by The Conservation of Habitats and Species Regulations 2017 (as amended).

The Regulations provide for the designation and protection of Natura 2000 sites (Special Areas of Conservation and Special Protection Areas), and the protection of European Protected Species. The species and habitats listed by these measures are legally protected to varying degrees through the WCA. Together, the WCA and The Conservation of Habitats and Species Regulations 2017 (as amended) form the precedent for species and habitat protection in England and Wales. In addition to terrestrial legislation, the Marine and Coastal Access Act (2009) protect nationally important marine wildlife, habitats, geology and geomorphology by created designated protection areas called Marine Conservation Zones (MCZs).

Appendix D outlines species-specific protection relevant to this report.

The Natural Environment and Rural Communities (NERC) Act 2006 requires public bodies, including local authorities, 'to have regard to the conservation of biodiversity in England' when carrying out their normal functions. Section 40 of the Act also refers to a list of habitats and species of 'principal importance to biodiversity in England. Hereafter, Section 41 (S41) habitats and species are referred to as 'priority habitats and species'.

1.6 National and Local Planning

The planning policy and biodiversity strategies which are most relevant to the Site are the National Planning Policy Framework (NPPF) 2019; Biodiversity 2020; The South Gloucestershire Core Strategy and Policies Sites and Places Plan; Severn Estuary Strategy and The South Gloucestershire Biodiversity Action Plan (SGBAP).

The NPPF is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

Biodiversity 2020 is a national strategy for wildlife and ecosystem surveys setting targets to halt the decline of biodiversity by 2020 (DEFRA, 2018).

The following local legislation and strategy summaries have been sourced from CH2M, 2018.

The SGC Core Strategy and Policies, Sites and Places Plan

The Site is located within SGC area. The Core Strategy is the key planning policy document for South Gloucestershire, setting out the general location of development, its type and scale, as well as protecting what is valued about the area. The Core Strategy was adopted on 11 December 2013. Policy CS9 – Managing the Environment and Heritage is of relevance to the biodiversity resource within the Site:

"The natural environment is a finite and irreplaceable resource. In order to protect and manage South Gloucestershire's environment and its resources in a sustainable way, new development will be expected to:

2. Conserve and enhance the natural environment, avoiding or minimising impacts on biodiversity and geodiversity.

4. Be located away from areas of flood risk.

5. Reduce and manage the impact of flood risk through location, layout, design, choice of materials and the use of Sustainable Drainage Systems (SuDS).

6. Protect the quality and quantity of the water resource and its margins.

7. Avoid the undeveloped coastal area.

11. Protect air, land and aqueous environments buildings and people from pollution"

The Policies, Sites and Places Plan (PSP plan) was adopted on the 8th November 2017 and forms part of the SGC Development plan. The PSP plan contains detailed planning policies to manage new development, allocate and safeguard sites for various types of development and is to be read alongside the Core Strategy. The following policies, are of relevance to the biodiversity resource within the Site:

• *PSP19. Protected Sites; and*

• *PSP20. Wider Biodiversity.*

Severn Estuary Strategy

Established in 1995, the Severn Estuary Partnership is an independent, estuary-wide non-statutory initiative led by local authorities and statutory agencies. The Severn Estuary Strategy was first produced in 2001 and has now been revised in the context of new and emerging legislation, plans, policies and developments. The aims of this Strategy are to:

• Update and streamline the 2001 Severn Estuary Strategy;

• Provide a strategic policy framework for the Severn Estuary;

• Provide context to inform and support decision-making; and

• Facilitate the Marine & Coastal Act (2009) obligations related to cross-border integration, land-sea integration and taking an ecosystem-based approach to management.

Objective 3.1 is of relevance to the biodiversity resource of the Severn Estuary:

"To protect, conserve and enhance the rich biodiversity and cultural heritage in order to achieve healthy, resilient and adaptable ecosystems."

South Gloucestershire Biodiversity Action Plan (SGBAP)

The South Gloucestershire BAP (SGBAP) contains 7 Habitat Action Plans (HAPs) for key habitats, of which the following are considered potentially relevant to the study site:

- Broadleaf Woodlands;
- Hedges and Field Margins;
- Old Meadows and Pastures;
- Ponds, Rhynes, Rivers and Water Bodies; and
- Saltmarsh and Coastal Floodplain Grazing Marsh.

The SGBAP lists 15 Species Action Plans (SAPs) of which the following are considered potentially relevant to the study site:

- Bullfinch *Pyrrhula pyrrhula*;
- Great Crested Newt *Triturus cristatus*;
- Lesser Horseshoe Bat *Rhinolophus hipposideros*;
- Song Thrush *Turdus philomelos*;
- Barn Owl *Tyto alba*;
- Slow-worm *Anguis fragilis*;
- Bath Asparagus *Ornithogalum pyrenacium*;
- Bithynian Vetch *Vicia bithynica*; and
- Glow Worm *Lampyris noctiluca*.

The South West Biodiversity Action Plan and Partnership oversees the implementations South West Biodiversity Implementation Plan (SWBIP) and identifies Strategic Nature Areas (SNAs) which are described later in this report.

2 Methods

2.1 Zone of Influence

The methodology follows the current guidance on ecological assessments being the 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018). This recommends that all ecological features that occur within a 'zone of influence' (ZoI) for a proposed development are investigated. The ZoI includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is variable depending on the ecological receptors affected. For this assessment, the phase 1 field survey was restricted to the Site boundary with a 50m buffer around the proposed stockpiling area and associated infrastructure. Table 1 below describes the size of the ZoI against different categories of ecological features.

Table 1: Zone of Influence used for this assessment

Ecological features	Zone of Influence
Internationally Designated Sites	5km buffer around the Site boundary
Nationally and Locally Statutory Designated Sites	2km buffer around Site boundary
Non-statutory Designated Sites	2km buffer around Site boundary
Protected species records	Records were returned up to 2km buffer around Site boundary
Priority habitats	2km from Site boundary
Protected species evidence	Within the Site boundary
Water bodies	500m buffer around Site boundary

2.2 Desk Study

A desk study was undertaken in accordance with CIEEM guidance of non-statutory designated sites for nature conservation, habitats of conservation importance and protected and notable species which occur within 2km of the Site. National and local statutory sites, including Sites of Special Scientific Interest (SSSIs) were searched within a radius of 2km from the Site boundary a radius of 10km was applied for international and European conservation sites including: Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

Biological records were obtained from the Bristol Regional Environmental Records Centre (BRERC). The biological data was curtailed to information recorded from ten years prior to August 2019 to ensure it is relevant to the present ecological composition. Biological data recorded more than ten years ago was checked for protected species. Additional sources of information include the Multi-Agency Geographic Information for the Countryside (MAGIC), Joint Nature Conservation Committee (JNCC) and CH2M, 2018.

2.3 Field Study

2.3.1 Extended Phase 1 Habitat Survey

A field survey, in the form of an extended Phase 1 Habitat Survey of the Site was undertaken by Bam Mott MacDonald Joint Venture (BMMJV) ecologists, on 15th August 2019 in accordance with CIEEM guidance. All habitats within the survey area were identified and mapped in compliance with the '*Handbook for Phase 1 habitat survey: a technique for environmental audit*' (Joint Nature Conservation Committee, 2010). Dominant plant species were noted, as were any protected, uncommon or invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and recorded for each broad habitat type identified, with nomenclature based on Stace (2010). A focus was given to surveying field signs of badgers (*Meles meles*) because of local records, following relevant guidance (Harris, 1989) and suitable water body breeding habitat for great crested newts (GCN). Preliminary Roost Assessments for bats within the Site were also undertaken (see Section 2.3.2 below for methodology).

An assessment was also undertaken of the likely presence or absence of other protected and notable animal species within the ZoI of the proposed stockpile. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations. The methodologies and assessment criteria used were based on current published guidance where available.

The immediate construction footprint and the focus of this report are the fields and their associated borders of trees and hedgerows.

Table 2 details the weather conditions at the time of survey.

Table 2: Survey weather conditions

Date	Temperature	Cloud cover	Wind (Beaufort Scale)	Precipitation
15 August 2019	18°C	65%	4	None

2.3.2 Preliminary Roost Assessment for Bats

2.3.2.1 Structures and Trees

To supplement the extended Phase 1 Habitat Survey, a preliminary roost assessment of structures and trees within the Site was undertaken, following the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016). The aim of this survey was to determine the actual or potential presence of bats and the need for further survey and/or mitigation.

A preliminary roost assessment for structures on Site that warrant a bat inspection involved a detailed inspection of the exterior and interior to look for bat roosting features. A tree preliminary roost assessment on each individual tree within the proposed stockpile area was undertaken during the field survey to look for features that bats could use for roosting and to search for other signs of bats. The trees within the proposed stockpile were examined from the ground using direct

observation and binoculars to enable closer inspection of suitable features. A search was also made for other evidence of use by bats, such as droppings, urine splashes and fur-oil staining.

Potential Roost Features (PRFs) were assessed at each tree as outlined below in Table 3.

Table 3: Features of structures to identify potential or actual bat access points and places commonly used by bats for roosting and shelter, and field signs that may indicate use of structures by bats

Features of structures (external) used as bat roosts	Signs indicating possible use by bats (internally)
Woodpecker holes	Bat droppings in, around or below a PRF
Rot holes	Urine splashes
Hazard beams	Audible squeaking at dusk or in warm weather
Other vertical or horizontal cracks and splits (such as frost-cracks) in stems or branches	Fur oil staining below the PRF
Partially detached platey bark	Feeding remains (moth wings)
Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar	Bat-fly (Nycteribiid) pupal cases
Man-made holes (e.g. cavities that have developed from flush cuts) or cavities created by branches tearing out from parent stems	Smoothing of surfaces around cavity
Cankers (caused by localised bark death) in which cavities have developed	A bat smell emitting from the PRF
Other hollows or cavities, including butt-rots	
Double-leaders forming compression forks with included bark and potential cavities	
Gaps between overlapping stems or branches	
Partially detached ivy with stem diameters in excess of 50mm	
Bat, bird or dormouse boxes	

Source: Collins 2016

2.3.2.2 Other habitats

Suitable bat habitats for commuting, foraging and swarming were identified and assessed in accordance with the guidance outlined in Table 4. They were then considered in conjunction with suitable roosting habitat.

Table 4: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.

Suitability	Description Roosting Habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions, and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection,	Continuous habitat connected to the wider landscape that could be used by

Suitability	Description Roosting Habitats	Commuting and foraging habitats
	conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broad-leaved woodland, tree-lined watercourses, and grazed parkland. Site is close to and connected to known roosts.

Source: Collins 2016

2.4 Limitations

Biological records obtained from third parties and presented in the desk study do not represent a full and complete species list for the area. They are mostly given by individuals on an *ad hoc* basis, often meaning there are areas of deficiency in the data.

Ecological surveys are limited to factors which affect the presence of plants and animals, such as time of year, migration patterns and behaviour. With a single site visit it is possible that certain species may have been overlooked or under-recorded during the assessment as optimal survey periods vary from species to species. The survey does, however, provide a “snapshot” of the ecological interest present on the day of the survey visit.

Individual assessments of trees (to determine potential for bat roosting), were only assessed partially from within the area of the proposed stockpile and not from the road or adjacent fields due to access and time constraints.

3 Desk Study Results

All relevant ecological data received from the consultation exercise has been reviewed, the results of which are summarised below in Sections 3.1 and 3.2.

3.1 Designated Sites

3.1.1 Statutory Sites

3.1.1.1 International and European Designated Sites

Reference to the MAGIC website (http://magic.defra.gov.uk/) and data from BRERC indicates that there are two European sites and two international designated site for nature conservation within 5km of ASEA. The *Severn Estuary* being a designated Ramsar, Special Protection Area and Special Area of Conservation, which has a boundary approximately 21m from ASEA site. See Table 5 for a further description of the designated sites and Appendix E (drawing number ENVIMSW002194-BMM-XX-A10-DR-EY-0301012) for a map showing their proximity to the Site.

Table 5: Summary of International and European designated sites within 5km of the Site

Site name	Designation	Approximate Proximity to the Site	Description
Severn Estuary	Ramsar	21.3m north-west	This 73714.11ha site is 98% marine area, with the boundary running parallel to the west boundary of the Site. The Ramsar is important due to the number of wintering and passage waterfowl (wildfowl and waders), averaging at 44,000 individuals in winter populations.
Severn Estuary	SAC	21.3m north-west	This 73714.11ha site is 98% marine area, with the boundary running parallel to the west boundary of the Site. The SAC is designated by its Annex I habitats *(Estuaries, Mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows (Glauco-Puccinellietalia maritimae)*) and the Annex II species; sea lamprey *(Petromyzon marinus),* river lamprey *(Lampetra fluviatilis)* and twaite shad *(Alosa fallax).* Annex I habitats present as a qualifying feature but not a primary reason for selection of this site include S*andbanks which are slightly covered by sea water all the time* and *Reefs*.
Severn Estuary	SPA	21.3m north-west	This 73714.11ha site is 98% marine area, with the boundary running parallel to the west boundary of the Site. The SPA is important due to the number of wintering and passage waterfowl (wildfowl and waders), averaging at 44,000 individuals in winter populations.
River Wye	SAC	3.7km north-west	This 2147.64ha site represents river sub-type 2, which mouth is 3.7km north west of the Site and continues in a north western direction. The SAC is designated by its Annex I habitat (W*ater courses of plain to montane levels with the Ranuculion fluitantis and Callitricho-Batrachion vegetation)* and the Annex II species; white-clawed crayfish (*Austropotamobius pallipes*), sea lamprey (*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), twaite shad (*Alosa fallax*), Atlantic salmon (*Salmo salar*), bullhead (*Cottus gobio*) and otter *(Lutra lutra*).

Site name	Designation	Approximate Proximity to the Site	Description
			Annex I habitats that present as a qualifying feature but not a primary reason for selection are: *Transition mires and quaking bogs.* Annex II species present as a qualifying features but not a primary reason for section are: allis shad *(Alosa alosa).*

Source: MAGIC, JNCC (http://jncc.defra.gov.uk), CH2M, 2018

Within 30km of the Site, there are two SACs designated for bats, with *Wye Valley and Forest of Dean Bat Sites* being the closest. See Table 6 for further detail of these designated sites.

Table 6: Summary of SACs designated for bats within 30km of the Site

Site Name	Approximate Proximity to the Site	Description
Wye Valley and Forest of Dean Bat Sites	16.9km north	This 144.82ha SAC is 26.2% deciduous woodland with the remainder consisting for other land, including buildings. The SAC designation for bats is due to its Annex II species; lesser horseshoe bats (*Rhinolophus hipposideros*) and greater horseshoe bats (*Rhinolophus ferrumequinum*).
North Somerset and Mendip Bats	24.3km south	This 555.93ha SAC is 30% broad-leaved deciduous woodland, with the remainder consisting of heath, scrub, mixed woodland and dry grassland. The SAC's designation for bats is due to its Annex II species: lesser horseshoe bats and greater horseshoe bats.

Source: MAGIC, JNCC (http://jncc.defra.gov.uk)

3.1.1.2 National and Local Designated Sites

Reference to the MAGIC website (http://magic.defra.gov.uk/) and data from BRERC indicates that there are two SSSIs within 2km of the area of the proposed stockpile. There are no Local designated sites within 2km.

The closest is the Severn Estuary SSSI which is 21m north west of the Site. See Table 7 for a further description of designated sites within 2km and Appendix F (drawing number ENVIMSW002194-BMM-XX-A10-DR-EY-0301013) for a map showing their proximity to the Site.

Table 7: Summary of national and local designated sites within 2km of the Site

Site name	Designation	Approximate proximity to the Site	Description
Aust Cliff	SSSI	1.22km north-east	This 6.2308ha site has been designated for its geological features
Severn Estuary	SSSI	21.3m west	This 10001.18ha site has overlapping designations with *Severn Estuary* (Ramsar, SPA and SAC) with the boundary running parallel to the west boundary of the Site. It lies at the mouth of four major rivers and holds a wide range of geomorphological features due to its immense tidal range. The estuary is used by seven migratory fish as a link between the sea and rivers. It holds significance for wintering and passage wading birds, with winter

Site name	Designation	Approximate proximity to the Site	Description
			populations reaching 44,000 and is the single most important wintering ground of dunlin (*Calidris alpina*) in Britain.

Source: MAGIC, Natural England (https://designatedsites.naturalengland.org.uk)

3.1.2 Non-statutory Sites

Reference from BRERC indicates that there are five non-statutory sites within 2km, four being Sites of Nature Conservation Importance (SNCI) and one a Strategic Nature Area (SNA) as described in Table 8. An SNA is not a designated site but an area which contains higher than average concentrations of wildlife habitats. The boundaries for these sites are as shown in Appendix G (drawing number ENVIMSW002194-BMM-XX-A10-DR-EY-0301014).

Table 8: Summary of non-statutory sites within 2km of the Site

Designations	Approximate proximity to the Site	Reason(s) for Designation
Aust to New Passage SNCI *(part of Severn estuary SSSI)*	The boundary of this SNCI largely forms the western boundary of the Site with a small area (10m) within the west section of the surveyed area in the southern field.	Protected fauna. SSSI Estuary with Saltmarsh, Mudflats and species interest, cliffs, diverse shore, mudflats and birds.
New Passage to Chittening Warth SNCI *(part of Severn estuary SSSI)*	1.5km south-west	Protected fauna. SSSI Estuary with Saltmarsh, Mudflats and species interest, cliffs, diverse shore, mudflats and birds.
Fields north of Rifle Range SNCI	700m south-west	Protected fauna. Wetland, marshy grassland - diverse wetland with Nationally Scarce species.
The Pill, New Passage SNCI	1.1km south-west	Rhines with diverse flora and *Odonata* species.
Maritime Cliff and Slope SNA	The site is within the boundary of this SNA. The Site's eastern boundary also forms the eastern boundary of the SNA, this is not shown in Appendix G since it is not a designated Site.	There are no specific details for this area except its designation for its *Maritime Cliff and Slope* habitats.

Source: BRERC

3.2 Habitats

3.2.1 Priority Habitat

Reference to the MAGIC website (http://magic.defra.gov.uk/) indicates that there are six Priority Habitats (Habitats of Principal Importance) within 2km of the Site boundary. The location of the Priority Habitats in relation to the Site is as shown in Appendix H (drawing number ENVIMSW002194-BMM-XX-A10-DR-EY-0301015).

Priority Habitats within 2km of the Site include:

- *Coastal saltmarsh;*
- *Maritime cliff and slope;*
- *Mudflats;*
- *Coastal floodplain grazing marsh;*
- *Traditional Orchards*; and
- *No main habitat but additional habitat exists*.

The Site is set within *Coastal and Floodplain Grazing Marsh* with *No main habitat but additional habitat exists* on the western border of the site.

3.2.1.1 Ancient Woodland

There is no Ancient Woodland located within 2km of the area of the proposed stockpile.

3.2.1.2 Hedgerows

Reference from BRERC indicates that there is one "Important" hedge (containing more than 7 species) within the area of the proposed stockpile. Its designated number from BRERC is 8,202 and is located on the southern border of the Site as shown in the Phase 1 map in Appendix A (drawing number ENVIMSW002194-BMM-XX-A10-DR-EY-0301010) under Target Note (TN) 1.

3.2.2 Water Bodies

Reference to BRERC and MAGIC website (http://magic.defra.gov.uk/) indicates that there are at least fourteen areas containing water bodies within 500m of the Site; the water body closest (water body 5) is located 65m east.

All areas containing water bodies are described in Table 9 below.

Table 9: Summary of external water bodies within 500m of the area of the proposed stockpile

Water body	Distance to Site	Grid Reference	Description
1	488m north-east	ST56328813	A medium sized water body situated on a hedgerow border connecting two arable fields, and close to another hedgerow connecting a third field.
2	458m east	ST56528787	A small water body under the cover of a single large tree in the centre of an arable field.
3	273m east	ST56368770	A medium sized water body positioned through a hedgerow connecting two arable field. Directly surround by shrubbery and larger trees.
4	264m east	ST56338767	A small water body on the same hedgerow as water body 3, the majority of it is covered by surrounding trees.
5	65m east	ST56038752	A small water body in a wooded area connecting arable fields to a main road and farm buildings. On a previous site visit by Max Hemmings on 09 April 2019 it was not possible to survey this pond since it was surrounded by a thick cover of bramble.
6	382m east	ST56278734	A small water body in an arable field entirely covered by large trees overhead. This is pond number 277 from BRERC with no notes of it hosting newts. However, previous eDNA surveys have identified this pond to contain great crested newt (*Triturus cristatus*).
7	178m east	ST56028734	A large water body in an arable field close to hedgerow connecting to another arable field. Surrounded by scrub and trees. This is pond number 276 from BRERC with notes of it hosting birds, butterflies, damselfly and mosses with no notes of newts.
8	445m south-east	ST56258720	A medium sized water body in an arable field close to a hedgerow connecting to another arable field. Large trees and scrub surrounding. This is pond number 280 from BRERC with notes of it hosting plants and no notes of newts.
9	154m south-east	ST55938726	A medium sized water body in the centre of an arable field, surrounded by scrub and trees. This is pond number 279 from BRERC with notes of it hosting birds, butterflies, damselfly and mosses and great crested newt larvae.
10	475m south-east	ST56208708	A small body at the edge of an arable field, surrounded by scrub and trees that are connected with the hedgerow. This is pond number 283 from BRERC with no additional notes.

Water body	Distance to Site	Grid Reference	Description
11	261m south-east	ST55928710	A small water body near the edge of an arable field, close to hedgerow, surrounded by scrub and trees. This is pond number 282 from BRERC with notes of it hosting plants, dragonflies and common newt larvae.
12	366m south-east	ST55788696	A small water body in a hedgerow that connects two arable fields, surrounded by scrub and trees. This is pond number 851 from BRERC with notes of it hosting plants and no notes of newts.
13	360m south	ST55638700	A large water body on land used by kennels, surrounded by scattering of scrub and trees but mostly uncovered. Close to hedgerow.
14	270m south	ST55458720	The western on of a field margin ditch surrounded by hedgerow and trees. This has confirmed records of GCN.
15	423m south-west	ST55438704	A large water body om the boundary of a hedgerow of two arable fields, surrounded by scrub and trees. A drain runs directly to it. This is pond number 269 from BRERC with notes of it hosting birds, beetles, butterflies, damselfly.

Source: MAGIC website (http://magic.defra.gov.uk/), BRERC

3.2.3 Veteran Trees

Reference to BRERC indicates that there are two veteran trees within 500m of the Site both are crack willows (*Salix fragilis*) and are 230m (BRERC tree number *1,004*) and 270m (BRERC tree number *1,003*) east of the area of the proposed stockpile.

3.3 Protected and Notable Species

3.3.1 Amphibians

BRERC data returned two records of common frog (*Rana temporaria*) within a 2km radius of the Site between the years of 2009 to 2019; both were recorded in 2018. The closest record was 150m south from the Site.

Eighteen records of smooth newt (*Lissotriton vulgaris*) were returned with the closest record being 270m south of the area of the proposed stockpile.

BRERC data returned 59 records for GCN (*Triturus cristatus*) across fourteen locations, with the closest being 350m from Site. The closest pond containing GCN according to BRERC is waterbody 9 (Table 9) being 154m south-east of the Site.

3.3.2 Badgers

Nine records of badger were returned from BRERC within a 2km radius of the Site, the closest being 260m north of the Site with the remaining records over 1km from Site.

3.3.3 Bats

Thirteen records of bats were returned from BRERC with a minimum of five species and one unidentified species, which have been summarised in Table 10. Due to confidentiality, four-digit grid references have been provided instead of exact locations.

Table 10: Summary of bat biological records with 2km of the Site

Bat Species	Location	Description
Common pipistrelle (*Pipistrellus pipistrellus*)	2.0km south from Site, grid reference ST551854, recorded one five occasions.	Between one and three bats observed as a 'field record' interpreted as flying.
Soprano pipistrelle (*Pipistrellus pygmaeus*)	1.9km north from Site at grid reference ST5789 recorded on three occasions.	Bat roost
Plecotus spp.	1.9km north from Site at grid reference ST5789	Bat roost
Noctule (*Nyctalus noctula*)	1.9km north from Site at grid reference ST5789	Bat roost
Myotis spp.	1.9km north from Site at grid reference ST5789	Bat roost
Chiroptera spp.	This record in 2.4km from Site at grid reference ST5585	Bat roost

Source: BRERC

3.3.4 Birds

There are 122 notable bird species recorded within 2km of the Site, a summary of these species is shown in Table 15 (Appendix K).

3.3.5 Fish

The information from BRERC returned one record of a notable fish species within 2km of the Site, a European eel (*Anguilla anguilla*) near New Passage Road (only a 4-figure grid reference was provided by BRERC).

3.3.6 Flora and Fungi

Twelve notable plant species were returned from BRERC within 2km of the Site centre dating from 2009 to 2019, the summary of these records is shown in Table 11. Notable native species is defined as those part of a Biodiversity Action Plan, all of the below species are part of the Bath and North East Somerset Biodiversity Action Plan (BNESBAP).

Table 11: Summary of notable native botanical records within 2km of the Site

Species	Location
Great lettuce (*Lactuca virosa*)	Pilning, 2km south of the Site
Various-leaved water-starwort (*Callitriche platycarpa*)	Pilning, 2km south of the Site
Sea mouse-ear (*Cerastium diffusum*)	New Passage, 13km south-west of the Site
Fat duckweed (*Lemna gibba*)	Immediately south of the Site
Least duckweed (*Lemna minuta*)	1.5km south of the Site
Ivy-leaved duckweed (*Lemna trisulca*)	1.5km south of the Site
Spreading meadow-grass (*Poa humilis*)	Old Passage, 1.5km north of the Site
Small pondweed (*Potamogeton berchtoldii*)	1.5km south of the Site
Thread-leaved water-crowfoot (*Ranunculus trichophyllus*)	1.5km south of the Site
Small-flowered sweet-briar (*Rosa micrantha*)	Pilning, 2km south of the Site
Common stonewort (*Chara vulgaris*)	Pilning, 2km south of the Site
Sea club-rush (*Bolboschoenus maritimus*)	North Worthy Farm 1km south

Source: BRERC

3.3.7 Hazel Dormice

No records of hazel dormice (*Muscardinus avellanarius*) were returned from BRERC within 2km of the Site including any historic records.

3.3.8 Invasive Species

Eight invasive plant and animal species were returned from BRERC within a 2km radius of Site between the years of 2009 to 2019, a summary which is shown in Table 12.

Table 12: Summary of relevant invasive species records with 2km of the area of the proposed stockpile

Species	Location
American mink (*Neovison vison*)	1.7km south west to site
Canadian waterweed (*Elodea canadensis*)	Two records, both 1.7km south to Site
Himalayan balsam (*Impatiens glandulifera*)	1.1km south west to Site
Montbretia (*Corosmia spp.*)	500m north to Site.
Three-cornered garlic (*Allium triquetrum*)	2.5km north to Site (grid reference ST5585)
Variegated yellow archangel (*Lamium galeobdolon subsp. argentatum*)	2.5km north to Site (grid reference ST5585)
Wall Cotoneaster (*Cotoneaster horizotalis*)	1.5km north to Site, within the Severn Estuary.
Water fern (*Azolla filiculoides*)	Two records, the closest at 800m north west to Site, the other 1.6km north east to Site.

Source: BRERC

3.3.9 Invertebrates

Eight records of four notable invertebrate species were returned from BRERC dating from 2009 to 2012 within 2km of the Site, the summary of these records is shown in Table 13. Notable native species are defined as those listed under a Biodiversity Action Plan.

Table 13: Summary of relevant invertebrate records within 2km of the Site

Species	Location
Latticed heath (*Chiasmia clathrate*)	Pilning, 2km south of the Site
Long-winged conehead (*Conocephalus fuscus*)	Pilning, 2km south of the Site
Cinnabar (*Tyria jacobaeae*)	Pilning, 2km south of the Site
Small blue (*Cupido minimus*)	Pilning, 2km south of the Site

Source: BRERC

3.3.10 Other Mammal Species

Three species were returned from BRERC within a 2km radius of the Site between the years of 2009 and 2019, as listed in Table 14.

Table 14: Summary of other mammal records within 2km of the Site

Species	Location
European hedgehog (*Erinaceus euopaeus*)	Hedgehogs were recorded two times, the closest being 1.8km from the Site
Weasel (*Mustela nivalis*)	One record 1.7km north east of Site
Common shrew (*Sorex araneus*)	Fours records all from the same location being Pilning

Source: BRERC

3.3.11 Otter

No records have been returned from BRERC for otter (*Lutra lutra*) within 2km of the Site including any historic records.

3.3.12 Reptiles

One record for grass snake (*Natrix natrix*) was returned from BRERC within 2km of the Site between the years of 2009-2019, which was 1.9km from the Site. Grass snakes are part of Avon's Biodiversity Action Plan (Avon BAP) which covers all four of the unitary authority areas; Bath & North East Somerset, North Somerset, Bristol and South Gloucestershire.

One record for slow-worm (*Anguis fragilis*) was also returned, at an estimated 2km north from the Site. Slow worms are also part of the Avon and South Gloucestershire BAPs.

3.3.13 Water Vole

No records have been returned from BRERC for water vole (*Arvicola amphibius*) within 2km of the Site with exception of one record in 1999, 1.5km south of the site and immediately north of the M4.

4 Phase 1 Survey Results

4.1 Introduction

The Phase 1 Habitat plan showing the extent of the field survey is provided in Appendix A along with associated Target Notes in Appendix B. Target Notes are referred to as TN1, TN2 etc. for the remainder of this report. Photographs are provided in Appendix I.

4.2 Habitats

The habitats identified within the survey area include;

- B2.2 - Neutral grassland – Semi-improved;
- J2.2 - Defunct hedge;
- J2.3 – Hedgerow (intact) with trees;
- A1.1.2 - Woodland – Broadleaved – Plantation;
- J5 - Hardstanding;
- C3.1 - Tall ruderal vegetation;
- J3.6 - Buildings & Infrastructure; and
- J2.4 - Fence.

4.2.1 Neutral grassland – Semi-improved (B2.2)

The majority of the grass and most of the wildflowers here have do not have a flowering head (in species which are expected to be flowering at this time of year) suggesting the grassland has been cut this year, however the vegetation was at least 30cm tall, so it has been unmanaged for a sufficient amount of time for it not to be labelled as amenity grassland. The floral composition between the northern (TN 2, Photograph 8.1) and southern field (TN 3, Photograph 8.2) was largely similar and for the context of this report they shall be combined. The species identified within this area includes:

- Redshank (*Persicaria maculosa*);
- Compact rush (*Juncus conglomeratus*);
- Creeping bent (*Agrostis stolonifera*);
- Wall barley (*Hordeum murinum*);
- Prerennial ryegrass (*Lolium perenne*);
- Italian ryegrass (*Lolium multiflorum*);
- Timothy (*Phleum pratense*);
- False oat grass (*Arrhenatherum elatius*);
- Common bent (*Agrostis capillaris*);
- Yorkshire fog (*Holcus lanatus*);
- Cock's foot (*Dactylus glomerata*);
- Stone parsley (*Sison amomum*);
- Brassicaceae spp. (samples were dead strands);

- Reed (*Phragmites australis*);
- Horse mushroom (*Agaricus arvensis subspecies*);
- Red clover (*Trifolium pratense*);
- White clover (*Trifolium repens*);
- Creeping thistle (*Cirsium arvense*);
- Curled dock (*Rumex crispus*);
- Common mouse-ear (*Cerastium fontanum*);
- Prickly sow thistle (*Sonchus asper*);
- Poplar hybrid (*Poplus spp.*) saplings:
- Broad leaved dock (*Rumex obtusifolius*);
- Tufted vetch (*Vicia cracca*);
- Field bindweed (*Convolvulus arvensis*);
- Creeping cinquefoil (*Potentilla reptans*);
- Birds-foot trefoil (*Lotus corniculatus*);
- Field rose (*Rosa arvensis*);
- Dandelion (*Taraxacum spp.*);
- Yarrow (*Achillea millefolium*);
- Great willow herb (*Epilobium hirsutum*);
- Hogweed (*Heracleum mantegazzianum*);
- Common nettle (*Urtica dioica*);
- Cow parsley (*Anthriscus sylvestris*);
- Agrimony (*Agrimonia eupatoria*);
- Bristly ox-tongue (*Helminthotheca echioides*);
- Greater burdock (*Arctium lappa*);
- Scentless mayweed (*Tripleurospermum inodorum*);
- Common ragwort (*Senecio jacobaea*); and
- Hoary willow herb (*Epilobium parviflorum*).

4.2.2 Defunct hedge (J2.2)

There are two defunct hedgerows running parallel and east-west within the Site (Photograph 8.3 and 8.4). The southern defunct hedgerow is within the middle, whereas the other hedgerow forms the northern border to the area surveyed.

The two hedgerows contain unmanaged vegetation previously delineated by a chest-height wire fence line, which now only remains standing in small sections of each hedgerow. Large sections of each hedgerow consist of ruderal and tall grass with an absence of scrub generally associated with a hedgerow habitat. These sections of tall grass (Photograph 8.3) has been labelled as hedgerow in the Phase 1 map since they are part of the liner habitat features which includes the pockets of scrub and it helps visualise the change in habitat from managed neutral grassland.

The species list within these hedgerows includes:

- Hawthorn (*Crataegus monogyna*);
- Blackthorn (*Prunus Spinosa*);
- Hogweed;
- Great willow herb;
- Hedge bindweed (*Calystegia sepium*);
- Cock's foot;
- Creeping thistle;
- Brassicaceae spp. (samples were dead strands); and
- Common nettle.

The stands of blackthorn and hawthorn were approximately 5m high and 4m wide.

4.2.3 Hedgerow (intact) with trees (J2.3)

This habitat formed the southern, eastern and western border of the Site. All of the borders were relatively unmanaged with established trees.

The species observed within this habitat includes:

- Ash (*Fraxinus excelsior*);
- Elder (*Sambucus nigra*);
- Ivy (*Hedera helix*);
- Bramble (*Rubus fruticosus*);
- Hedge bindweed;
- Hawthorn;
- Blackthorn;
- Oak (*Quercus robur*);
- Field maple (*Acer campestre*);
- English elm (*Ulmus minor*);
- Black bryony (*Tamus communis*);
- Hart's-tongue fern (*Asplenium scolopendrium*); and
- Willow (*Salix spp*).

The southern boundary (Photograph 8.5) contained the most diverse array of species and contained the larger proportion of mature trees, it was delineated with an intact wire fence approximately 1.5m high. The understory was bare earth, ivy, with a dry ditch and occasional common nettle and Hart's-tongue fern (Photograph 8.6).

The hedgerow on the western border of the surveyed area contained fewer mature trees than the hedgerow on the southern border. The western hedgerow contained a dense scrub layer of bramble forming a thick barrier preventing access to survey the inside of the hedge (Photograph 8.7).

The eastern border also contained fewer trees than the southern border especially in its northern section where the hedge has historically seemingly been cut more frequently preventing mature tree formation. This hedgerow was delineated by a head-height fence line in (Photograph 8.8) and hosted and old access point shown by a metal gate (Photograph 8.9).

4.2.4 Woodland – Broadleaved – Plantation (A1.1.2)

This habitat has been used to describe the line of established hybrid poplar trees approximately 30m tall on the north-west border of the survey area (Photographs 8.1, 8.3, 8.4, 8.10 and 8.11). Some of these trees hosted mistletoe (*Viscum album)*. The trees are planted in two rows with a relatively open understory containing bramble and hawthorn at chest-height with ground flora similar to the neutral grassland with the addition of garlic mustard (*Alliaria petiolata*). This habitat had a border of waist-height barbed wire fencing.

4.2.5 Hardstanding (J5)

Two sections of hardstanding were identified within the survey area, the first being outside the old access point (Photograph 8.9) and the other section next to the proposed access point in the south-east corner of the area of the proposed stockpile(Photographs 8.12 and 8.13).

4.2.6 Tall ruderal vegetation (C3.1)

The borders of the grassland and the hedge contained tall ruderal vegetation but the extent was too thin to clearly display in the Phase 1 map. A large section of tall ruderal vegetation consisting of common nettle, great willow herb and reed is present in the south-east corner of the southern field, which surrounds an area of hardstanding supporting farming equipment (Photograph 8.13).

4.2.7 Buildings & Infrastructure (J3.6)

A cattle trough was noted in the south-east corner of the survey area and is shown in Photograph 8.12 and TN4.

4.2.8 Fence (J2.4)

In addition to the fences described around the hedgerows and the poplar trees, the south-east corner of the survey area contains a set of large locked metal gates which is the proposed access point to the proposed stockpile and can be seen in Photograph 8.14.

4.3 Protected and Notable Species

4.3.1 Amphibians

No amphibians were observed during the site visit in the surveyed area.

There were no ponds within the Site and the ditches that were visible in the hedgerows were shallow and dry at the time of the survey.

The intact hedgerows provide suitable foraging and hibernation habitat for amphibians, whereas the defunct hedgerows offer low foraging and hibernation habitat. If the grassland was left unmanaged it would eventually turn into good habitat for amphibians, however in its current intensively managed state, it is considered to have low suitability for amphibians due to being exposed to

predation. In certain small sections of grassland borders, within 5m of the intact hedgerow, the vegetation has been unmanaged and moderate terrestrial habitat is therefore present for amphibians.

4.3.2 Badgers

No definitive evidence of badgers, such as setts, hairs, dung pits/latrines, was observed within the surveyed areas during the site visit.

There is suitable habitat for badger foraging across the Site and moderate potential for sett creation in the hedgerows but low potential for sett formation in the grassland. The most likely location for badger foraging is the south-west corner where the mammal tracks were seen in the field and entering the hedgerow in the south (TN5).

4.3.3 Bats

No bats or evidence of bats were noted within the surveyed area during the site visit.

There were no structures with the exception of the cattle trough and feeder in area of the proposed stockpile which have negligible bat roost potential.

All of the trees with the survey area were healthy with no noticeable crevices for potential roosts or not of a sufficient size to host any significant cavities. However, due the time of year the survey was undertaken, the trees were covered in leaves that could have obscured any potential roosting features from a ground survey.

The Site has good potential for foraging bats especially along the intact hedgerows which have high potential, the defunct hedgerows have moderate potential for foraging bats.

4.3.4 Birds

The following bird species were observed in the survey area during the site visit:

- Swallow (*Hirundo rustica*);
- Goldfinch (*Carduelis carduelis*);
- Great tit (*Parus major*); and
- Blue tit (*Cyanistes caeruleus*).

The strong gusts of wind experienced during the survey will likely have reduced the number of birds observed. No bird nests were noted on the site visit.

The intact hedgerow and planted trees provide the most likely habitat to host breeding birds, the intact hedgerow has moderate potential to host nests and the grassland if left unmanaged would be able to host ground nesting birds such as meadow pipit (*Anthus pratensis*) and skylark (*Alauda arvensis*).

4.3.5 Fish

No fish were observed in the survey area and no suitable habitat for a sustainable fish population was noted on Site due to lack of suitable water bodies.

4.3.6 Flora and Fungi

The species observed on the site visit are noted in the habitat section of this report. It is not considered that the site visit provided an exhaustive list of species on the Site, as due to the time restrictions it was not possible to perform a comprehensive botanical survey. The species listed are considered to be common, with the most diverse floral compositions being on the borders (within 10m) of the intact hedgerows.

4.3.7 Hazel Dormice

No evidence of this species, such as nests or characteristically chewed hazelnuts, was observed during the site visit. The intact hedgerows and trees offer good suitable habitat for this species, whereas the grassland and defunct hedgerow have negligible potential respectively to host nesting dormice.

4.3.8 Invasive Species

No invasive species were noted during this walkover.

4.3.9 Invertebrates

The following species were observed during the site visit:

- Large white (*Pieris brassicae*);
- Tree bumble bee (*Bombus hypnorum*);
- Small heath (*Coenonympha pamphilus*);
- Common blue (*Polyommatus Icarus*)
- Gatekeeper (*Pyronia tithonus*);
- Small tortoiseshell (*Aglais urticae*);
- White butterfly spp.;
- Meadow grasshopper (*Chorthippus parallelus*);
- Roesel's Bush-cricket (*Metrioptera roeselii*);
- Mint leaf beetle (*Chrysolina herbacea*);
- Common carder bee (*Bombus pascuorum*);
- White tailed bumble bee (*Bombus lucorum*);
- Southern hawker (*Aeshna cyanea*);
- Honey bee (*Apis mellifera*);
- Cinnabar moth (*Tyria jacobaeae*);
- Speckled wood (*Pararge aegeria*); and
- Red admiral (*Vanessa atalanta*).

The above list is not considered to be a holistic list for invertebrates using this area. There are multiple suitable habitat niches across the site for invertebrates, including the managed semi-improved grassland hosts sporadic wildflowers that survive the cutting and grazing. However, the most diverse areas for invertebrates were the borders of the intact hedgerows where more

flowering plants were noted and the vegetation has remained less managed compared the centre of the fields.

4.3.10 Other Mammal Species

No mammals were directly observed within the surveyed area of the Site. Evidence of rabbits was found in the field north of the survey area in the form of latrines and likely rabbit paths in the southern field (TN5).

There is suitable habitat for grey squirrels (*Sciurus carolinesis*), voles, shrews, mice, stoat (*Mustela erminea*), weasel (*Mustela nivalis*) and fox (*Vulpes vulpes*) within the intact hedgerows surrounding the Site, although no evidence of these species, such as scats or footprints, was observed during the field survey.

4.3.11 Otter

No evidence of otter was noted during the site visit in the surveyed area. There is no suitable habitat for otter within the Site but the borders of the Site being the hedgerows and trees hosting draining ditches (albeit dry at the time of the survey), could offer temporary refuge especially on the south side of the Site.

During the site visit it was not clear if the Site connects to more suitable otter habitat to the south since it was not possible to survey this area from the ground. The Severn Estuary and its associated habitats have the potential to support otters.

4.3.12 Reptiles

No evidence of reptile was noted during the site visit in the surveyed area. The intact hedgerows provide highly suitable foraging and hibernation habitat for reptiles. The defunct hedgerows offer moderate foraging and hibernation habitat.

If the grassland was left unmanaged it would turn into good habitat for reptiles. However, in its current intensively managed state, it is considered to have low suitability for these species as reptiles are exposed to predation. In some small sections of the grassland borders within 5m of the intact hedgerow, the vegetation has been unmanaged and therefore moderate terrestrial habitat is present for reptiles.

4.3.13 Water Vole

No evidence of water vole was noted during the site visit, however the borders of the Site include ditches lined with hedgerows and trees that could offer temporary refuge for water vole, especially on the south side of the Site.

During the site visit it was not clear if the ditch connects to rhines with more suitable water vole habitat since it was not possible to survey the surrounding area from the ground. The ditch in the Site border would be more suitable for water voles if it contained permanent standing water, was more exposed to sunlight and was connected to a network of similar ditches which host permanent standing water.

An aerial analysis suggests there are no rhines connected to the Site that are highly likely to support water voles.

5 Interpretation, Assessment and Recommendations

5.1 Designated Sites

5.1.1 Statutory Sites

5.1.1.1 International and European Designated Sites

It is considered that the *River Wye* SAC is a suitable distance away from the area of the proposed stockpile (3.7km) for the proposed works not to impact this site.

The *Severn Estuary* SPA, SAC, and Ramsar is adjacent to the Site and consequentially a Habitat Regulations Assessment (HRA) screening has been carried out to accompany this EcIA. The HRA screening concluded the project *is thought to not have a likely significant effect on the qualifying features of the designated sites* (BMMJV, 2019).

The Site hosts a different habitat composition to those found in the Severn Estuary being; *Estuaries*, *Mudflats*, *Sandflats not covered by seawater at low tide, Atlantic salt meadows, Sandbanks which are slightly covered by sea water all the time* and *Reefs*. The western border of the survey area being the earth bund, intact hedgerow and Severn Way footpath signal the change in habitat type between the Site and *Severn Estuary*. The western intact hedgerow is over 5m tall and approximately 15m wide forming a thick vegetative barrier between the site and the wider environment. In addition, the current earth bund forming the Severn Way footpath creates a further visual barrier between the site and the designated Sites.

The difference in habitat type and use suggests the habitat in the survey area isn't functionally linked to the *Severn Estuary* and the main concern is if the proposed works will cause disturbance to the species within the *Severn Estuary*. The HRA screening concludes no significant impact will occur and the proposed stockpile will not be higher than the bund and surrounding hedgerow and trees. Therefore, the active works are not anticipated to cause visual disturbance to the *Severn Estuary* if the hedgerows remain unmanaged when the stockpiling is undertaken.

The earth bund and dense intact hedgerows will also provide a noise reducing barrier of the works to the *Severn Estuary*. The known key bird roosting sites within the *Severn Estuary* were checked (JNCC) to confirm their proximity to the Site. The Environmental Constraints Plan (Appendix J, drawing number ENIMSW002194-BMM-000-A10-DR-EN-0202402) shows the known *Severn Estuary* high tide roosting site within proximity to the Site being the *Northwick Warth and flush* with a 200m buffer. The 200m buffer shows an approximate area in which works could cause disturbance to the *Severn Estuary's* roosting site, its boundary is more than 275m south of the southern border of the Site. It is considered that this is sufficient distance to prevent disturbance to this roost site especially since the southern border is formed by a large intact hedgerow with mature trees. In addition, it is assumed that the sub optimal habitat contained within the Site makes it less suitable for overwintering birds, which has been confirmed following an ornithological check on 22.11.19 (see Section 5.3.4.1).

The following recommendations to avoid impacting these statutory sites include:

- Works should follow Environmental Good Practice Guidelines (CIRIA C741D, 2012 and BS 42020, 2013);

- Tool box talks should be implemented to raise awareness of the work requirements;
- All noise and light pollution should be avoided, further light reduction advice is discussed in Section 5.3.3; and
- The machinery used to move the earth around the Site should be minimised and low in stature as possible to avoid visual disturbance.

Therefore, the proposed works as described in this report are not considered to cause significant impact to international and national designated sites if the above recommendations are implemented and the Site is returned to its original condition.

5.1.1.2 National and Local Designated Sites

The *Aust Cliff* SSSI is 1.22km north-east of the Site and is designated for its geographical features, therefore the proposed stockpile will not impact any notified features within this designated Site.

The *Severn Estuary* SSSI has the same boundary as the *Severn Estuary* SPA, SAC, and Ramsar and therefore the recommendations described in Section 5.1.1.1 will be applied to this SSSI.

5.1.2 Non-statutory Sites

The *Aust to New Passage* SNCI largely shares the same boundary as the *Severn Estuary* SPA, SAC, Ramsar and SSSI with a small area within the west section of the surveyed area. This section of SNCI within the survey area is the line of hedgerows on the western border. Therefore, the recommendations described in Section 5.1.1.1 will be applied to this SNCI. If the Site boundary is 20m from the western intact hedgerow it is not considered to impact the section of SNCI.

New Passage to Chittening Warth SNCI (1.5km south-west), *Fields north of Rifle Range* SNCI (700m south-west) and *The Pill, New Passage* SNCI (1.1km south-west) are considered to be a sufficient distance away from the Site to not be impacted by the proposed stockpile. Therefore, they will not be considered further in this report.

The *Maritime Cliff and Slope* SNA is within the Site however, the surveyed area doesn't contain this habitat type. This SNA has a generic buffer following the length of the Severn Estuary and is unspecific in its designation of Maritime Cliff and Slope habitat. Since the Site doesn't contain this habitat type it will not impact this SNA and it will not be considered further in this report.

5.2 Habitats

5.2.1 Priority Habitat

The western intact hedgerow boundary of the Site is defined as *No main habitat but additional habitat exists*, on the western side of this boundary the area is labelled as *Coastal Saltmarsh* which then leads to *Mudflats*. The proposed works are not anticipated to cut into the intact hedgerow or impact the *Coastal Saltmarsh* or *Mudflats* (as discussed in Section 5.1.1.1). A 20m gap between the hedgerow and the stockpiling working area will be implemented to ensure the works do not impact upon the *No main habitat but additional habitat exists*.

The entire survey area is designated *Coastal and Floodplain Grazing Marsh* therefore it is impossible to avoid temporarily impacting this Priority Habitat. This designation is questionable since its recent excavation and use as a landfill and the ditches in the intact hedgerows were shallow and dry at the

time of the survey. Although it is grazed and contains infrequent samples of *Juncus spp* it is considered too dry to be considered a floodplain and is more likely to have been designated as this habitat due to its proximity to the coastal lowlands in the Severn Estuary. Regardless, to avoid impacting the Priority Habitat the works will return the Site to its current condition on completion.

The impact of the works on the Priority Habitat must be minimised by engaging the following procedures:

- Works should follow Environmental Good Practice Guidelines (CIRIA C741D, 2012 and BS 42020, 2013) to prevent fuel and chemical spillage into this area;
- Tool box talks should be implemented to raise awareness of the work requirements;
- The wheel wash should be correctly used and maintained throughout the project to prevent invasive plant species entering the Site; and
- A geotextile membrane should be installed over the area of the proposed stockpile to protect the landfill cap.

Although the intact hedgerow isn't part of the *Coastal and Floodplain Grazing Marsh,* it should still be protected where possible. Photograph 8.4 shows an example of a good position to install the temporary track to connect the two section of stockpiling since the gap in the scrub vegetation is already over 10m (grid reference ST 55795 87541). Therefore, only the unmanaged grass and ruderal vegetation need to be cut to create a track, this vegetation type will re-establish quicker than scrub after the works are completed.

5.2.2 Ancient Woodland

The desk study using MAGIC identified no Ancient Woodland with 2km of the Site. Therefore, the proposed works will not impact this habitat type and it will not be considered further in this report.

5.2.3 Veteran Trees

The veteran trees returned from the BRERC records are of a suitable distance away (230m east) from the Site to not be affected. Therefore, they will not be considered further in this report.

5.3 Protected and Notable Species

5.3.1 Amphibians

There are 15 ponds within 500m of the Site of which have been identified from BRERC, aerial view or previous surveys. Three of these have confirmed GCN populations, although two of these lie to the east of the A403, which is considered to be a barrier to the dispersal of GCN from the east.

The third confirmed population is within a pond approximately 270m south of the site, shown on the Environmental Constraints Plan (Appendix J, drawing number ENIMSW002194-BMM-000-A10-DR-EN-0202402). The western intact hedgerow connects this pond to the Site. The central grassland within the survey area is not considered to be good terrestrial habitat for newts since it is exposed and provides negligible shelter for amphibians from predation. The intact hedgerows are considered to be the preferred habitat for amphibians to forage and commute in this area.

Therefore, the area of the proposed stockpile as shown in Appendix C (drawing number ENVIMSW002194-BMM-XX-A10-DR-T-0202448) is not considered to affect a place of refuge for GCN or other amphibians.

However, the precautionary principle should be applied and the following recommendations should be implemented:

- Tool box talks should be implemented to raise awareness of amphibians;
- If a GCN is discovered all works must cease immediately and consultation with Natural England will be required before works can continue;
- A 20m buffer from all hedgerows should be created to prevent works from impacting the hedgerows;
- The grass up to 5m away from the stockpile should be maintained to a maximum of 5cm from ground level to prevent amphibians from entering the Site. Therefore, a 15m buffer of unmaintained grassland between the hedgerow and the Site will be present for the duration of the project;
- All vegetation clearance should be conducted under ecological supervision;
- The cutting of the grassland can be conducted at any time of year but ideally over winter when amphibians are less likely to be in the open;
- The cutting of the grassland should be in the phased manner with the first cut to 300mm towards the intact hedgerow and a minimum of 15m from any hedgerow. The second cut to ground level should be conducted on the following day. This area of grass should then be maintained at ground level for the remainder of the project;
- The section of defunct hedgerow in which the temporary track will be located should be positioned at grid refence ST 55795 87541 since there is minimal scrub vegetation and cover for amphibians. This should be subject to the same grass cutting regime, but a hand search by an ecologist should be conducted before it can be cut to ground level;

5.3.2 Badgers

There was no definitive evidence of badger from the Site walkover, the mammal paths in the south-west section of the surveyed area (as shown in Appendix A, TN5) are more likely to have been created by rabbits but there is a very small chance that could have also been formed by badgers.

There is suitable foraging habitat for badgers across the majority of the Site in the form of the woodland, hedges and grassland. The fence does restrict the movement of badgers in sections, but it is not sufficient to prevent this species from readily entering the area. The defunct hedgerows in the middle of the Site have low potential for sett creation but the hedgerows and trees in the boundary have high potential to host badger setts.

The biological records returned evidence of badger within 260m north of the Site, there are no significant barriers for badger to enter the Site from this location. As part of the wider ASEA project badger surveys including camera trap surveys have been conducted in this region with on-going monitoring for incidental observations. These surveys have not resulted in any observations of badgers or setts within 500m of the Site. An annex sett was identified by CH2M in 2017 500m south

of the Site however, an inspection of the sett this year with camera trap surveys identified no badgers and could not identify any recently used (within a year minimum) setts. It is considered unlikely that badger setts will occur within the Site since there are no recent records and the open field and intact hedgerow are not considered optimal habitat for sett creation.

Currently the Site has low potential to impact badgers, however badgers can move into the area and excavations which are left open can trap foraging badgers. In addition, the stockpiling of earth can create suitable sett creation habitat for badgers. The following recommendations are put forward with respect to badgers to help avoid and mitigate the low risk of the species being impacted:

- A pre-construction walkover 12 weeks before site works begin should be undertaken to search for badger evidence, such as latrines;
- The stockpiling should allow a 20m gap away from all the hedgerows (with the exception of the access road between the two fields and the Site entrance). The gap allows badgers to safely commute around the proposed works;
- Tool box talks should be implemented to raise awareness of badgers;
- The amphibian grid at the site entrance will not prevent badgers from entering the working area and so a gate will also need to be installed at this point;
- In the unlikely event badger setts are found, the development works must be kept 30m away from any badger sett to avoid disturbance to the sett and therefore avoiding the requirement to carry out works under a licence (under the Badgers Protection Act 1992) from Natural England;
- If works within 30m of a badger sett cannot be avoided, a licence will be necessary and appropriate mitigation should be put in place as a result of the findings of the badger survey; and
- Good practice measures should be implemented during the construction process by covering any open excavations (if any) during the night or by providing a suitable safe egress for badgers (and other species) that could potentially enter the Site and fall into them.

5.3.3 Bats

There are no structures on site that warranted a bat inspection therefore a preliminary roost assessment involving detailed inspection of the exterior and interior of a structure to look for features that bats was not undertaken.

The trees within the survey area contained no obvious bats roosting features, however the trees were in full leaf and it was not always possible to view the entirety of each tree. The trees were healthy without any signs significant cavities caused by decay and/or broken branches. In addition, the environment surrounding each tree was cluttered by vegetation which decreases the potential of bats roosting within any undiscovered features. Therefore, the trees within the area of the proposed stockpile are considered to have negligible bat roosting potential. The proposed works do not include tree removal and the works will be 20m from the hedgerows, therefore it is considered that there is negligible risk of impacting any bats roosting within trees.

The Site is likely to host foraging bats with the intact hedgerows surrounding the site being key linear features for commuting and foraging bats. The proposed stockpile will be contained within the grassland and is not anticipated to cut any of the intact hedgerows around the Site. The access route

between the two fields should cut though a section of the intact hedgerow that does not contain any scrub vegetation, so it does not further degrade this linear feature.

It is considered possible that the Site could host all foraging and commuting species listed in Table 10. In addition, since it is within 30km of SACs designated for bats (*Wye Valley and Forest of Dean Bat Sites* and *North Somerset and Mendip Bats*) it could also host foraging and commuting lesser and greater horseshoe bats. However, given that the Site's habitat is unremarkable and there is preferential feeding habitat closer to the SACs designated for bats, it is considered unlikely for the proposed stockpile to have any impact on bats. However, adherence to best practice mitigation should be ensured and therefore the works will follow the lighting guidance (ILP, 2018) discussed below.

If the works follow these recommendations then it is considered that the works will not have any significant impact on disturbing bats and no further surveys will be required:

A summary of the key points are summarised below:

- Works should not cut or strim the hedgerows within and surrounding the Site, the access track between the fields should not be wider than 10m and should avoid cutting down existing scrub vegetation;
- Tool box talks should be implemented to raise awareness of bats;
- Working in the hours of darkness should be avoided wherever possible, to minimise disruption to nocturnal wildlife;
- The use of artificial lighting is to be limited to the essential minimum throughout the works;
- Any lighting should avoid upward pointing lights, with the spread of light being kept near to or below the horizontal and away from intact hedgerows. Necessary lighting should also utilise an LED source and concord to the provisions of 'Guidance Note 08/18 Bats and Artificial Lighting in the UK (Bats and The Built Environment Series)' by the Institute of Lighting Professionals (IPL) and Bat Conservation Trust (BCT);
- All machinery and non-essential lighting should be switched off at least 30 minutes before dusk until 30 minutes before dawn or later where possible;
- Any external security lighting should be set on motion-sensors and short (1 minute) timers;
- As a last resort, directional lighting/shielding of lights with accessories such as hoods, covers, louvers and shields is to be used throughout to avoid excessive light spill; and
- The above measures should be used to maintain "dark corridors" around the intact hedgerows for bats to use for commuting or foraging. The creation of designated "dark corridors" will ensure bats are less likely to disturbed by light pollution.

It is suggested that a lighting strategy for the scheme could form the basis of an appropriate planning condition. The line of poplar trees are scheduled to be removed and they are already positioned in an exposed area therefore are not suitable to host bat boxes. The trees within the site are either in cluttered environments or are in close proximity to the main road so are not considered to be optimal for installing bat boxes.

The intact hedgerows and the 15m of grassland from the hedgerows should not be cut for the duration of the stock piling. This will encourage more invertebrates into the area to improve the

foraging habitat around the area of the proposed stockpile. In addition, it is recommended that restoration should occur on the defunct central hedge with a suitably diverse shrub mix. The increases in hedgerow vegetative cover over time will potentially increase the commuting corridor for bats by enhancing protection for bats from strong winds.

5.3.4 Birds

There are multiple records of birds within close proximity to the area of the proposed stockpile, including overwintering birds and birds which could be using the site for breeding over summer. The recommendations for birds are discussed below.

5.3.4.1 Overwintering Birds

The Site is situated in close proximity to international statutory habitats designated for birds with the *Severn Estuary* Ramsar and SPA on its western border. These sites contain internationally important mudflats, reefs, sand banks and salt meadows which are of huge importance to over wintering birds.

As discussed in the statutory site recommendations, the habitats identified within the designated sites are very different from the proposed stockpile's managed neutral grassland and hedgerows. When reviewing the landscape for overwintering birds the field of view across the Site is poor due to the elevation and surrounding hedgerows especially when compared to the long stretches of open mudflats. In addition, no obvious pools of water have been observed within these fields and an ornithological check did not identify any overwintering birds present at high tide.

The poor field of vision and sub-optimal habitat within the Site would not encourage overwintering birds into this area, especially when there is far more suitable habitat within the designated sites. Therefore, it is considered unlikely that the Site will host significant and protected overwintering birds since they are more likely to reside in the Severn Estuary. As discussed in Section 5.1.1 and within the Habitat Regulations Assessment (HRA) for the proposed works, it is not anticipated the works will cause disturbance to the notified features of the Severn Estuary designated sites. The HRA screening concluded the project *is thought to not have a likely significant effect on the qualifying features of the designated sites* (BMMJV 2019).

Therefore, it is concluded that the Site is unlikely to support overwintering birds.

5.3.4.2 Breeding Birds

Four species of birds were noted during the survey visit which was conducted outside of what is considered to be the optimal season for breeding bird surveys (March to June). The timing of the survey and strong gusts of wind experienced during the visit could have reduced the observed number of birds using the Site.

The Site is capable of hosting a wide range of breeding birds especially within the trees, hedgerows (the intact hedgerow with trees and sections of the scrub in the defunct hedgerow). If the grassland on site is no longer intensively managed, it would have the potential to host skylark and meadow pipits being ground nesting birds. The recommendations to prevent impacting these species is therefore to keep the grassland intensively managed but avoid other vegetation clearance such as cutting the hedgerows or similar disturbance during the main breeding bird season, which is considered to be March to August.

If the works require vegetation to be removed within March to August:

- The Site should be checked for breeding birds by an ecologist the day before and the morning of the vegetation clearance;
- If an active bird nest is found, it must be left *in situ* and protected from works by a suitable buffer zone (species dependent);
- No works can be undertaken in that area until the young birds have fledged from the nest site. This may take up to 6 weeks depending on the species; and
- Tool box talks should be implemented to raise awareness of this constraint.

5.3.5 Fish

The Site hosts no suitable habitat for fish, however the works should follow good environmental practice guidelines (CIRIA C741D, 2012 and BS 42020, 2013) to prevent any polluted runoff being released into the wider environment via surface water channels.

It is considered the proposed works are unlikely to impact these species and they will not be considered further in this report.

5.3.6 Flora and Fungi

No notable species including those in Table 12 (section 3.3.6) were noted during the walkover survey. Since the field is manged for livestock it is considered less likely that significant species would be present within the proposed area for the stockpiling. The most diverse composition of flora was noted on the borders of the grassland in close proximity to the hedgerows.

Therefore, it is considered unlikely that the works will impact notable flora and fungi species. A precautionary principle will be implemented, and the topsoil and associated seedbank will be protected by the geotextile membrane methods described in the Priority Habitat recommendations (section 5.2.1).

The buffer of 20m around the hedgerows will enable some species to flower (currently some species are growing blind) and ensure the continuity of the seedbank for the large majority noted on the walk over.

5.3.7 Hazel Dormice

The biological records returned no evidence for hazel dormice within 2km of the Site within the past ten years.

The Site does contain habitat which could host this largely arboreal species, including the intact hedgerow with trees that form the borders of the site. The southern border is well adapted to hazel dormice since it is species rich and its vegetation is more established than the other borders providing more shelter form predation. The other intact hedgerows forming the border of the Site are species poor and are less likely to host this species. The current proposed works do not include the removal or significant disruption of the intact hedgerow and trees. In addition to this, the site is landlocked by roads and other infrastructure and thus is not linked to any known or core populations of the species within South Gloucestershire, such as blocks of ancient and broad-leaved woodland which are only distant to the site.

Therefore, as the intact hedgerows are to remain undisturbed by the works this species and its place of residence will not be impacted.

If the proposed works changes or if a hazel dormouse is observed within the site, all works must cease, and an ecologist must be contacted immediately. Consultation with Natural England may be necessary which could lead to further surveys and a European Protected Species (EPS) licence application before works can proceed.

5.3.8 Invasive Species

No invasive species were observed during the walkover. The species returned from the biological records are capable of moving into the Site before works begin and during the works since the earth from wider area is being brought to the Site which could be contaminated with invasive plant species' seeds.

A walkover of the Site 12-weeks before works commence is recommended to check if invasive species have become established. If an invasive plant species is noted before or during the works, a 7m zone should be marked around the affected area to prevent access and a management plan implemented to remove the species. These plant species will be removed and disposed of using specialist contractors and adherence to the industry standard working methodology will be ensured. Works can proceed when the invasive species has been successfully removed as confirmed by an ecologist.

It is essential the proposed wheel wash is correctly used to clean the machinery entering the Site and the waste products are correctly disposed to prevent the spread of invasive species into the area.

5.3.9 Invertebrates

No notable species were noted during the walk over including those in Table 14 (Section 3.3.9) but the Site is deemed capable of hosting a range of invertebrate life due to its location away from an urban setting and range of ecological habitats especially within the hedgerows and associated ruderal vegetation.

The Site is capable of hosting all of the species listed in Table 14, with the exception of small blue since its main food plant, kidney vetch (*Anthyllis vulneraria*), is absent from the area. The most important areas for invertebrates within the Site are the hedgerows and their relatively undisturbed grassland and ruderal vegetation borders. These areas contained a diverse composition of vegetation for invertebrates to thrive in comparison to the managed grassland in the centre of the fields.

If the borders around the hedgerows were left unmanaged for the duration of the works, it is considered to provide sufficient mitigation and possibly enhancement to invertebrates for the temporary loss of the managed grassland.

The area of grassland designated for the stockpiling should be continually cut to 300mm or ankle height (as advised in the reptile recommendations) before works begin to help prevent invertebrates from becoming established in this area.

5.3.10 Other Mammals

The Site is capable of hosting a range of mammals. Rabbit latrines were noted in the western edge of the northern field as well as mammal paths that were observed on the south-west corner of the Site. The central areas of the field did not contain any obvious burrows or nests therefore the grassland is not considered to host refuge for this species. The hedgerows within and around the Site are considered to be important for mammals to reside within and commute around the Site under cover.

The following recommendations and enhancements should be followed to prevent works from impacting these species:

- A pre-construction walkover should be undertaken 12-weeks before site works begin. This should be undertaken to search for mammal evidence such as rabbit warrens;
- The stockpiling will leave a 20m buffer away from all the hedgerows (with the exception of the access road between the two fields and the Site entrance), which will allow mammals to safely commute around the proposed stockpile;
- The intact hedgerows and the 15m strip of grassland next to the hedgerows should not be cut for the duration of the project to enhance the commuting corridors for mammals around the site;
- Works should be considerate to avoid injuring or killing these or other mammals not mentioned. If works are to disturb a place of residence for these species such as a fox earth or rabbit warren, they should be humanely displaced from the Site; and
- Grey squirrels are included in Schedule 9 of the WCA which lists the invasive non-native species in England and Wales. If grey squirrels are accidently trapped during works, it is illegal to re-release them and therefore will need to be humanely killed by an authorised rodent control company.

5.3.11 Otter

There was no evidence of otter from the walkover survey and minimal suitable habitat for this species within the working area of the proposed works. The biological records returned no evidence for otter within 2km of the area of the proposed stockpile within the past ten years.

It is considered the Site has negligible potential for otter and the proposed works are unlikely to disturb, injure or kill this species or destroy a place of otter refuge. Therefore, this species will not be considered further in this report.

If an otter is observed within the Site, all works must cease, and an ecologist must be contacted immediately. Subject to the circumstances, consultation with Natural England will be necessary which could lead to an EPS licence application before works can proceed.

5.3.12 Reptiles

There are biological records of slow-worm and grass snake around the Site and sections of the site host suitable habitat for this species. The hedgerows (intact and defunct) have high potential to host reptiles and the grassland has low potential but could have moderate potential if it was left unmanaged.

On previous visits it was noted that the grassland is cut /cattle-grazed short, therefore the suitability of this habitat is reduced for reptiles and is dependent on the length of grass with taller vegetation

providing more cover for this species. It is recommended that to prevent reptiles from becoming established in the Site, that the grass is grazed initially and then cut short using the methodology below:

- A toolbox talk should be delivered to contractors undertaking the work to raise the awareness of the risk;
- All vegetation removal such as the grassland and the defunct hedgerow will need be under ecological supervision;
- All vegetation removal should be conducted when the day temperature is above 10°C and after 5 consecutive days and nights of the temperature being above 5 °c;
- The grassland cutting should be conducted in a phased manner towards retained vegetation (the intact hedgerows) with the first cut using hand held machinery to ankle height. If works needs to cut the grass to bare earth the second cut should be conducted the proceeding day again towards retained vegetation;
- The clearance of10m of defunct hedgerow between the two fields within the proposed stockpile area for the temporary haul road, should ideally be conducted outside of the winter period (November to March) to reduce the risk of impacting hibernating reptiles. A check for nesting birds should be conducted by an ecologist 24-48 hours prior to clearance of the vegetation. The nesting bird check should also search for nests at least 5m either side of the section of hedgerow that is to be removed. If an active nest is found, the works will have to be delayed until the chick(s) have fledged. The clearance will also need to be conducted in a phased manner over two days (as above) with the additional requirement of hand searching by an ecologist;
- If any reptiles are discovered the works should stop and the ecologist should translocate the reptile to a safe area on the site away from the works;
- Due to the site containing sub-optimal habitat for GCN and badgers, it is not intended for wildlife exclusion fencing to be used. Instead maintaining a band of 5m of rough grassland around the stockpiling area to a height of 5cm will discourage these species from entering the site. However, it is recommended for periodic ecological searches of the site periphery to be undertaken and if signs of either of these species are found, then the use of wildlife exclusion fencing for GCN and badger should be revisited and implemented if necessary. In addition this lack of fencing will lessen the material usage associated with the stockpiling; and
- The intact hedgerows and the grassland next to the hedgerows should not be cut for the duration of the stock piling. Enabling the 15m of grassland around the hedgerows to grow naturally will help provide a safe passage of reptiles around the site.

5.3.13 Water Vole

There was no evidence of water vole from the site walkover and minimal suitable habitat for this species within the working area of the proposed works. The biological records returned no evidence for water vole within 2km of the Site within the past ten years.

It is considered the Site has negligible potential for water vole due to lack of suitable water bodies and the proposed works are unlikely to disturb, injure or kill this species or destroy a place of water vole refuge. Therefore, this species will not be considered further in this report.

In the unlikely event a water vole is observed within the Site, all works must cease, and an ecologist must be contacted immediately. Subject to the circumstances, consultation with Natural England will be necessary which could lead to a licence application before works can proceed.

6 Conclusion

An EcIA was undertaken to assess the potential ecological impact of the proposed stockpile associated with the ASEA scheme.

A number of potential ecological constraints have been identified in this EcIA concerning designated sites, habitats and protected species including:

- Severn Estuary SSSI, SPA, SAC, and Ramsar;
- Aust to New Passage SNCI;
- Coastal and Floodplain Grazing Marsh;
- GCN;
- Badgers;
- Bats;
- Birds (over wintering and breeding);
- Flora;
- Hazel dormice;
- Invasive species;
- Invertebrates;
- Other mammals; and
- Reptiles;

If any of the protected species described in the constraints list are identified during the project, all works must cease immediately and consultation with Natural England may be required which could lead to further surveys and licence applications.

The following constraints are considered low risk, but a toolbox talk should be created for all of the features listed above to raise awareness; badgers, bats, flora & fungi and invertebrate. The other constraints are high risk but if the recommendations outlined in this report are followed, the potential of impacting these species/habitats is low.

A site walkover 12-weeks before works commence is required to ensure the Site is as described in this report and no further constraints have developed. No other further surveys are required permitting the recommendations in this report are adhered and the Site is returned to its original condition when the project is finished.

General recommendations include:

- Environmental Good Practice Guidelines (CIRIA C741D, 2012 and BS 42020, 2013);
- All artificial lighting should be turned off between 30 minutes before dusk and 30 minutes after dawn. Further guidance on lighting is shown in Section 5.3.3;
- The intact hedgerows and adjacent grassland creating the borders of the Site should not be cut for the duration of the project;

- The vegetation 5m from the edge of the stockpile should be maintained as rough grassland at a maximum of 5cm for the duration of the project to deter GCN and badger from entering the site;
- Any vegetation clearance should be conducted under ecological supervision and should follow the guidance in Section 5.3 (specifically 5.3.1 and 5.3.12);
- The specified area of grassland where the stockpiles will be positioned should be maintained at ground level before works begin; and
- A geotextile membrane should be installed on the ground where the stockpiles are to be positioned.

Periodic checks of the periphery of the stockpile area will be undertaken. If signs of badger or GCN are found, then it should be considered whether the installation of a GCN and badger fence around the stockpile are necessary. If GCN are discovered all works must stop and a licence will be required from Natural England before works can procced.

If the proposed works change, this document needs to be reviewed again by an ecologist with consultation with the local planning authority before works can proceed.

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8 Appendices

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A. Phase 1 Habitat Map

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Key to symbols

Legend

- Site extent
- Surveyed Area
- A1.1.2 - Broadleaved woodland - plantation
- B2.2 - Neutral grassland - semi-improved
- C3.1 - Other tall herb and fern - ruderal
- J2.2.2 - Defunct hedge - species-poor
- J2.3.1 - Hedge with trees - native species-rich
- J4 - Bare ground
- J5 - Hardstanding
- J2.4 - Fence
- Target Notes

Key plan

Rev	Date	Drawn	Description	Ch'k'd	App'd
P02	25/11/19	JF	Site extent amended	EH	MS
P01	25/09/19	MH	For Information	TC	MS

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Title

ASEA Ecology & Flood Mitigation and Ecology Scheme
Stockpiling at Land off A403 at Northwick
Ecological Impact Assessment
Phase 1 Habitat Map

Designed	M Hemmings	MH	Eng Check	E Haggett	EH
Drawn	J Faber	JF	Coordination	C Postlethwaite	CP
GIS Check	M Hayward	MHa	Approved	M Secker	MS

Scale at A3	Status	Rev	Security
1:3,000	INF	P02	STD

Drawing number
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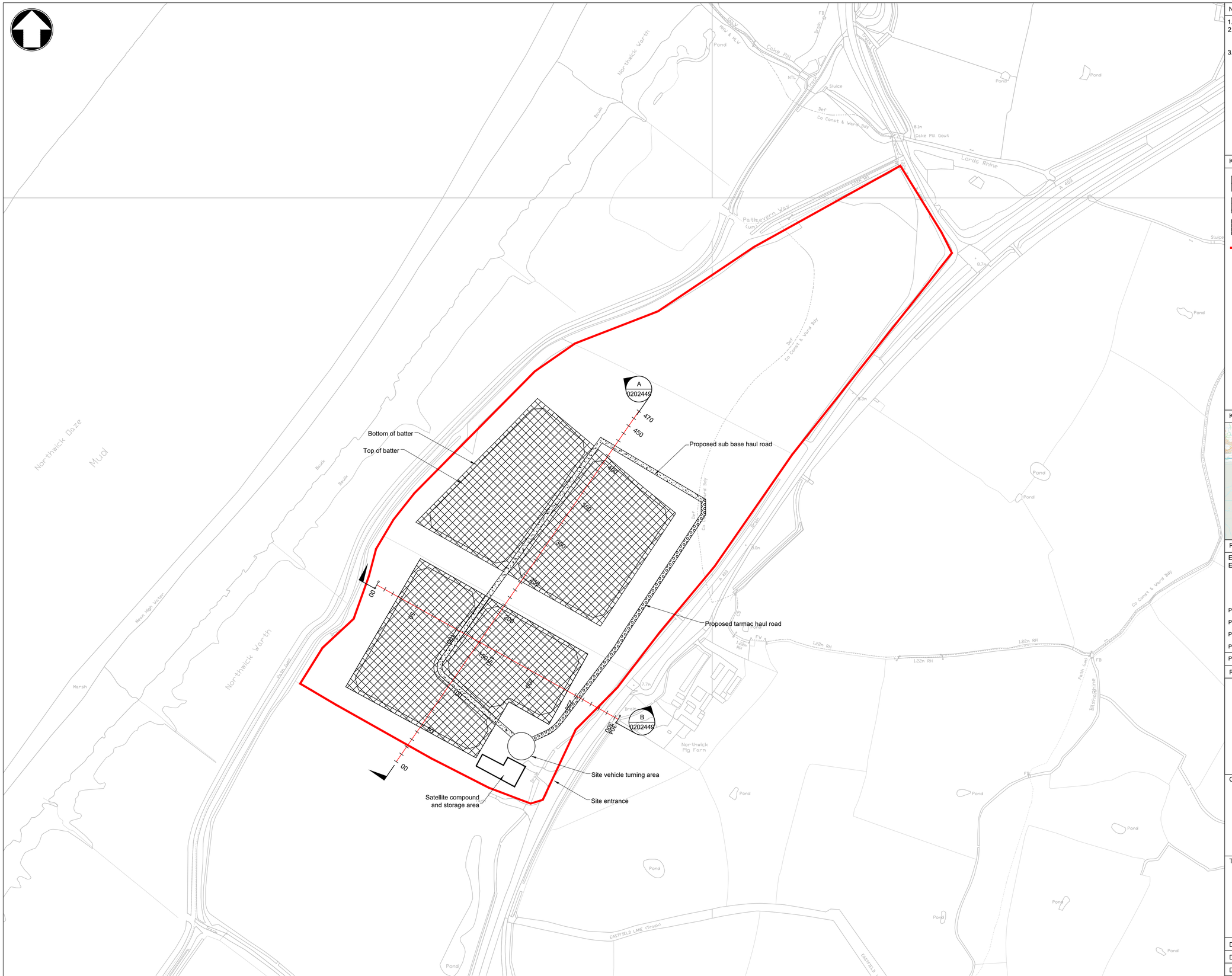
B. Phase 1 Habitat Target Notes

Target Note (TN)	Description	Location (grid reference)	Photograph(s)
1	BRERC designated ""Important" hedge (containing more than 7 species) number 8,202.	ST55548746 to ST55798733	8.2
2	Northern field	Centred at ST55878765	8.1
3	Southern field	Centred at ST55728747	8.2
4	Cattle trough	ST5578787377	8.12
5	Mammal paths	ST5556587470	n/a

C. Proposed Site Plan



Plan
1:2000

1:2000 0 100m 200m

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Notes

1. All measurements are in metres unless otherwise stated.
2. This drawing has been produced as part of the planning application for the Stockpile at the land off A403 at Northwick, and should be read in conjunction with the other materials submitted as part of this application.
3. 20m buffer between stockpile and field edge, to protect trees, hedges and ditches/rhines'.

Key to symbols

- Proposed Stockpile
- Proposed Haul Road
- Proposed Tarmac Surface
- Proposed Site Boundary

Key Plan

Reference drawings

ENVIMSW002194-BMM-XX-A10-DR-T-0202449 - Proposed Stockpile Sections
ENVIMSW002194-BMM-XX-A10-DR-C-0202453 - Location Plan

Rev	Date	Drawn	Description	Ch'k'd	App'd
P01	09/10/19	JW	For Construction	LH	
P01	11/10/19	WE		WE	
P02	15/10/19	JW	For Construction	CP	MS
P03	22/11/19	JW	For Construction	IB	MS
P04	26/11/19	JW	For Construction	IB	MS

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ASEA Ecology & Flood Defence Scheme Area 1
Stockpile at land off A403 at Northwick Proposed Site Plan

Designed	J YOUNG	JY	Eng check	I.BRUMWELL	IB
Drawn	J.WARREN	JW	Coordination	I.BRUMWELL	IB
Dwg check	G.J.BRAILEY	GB	Approved	M.D.SECKER	MS

Scale at A1	Status	Rev	Security
1:2000	CON	P04	STD

Drawing Number
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D. Species Specific Legislation

The following information in this appendix relates to species assessed within this document as being potentially affected by the proposed works and is a summary version of the full legislative text only. The relevant acts referred to in this appendix should be referred to for the full legislative text.

Breeding Birds

All breeding birds are protected under the Wildlife and Countryside Act (WCA) 1981 (as amended) which prohibits the intentional killing, injuring or taking of any wild bird (and) the taking, damaging or destroying eggs or of the nest (whilst being built or in use). Schedule 1 bird species are afforded greater protection under the WCA. It is an offence to disturb Schedule 1 birds or the dependants in the vicinity of their nest site.

Reptiles

Reptiles have varying degrees of protection under the Wildlife and Countryside Act 1981 (as amended). The four wide spread species of reptiles that are protected under Schedule 5 are common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), grass snake (*Natrix natrix*) and adder (*Vipera berus*). This means it is prohibited to intentionally kill, injure or trade these species.

Invasive Species

Schedule 9 and Section 14 of the Wildlife and Countryside Act 1981 (as amended) prohibits the introduction into the wild of any species that is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state, or any species of the 69 plants listed on Schedule 9.

The frequently encountered invasive species within proposed development sites include Japanese knotweed (*Fallopia japonica*); giant hogweed (*Heracleum mantegazzianum*); Himalayan balsam (*Impatiens glandulifera*); floating pennywort (*Hydrocotyle ranunculoides*); New Zealand pygmyweed (*Crassula helmsii*); rhododendron (*Rhododendron ponticum*); and certain hybrids of the above, some species may be native yet are listed for conservation purposes.

Plant or soil material contaminated by Japanese knotweed that is to be discarded is considered to be a 'controlled waste' under the Environmental Protection Act 1990 (EPA 1990). It is an offence to deposit, treat, keep, or dispose of controlled waste without a licence. Furthermore, knotweed that has been cut down and removed must be received by an authorised person to be disposed of correctly. A licence can be obtained from the Environment Agency (EA). The release or planting of a listed species in the wild can be permitted under a licence granted by the relevant statutory body.

Badgers

Badgers (*Meles meles*) and their setts are protected under the Protection of Badgers Act 1992. This makes it an offence to:

- Directly or indirectly kill, injure or take badgers;
- Cruelly ill-treat a badger;
- Dig for a badger;
- Intentionally or recklessly damage or destroy a badger sett, or obstruct access to it;
- Cause a dog to enter a badger sett; and
- Disturb a badger when it is occupying a sett.

Otter

Otter (*Lutra lutra*) are a European Protected species and are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and The Conservation of Habitats and Species Regulations 2017. It is an offence to:

- Intentionally or deliberately kill, injure or take an otter;
- Intentionally or deliberately damage, destroy or obstruct access to any structure or place used for shelter or protection by an otter; and
- Intentionally or deliberately disturb an otter while it is occupying a structure or place which it uses for that purpose.

Water Vole

Water vole (*Arvicola amphibius*) are a European Protected species and are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and The Conservation of Habitats and Species Regulations 2017. It is an offence to:

- Intentionally capture, kill or injure water voles;
- Damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care);
- Disturb them in a place of shelter or protection (on purpose or by not taking enough care); and,
- Possess, sell, control or transport live or dead water voles or parts of them (not water voles bred in captivity).

Bats

All bat species are protected under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017. This means it is illegal to intentionally or deliberately kill, injure, disturb or capture these species or damage, destroy or obstruct access to any structure, breeding or resting place used by them.

Hedgehog

The hedgehog (*Erinaceus europaeus*) is partially protected under Schedule 6 of the Wildlife and Countryside Act 1981.

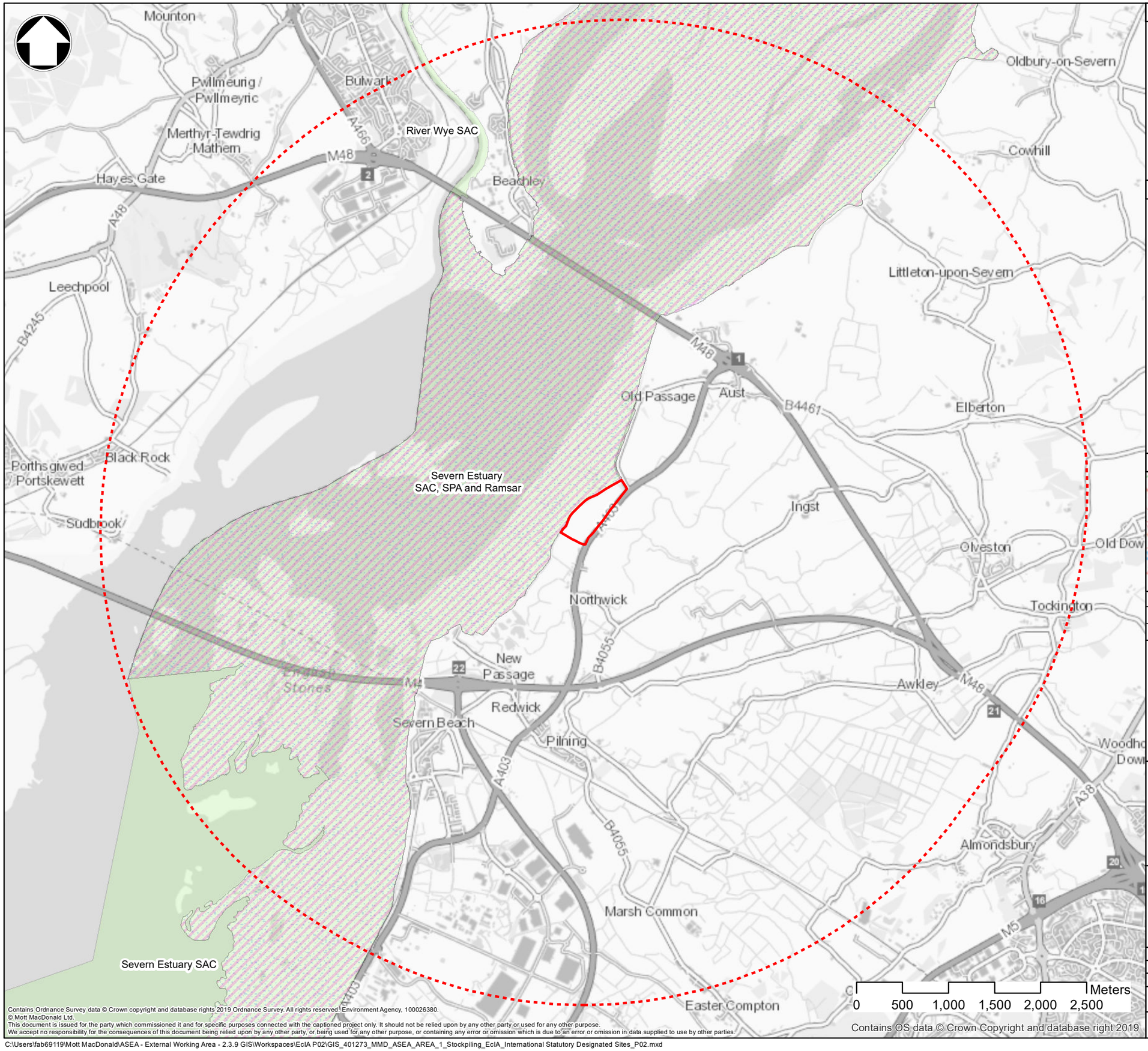
Great Crested Newt

GCN (*Triturus cristatus*) (GCN) are fully protected under The Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended). This means that is an offence to intentionally or recklessly kill, injure or take GCN. In addition, the following are also in breach of the legislation:

- To possess or control any live or dead specimen or anything derived from a GCN;
- To intentionally or recklessly damage, destroy or obstruct access to any structure or place used as shelter or protection by a GCN; and
- To intentionally or recklessly disturb a GCN while it is occupying a structure or place, which it uses for that purpose.

The legislation applies to all life stages of GCN.

E. International and European Statutory Designated Sites



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Key to symbols

Legend

- Site extent
- 5km buffer
- Ramsar Sites
- Special Protection Areas (SPAs)
- Special Areas of Conservation (SACs)

Key plan

Rev	Date	Drawn	Description	Ch'k'd	App'd
P02	25/11/19	JF	Site extent amended	EH	MS
P01	25/09/19	MH	For Information	TC	MS

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ASEA Ecology & Flood Mitigation and Ecology Scheme
Stockpiling at Land off A403 at Northwick
Ecological Impact Assessment
International Statutory Designated Sites

Designed	M Hemmings	MH	Eng Check	E Haggett	EH
Drawn	J Faber	JF	Coordination	C Postlethwaite	CP
GIS Check	M Hayward	MHa	Approved	M Secker	MS

Scale at A3	Status	Rev	Security
1:40,000	INF	P02	STD

Drawing number
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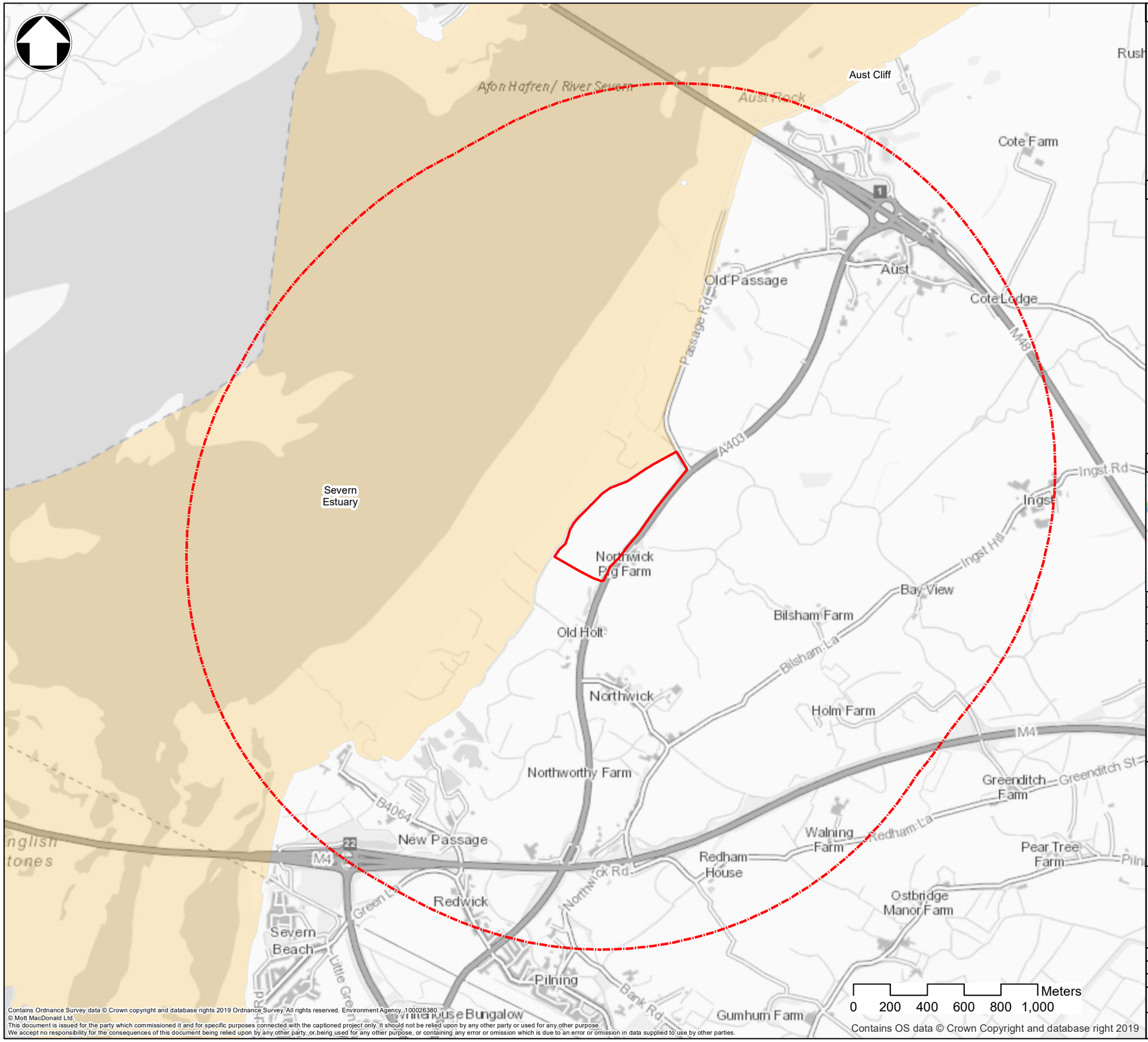
F. National and Local Statutory Designated Sites



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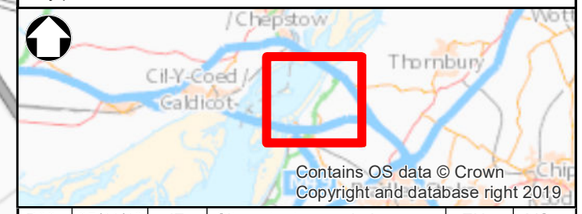
Key to symbols

Legend

- Site extent
- 2km buffer
- Sites of Special Scientific Interest (SSSIs)

Key plan



Rev	Date	Drawn	Description	Ch'k'd	App'd
P02	25/11/19	JF	Site extent amended	EH	MS
P01	25/09/19	MH	For Information	TC	MS

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ASEA Ecology & Flood Mitigation and Ecology Scheme
Stockpiling at Land off A403 at Northwick
Ecological Impact Assessment
National and Local Statutory Designated Sites

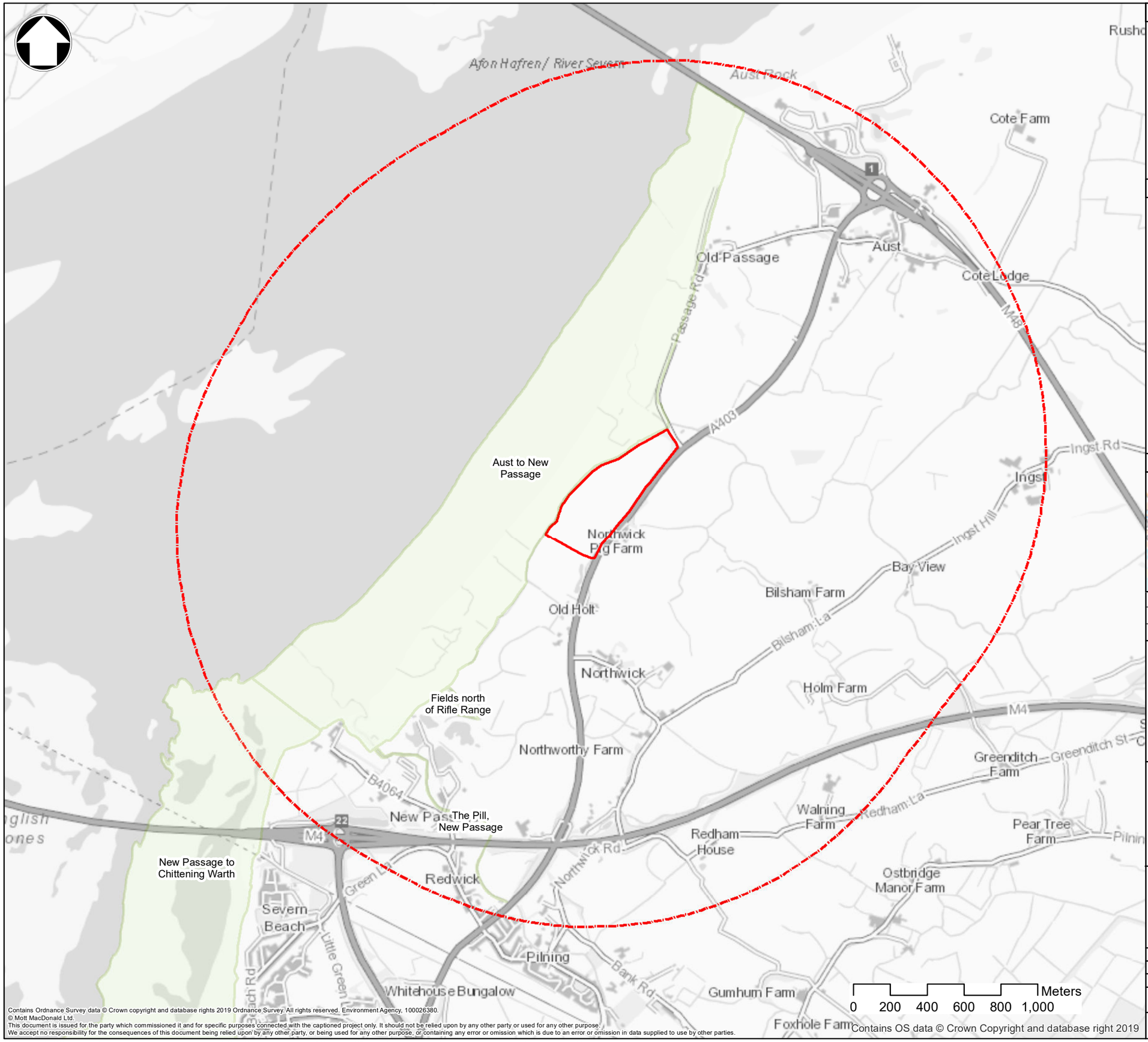
Designed	M Hemmings	MH	Eng Check	E Haggett	EH
Drawn	J Faber	JF	Coordination	C Postlethwaite	CP
GIS Check	M Hayward	MHa	Approved	M Secker	MS

Scale at A3	Status	Rev	Security
1:20,000	INF	P02	STD

Drawing number

ENVIMSW002194-BMM-XX-A10-DR-EY-0301013

G. Non-statutory Designated Sites



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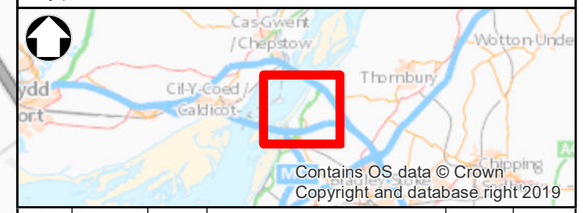
Key to symbols

Legend

- Sites of Nature Conservation Importance (SNCIs)
- Site extent
- 2km buffer

Key plan



Rev	Date	Drawn	Description	Ch'k'd	App'd
P02	25/11/19	JF	Site extent amended	EH	MS
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Ecological Impact Assessment
Non-statutory Sites

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GIS Check	M Hayward	MHa	Approved	M Secker	MS

Scale at A3	Status	Rev	Security
1:20,000	INF	P02	STD

Drawing number
ENVIMSW002194-BMM-XX-A10-DR-EY-0301014

H. Habitats of Principal Importance

Afon Hafren/ River Severn
Aust Pill
Rusholme
Cote Farm
Aust
Old Passage
Passage Rd
Cote Lodge
M48
A403
Ingst Rd
Ingst
Ingst Hill
Box
Northwick Pig Farm
Bay View
Bilsham Farm
Old Holt
Bilsham La
Northwick
Holm Farm
M4
Sidney Cottage
Northworthy Farm
Greenditch Farm
Greenditch St
B4064
New Passage
22
M4
Walning Farm
Redham La
Redham House
Pear Tree Farm
Pilning St
Northwick Rd
Redwick
Ostbridge Manor Farm
Severn Beach
Green La
Little Green La
Beach Rd
Pilning
Bank Rd
Whitehouse Bungalow
Gumhum Farm
Foxhole Farm
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Notes

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2. Contains public sector information licensed under the Open Government Licence v3.0 (http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/)
3. To be read in conjunction with ENVIMSW002194-BMM-XX-A10-RP-EY-0301009

Key to symbols

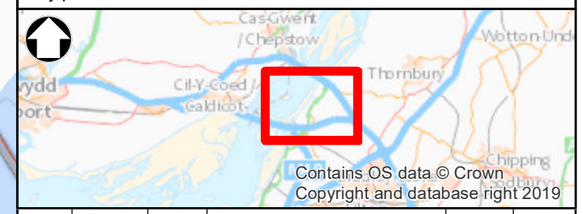
Legend

- Site extent
- 2km buffer

Priority habitat types

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Deciduous woodland
- Lowland meadows
- Maritime cliff and slope
- Mudflats
- No main habitat but additional habitats present
- Traditional orchard

Key plan



Rev	Date	Drawn	Description	Ch'k'd	App'd
P02	25/11/19	JF	Site extent amended	EH	MS
P01	25/09/19	MH	For Information	TC	MS

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Client

Title

ASEA Ecology & Flood Mitigation and Ecology Scheme
Stockpiling at Land off A403 at Northwick
Ecological Impact Assessment
Habitats of Principal Importance

Designed	M Hemmings	MH	Eng Check	E Haggett	EH
Drawn	J Faber	JF	Coordination	C Postlethwaite	CP
GIS Check	M Hayward	MHa	Approved	M Secker	MS

Scale at A3	Status	Rev	Security
1:20,000	INF	P02	STD

Drawing number
ENVIMSW002194-BMM-XX-A10-DR-EY-0301015

I. Photographs

Photograph 8.1: Neutral grassland in the northern field facing west with the line of poplar trees in the background.

Photograph 8.2: Neutral grassland in the southern field facing south-east.

Photograph 8.3: Northern defunct hedge facing west with the line of poplar trees in the background.

Photograph 8.4: Southern defunct hedge facing north.

Note: The gap between the scrub shown in this picture (at grid reference ST5579587541) is a good example of a potential location for the temporary access road between the two fields since it is wider than 10m.

Photograph 8.5: Southern intact hedge facing west.

Photograph 8.6: Understory and dry ditch in the southern intact hedgerow.

Photograph 8.7: Western intact hedgerow in the south-west corner of the survey area facing north.

Photograph 8.8: Eastern hedgerow facing south with head-height wire fence.

Photograph 8.9: Eastern intact hedgerow in the northern field facing north with and old access point.

Photograph 8.10: Inside the two rows of polar trees facing north.

Photograph 8.11: The understory of the poplar trees with the barbed wire fence border facing west.

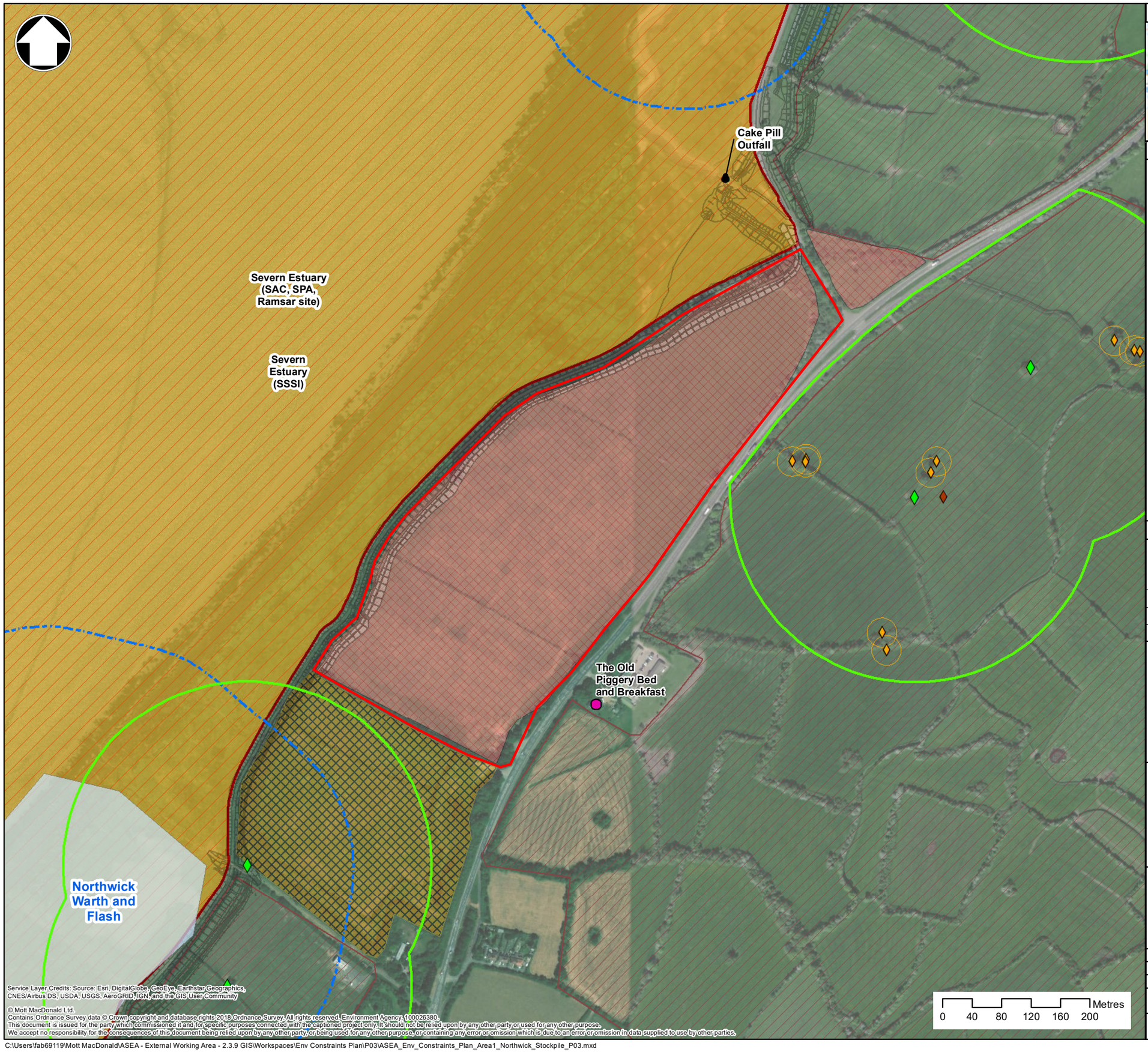
Photograph 8.12: Hardstanding next to the proposed Site access point in the south-east corner.

Photograph 8.13: Hardstanding next to the proposed Site access point supporting farming equipment in the south-east corner.

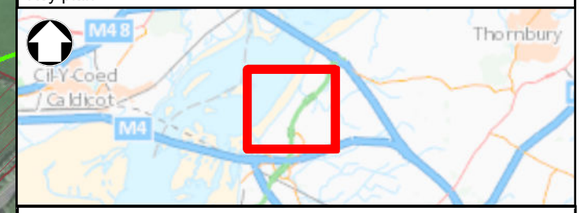
Photograph 8.14: The metal gates in the south-east corner of the Site which is the proposed access point to the Site from the A403.

The vegetation above this gate might need pruning to permit larger vehicle access. Consideration should be given to minimising the

J. Environmental Constraints Plan



Key plan



Key to symbols

- Northwick stockpile
- The Old Piggery Bed and Breakfast
- Outfall
- Bat record
- Bat roost
- 20m buffer around bat roost
- Confirmed great crested newt pond
- 250m buffer around great crested newt ponds
- High tide roost site
- 200m buffer around high tide roost sites
- Site of Special Scientific Interest (SSSI)
- Severn Estuary Special Area of Conservation (SAC), Special Protection Area (SPA), and Ramsar site (shared boundaries with project area)
- Ridge and furrow
- Historical landfill
- Authorised landfill

Notes

1. For information only, not for construction.
2. Proposed scheme layout is representative at the date of drawing issue. Drawing will be revised, if required, following design updates.
3. Contains, or is based on, information supplied by Natural England.

Rev	Date	Drawn	Description	Ch'k'd	App'd
P03	22/11/19	JF	Stockpile boundary amended	CP	PE
P02	04/11/19	JF	The Old Piggery Bed and Breakfast added	CP	PE

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Environment Agency
South Gloucestershire Council

Title

ASEA Ecology & Flood Mitigation Scheme
Stockpile at land off A403 at Northwick
Environmental Constraints Plan

Originator	J Faber	JF	Tech Check	C Postlethwaite	CP
Content Check	E Haggett	EH	Coordination	A Kirby	AK
GIS Check	T Ruff	TR	Approved	P Easton	PE

Scale at A3	Status	Rev	Security
1:5,000	INF	P03	STD

Drawing number

ENVIMSW002194-BMM-XX-A10-DR-EN-0302078

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K. Notable Bird Species Recorded Within 2km of the Site

Table 15: Summary of bat biological records with 2km of the Site

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Avocet (*Recurvirostra avosetta*)	1	2017	Y			**Y**
Barn owl (*Tyto alba*)	3	2013	Y			**Y**
Bar-tail godwit (*Limosa lapponica*)	4	2017				**Y**
Bearded tit (*Panurus biarmicus*)	3	2012	Y			**Y**
Bewick's swan (*Cygnus columbianus*)	2	2010	Y	**Y**		**Y**
Black term (*Chilidonia niger*)	1	2010	Y			**Y**
Blackcap (*Sylvia atricapilla*)	5	2010				
Black-headed gull (*Chroicocephalus ridibundus*)	56	2018				Y
Black-tailed godwit (*Limosa limosa*)	37	2018	Y	Y	Y	
Brent goose (*Branta bernicla*)	2	2014				Y
Bullfinch (*Pyrrhula pyrrhula*)	3	2012		Y		Y
Buzzard (*Buteo buteo*)	20	2018				
Canada goose (*Branta canadensis*)	56	2018				
Cetti's warbler (*Cettia cetti*)	2	2009	Y			

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Chiffchaff (*Phylloscopus collybita*)	11	2013				
Common cuckoo (*Cuculus canorus*)	1	2012		Y	Y	
Common gull (*Larus canus*)	8	2018				Y
Common sandpiper (*Actitis hypoleucos*)	53	2018				Y
Cormorant (*Phalacrocorax carbo*)	29	2018				Y
Curlew (*Numenius arquata*)	98	2018		Y		Y
Curlew sandpiper (*Calidris ferruginea*)	3	2016				
Dunlin (*Calidirs alpine*)	77	2018			Y	
Eygptian goose (*Alopochen aegyptiacus*)	2	2016				
Fieldfare (*Turdus pilaris*)	6	2013	Y		Y	
Gadwall (*Anas Strepera*)	38	2018				Y
Garden warbler (*Sylvia borin*)	4	2010				
Glossy Ibis (*Plegadis falcinellus*)	1	2015				
Goldcrest (*Regulus regulus*)	2	2013				Y
Golden plover (*Pluvialis apricaria*)	1	2016				Y
Goldeneye (*Bucephala clangula*)	2	2010	Y			Y
Goldfinch (*Carduelis carduelis*)	7	2016				
Great black-backed gull	3	2016				Y

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
(*Larus marinus*)						
Great spotted woodpecker (*Dendrocopos major*)	2	2013				
Green sandpiper (*Tringa ochropus*)	5	2017	Y			Y
Green woodpecker (*Picus viridis*)	2	2013				Y
Greenfinch (*Cholirs chloris*)	1	2010				
Greenshank (*Tringa nebularia*)	12	2017	Y			Y
Grey heron (*Ardea cinereal*)	44	2018	Y			
Grey plover (*Pluvialis squatarola*)	11	2018				Y
Grey wagtail (*Montacilla cinerea*)	3	2013				Y
Greylag goose (*Anser anser*)	4	2016	Y			Y
Guillemot (*Uria aalge*)	1	2010				Y
Herring gull (*Larus argentatus*)	23	2018		Y	Y	
Hobby (*Falco Subbuteo*)	3	2017	Y			
House Martin (*Delichon urbicum*)	3	2018				Y
House sparrow (*Passer domesticus*)	7	2016		Y	Y	
Jack snipe (*Lymnocryptes minimus*)	5	2016				Y
Kestrel (*Falco tinnunculus*)	38	2018				Y
Kingfisher (*Alcedo atthis*)	4	2016	Y			Y
Knot (*Calidris canutus*)	14	2017				Y

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Lapland bunting (*Calcarius lapponicus*)	1	2010	Y			Y
Lapwing (*Vanellus vanellus*)	56	2018		Y	Y	
Lesser black-backed gull (*Larus fuscus*)	25	2018				Y
Lesser whitethroat (*Sylvia curruca*)	3	2010				
Linnet (*Linaria cannabina*)	12	2018		Y	Y	
Little egret (*Egretta garzetta*)	56	2018				Y
Little grebe (*Tachybaptus ruficoliis*)	33	2018				Y
Little gull (*Hydrocoloeus minutus*)	1	2016	Y			Y
Little ringed plover (*Charadrius dubius*)	7	2018	Y			
Little Stint (*Calidris minuta*)	1	2016				
Mallard (*Anas platyrhynchos*)	99	2018				Y
Marsh harrier (*Circus aeruginosus*)	2	2010	Y			Y
Marsh tit (*Poecile palustris*)	1	2009		Y	Y	
Meadow pipit (*Anthus pratensis*)	17	2018				Y
Mediterranean gull (*Larus melanocephalus*)	8	2018	Y			Y
Merlin (*Falco columbarius*)	8	2010	Y			Y
Mistle thrush (*Turdus viscivorus*)	4	2013				Y
Mute Swan (*Cygnus olor*)	40	2018				Y

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Oystercatcher (*Haematopus ostralegus*)	65	2018				Y
Peregrine (*Falco peregrinus*)	15	2010	Y			Y
Pied wagtail (*Motacilla alba*)	9	2018				
Pintail (*Anas acuta*)	8	2017	Y			Y
Pochard (*Aytha farina*)	6	2018				Y
Raven (*Corvus corax*)	15	2010				
Red kite (*Milvus milvus*)	4	2013	Y			Y
Redshank (*Tringa tetanus*)	67	2018				Y
Redwing (*Turdus iliacus*)	8	2013	Y		Y	
Reed bunting (*Emberiza schoeniclus*)	7	2012		Y		Y
Reed warbler (*Acrocephalus scripaceus*)	37	2013				
Ringed plover (*Charadrius hiaticula*)	18	2018				Y
Robin (*Erithacus rubecula*)	2	2016				
Rock pipit (*Anthus petrosus*)	1	2009				
Ruff (*Calidris pugnax*)	5	2017	Y		Y	
Sand martin (*Riparia riparia*)	5	2018				Y
Sanderling (*Calidirs alba*)	3	2018				
Scaup (*Aythya marila*)	1	2010	Y	Y	Y	
Sedge warbler (*Acrocephalus*)	11	2013				

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Shelduck (*Tadorna tadorna*)	126	2018				Y
Short-eared owl (*Asio flammeus*)	20	2018				Y
Shoveler (*Anas clypeata*)	37	2018				Y
Siskin (*Spinus spinus*)	5	2016				
Skylark (*Aluda arvensis*)	17	2018		Y	Y	
Smew (*Mergellus albellus*)	2	2010				Y
Snipe (*Gallinago gallinago*)	39	2018				Y
Song thrush (*Turdus philomelos*)	9	2013		Y	Y	
Sparrowhawk (*Accipiter nisus*)	10	2012				
Spotted flycatcher (*Muscicapa striata*)	2	2009		Y	Y	
Spotted redshank (*Tringa erthopus*)	2	2017				Y
Starling (*Sturnus vulgaris*)	24	2018		Y	Y	
Stock dove (*Coumba oenas*)	1	2017				Y
Stonechat (*Saxicola rubicola*)	9	2010				Y
Swallow (*Hirundo rustica*)	15	2018				Y
Swift (*Apus apus*)	2	2017				Y
Teal (*Anas crecca*)	94	1018				y
Temmick's stint (*Calidirs temminckii*)	1	2016			Y	
Tree pipit (*Anthus trivialis*)	1	2010		Y	Y	

Species	No. of records	Most recent record	Schedule 1 of WCA	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Tufted duck (*Aythya fuligula*)	32	2018				Y
Turnstone (*Arenaria interpres*)	17	2018				Y
Water pipit (*Anthus spinoletta*)	3	2012				Y
Water rail (*Rallus aquaticus*)	9	2016				Y
Wheateater (*Oenanthe oenanthe*)	11	2018				Y
Whimbrel (*Numenius phaeopus*)	21	2018	Y		Y	
Whinchat (*Saxicola rubetra*)	4	2010				Y
White-fronted goose (*Anser albifrons*)	3	2010				Y
Whitethroat (*Sylvia communis*)	1	2017				Y
Whooper swan (*Cygnus cygnus*)	3	2018	Y			Y
Wigeon (*Anas Penelope*)	106	2018				Y
Willow warbler (*Phylloscopus trochilus*)	2	2016				Y
Wood sandpiper (*Tringa glareola*)	3	2018	Y			Y
Wren (*Troglodytes troglodytes*	4	2018				
Yellow wagtail (*Motacilla flava*)	5	2012		Y	Y	
Yellowhammer (*Embberiza citronella*)	2	2010		Y	Y	

Source: BRERC