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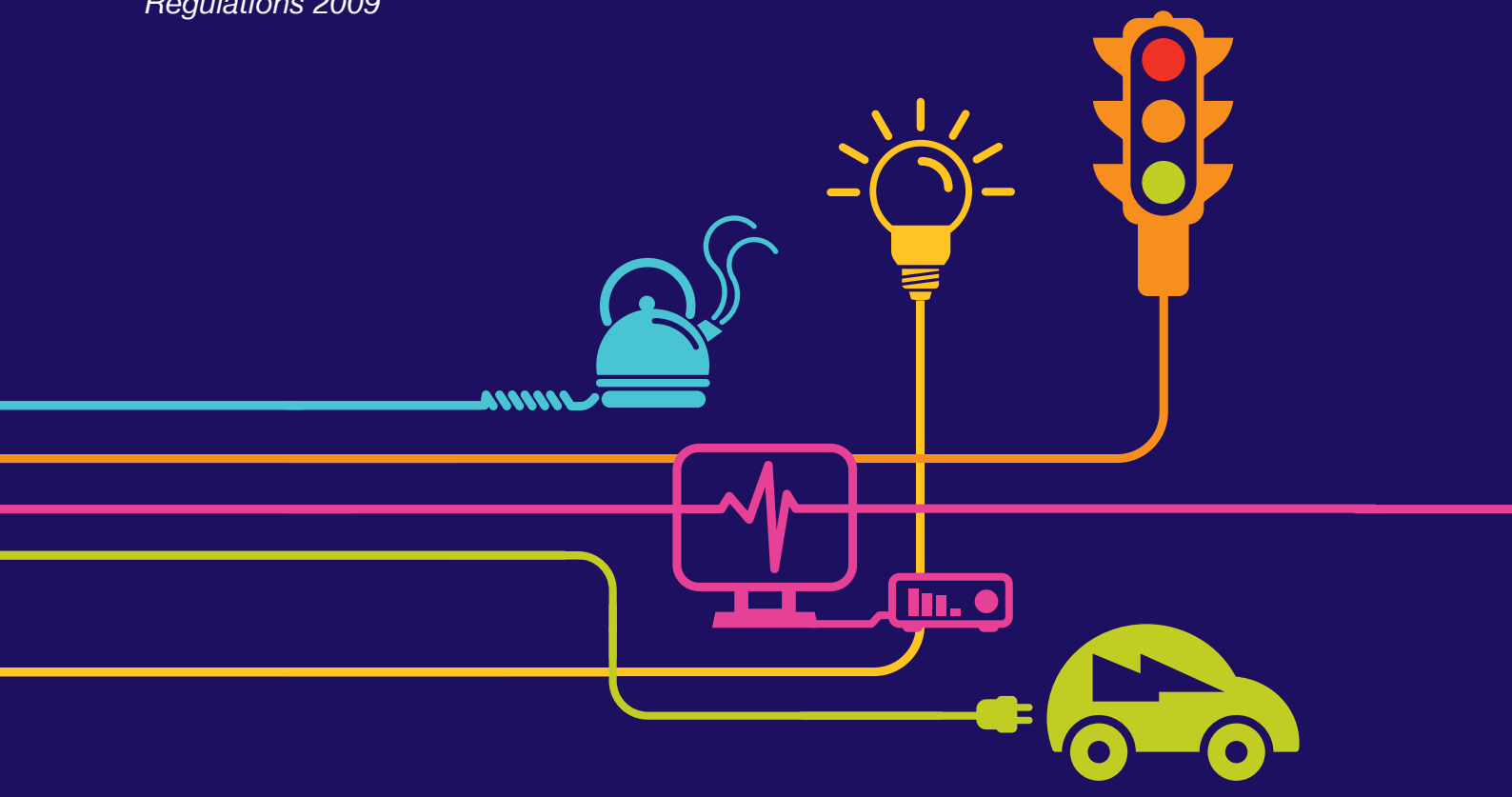
Environmental Statement
The Applicant's Report to Support Habitats Regulations Assessment Appendices

Hinkley Point C Connection Project

Regulation 5(2)(g) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009



Application Reference EN020001

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Appendix 20A – Screening Matrices

Potential Impacts

Potential impacts upon the European site(s)* which are considered within the submitted Habitats Regulations Assessment report (Volume 5.20 of Environmental Statement) are provided in the table below. Impacts have been grouped where appropriate for ease of presentation.

* As defined in PINS Advice Note 10.

Impacts considered within the screening matrices

Designation	Impacts in submission information	Presented in screening matrices as
European site name/designation **Avon Gorge Woodlands SAC** **Chew Valley Lake SPA** **Wye Valley Woodlands SAC** **Wye Valley & Forest of Dean Bat Sites SAC** **River Wye SAC** **Somerset Levels and Moors SPA** **Somerset Levels and Moors Ramsar** **Severn Estuary SPA** **Severn Estuary Ramsar** **Severn Estuary SAC** **North Somerset and Mendip Bats SAC** **Mendip Limestone Grasslands SAC** **Mendip Woodlands SAC** **Exmoor and Quantock Oakwoods SAC** **Mells Valley SAC** **Bath and Bradford on Avon Bat SAC**	Collision during Daily Feeding Flights	Effect 1
	Collision during migratory flights	Effect 2
	Displacement from feeding grounds	Effect 3
	Disturbance (human activity, noise and artificial lighting)	Effect 4
	Deterioration in air quality	Effect 5
	Deterioration in water quality	Effect 6
	Habitat losses	Effect 7
	Loss/disturbance of bat foraging and commuting routes	Effect 8
	Loss of bat roosting habitat	Effect 9
	Risk of death/injury to bats	Effect 10
	Habitat degradation	Effect 11
	Increased sedimentation in intertidal areas	Effect 12

STAGE 1: SCREENING MATRICES

The European Sites included within the Applicant's assessment are:

A - Avon Gorge Woodlands SAC UK0012734

B - Chew Valley Lake SPA UK9010041

C - Wye Valley Woodlands SAC UK0012727

D - Wye Valley & Forest of Dean Bat Sites SAC UK0014794

E - River Wye SAC UK0012642

F - The Somerset Levels and Moors SPA (site code: UK9010031)

G - The Somerset Levels and Moors Ramsar (site code: UK11064)

H - The Severn Estuary SPA (site code: UK9015022)

I - The Severn Estuary Ramsar (site code: UK11081)

J - The Severn Estuary SAC (site code: UK0013030)

K - North Somerset and Mendip Bats SAC (site code: UK0030052)

L - Mendip Limestone Grasslands SAC (site code: UK0030203)

M - Mendip Woodlands SAC UK0030048

N - Exmoor and Quantock Oakwoods SAC (site code: UK0030148)

O - Mells Valley SAC (site code: UK0012658)

P - Bath and Bradford on Avon Bat SAC (site code: UK0012584)

Evidence for likely significant effects on their qualifying features is detailed within the footnotes to the screening matrices.

Matrix Key:

✓ = Likely significant effect **cannot** be excluded
✗ = Likely significant effect **can** be excluded

C = construction
O = operation
D = decommissioning

Where effects are not applicable to a particular feature they are greyed out.

Stage 1 Matrix A : Avon Gorge Woodlands SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 11 = Habitat degradation

Name of European site: Avon Gorge Woodlands SAC															
Distance to NSIP 3km															
European site features	**Likely Effects of NSIP**														
	Effect 4			*Effect 5*			*Effect 7*			*Effect 11*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H9180 *Tilio-Acerion* forests of slopes, screes and ravines.	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*).	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**

Evidence supporting conclusions

a. Avon Gorge SAC is located over 3km from the nearest area of the Proposed Development. Due to the distance between the designation and proposals no direct or indirect adverse effects on Annex 1 habitats are considered likely to arise (Section 3.4 of HRA (ES Volume 5.20)).

Stage 1 Matrix B : Chew Valley Lake SPA

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement from feeding grounds

Name of European site: Chew Valley SPA												
Distance to NSIP 10km												
European site features	**Likely Effects of NSIP**											
	Effect 1			*Effect 2*			*Effect 3*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Article 4.2 of the Directive (79/409/EEC): Supports populations of European importance of over wintering Shoveler *Anas clypeata*, (503 individuals representing up to 1.3% of the wintering Northwestern/ Central Europe population (5 year	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**

peak mean 1991/2 - 1995/6))												

Evidence supporting conclusions

a. Chew Valley Lake SPA is located 10km from the nearest area of the Proposed Development. Virtually no records of shoveler (either in-flight or otherwise) were identified during field surveys along or adjacent to the Proposed Development (Section 4 of HRA, Paras 4.2.102 – 4.2.106). Due to these factors no direct or indirect adverse effects on the designated over wintering population shoveler are considered likely to arise (Section 3.4 of HRA).

Stage 1 Matrix C : Wye Valley Woodlands SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: Wye Valley Woodlands SAC																					
Distance to NSIP over 5km																					
European site features	**Likely Effects of NSIP**																				
	Effect 4			*Effect5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H9130 *Asperulo-Fagetum* beech forests	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
H9180 *Tilio-Acerion* forests of slopes, screes and ravines	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
H91J0 *Taxus baccata* woods of the British Isles	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
S1303 Lesser horseshoe bat *Rhinolophus*	**x b**	**x b**	**x b**				**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**

hipposideros ferrumequinum																				

Evidence supporting conclusions

a. Wye Valley Woodlands SAC is located over 5km from the nearest area of the Proposed Development. Due to the distance between the designation and proposals no direct or indirect adverse effects on Annex 1 habitats are considered likely to arise (Section 3.4 of HRA).

b. Research indicates that the lesser horseshoe bat forages in close proximity to roost sites. Habitat within 1 to 2.5km of a nursery roost is quoted as being important for conservation management of this species (Bontadina et al., 2001). Hibernation roosts are typically within 5km of the maternity roost. The lesser horseshoe bat populations associated with this designation are likely to be distinct from those associated with the North Somerset and Mendip Bats SAC or individuals recorded within Section F of the Proposed Development route. No direct or indirect adverse effects on Annex II bats associated with this site are considered likely to arise (Section 3.4 of HRA).

Stage 1 Matrix D : Wye Valley & Forest of Dean Bat Sites SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: Wye Valley & Forest of Dean Bat Sites SAC																		
Distance to NSIP 7km																		
European site features	**Likely Effects of NSIP**																	
	Effect 4			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1303 Lesser horseshoe bat *Rhinolophus hipposideros*	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
S1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**

Evidence supporting conclusions

a. Research indicates that lesser horseshoe bat forage in close proximity to roost sites. Habitat within 1 to 2.5km of a nursery roost is quoted as being important for conservation management of this species. Hibernation roosts are typically

within 5km of the maternity roost. The lesser horseshoe bat populations associated with this designation are likely to be distinct from those associated with the North Somerset and Mendip Bats SAC or individuals recorded within Section F of the Proposed Development route. No direct or indirect adverse effects on LHS bats associated with this site are likely (Section 3.4 of HRA).

b. No direct effects on greater horseshoe bat roosts within this SAC would arise. Research indicates that greater horseshoe bats typically forage 3 to 5km from the roost. There are some records of greater horseshoe travelling over 10km but habitat at such distances is unlikely to be significantly used. The greater horseshoe bat populations associated with this designation are likely to be distinct from those associated with the North Somerset and Mendip Bats SAC or individuals recorded within Section F of the Proposed Development route. It is unlikely that any indirect effects on greater horseshoe bat roosts or foraging habitat or daily commuting routes would result from the development proposals, particularly given that the presence of the Severn Estuary would effectively preclude any regular movement of bats between the SAC and the proposed route of the overhead line (ES Volume 5.8.2.4 Appendix 8F).

Stage 1 Matrix E : River Wye SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 6 = Deterioration in water quality
Effect 7 = Habitat losses
Effect 11 = Habitat degradation
Effect 12 = Increased sedimentation in intertidal areas

Name of European site: River Wye SAC																		
Distance to NSIP 3km																		
European site features	**Likely Effects of NSIP**																	
	Effect 4			*Effect 6*			*Effect 7*			*Effect 11*			*Effect 12*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *callitricho-Batrachion* vegetation.	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
H7140 Transition mires and quaking bogs.	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
S1092 White-clawed crayfish	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**				**x b**	**x b**	**x b**	**x b**	**x b**	**x b**

Austropotamobius pallipes																	
S1095 Sea lamprey *Petromyzon marinus*	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**				**x c**	**x c**	**x c**	**x c**	**x c**	**x c**
S1096 Brook lamprey *Lampetra planeri*	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**				**x d**	**x d**	**x d**	**x d**	**x d**	**x d**
S1099 River lamprey *Lampetra fluviatilis*	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**				**x c**	**x c**	**x c**	**x c**	**x c**	**x c**
S1103 Twaite shad *Alosa fallax*	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**				**x e**	**x e**	**x e**	**x e**	**x e**	**x e**
S1106 Atlantic salmon *Salmo salar*	**x f**	**x f**	**x f**	**x f**	**x f**	**x f**	**x f**	**x f**	**x f**				**x f**	**x f**	**x f**	**x f**	**x f**	**x f**
S1163 Bullhead *Cottus gobio*	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**				**x c**	**x c**	**x c**	**x c**	**x c**	**x c**
S1102 Allis shad *Alosa alosa.*	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**	**x e**				**x e**	**x e**	**x e**	**x e**	**x e**	**x e**
S1355 Otter *Lutra lutra*	**x g**	**x g**	**x g**	**x g**	**x g**	**x g**	**x g**	**x g**	**x g**				**x g**	**x g**	**x g**	**x g**	**x g**	**x g**

Evidence supporting conclusions

a. The River Wye SAC is located 3km from the nearest area of the Proposed Development. Due to the distance between the designation and proposals no direct or indirect adverse effects on Annex 1 habitats are considered likely to arise (Section 3.4 of the HRA).

b. White clawed crayfish populations associated with this designation are unlikely to cross the Severn Estuary (Section 3.4 of the HRA).

c. Current knowledge indicates river lamprey do not use watercourses crossed by the Proposed Development. There are no records for sea lamprey in rivers feeding into the Severn Estuary from the south. There is an isolated record at the River Parrett estuary but this river system is not crossed by the Proposed Development. It is concluded that there is no likely significant effect on the River Wye SAC regarding sea and river lamprey (Section 3.6 of the HRA, Para 3.6.24 – 3.6.26 and Para 3.6.27 – 3.6.29).

d. Due to the separation of the designation from the location of the Proposed Development it is concluded that there is no likely significant effect on the River Wye SAC regarding brook lamprey or bullhead, both of which are non-migratory freshwater species (Section 34 of the HRA).

e. The designated River Wye population of both twaite and allis shad will form part of the Severn Estuary SAC designated population and therefore works within or adjacent to the Severn Estuary could potentially affect the designated River Wye population of both species. There are no known spawning sites on rivers crossed by the Proposed Development. The two areas of the Proposed Development that intersect with the Severn Estuary SAC designation comprise new overhead line entries in agricultural land at Hinkley Point C and the overhead line crossing of the River Avon. These works would not influence the environmental conditions of the estuary. No likely significant effect on the designated populations of the River Wye SAC twaite and allis shad is, therefore, concluded (Section 3.4 of the HRA).

f. Breeding adult Atlantic salmon are faithful to their spawning grounds. Therefore populations associated with this designation are highly unlikely to use rivers crossed by the Proposed Development. A conclusion of no likely significant effect on the River Wye SAC population of Atlantic salmon is therefore reached (Section 3.4 of the HRA).

g. Otters associated with the River Wye SAC are considered unlikely to routinely cross the Severn Estuary. Otter home range size can vary considerably and individuals could potentially undertake movements into the Proposed Development area. However, given the significant distance from the SAC and the presence of the estuary it is considered that a conclusion of no likely significant effect with respect to the otter population of the River Wye SAC can be reached (Section 3.4 of the HRA).

Stage 1 Matrix F : Somerset Levels and Moors SPA

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses

Name of European site: Somerset Levels and Moors SPA																		
Distance to NSIP 2km																		
European site features	**Likely Effects of NSIP**																	
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
A037 Cygnus columbianus bewickii; Bewick's swan (over-wintering)		✓ **a**			**x b**		**x c**	**x d**	**x c**	**x c**	**x d**	**x c**	**x c**	**x e**	**x c**	**x f**	✓ **g**	**x f**
A052 Anas Crecca; Eurasian teal (over-wintering)		✓ **h**			✓ **h**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A140 Pluvialis apricaria; Golden plover (over-wintering)		✓ **k**			✓ **k**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A142 Vanellus vanellus Northern lapwing (over-wintering)		✓ **l**			✓ **l**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A050 Anas		✓			✓		✓	**x**	✓	✓	**x**	✓	✓	**x**	✓	✓	✓	✓

penelope; Eurasian wigeon (over-wintering)		**m**			**m**		**i**	**d**	**i**	**i**	**d**	**i**	**i**	**e**	**i**	**j**	**g**	**j**
A056 Anas clypeata; Northern Shoveler (over-wintering)		**x n**			**x n**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **i**	**x d**	✓ **i**
Under Article 4.2 Qualification, the Somerset Levels and Moors SPA regularly supports an overwintering population of 72,874 waterfowl (5-year peak mean 1991/2-1995/6). Contributing bird species include Bewick's swan, wigeon, gadwall, teal, pintail, shoveler, snipe, lapwing, and golden plover.		✓ **o**			✓ **o**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **i**	✓ **g**	✓ **i**

Evidence supporting conclusions

a. Desktop and field survey findings suggest that Bewick's swan do not undertake local flights between feeding sites within the study area. The proximity of the study area to parts of the Somerset Levels suggests that foraging swans might fly across parts of the study area at least occasionally (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Bewick's swan (and other swan species) are known to be at risk of collision with overhead power lines because of their relatively large body size and reduced manoeuvrability (Rose and Baillie, 1989). While no Bewick's swans were observed during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5), the potential for collision mortality to this species cannot be discounted, and given its small wintering population on the Somerset Levels (ES Volume 5.8.2.4 Appendix 8F Section 4.5), any mortality loss could potentially be significant.

b. Migration of Bewick's swan through the study area is considered very unlikely (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

c. Bewick's swans do not regularly use fields within the study area for feeding or resting (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Given the relatively small size of the Bewick's swan population and the lack of evidence to indicate that the swans regularly use the study area it is considered that any disturbance and displacement effects of the Proposed Development on the Bewick's swan population during construction and decommissioning would be insignificant. No habitat loss from within existing designated areas that may be used by this species would arise. The temporary loss of agricultural grasslands within the power line corridor during construction would not affect habitats used by this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

d. Disturbance to waterbirds during the operational phase of the project was not identified as a potential effect that would give rise to any significant impact (ES Volume 5.8.1).

e. No habitat loss additional to the temporary habitat loss that would occur during construction, and likely to affect waterbird species, would arise during the operational phase of the project (ES Volume 5.8.1).

f. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA/Ramsar designated population of Bewick's swan.

g. As potential for a significant collision mortality exists for the project alone, a potential significant effect in-combination with other projects (in particular proposed onshore wind farms) and plans cannot be ruled out at this stage.

h. Teal were observed in small numbers flying close to and across the route corridor during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The movements of small ducks detected in the Radar study for the proposed wind farm near West Huntspill could potentially include this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect on the Somerset Levels and Moors SPA is therefore not ruled out for collision risk during operation (HRA Table 4.3).

i. The available survey data (Volumes 5.8.3.3 to 5.8.3.5, Figures 8.11 to 8.16 and ES Volume 5.8.2.4 Appendix 8F Section 4.5) indicates that usage of land within the preferred corridor by teal, golden plover, lapwing, wigeon, shoveler and other waterbird species for which the Somerset Levels and Moors SPA is designated is limited. Disturbance and displacement that would have potential consequences at the designated population level is therefore unlikely to be of significance. However, given the proximity of the Proposed Development at several locations to the SPA, it is considered a likely significant effect could arise and it is therefore appropriate to examine the potential for this effect to influence designated populations. Similarly, the bird surveys revealed only a few small areas where habitat is likely to be of importance to waders and waterfowl during the winter months. Works within or adjacent to these areas may result in the loss of habitat used by SPA designated populations.

j. A number of other projects were identified through the screening process (Section 3.10 of the HRA) that could potentially also lead to disturbance and displacement effects on designated SPA waterbird populations, potentially leading to interaction and in-combination effects with the Hinkley Point C Connection Project.

k. Small flocks of golden plover were observed flying across the route corridor during the vantage point surveys. These birds flew well above potential risk height (ES Volume 5.8.2.4 Appendix 8F Section 4.5). However, there is the possibility that some birds may fly through across the proposed corridor at risk height and given the potential movement of birds between Bridgwater Bay and the Somerset Levels, the potential for collision mortality cannot be discounted.

l. Lapwing was the most numerous waterbird species recorded during the vantage point surveys. Between 35-56% of flights were observed to occur within the potential collision risk zone, indicating that this species may potentially be at risk of collision (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

m. Wigeon were observed in small numbers flying close to and across the route corridor during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The movements of small ducks detected in the Radar study for the proposed wind farm near West Huntspill could potentially include this species (ES Volume 5.8.2.4 Appendix 8F Section

4.5). A likely significant effect on the Somerset Levels and Moors SPA regarding is therefore not ruled out for collision risk during operation.

n. There is no evidence to suggest that shoveler undertake regular movements (locally or between the Somerset Levels and the Severn Estuary) that would entail birds crossing the proposed power line route (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The vantage point surveys recorded only two shoveler flying above collision risk height (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

o. Bewick's swan, wigeon, teal, shoveler, lapwing and golden plover are all part of the Somerset Levels and Moors SPA wintering bird assemblage. In addition to these, other species such as pintail, snipe and gadwall, that may be present in the vicinity of the route of the overhead line (ES Volume 5.8.2.4 Appendix 8F Section 4.5) may be at risk of collision during the operational phase of the project.

Stage 1 Matrix G : Somerset Levels and Moors Ramsar

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 6 = Deterioration in water quality
Effect 7 = Habitat losses

Name of European site: Somerset Levels and Moors Ramsar																					
Distance to NSIP 2km																					
European site features	**Likely Effects of NSIP**																				
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 6*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Cygnus columbianus bewickii; Tundra swan (winter)		✓ **a**			**x b**		**x c**	**x d**	**x c**	**x c**	**x d**	**x c**				**x c**	**x e**	**x c**	**x f**	✓ **g**	**x f**
Anas Crecca; Eurasian teal (winter)		✓ **h**			✓ **h**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
Vanellus vanellus Northern lapwing (winter)		✓ **k**			✓ **k**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
Cygnus olor; Mute swan		✓			✓		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**

(winter)		l			l															
Anas penelope; Eurasian wigeon (winter)		✓ m			✓ m		✓ i	x d	✓ i	✓ i	x d	✓ i				✓ i	x d	✓ i	✓ i	x d	✓ i
Anas acuta; Northern pintail (Winter)		✓ n			✓ n		✓ i	x d	✓ i	✓ i	x d	✓ i				✓ i	x d	✓ i	✓ i	x d	✓ i
Anas clypeata; Northern Shoveler (Winter)		x o			x o		✓ i	x d	✓ i	✓ i	x d	✓ i				✓ i	x d	✓ i	✓ i	x d	✓ i
Criterion 5 Wintering waterfowl assemblage		✓ p			✓ p		✓ i	x d	✓ i	✓ i	x d	✓ i				✓ i	x e	✓ i	✓ i	✓ g	✓ i
Seventeen species of British Red Data Book invertebrates										x q	x q	x q	x q	x q	x q	x q	x q	x q	x q	x q	x q

Evidence supporting conclusions

a. Desktop and field survey findings suggest that Bewick's swan do not undertake local flights between feeding sites within the study area. The proximity of the study area to parts of the Somerset Levels suggests that foraging swans might fly across parts of the study area at least occasionally (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Bewick's swan (and other swan species) are known to be at risk of collision with overhead power lines because of their relatively large body size and reduced manoeuvrability (Rose and Baillie, 1989). While no Bewick's swans were observed during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5), the potential for collision mortality to this species cannot be

discounted, and given its small wintering population on the Somerset Levels (ES Volume 5.8.2.4 Appendix 8F Section 4.5), any mortality loss could potentially be significant.

b. Migration of Bewick's swan through the study area is considered very unlikely (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

c. Bewick's swans do not regularly use fields within the study area for feeding or resting (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Given the relatively small size of the Bewick's swan population and the lack of evidence to indicate that the swans regularly use the study area it is considered that any disturbance and displacement effects of the Proposed Development on the Bewick's swan population during construction and decommissioning would be insignificant. No habitat loss from within existing designated areas that may be used by this species would arise. The temporary loss of agricultural grasslands within the power line corridor during construction would not affect habitats used by this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

d. Disturbance to waterbirds during the operational phase of the project was not identified as a potential effect that would give rise to any significant impact (ES Volume 5.8.1).

e. No habitat loss additional to the temporary habitat loss that would occur during construction, and likely to affect waterbird species, would arise during the operational phase of the project (ES Volume 5.8.1).

f. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA/Ramsar designated population of Bewick's swan.

g. As potential for a significant collision mortality exists for the project alone, a potential significant effect in-combination with other projects (in particular proposed onshore wind farms) and plans cannot be ruled out at this stage.

h. Teal were observed in small numbers flying close to and across the route corridor during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The movements of small ducks detected in the Radar study for the proposed wind farm near West Huntspill could potentially include this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect on the Somerset Levels and Moors Ramsar is therefore not ruled out for collision risk during operation (Table 4.3 of the HRA).

i. The available survey data (Volumes 5.8.3.3 to 5.8.3.5, Figures 8.11 to 8.16 and ES Volume 5.8.2.4 Appendix 8F Section 4.5) indicates that usage of land within the preferred corridor by teal, lapwing, mute swan, wigeon, pintail, shoveler and other waterbird species for which the Somerset Levels and Moors Ramsar is designated is limited. Disturbance and displacement that would have potential consequences at the designated population level is therefore unlikely to be of significance. However, given the proximity of the Proposed Development at several locations to the Ramsar, it is considered a likely significant effect could arise and it is therefore appropriate to examine the potential for this effect to influence designated populations. Similarly, the bird surveys revealed only a few small areas where habitat is likely to be of importance to waders and waterfowl during the winter months. Works within or adjacent to these areas may result in the loss of habitat used by Ramsar designated populations.

j. A number of other projects were identified through the screening process (Section 3.10 of the HRA) that could potentially also lead to disturbance and displacement effects on designated Ramsar waterbird populations, potentially leading to interaction and in-combination effects with the Hinkley Point C Connection Project.

k. Lapwing was the most numerous waterbird species recorded during the vantage point surveys. Between 35-56% of flights were observed to occur within the potential collision risk zone, indicating that this species may potentially be at risk of collision (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

l. Field survey findings confirm that mute swan do regularly fly in small numbers within the risk zone when undertaking local flights between feeding sites within the study area (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect on the Somerset Levels and Moors Ramsar population of mute swan regarding collision risk during operation is not ruled out at this stage.

m. Wigeon were observed in small numbers flying close to and across the route corridor during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The movements of small ducks detected in the Radar study for the proposed wind farm near West Huntspill could potentially include this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect on the Somerset Levels and Moors Ramsar regarding is therefore not ruled out for collision risk during operation.

n. Pintail were not recorded during any wintering bird surveys undertaken for this project and no pintail flight lines were recorded (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Some of the flight lines within the radar study carried out by

FERA may have included this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect on the Somerset Levels and Moors Ramsar is therefore not ruled out for collision risk during operation.

o. There is no evidence to suggest that shoveler undertake regular movements (locally or between the Somerset Levels and the Severn Estuary) that would entail birds crossing the proposed power line route (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The vantage point surveys recorded only two shoveler flying above collision risk height (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

p. Bewick's swan, mute swan, wigeon, teal, shoveler, pintail and lapwing are all part of the Somerset Levels and Moors Ramsar wintering bird assemblage. In addition to these, other species that form part of the waterfowl assemblage may be present in the vicinity of the route of the overhead line (ES Volume 5.8.2.4 Appendix 8F Section 4.5) may be at risk of collision during the operational phase of the project.

q. No direct or indirect adverse effects on qualifying invertebrate species are likely (Section 3.4 of the HRA) and as such it is concluded that there is no likely significant effect on the Somerset Levels and Moors Ramsar regarding invertebrate species.

Stage 1 Matrix H : Severn Estuary SPA

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses

Name of European site: Severn Estuary SPA																		
Distance to NSIP 0km																		
European site features	**Likely Effects of NSIP**																	
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
A037 Cygnus columbianus bewickii; Bewick's swan *(over-wintering)*		✓ **a**			**x b**		**x c**	**x d**	**x c**	**x c**	**x d**	**x c**	**x c**	**x e**	**x c**	**x f**	✓ **g**	**x f**
A048 Tadorna tadorna; Shelduck *(over-wintering)*		✓ **h**			✓ **h**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A051 Anas strepera; Gadwall *(over-wintering)*		✓ **k**			✓ **k**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A149 Calidris alpina alpina Dunlin		**x l**			**x l**		**x m**	**x m**	**x m**	**x m**	**x m**	**x m**	**x m**	**x m**	**x m**	**x n**	**x n**	**x n**

(over-wintering)																		
A162 Tringa totanus; Redshank *(over-wintering)*		✓ **o**			✓ **o**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A394 Anser albifrons albifrons; European white-fronted goose (over-wintering)		**x p**			**x p**		**x p**	**x p**	**x p**	**x p**	**x p**	**x p**	**x p**	**x p**	**x p**	**x p**	**x p**	**x p**
A160 Numenius arquata; Curlew (over-wintering)		✓ **q**			✓ **q**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A054 Anas acuta; Northern pintail *(over-wintering)*		✓ **r**			✓ **r**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **j**	✓ **g**	✓ **j**
A137 Charadrius hiaticula; Ringed plover (On passage)		**x s**			**x s**		**x t**	**x t**	**x t**	**x t**	**x t**	**x t**	**x t**	**x t**	**x t**	**x u**	**x u**	**x u**
Under Article 4.2 Qualification, the Severn Estuary SPA regularly supports an overwintering population of 93,986 waterfowl (5-year peak mean 1991/2-1995/6). Contributing bird species include:		✓ **v**			✓ **v**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**	✓ **i**	**x e**	✓ **i**	✓ **i**	✓ **g**	✓ **i**

Bewick's Swan, Curlew, Dunlin, Gadwall, Grey Plover, Lapwing, Mallard, Pintail, Pochard, Redshank, Shelduck, Shoveler, Teal, Tufted Duck, White-fronted Goose, and Wigeon.																		

Evidence supporting conclusions

a. Desktop and field survey findings suggest that Bewick's swan do not undertake local flights between feeding sites within the study area. The proximity of the study area to parts of the Severn Estuary suggests that foraging swans might fly across parts of the study area at least occasionally (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Bewick's swan (and other swan species) are known to be at risk of collision with overhead power lines because of their relatively large body size and reduced manoeuvrability (Rose and Baillie, 1989). While no Bewick's swans were observed during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5), the potential for collision mortality to this species cannot be discounted, and given the relatively small wintering population on the Severn Estuary (ES Volume 5.8.2.4 Appendix 8F Section 4.5), any mortality loss could potentially be significant.

b. Migration of Bewick's swan through the study area is considered very unlikely (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

c. Bewick's swans do not regularly use fields within the study area for feeding or resting (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Given the relatively small size of the Bewick's swan population and the lack of evidence to indicate that the swans regularly use the study area it is considered that any disturbance and displacement effects of the Proposed Development on the Bewick's swan population during construction and decommissioning would be insignificant. No habitat loss from within existing designated areas that may be used by this species would arise. The temporary loss of

agricultural grasslands within the power line corridor during construction would not affect habitats used by this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

d. Disturbance to waterbirds during the operational phase of the project was not identified as a potential effect that would give rise to any significant impact (ES Volume 5.8.1).

e. No habitat loss additional to the temporary habitat loss that would occur during construction, and likely to affect waterbird species, would arise during the operational phase of the project (ES Volume 5.8.1).

f. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA/Ramsar designated population of Bewick's swan.

g. As potential for a significant collision mortality exists for the project alone, a potential significant effect in-combination with other projects (in particular proposed onshore wind farms) and plans cannot be ruled out at this stage.

h. Surveys and available literature indicate that small numbers of shelduck may be present in the vicinity of the study area, particularly in the Portbury and Avonmouth area. Field survey findings confirm that shelduck do occasionally fly along the River Avon within the potential collision risk zone (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

i. The available survey data (Volumes 5.8.3.3 to 5.8.3.5, Figures 8.11 to 8.16 and ES Volume 5.8.2.4 Appendix 8F Section 4.5) indicates that usage of land within the preferred corridor by waterbird species for which the Severn Estuary SPA is designated is limited. Disturbance and displacement that would have potential consequences at the designated population level is therefore unlikely to be of significance. However, given the proximity of the Proposed Development at several locations to the SPA (e.g. Hinkley, Portbury, Avonmouth), it is considered a likely significant effect could arise and it is therefore appropriate to examine the potential for this effect to influence designated populations. Similarly, the bird surveys revealed only a few small areas where habitat is likely to be of importance to waders and waterfowl during the winter months. Works within or adjacent to these areas may result in the loss of habitat used by SPA designated populations.

j. A number of other projects were identified through the screening process (Section 3.10 of the HRA) that could potentially also lead to disturbance and displacement effects on designated SPA waterbird populations, potentially leading to interaction and in-combination effects with the Hinkley Point C Connection Project.

k. Small numbers of gadwall were recorded during surveys at Portbury Wharf and Avonmouth Sewage Works (ES Volume 5.8.2.4 Appendix 8F Section 4.5). While field surveys did not record any gadwall crossing the route of the proposed overhead line, this species could still potentially be at risk of collision.

l. No dunlin were recorded during winter bird surveys Dunlin are considered unlikely to undertake regular flight movements from the estuary inland that would place birds at potential risk (ES Volume 5.8.2.4 Appendix 8F Section 4.5). No potential for significant collision risk is identified.

m. No dunlin were recorded during winter bird surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). It is therefore considered that no disturbance and displacement effects or habitat loss that would affect this species would be likely to arise.

n. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA designated population of dunlin.

o. Small numbers of redshank were recorded during winter bird surveys undertaken for the project and a few redshank flight lines were recorded during the vantage point survey work (ES Volume 5.8.2.4 Appendix 8F Section 4.5)...

p. The distribution of European white-fronted goose and its effective confinement to the upper part of the Severn Estuary essentially precludes any potential risk of collision, disturbance and displacement effects or habitat loss effects (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

q. During the winter curlew are largely restricted to the mudflats, saltmarsh and coastal grasslands of the Severn Estuary, including the River Avon. A few curlew were recorded during winter birds survey or vantage point survey work, suggesting that collision mortality is unlikely to be significant, but that without further consideration a likely significant effect cannot be ruled out.

r. Pintail were not recorded during any wintering bird surveys undertaken for this project and no pintail flight lines were recorded (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Some of the flight lines within the radar study carried out by FERA may have included this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect is therefore not ruled out for collision risk during operation.

s. No ringed plover were recorded during winter bird surveys Dunlin are considered unlikely to undertake regular flight movements from the estuary inland that would place birds at potential risk (ES Volume 5.8.2.4 Appendix 8F Section 4.5). No potential for significant collision risk is identified.

t. No ringed plover were recorded during winter bird surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). It is therefore considered that no disturbance and displacement effects or habitat loss that would affect this species would be likely to arise.

u. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA designated population of ringed plover.

v. Bewick's swan, European white-fronted goose, shelduck, gadwall, dunlin, curlew, ringed plover and pintail are all part of the Severn Estuary wintering bird assemblage. In addition to these, other species that form part of the waterfowl assemblage may be present in the vicinity of the route of the overhead line (ES Volume 5.8.2.4 Appendix 8F Section 4.5) may be at risk of collision during the operational phase of the project.

Stage 1 Matrix I : Severn Estuary Ramsar

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 6 = Deterioration in water quality
Effect 7 = Habitat losses
Effect 12 = Increased sedimentation in intertidal areas

Name of European site: Severn Estuary Ramsar																								
Distance to NSIP 0km																								
European site features	**Likely Effects of NSIP**																							
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 6*			*Effect 7*			*Effect 12*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Cygnus columbianus bewickii; Bewick's swan *(over-wintering)*		✓ **a**			**x b**		**x c**	**x d**	**x c**	**x c**	**x d**	**x c**				**x c**	**x e**	**x c**				**x f**	✓ **g**	**x f**
Tadorna tadorna; Shelduck *(winter)*		✓ **h**			✓ **h**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**				✓ **j**	✓ **g**	✓ **j**
Anas strepera;		✓			✓		✓	**x**	✓	✓	**x**	✓				✓	**x**	✓				✓	✓	✓

Gadwall *(winter)*		**k**			**k**		**i**	**d**	**i**	**i**	**d**	**i**				**i**	**e**	**i**				**j**	**g**	**j**
Calidris alpina alpina Dunlin *(over-wintering)*		**x l**			**x l**		**x m**	**x m**	**x m**	**x m**	**x m**	**x m**				**x m**	**x m**	**x m**				**x n**	**x n**	**x n**
Tringa totanus; Redshank *(winter)*		**x o**			**x o**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**				✓ **j**	✓ **g**	✓ **j**
Anser albifrons albifrons; European white-fronted goose (winter)		**x p**			**x p**		**x p**	**x p**	**x p**	**x p**	**x p**	**x p**				**x p**	**x p**	**x p**				**x p**	**x p**	**x p**
Larus fuscus graellsii; Lesser black-backed gull (Breeding)		**x q**			**x q**		**x q**	**x q**	**x q**	**x q**	**x q**	**x q**				**x q**	**x q**	**x q**				**x q**	**x q**	**x q**
Charadrius hiaticula; Ringed plover (On passage)		**x r**			**x r**		**x s**	**x s**	**x s**	**x s**	**x s**	**x s**				**x s**	**x s**	**x s**				**x t**	**x t**	**x t**
Anas crecca; Eurasian teal (winter)		✓ **u**			**x u**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**				✓ **j**	✓ **g**	✓ **j**
Anas acuta; Northern pintail *(winter)*		✓ **v**			✓ **v**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**				✓ **j**	✓ **g**	✓ **j**
Criterion 5 Wintering		✓ **w**			✓ **w**		✓ **i**	**x d**	✓ **i**	✓ **i**	**x d**	✓ **i**				✓ **i**	**x e**	✓ **i**				✓ **j**	✓ **g**	✓ **j**

waterfowl assemblage																								
Migratory fish populations										x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x

Evidence supporting conclusions

a. Desktop and field survey findings suggest that Bewick's swan do not undertake local flights between feeding sites within the study area. The proximity of the study area to parts of the Severn Estuary suggests that foraging swans might fly across parts of the study area at least occasionally (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Bewick's swan (and other swan species) are known to be at risk of collision with overhead power lines because of their relatively large body size and reduced manoeuvrability (Rose and Baillie, 1989). While no Bewick's swans were observed during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5), the potential for collision mortality to this species cannot be discounted, and given its relatively small wintering population on the Severn Estuary (ES Volume 5.8.2.4 Appendix 8F Section 4.5), any mortality loss could potentially be significant.

b. Migration of Bewick's swan through the study area is considered very unlikely (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

c. Bewick's swans do not regularly use fields within the study area for feeding or resting (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Given the relatively small size of the Bewick's swan population and the lack of evidence to indicate that the swans regularly use the study area it is considered that any disturbance and displacement effects of the Proposed Development on the Bewick's swan population during construction and decommissioning would be insignificant. No habitat loss from within existing designated areas that may be used by this species would arise. The temporary loss of agricultural grasslands within the power line corridor during construction would not affect habitats used by this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

d. Disturbance to waterbirds during the operational phase of the project was not identified as a potential effect that would give rise to any significant impact (ES Volume 5.8.1).

e. No habitat loss additional to the temporary habitat loss that would occur during construction, and likely to affect waterbird species, would arise during the operational phase of the project (ES Volume 5.8.1).

f. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA/Ramsar designated population of Bewick's swan.

g. As potential for a significant collision mortality exists for the project alone, a potential significant effect in-combination with other projects (in particular proposed onshore wind farms) and plans cannot be ruled out at this stage.

h. Surveys and available literature indicate that small numbers of shelduck may be present in the vicinity of the study area, particularly in the Portbury and Avonmouth area. Field survey findings confirm that shelduck do occasionally fly along the River Avon within the potential collision risk zone (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

i. The available survey data (Volumes 5.8.3.3 to 5.8.3.5, Figures 8.11 to 8.16 and ES Volume 5.8.2.4 Appendix 8F Section 4.5) indicates that usage of land within the preferred corridor by waterbird species for which the Severn Estuary Ramsar is designated is limited. Disturbance and displacement that would have potential consequences at the designated population level is therefore unlikely to be of significance. However, given the proximity of the Proposed Development at several locations to the Ramsar (e.g. Hinkley, Portbury, Avonmouth), it is considered a likely significant effect could arise and it is therefore appropriate to examine the potential for this effect to influence designated populations. Similarly, the bird surveys revealed only a few small areas where habitat is likely to be of importance to waders and waterfowl during the winter months. Works within or adjacent to these areas may result in the loss of habitat used by Ramsar designated populations.

j. A number of other projects were identified through the screening process (Section 3.10 of the HRA) that could potentially also lead to disturbance and displacement effects on designated Ramsar waterbird populations, potentially leading to interaction and in-combination effects with the Hinkley Point C Connection Project.

k. Small numbers of gadwall were recorded during surveys at Portbury Wharf and Avonmouth Sewage Works (ES Volume 5.8.2.4 Appendix 8F Section 4.5). While field surveys did not record any gadwall crossing the route of the proposed overhead line, this species could still potentially be at risk of collision.

l. No dunlin were recorded during winter bird surveys Dunlin are considered unlikely to undertake regular flight movements from the estuary inland that would place birds at potential risk (ES Volume 5.8.2.4 Appendix 8F Section 4.5). No potential for significant collision risk is identified.

m. No dunlin were recorded during winter bird surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). It is therefore considered that no disturbance and displacement effects or habitat loss that would affect this species would be likely to arise.

n. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the SPA designated population of dunlin.

o. Small numbers of redshank were recorded during winter bird surveys undertaken for the project and a few redshank flight lines were recorded during the vantage point survey work (ES Volume 5.8.2.4 Appendix 8F Section 4.5)...

p. The distribution of European white-fronted goose and its effective confinement to the upper part of the Severn Estuary essentially precludes any potential risk of collision, disturbance and displacement effects or habitat loss effects (ES Volume 5.8.2.4 Appendix 8F Section 4.5).

q. Lesser black-backed gull were not recorded to breed within 250m of the Proposed Route (Volume 5.8.2.4 Appendix 8F). It is considered highly unlikely that breeding lesser black-backed gull will suffer any significant effects regarding disturbance, displacement, habitat loss or collision risk as a result of the Proposed Development (Volume 5.8.2.4 Appendix 8F).

r. No ringed plover were recorded during winter bird surveys Dunlin are considered unlikely to undertake regular flight movements from the estuary inland that would place birds at potential risk (ES Volume 5.8.2.4 Appendix 8F Section 4.5). No potential for significant collision risk is identified.

s. No ringed plover were recorded during winter bird surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). It is therefore considered that no disturbance and displacement effects or habitat loss that would affect this species would be likely to arise.

t. No significant displacement and disturbance effects that would potentially interact with the effects of other projects were identified for the Ramsar designated population of ringed plover.

u. Teal were observed in small numbers flying close to and across the route corridor during the vantage point surveys (ES Volume 5.8.2.4 Appendix 8F Section 4.5). The movements of small ducks detected in the Radar study for the proposed wind farm near West Huntspill could potentially include this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect on the Severn Estuary Ramsar is therefore not ruled out for collision risk during operation.

v. Pintail were not recorded during any wintering bird surveys undertaken for this project and no pintail flight lines were recorded (ES Volume 5.8.2.4 Appendix 8F Section 4.5). Some of the flight lines within the radar study carried out by FERA may have included this species (ES Volume 5.8.2.4 Appendix 8F Section 4.5). A likely significant effect is therefore not ruled out for collision risk during operation.

w. Bewick's swan, European white-fronted goose, shelduck, gadwall, dunlin, redshank, ringed plover and pintail are all part of the Severn Estuary Ramsar wintering bird assemblage. In addition to these, other species that form part of the waterfowl assemblage may be present in the vicinity of the route of the overhead line (ES Volume 5.8.2.4 Appendix 8F Section 4.5) may be at risk of collision during the operational phase of the project.

x. While some of the migratory fish species have no known spawning grounds within watercourses crossed by the Proposed Development, other species such as eel have known migratory routes in watercourses that may be affected by the works. Desk study findings indicate that the main potential effect could be the operational phase effects of EMF disturbance. Research has revealed that there will only be small increases in magnetic fields at watercourses (Section 3.6 of the HRA Para 3.6.45 – 3.6.58). It is concluded that the Proposed Development would not have a significant effect on migratory fish within the Severn Estuary Ramsar (Section 3 of the HRA, Para 3.6.18 – 3.6.66).

Stage 1 Matrix J : Severn Estuary SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 6 = Deterioration in water quality
Effect 7 = Habitat losses
Effect 11 = Habitat degradation
Effect 12 = Increased sedimentation in intertidal areas

Name of European site: Severn Estuary SAC																		
Distance to NSIP 0km																		
European site features	**Likely Effects of NSIP**																	
	Effect 4			*Effect 6*			*Effect 7*			*Effect 11*			*Effect 12*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H1130 Estuaries	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
H1110 Subtidal sandbanks	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
H1140 Intertidal mudflats and sandflats	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
H1170 Reefs	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**
S1099 River	**x b**	**x b**	**x b**	**x**	**x**	**x**	**x**	**x**	**x**				**x**	**x**	**x**	**x b**	**x b**	**x b**

lamprey *Lampetra fluviatilis*				**b**	**b**	**b**	**b**	**b**	**b**				**b**	**b**	**b**			
S1095 Sea lamprey *Petromyzon marinus*	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**				**x b**	**x b**	**x b**	**x b**	**x b**	**x b**
S1103 Twaite shad *Alosa fallax*	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**				**x c**	**x c**	**x c**	**x c**	**x c**	**x c**

Evidence supporting conclusions

a. There are unlikely to be any construction phase activities (i.e. contamination) or operational phase activities (i.e. thermal changes) that would affect these habitats. Indirect effects that could affect designated features within the boundary of the SAC would be associated with the temporary ditch and watercourse crossing points required for works access or from the construction of the 132kV and 400kV underground cables. These works have the potential to affect water quality in the watercourses, which may form part of the catchment of the Severn Estuary. It is, however, not anticipated that sediment generation during the works would be significant, particularly given the use of appropriate measures to minimise potential inputs into watercourses. Accidental pollution incidents would be minimised and/or avoided through the use of good working practice, including the siting of machinery, use of drip trays, settlement tanks, sediment traps/bunding etc (Section 3.7 of the HRA, Para 3.7.1 – 3.7.4). It is concluded that the Proposed Development would not have a likely significant effect upon the designated Annex I habitat features of the Severn Estuary SAC.

b. Current knowledge indicates river lamprey do not use watercourses crossed by the Proposed Development. There are no records for sea lamprey in rivers feeding into the Severn Estuary from the south. There is an isolated record at the River Parrett estuary but this river system is not crossed by the Proposed Development. It is concluded that there would be no likely significant effect on the Severn Estuary SAC regarding sea and river lamprey (Section 3.6 of the HRA, Para 3.6.25 – 3.6.26 and 3.6.28 – 3.6.29).

c. There are no known twaite shad spawning sites on rivers crossed by the Proposed Development. The two areas of the Proposed Development that intersect with the Severn Estuary SAC designation comprise new overhead line entries in

agricultural land at Hinkley Point C and the overhead line crossing of the River Avon. These works would not influence the environmental conditions of the estuary and therefore, no direct or indirect adverse effects on the Twaite shad population in the Severn Estuary SAC would arise (Section 3.6 of the HRA, Para 3.6.37 – 3.6.38).

Stage 1 Matrix K : North Somerset and Mendip Bats SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: North Somerset and Mendip Bats SAC																					
Distance to NSIP 3km																					
European site features	**Likely Effects of NSIP**																				
	Effect 4			*Effect 5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H6210 Semi-natural dry grassland and dry facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone.	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**xa**	**x a**	**xa**
H8310 Caves not open to the public	**x a**	**x a**	**x a**				**x a**	**x a**	**x a**										**xa**	**x a**	**xa**

H9180 *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**xa**	**x a**	**xa**
S1303 *Rhinolophus hipposideros;* lesser horseshoe bat	✓ **b c**	**x b c**	✓ **b c**				✓ **d**	✓ **d**	✓ **d**	✓ **d**	✓ **d**	✓ **d**	**x e**	**x e**	**x e**	**x f**	**x f**	**x f**	**x g**	**x g**	**x g**
S1304 *Rhinolophus ferrumequinum;* greater horseshoe bat	✓ **b c**	**x b c**	✓ **b c**				✓ **d**	✓ **d**	✓ **d**	✓ **d**	✓ **d**	✓ **d**	**x e**	**x e**	**x e**	**x f**	**x f**	**x f**	**x g**	**x g**	**x g**

Evidence supporting conclusions

a. The nearest qualifying habitats are over 350m from the proposed 400kV underground cable route. There are unlikely to be any construction phase activities (i.e. ground contamination or reduction in air quality) or operational phase activities (i.e. thermal or hydrological changes) that would affect Annex I habitats (Section 3.4 of the HRA).

b. For the Somerset and Mendip Bats SAC noise levels are 40-67dB (underground cable 75m away) and 64-70dB (decommissioning 60m away). These noise levels are described as equivalent to a quiet garden (40dB) a quiet office (50dB) a normal conversation (60dB) a busy road at kerbside (70db). Given the duration of the works and the predicted

noise levels (above ground at the closest point of the SAC boundaries), noise disturbance is unlikely to have a significant effect on SAC bat populations (Section 3.9 of the HRA, Para 3.9.6 – 3.9.7).

c. Horseshoe bats are particularly sensitive to the effects of lighting. The construction phase of works will require lighting around compound areas (which are within 4km of the SAC) and there may be some lighting of working areas during winter. A likely significant effect on both lesser horseshoe and greater horseshoe bats that could derive from the North Somerset and Mendip Bats SAC cannot be discounted.

d. Research indicates that lesser horseshoe bats forage in close proximity to roost sites. Habitat within 1 to 2.5km of a nursery roost is quoted as being important for conservation management of this species (Bontadina et al., 2001). Greater horseshoe bats typically forage 3 to 5km from the roost (Section 3.4 in HRA). While effects from the Proposed Development may be of a temporary nature, it is possible that the loss of commuting routes that may provide links to important foraging areas, could be of significance to bat populations. The potential for a likely significant effect with respect to qualifying Annex II bat populations cannot, therefore, be discounted (Section 3.9 of the HRA, Para 3.9.15 – 3.9.16).

e. Greater and lesser horseshoe bats roost in buildings, caves and other underground structures. As no loss of buildings or caves will result from the Proposed Development it is unlikely that any direct effects on bat roosts would result (Section 3.9 of the HRA, Para 3.9.5).

f. There is very limited evidence to indicate that bats are prone to collision with overhead lines, particularly small-medium sized agile species (Section 3.9 of the HRA, Para 3.9.11 – 3.9.12). This risk of collision is further reduced by the low flying behaviour of horseshoe bats, the lowest conductors are approximately 10m from the ground and the thinner earth wire is over 30m from the ground with either pylon design..

g. A number of other projects are identified (ES Volume 5.8.2.4 Appendix 8F) as having the potential to act in-combination with the Hinkley Point C Connection Project and affect designated Annex II bat populations. The range of identified effects are the same as those determined for the HPCC Project alone.

Stage 1 Matrix L : Mendip Limestone Grasslands SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: Mendip Limestone Grasslands SAC																					
Distance to NSIP 0.2km																					
European site features	**Likely Effects of NSIP**																				
	Effect 4			*Effect 5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H4030 European dry heaths	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**

grasslands and scrublands on chalk or limestone																					
H8310 Caves not open to the public	**x a**	**x a**	**x a**				**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
H9180 *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
S1304 *Rhinolophus ferrumequinum;* Greater horseshoe bat	**✓ b c**	**x b c**	**✓ b c**				**✓ d**	**✓ d**	**✓ d**	**✓ d**	**✓ d**	**✓ d**	**x e**	**x e**	**x e**	**x f**	**x f**	**x f**	**x g**	**x g**	**x g**

Evidence supporting conclusions

a. The nearest qualifying habitats are over 150m from the proposed 400kV underground cable route. There are unlikely to be any construction phase activities (i.e. ground contamination or reduction in air quality) or operational phase activities (i.e. thermal or hydrological changes) that would affect Annex I habitats (Section 3.4 of the HRA).

b. For the Mendip Limestone Grasslands SAC (above ground at the nearest point to works) noise levels are in the region of 55-61dB (decommissioning works 180m away) and 31-58dB (underground works 180m away). These noise levels are described as equivalent to a quiet garden (40dB) a quiet office (50dB) a normal conversation (60dB) a busy road at kerbside (70db). Given the duration of the works and the predicted noise levels (above ground at the closest point of the

SAC boundaries), noise disturbance is unlikely to have a significant effect on SAC bat populations (Section 3.9 of the HRA, Para 3.9.6 – 3.9.7).

c. Horseshoe bats are particularly sensitive to the effects of lighting. The construction phase of works will require lighting around compound areas (which are within 4km of the SAC) and there may be some lighting of working areas during winter. A likely significant effect on both lesser horseshoe and greater horseshoe bats deriving from the Mendip Limestone Grasslands SAC cannot be discounted.

d. Research indicates that lesser horseshoe bats forage in close proximity to roost sites. Habitat within 1 to 2.5km of a nursery roost is quoted as being important for conservation management of this species (Bontadina et al., 2001). Greater horseshoe bats typically forage 3 to 5km from the roost (Section 3.4 in HRA). While effects from the Proposed Development may be of a temporary nature, it is possible that the loss of commuting routes that may provide links to important foraging areas, could be of significance to bat populations. The potential for a likely significant effect with respect to the qualifying populations of lesser horseshoe bat and greater horseshoe bat of the Mendip Limestone Grasslands SAC cannot, therefore, be discounted (Section 3.9 of the HRA, Para 3.9.15 – 3.9.16).

e. Greater and lesser horseshoe bats roost in buildings, caves and other underground structures . As no loss of buildings or caves will result from the Proposed Development it is unlikely that any direct effects on lesser horseshoe or greater horseshoe roosts would result (Section 3.9 of the HRA, Para 3.9.5).

f. There is very limited evidence to indicate that bats are prone to collision with overhead lines, particularly small-medium sized agile species (Section 3.9 of the HRA, Para 3.9.11 – 3.9.12). This risk of collision is further reduced by the low flying behaviour of horseshoe bats, the lowest conductors are approximately 10m from the ground and the thinner earth wire is over 30m from the ground with either pylon design..

g. A number of other projects are identified (ES Volume 5.8.2.4 Appendix 8F) as having the potential to act in-combination with the Hinkley Point C Connection Project and affect designated Annex II bat populations. The range of identified effects are the same as those determined for the HPCC Project alone.

Stage 1 Matrix M : Mendip Woodlands SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 11 = Habitat degradation

Name of European site: Mendip Woodlands SAC															
Distance to NSIP 6km															
European site features	**Likely Effects of NSIP**														
	Effect 4			*Effect 5*			*Effect 7*			*Effect 11*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H9180 *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**

Evidence supporting conclusions

a. The nearest qualifying habitats are over 6km from the Proposed Development. There are unlikely to be any construction phase activities (i.e. ground contamination or reduction in air quality) or operational phase activities (i.e. thermal or hydrological changes) that would affect Annex I habitats within the Mendip Woodlands SAC (Section 3.4 of the HRA).

Stage 1 Matrix N : Exmoor and Quantock Oakwoods SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: Exmoor and Quantock Oakwoods SAC																					
Distance to NSIP - over 5km																					
European site features	**Likely Effects of NSIP**																				
	Effect 4			*Effect5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; Western acidic oak woodland	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*);	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**

Alder woodland on floodplains																				
S1308 *Barbastella barbastellus;* Barbastelle bat	✓ **b c**	**x b c**	✓ **b c**				**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x e**	**x e**	**x e**	**x f**	**x f**	**x f**	**x g**	**x g**	**x g**
S1323 *Myotis bechsteinii;* Bechstein's bat	**x h**	**x h**	**x h**				**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**	**x h**
S1355 *Lutra lutra;* Otter	**x i**	**x i**	**x i**				**x i**	**x i**	**x i**										**x i**	**x i**	**x i**

Evidence supporting conclusions

a. The nearest qualifying Annex I habitats are over 6km from the proposed Hinkley Point C line entries. There are unlikely to be any construction phase activities (i.e. ground contamination or reduction in air quality) or operational phase activities (i.e. thermal or hydrological changes) that would affect Annex 1 habitats (Section 3.4 of HRA).

b. Exmoor and Quantock Oakwoods SAC is over 6km from the Proposed Development. Increased noise levels during construction and decommissioning would therefore not affect barbastelle roosts within the SAC. The distance is, however, within the recorded range of barbastelles and therefore barbastelles that may forage and commute within the Proposed Development area could originate from the Exmoor and Quantock Oakwoods SAC (Section 3.9 of the HRA,para. 3.9.6). Noise levels would not be increased outside of daylight hours during construction and decommissioning, therefore no effects on foraging or commuting barbastelle are predicted as a result of noise.

c. Some bat species are sensitive to the effects of lighting. The construction phase of works will require lighting around compound areas and there may be some lighting of working areas during winter (Section 5.2 of the HRA, Para 5.2.89 – 5.2.90). A likely significant effect on barbastelle in the Exmoor and Quantock Oakwoods SAC cannot be discounted (Table 6.1 of HRA).

d. Zeale *et al.* (2012) concluded that conservation efforts for barbastelle should target preferred foraging habitats within 7km of roosts. Important foraging areas include riparian, broadleaved woodland and unimproved grassland. (Section 5.2 of the HRA, Para 5.2.13). These habitats are not affected by the removal of the 132kV overhead line at Bridgwater (which will not result in any significant habitat loss) nor are they affected by the realignment of the overhead line entries at Hinkley Point C (which will not result in any significant loss of habitat). Therefore no effects on the foraging resource available to barbastelle bats originating from the Exmoor and Quantock Oakwoods SAC are predicted.

e. Barbastelle bats roost in trees and there is some potential for tree loss to occur. However, surveys did not record any barbastelle roosts along the Proposed Development (ES Volume 5.8.2.4 Appendix 8H Section 4.2) and the only works within the ecological zone of influence of the barbastelle bat populations associated with the Exmoor and Quantocks Oakwoods SAC are the Hinkley Point C line entries and the 132kV overhead line removal. Neither of these options will result in the loss of woodland trees (the habitat associated with Barbastelle roost trees) (Section 5.2 of the HRA,, Para 5.2.12). Therefore no effects on barbastelle bat roosts in the Exmoor and Quantock Oakwoods SAC are predicted.

f. There is very limited evidence to indicate that bats are prone to collision with overhead lines, particularly small-medium sized agile species (Section 3.9 of the HRA, Para 3.9.11 – 3.9.12). The conductors and earth wires of the 400kV overhead line have a relatively large diameter (19.53mm and 41.04mm respectively) which would easily be detected by echolocating bat species found in the UK. Therefore, no direct or indirect adverse effects on the barbastelle population in the Exmoor and Quantock Oakwoods SAC would arise.

g. Projects and plans with the potential for in-combination effects can be seen in Table 5.11 of the HRA. it is concluded that the proposed development in-combination with other plans and projects would not give rise to an adverse effect on the integrity of the designated bat populations of the Exmoor and Quantock Oakwoods SAC (Section 5.5 of the HRA, Para 5.5.1 – 5.5.3).

h. Research into Bechstein's bat indicates this species forages in close proximity to roost sites. Radio tracking surveys have shown the species to commute between <1km and <4km. The Bechstein's bats recorded during field surveys along the proposals route are likely to be distinct from populations associated with the SAC. Therefore no direct or indirect adverse effects on Bechsetin's bats associated with the Exmoor and Quantock Oakwoods SAC are predicted (Section 3.4 in the HRA).

i. During field surveys signs of otter were limited and no otter holts or shelters were recorded. Data searches revealed widespread records of otter across the majority of the Proposed Development. Otter is assumed to utilise all watercourses through the Levels, extending south to Bridgwater and north to Portbury (Section 3.6 of the HRA, Para 3.6.5 – 3.6.7). The wooded stream within the SAC component nearest to the Proposed Development, could support otter and there are records within 10km east of the SAC (within 6km southeast of the Proposed Development). However, no aquatic habitats will be affected by the Proposed Development works at Hinkley Point. Other areas of development are over 15km away from the SAC. Otter home range size can vary considerably and otters are present within land crossed by the Proposed Development but any works within or adjacent to aquatic habitats at this distance from the SAC is unlikely to affect SAC otter populations (Section 3.6 of the HRA, Para 3.6.11 – 3.6.13). Therefore no direct or indirect adverse effects on otters associated with the Exmoor and Quantock Oakwoods SAC are predicted (Table 6.1 of HRA).

Stage 1 Matrix O : Mells Valley SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: Mells Valley SAC																					
Distance to NSIP 27km																					
European site features	**Likely Effects of NSIP**																				
	Effect 4			*Effect5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)*	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
H8310 Caves not open to the public	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**	**x a**										**x a**	**x a**	**x a**
S1304 Greater horseshoe bat *Rhinolophus*	✓ **b**	✓ **b**	✓ **b**				**x c**	**x c**	**x c**	✓ **b**	✓ **b**	✓ **b**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**

ferrumequinum																				

Evidence supporting conclusions

a. The nearest qualifying habitats are over 27km from the nearest area of Proposed Development. No direct or indirect adverse effects on Annex I habitats are likely due to distance between the designation and proposals (Section 3.4 of HRA).

b. Although there are not likely to be any direct or indirect effects on daily commuting routes, greater horseshoe bat have been recorded travelling over 10km to mating roosts. There is a possibility that greater horseshoe migrate between this SAC and the North Somerset & Mendip Bats SAC (which is adjacent to the proposals) (Section 3.4 of the HRA). Interruption to commuting routes as a result of construction activities is therefore possible. Such effects, while temporary, would remain throughout the construction phase and through into operation, prior to the recovery of vegetation and re-establishment of habitat (Section 3.9 of the HRA, Paras 3.9.13-3.9.14). While effects from the Proposed Development may be of a temporary nature, it is possible that the loss of commuting routes could be of significance to bat populations. A likely significant effect on the designated greater horseshoe bat population of the Mells Valley SAC cannot therefore be discounted.

c. Research indicates that greater horseshoe bats typically forage 3 to 5km from the roost. There are some records of this species travelling over 10km but habitat at such distances is unlikely to be of significant use. It is unlikely that any direct or indirect effects on greater horseshoe bat roosts or foraging habitat or daily commuting routes would result from the development proposals (Section 3.4 of the HRA).

Stage 1 Matrix P : Bath and Bradford on Avon Bat SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury to bats

Name of European site: Bath and Bradford on Avon Bat SAC																		
Distance to NSIP 30km																		
European site features	**Likely Effects of NSIP**																	
	Effect 4			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	✓ **a**	✓ **a**	✓ **a**	**x b**	**x b**	**x b**	✓ **a**	✓ **a**	✓ **a**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**	**x b**
S1323 Bechstein`s bat *Myotis bechsteinii*	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**	**x c**
S1303 Lesser horseshoe bat *Rhinolophus hipposideros*	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**	**x d**

Evidence supporting conclusions

a. Although there are not likely to be any direct or indirect effects on daily commuting routes, greater horseshoe bats have been recorded travelling over 10km to mating roosts. There is a possibility that greater horseshoe migrate between this SAC and the North Somerset & Mendip Bats SAC (which is adjacent to the proposals) (Section 3.4 of the HRA). Interruption to commuting routes as a result of construction activities is therefore possible. Such effects, while temporary, would remain throughout the construction phase and through into operation, prior to the recovery of vegetation and re-establishment of habitat (Section 3.9 of the HRA, Paras 3.9.13-3.9.14). While effects from the Proposed Development may be of a temporary nature, it is possible that the loss of commuting routes could be of significance to bat populations. A likely significant effect on the greater horseshoe bat associated with the Bath and Bradford on Avon Bat SAC cannot therefore be discounted.

b. Research indicates that greater horseshoe typically forage 3 to 5km from the roost. There are some records of this species travelling over 10km but habitat at such distances is unlikely to be significantly used. It is unlikely that any direct or indirect effects on bat roosts or foraging habitat or daily commuting routes would result from the development proposals (Section 3.4 of the HRA).

c. Research into Bechstein's bat indicates this species forages in close proximity to roost sites. Radio tracking surveys have shown the species to commuting between <1km and <4km. The Bechstein's bats recorded during field surveys along the proposals route are likely to be distinct from populations associated with this SAC (Section 3.4 of HRA). Therefore no direct or indirect adverse effects on Bechsetin's bats associated with the Bath and Bradford on Avon Bat SAC are likely.

d. Lesser horseshoe bat forage in close proximity to roost sites. Habitat within 1 to 2.5km of a nursery roost is quoted as being important for conservation management of this species (Bontadina et al., 2001). Hibernation roosts are typically within 5km of the maternity roost. The lesser horseshoe bat populations associated with this designation are likely to be distinct from those individuals recorded during surveys along the proposals route, and no direct or indirect adverse effects on lesser horseshoe associated with the Bath and Bradford on Avon Bat SAC are likely (Section 3.4 of the HRA).

REFERENCES

Environmental Statement Volume 20. Hinkley Point C 400kV Connection Project – Applicant's Report to Inform a Habitats Regulation Assessment.

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Rose, P, & Baillie, S. (1989) The effects of collisions with overhead lines on British Birds: an analysis on ringing recoveries. Unpublished BTO report to Central Electricity Generating Board.

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Appendix 20B – Stage 2 Matrices

Potential Impacts

Potential impacts upon the European site(s)* which are considered within the submitted Habitats Regulations Assessment report (Volume 20.1 of Environmental Statement) are provided in the table below. Impacts have been grouped where appropriate for ease of presentation.

* As defined in Advice Note 10.

Impacts considered within the integrity matrices

Designation	Impacts in submission information	Presented in integrity matrices as
Wye Valley & Forest of Dean Bat Sites SAC **Somerset Levels and Moors SPA** **Somerset Levels and Moors Ramsar** **Severn Estuary SPA** **Severn Estuary Ramsar** **North Somerset and Mendip Bats SAC** **Mendip Limestone Grasslands SAC** **Exmoor and Quantock Oakwoods SAC** **Mells Valley SAC** **Bath and Bradford on Avon SAC**	Collision during Daily Feeding Flights	Effect 1
	Collision during migratory flights	Effect 2
	Displacement from feeding grounds	Effect 3
	Disturbance (human activity, noise and artificial lighting)	Effect 4
	Deterioration in air quality	Effect 5
	Deterioration in water quality	Effect 6
	Habitat losses	Effect 7
	Loss/disturbance of bat foraging and commuting routes	Effect 8
	Loss of bat roosting habitat	Effect 9
	Risk of death/injury to bats	Effect 10
	Habitat degradation	Effect 11
	Increased sedimentation in intertidal areas	Effect 12

STAGE 2: EFFECTS ON INTEGRITY

a. Somerset Levels and Moors SPA
b. Somerset Levels and Moors Ramsar
c. Severn Estuary SPA
d. Severn Estuary Ramsar
e. North Somerset and Mendip Bats SAC
f. Mendip Limestone Grasslands SAC
g. Exmoor and Quantock Oakwoods SAC
h. Mells Valley SAC
i. Bath and Bradford on Avon SAC

Evidence for the conclusions reached on integrity is detailed within the footnotes to the matrices below.

Matrix Key

✓ = Adverse effect on integrity cannot be excluded
× = Adverse effect on integrity can be excluded

C = construction
O = operation
D = decommissioning

Stage 2 Matrix A: Somerset Levels and Moors SPA

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses

Name of European site: Somerset Levels and Moors SPA																		
Distance to NSIP 2km																		
European site features	**Likely Effects of NSIP**																	
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
A037 Cygnus columbianus bewickii; Bewick's swan (over-wintering)		**x a**															**x b**	
A052 Anas Crecca; Eurasian teal (over-wintering)		**x c**			**x c**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x f**	**x e**
A140 Pluvialis apricaria; Golden plover (over-wintering)		**x g**			**x g**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x h**	**x e**
A142 Vanellus vanellus		**x i**			**x i**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x j**	**x e**

Northern lapwing (over-wintering)																	
A050 Anas penelope; Eurasian wigeon (over-wintering)		**x k**			**x k**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x l**	**x e**
A056 Anas clypeata; Northern Shoveler (over-wintering)							**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**		**x e**
Under Article 4.2 Qualification, the Somerset Levels and Moors SPA regularly supports an overwintering population of 72,874 waterfowl (5-year peak mean 1991/2-1995/6). Contributing bird species include Bewick's swan, wigeon, gadwall, teal, pintail, shoveler, snipe, lapwing, and golden plover.		**x a, c, g, I, k, m**			**x a, c, g, I, k, m**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x b, f, h, j, l**	**x e**

Evidence supporting conclusions

a. Consultations together with the findings of the literature review indicate that, although Bewick's swan are vulnerable to collisions with overhead lines, they generally manoeuvre better than whooper swan and are therefore more able to avoid aerial hazards such as overhead lines (Section 4.6 of HRA, Para 4.6.59). Desktop and field survey findings were that Bewick's swan did not use land within the Proposed Development for feeding or resting (Section 4.2 of HRA, Paras 4.2.16 – 4.2.29). Desktop and field survey findings also suggest that Bewick's swan do not undertake local flights between feeding sites within the study area (Section 4.6 of HRA, Para 4.6.60). There is little evidence to indicate that Bewick's swan undertake regular movements between Bridgwater Bay and the Somerset Levels (Section 4.6 f HRA, Para 4.6.61). There is strong evidence that Bewick's swan are visiting the west of the UK in far fewer numbers in comparison with other parts of the UK (Section 4.2 of HRA, Para 4.2.21 -4.2.23). Based on desktop and field survey findings during 2009 to 2011 there is little evidence to indicate that migrating Bewick's swan fly within the study area. It is likely that the majority of Bewick's swan migrate to the Somerset Levels overland via Scotland, possibly Welney in East Anglia and the majority flying to the Somerset Levels would therefore not fly through the preferred corridor during migration (Section 4.6 of HRA, Para 4.6.63 – 4.6.64). Overall it is considered that the risk of migrating Bewick's swan colliding with an overhead line in the preferred corridor is very low (Section 4.6 of HRA, Para 4.6.65).

b. No significant in-combination collision risks were identified for Bewick's swan (Section 4.11 of HRA).

c. Based on the Vantage Point survey data, calculated annual collision mortalities for teal associated with the Somerset Levels and Moors SPA range from 0.19 birds (99.9% avoidance rate) to 0.93 birds (99.5% avoidance rate.) (Section 4.6 of HRA, Paras 4.6.76 and Table 4.7). A 99.7% avoidance rate for this species is considered realistic (Section 4.6 of HRA, Paras 4.6.22 – 4.6.23), which would result in annual collision mortalities of 0.56 birds, representing 0.003% of the SPA population or an increase in background teal mortality of 0.006% (Section 4 of HRA, Table 4.7). The predicted number of annual collision mortalities for teal are very low and would not be significant in the context of the designated wintering population of the Somerset Levels and Moors SPA (Section 4.6 of HRA, Para 4.6.77). The calculated mortality from collision (based solely on VP data) is likely to be an overestimate. The proposed 400kV power line would replace the existing 132kV line and has a similar risk zone. Over 3km of the existing 132kV overhead line would be removed and not replaced by a similar length of new 400kV power line. It is therefore, on balance, unlikely to result in an increase in the overall level of potential collision risk compared to that which is likely to be currently occurring (Section 4.6 of HRA, Paras 4.6.77 – 4.6.80). A number of uncertainties exist, including the scale of movements of birds across the proposed connection corridor as indicated by the

radar studies and the likely avoidance rate. National Grid will therefore install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality and also undertake monitoring with the aim of ascertaining both the level of collision and whether further measures would be required (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180 and Section 4.7). Based on the radar collision risk modelling exercise, it can be seen that post-mitigation the calculated increase in background mortality for teal would be below 1% (Section 4.6 of HRA, Para 4.6.180, Table 4.11). The level of collision risk would therefore not be of significance at the population level (Section 4.6 of HRA, Para 4.6.182). Prior to mitigation, no impact is predicted on teal associated with the Somerset Levels and Moors SPA that would be considered to be significant at the population level. Taking into account the proposed mitigation, then the level of impact at the population level would be further reduced (HRA, Section 4.6, Para 4.6.180).

d. The small numbers of waterbirds observed to occur within the route corridor and adjacent habitats (ES Volume 5.8.2.4 Appendix F Section 4.5) indicate that if displacement were to arise, that any impacts at the designated species population level would not be significant (Section 4.5 of HRA, Paras 4.5.2-4.5.12). There are large areas of suitable habitat (e.g. other watercourses, grasslands, wetlands and estuarine habitats) in proximity to the corridor to which displaced birds could relocate. Given the extensive nature of these habitats and the small numbers of birds that could potentially be displaced at any one time it is considered highly unlikely that displacement would affect the capacity of these resources to support existing SPA designated populations of waterbirds.

The majority of the land within the corridor is assessed as being of low habitat value for wintering waders and wildfowl (Section 4.4 of HRA, Table 4.3 and ES Volume 5.8.2.4, Appendix 8F). A small number of fields were assessed as holding moderate potential for waders and wildfowl. Only 2 fields/field groups within the corridor were assessed as holding high potential for wildfowl. These included Portbury Wharf and Avonmouth Sewage Works. No areas were assessed as holding high potential for waders. Due to the very limited use of habitats within the corridor by SPA bird species, habitat loss as a result of the Proposed Development is highly unlikely to impact upon SPA designated bird populations.

e. No interactions with other projects screened into the assessment that would, in-combination, lead to significant in-combination disturbance or displacement impacts on the designated waterbird populations of the Somerset Levels and Moors SPA are predicted (Section 4.12 of HRA).

f. In-combination with the other wind farm projects that could potentially affect teal through collision mortality (Section 4.14 of HRA), and for which collision mortality for this species is predicted, a total of 0.92 teal representing 0.004% of the Somerset

Levels and Moors SPA/Ramsar would be predicted to collide with either the proposed overhead line or proposed wind farms each year. Bird flight diverters will be fitted in sections of the Proposed Development overhead line where bird species such as teal are considered most likely to cross the overhead line. The predicted in-combination annual mortality, as a result of these measures, would therefore be further reduced to 0.70 teal or 0.003% of the Somerset Levels and Moors teal population.

Calculations based on modelling of potential bird movements involving teal (Section 4.14 of HRA) show that 0.46% of the Somerset Levels and Moors SPA teal population would be affected by collision mortality based on a 99.7% avoidance rate. Following the provision of the proposed fitting of bird flight diverters on the Proposed Development overhead line, this would be likely to be reduced to 0.36% of the teal population of the Somerset Levels and Moors SPA. The predicted annual loss of 80.25 teal from the SPA would represent an increase in baseline mortality for the population of 0.77%. This is less than the 1% increase in baseline mortality that is considered to represent a 'small number' and a figure that is used as a trigger above which further consideration of population level impacts might be undertaken.

g. Desktop and field survey findings indicate that golden plover do not undertake regular local flights within the risk zone between feeding sites within the study area (Section 4.2 of HRA, Paras 4.2.148 – 4.2.154). Intensive nocturnal vantage point surveys undertaken during winter 2010-2011 between the Severn Estuary and the north half of the Somerset Levels only detected very small numbers of golden plover (Section 4.2 of HRA, Para 4.2.154). Desktop survey findings indicate that the southern half of the Somerset Levels attracts greater numbers of golden plover (Section 4.2 of HRA, Paras 4.2.144 and 4.6.92). Therefore it is possible that any golden plover movements between the Severn Estuary and Kings Sedgemoor would take place to the south of the study area (Section 4.6 of HRA, Para 4.6.92). There is no evidence to indicate that golden plover collisions with the existing overhead power line network are occurring and there is certainly no indication of any impact that could have potential population level effects (Section 4.6 of HRA, Paras 4.6.94).

h. The potential for any significant in-combination impact on the SPA golden plover population as a result of collision mortality is considered to be very low. The collision risk for the Proposed Development for this species is considered to not be significant given the lack of regular local flights within the potential risk zone (Section 4.2 of HRA, Paras 4.2.148 – 4.2.154). No other projects for which significant collision risk for golden plover was determined were identified as part of the assessment.

i. Based on the Vantage Point survey data, calculated annual collision mortalities for lapwing associated with the Somerset Levels and Moors SPA range from 15.36 birds (99.9% avoidance rate) to 76.81 birds (99.5% avoidance rate.) (HRA, Table 4.9). A 99.7% avoidance rate for this species is considered realistic (Section 4.6 of HRA, Paras 4.6.22 – 4.6.23), which

would result in annual collision mortalities of 46.09 birds, representing 0.12% of the SPA population or an increase in background mortality of 0.4% (Section 4.6 of HRA, Paras 4.6.98 – 4.6.100, Table 4.9, Table 4.11). The apportioning of the estimated collision mortality to the SPA is likely to be a significant overestimate as it includes for birds that form part of the wider, non-SPA, countryside population (Section 4.6 of HRA, Para 4.6.101). Even if it is assumed that the calculated total collision mortality is attributed solely to the SPA population, the predicted level of impact would not give rise to a detrimental effect at the designated population level (Section 4.6 of HRA, Paras 4.6.99 – 4.6.101, Table 4.11). As the increase in background mortality (stated as 0.3 – BTO Birdfacts) would also be less than 1%, this indicates that the predicted mortality loss due to collision would be unlikely to be significant at the population level (Section 4.6 of HRA, Para 4.6.138). There is no evidence to indicate that lapwing collisions with the existing overhead power line network are occurring (Section 4.6 of HRA, Para 4.6.7). The proposed 400kV overhead line essentially replaces the existing 132kV transmission line and the overall network of electricity overhead transmission and distribution lines in the vicinity of the Somerset Levels and Moors SPA would slightly decrease through this project (Section 4.6 of HRA, Paras 4.6.79 – 4.6.80). In relation to the existing 132kV line, the collision risk zone of the T-pylon is approximately the same (Section 4.6 of HRA, Paras 4.6.11 – 4.6.19, Table 4.4). The overall potential for collision risk is therefore considered to be very similar to that associated with the existing 132kV overhead and it is therefore highly unlikely that the Proposed Development will increase lapwing mortality (Section 4.6 of HRA, Paras 4.6.99 – 4.6.101).

j. Based on the Vantage Point survey data, using a 99.7% avoidance rate considered realistic for this species, it is predicted that the overhead line could result in an annual mortality of 46.09 lapwing, representing 0.12% of the Somerset Levels and Moors SPA population. When combined with other plans and projects where collision risks have been quantified, the total predicted collision risk is only raised to 46.27 lapwing per year (0.12% of Somerset Levels and Moors SPA Population). When the likely effects of the proposed mitigation of installing flight diverters to key locations of the proposed overhead line are taken into account, this results in a total combined collision risk of 27.65 lapwing or 0.07% of the Somerset Levels and Moors SPA. This level of mortality is not considered to be significant at the population (Section 4.14 of HRA).

k. Field survey findings suggest that wigeon do not regularly fly within the collision risk zone where the preferred corridor crosses the Huntspill River when undertaking local flights between feeding sites within the study area (Section 4 of HRA, Paras 4.2.94 – 4.2.96 and 4.6.83). It is possible that some of the bird movements recorded by the EDF radar study (EDF 2012) were of wigeon (Section 4.6 of HRA, Para 4.6.84), however the extensive vantage point work carried out for the Hinkley Connection C project found no evidence to support the suggestion that regular daily movements of wigeon take place between these areas (Section 4.6 of HRA, Para 4.6.83). The proposed overhead line removal includes more than 3km of 132kV overhead line which would not be replaced to the south of the most southerly point of the proposed 400kV overhead

line, the proposed 400kV overhead line would therefore result in a reduction in the overall length of overhead line to the south of the Mendips (Section 4.6 of HRA, Para 4.6.80). The 3km section of 132kV line that would not be replaced is located to the west of Bridgwater and potentially lies on the flight path of birds that may undertake movements between the southern part of the Somerset Levels and Moors SPA (notably Kings Sedgemoor) and Bridgwater Bay (Section 4.6 of HRA, Para 4.6.80). The proposed 400kV overhead line will have approximately the same collision risk zone to the existing 132kV line at a similar height and the overall collision risk for the existing and proposed line is therefore considered to be similar (Section 4.6 of HRA, Paras 4.6.11 – 4.6.19, Table 4.4). It is apparent from the available data (Section 4.6 of HRA, Para 4.6.144) that no discernible SPA population level impacts that could be attributed to collision mortality with the existing overhead power line network are occurring. A number of uncertainties exist, including the scale of movements of birds across the proposed connection corridor as indicated by the radar studies and the likely avoidance rate. National Grid will therefore install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality and also undertake monitoring with the aim of ascertaining both the level of collision and whether further measures would be required (Section 4.6 of HRA, Paras 4.6.143 – 4.6.180 and Section 4.7). Based on the radar collision risk modelling exercise, it can be seen that post-mitigation the calculated increase in background mortality for wigeon would be below 1% (Section 4.6 of HRA, Para 4.6.180, Table 4.11). The level of collision risk would therefore not be of significance at the population level (Section 4.6 of HRA, Para 4.6.180). Prior to mitigation, no impact is predicted on wigeon associated with the Somerset Levels and Moors SPA that would be considered to be significant at the population level. Taking into account the proposed mitigation, then the level of impact at the population level would be further reduced (Section 4.6 of HRA, Para 4.6.180).

I. No wigeon were recorded flying at risk height within 250m of the Proposed Development overhead line during vantage points undertaken for this project. Within the HRA undertaken for the Black Ditch wind farm only 4 individuals were recorded flying within the survey area during nocturnal vantage points undertaken. Based on the collision risk associated with wigeon flights observed during vantage point surveys undertaken for the Proposed Development or any of the wind farm projects, the predicted impact of collision risk on wigeon from these projects combined is negligible.

Calculations based on modelling of potential bird movements involving wigeon (Section 4.14 of HRA) show that, using an avoidance rate of 99.7%, 0.36% of wigeon associated with the Somerset Levels and Moors SPA would be affected through in-combination collision mortality each year. When the proposed mitigation is taken into consideration, assuming no mitigation undertaken at the proposed wind farms, this would be reduced to 0.28% of wigeon associated with the Somerset Levels and Moors SPA. The predicted annual loss of 80.25 wigeon from the SPA would represent an increase in background mortality for the population of 0.60%.

m. In addition to the individual qualifying waterbird species for which collision risk calculations have been undertaken, significant collision mortality is not predicted for any other species that may contribute to the overall assemblage (ES Volume 5.8.2.4 Appendix 8F and Section 4.4 of HRA).

Stage 2 Matrix B: Somerset Levels and Moors Ramsar

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 6 = Deterioration in water quality
Effect 7 = Habitat losses

Name of European site: Somerset Levels and Moors Ramsar																					
Distance to NSIP 2km																					
European site features	**Likely Effects of NSIP**																				
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 6*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Cygnus columbianus bewickii; Tundra swan (winter)		**x a**																		**x b**	
Anas Crecca; Eurasian teal (winter)		**x c**			**x c**		**x d**		**x d**	**x d**		**x d**				**x d**		**x d**	**x e**	**x f**	**x e**
Vanellus vanellus Northern lapwing (winter)		**x g**			**x g**		**x d**		**x d**	**x d**		**x d**				**x d**		**x d**	**x e**	**x h**	**x e**
Cygnus olor;		**x**			**x**		**x**		**x**	**x**		**x**				**x**		**x**	**x**	**x**	**x**

Mute swan (winter)		**i**			**i**		**d**		**d**	**d**		**d**				**d**		**d**	**e**	**j**	**e**
Anas penelope; Eurasian wigeon (winter)		**x k**			**x k**		**x d**		**x d**	**x d**		**x d**				**x d**		**x d**	**x e**	**x l**	**x e**
Anas acuta; Northern pintail (Winter)		**x m**			**x m**		**x d**		**x d**	**x d**		**x d**				**x d**		**x d**	**x e**	**x n**	**x e**
Anas clypeata; Northern Shoveler (Winter)							**x d**		**x d**	**x d**		**x d**				**x d**		**x d**	**x e**		**x e**
Criterion 5 Wintering waterfowl assemblage		**x a, c, g, i, k, m, o**			**x a, c, g, i, k, m, o**		**x d**		**x d**	**x d**		**x d**				**x d**		**x d**	**x e**	**x b, f, h, I, l, n, o**	**x e**

a. Consultations together with the findings of the literature review indicate that, although Bewick's swan are vulnerable to collisions with overhead lines, they generally manoeuvre better than whooper swan and are therefore more able to avoid aerial hazards such as overhead lines (Section 4.6 of HRA, Para 4.6.59). Desktop and field survey findings were that Bewick's swan did not use land within the Proposed Development for feeding or resting (Section 4.2 of HRA, Paras 4.2.16 – 4.2.29). Desktop and field survey findings also suggest that Bewick's swan do not undertake local flights between feeding sites within the study area (Section 4.6 of HRA, Para 4.6.60). There is little evidence to indicate that Bewick's swan undertake regular movements between Bridgwater Bay and the Somerset Levels (Section 4.6 of HRA, Para 4.6.61). There is strong evidence that Bewick's swan are visiting the west of the UK in far fewer numbers in comparison with other parts of the UK (Section 4.2 of HRA, Para 4.2.21 -4.2.23). Based on desktop and field survey findings during 2009 to 2011 there is little evidence to indicate that migrating Bewick's swan fly within the study area. It is likely that the majority of Bewick's swan migrate to the Somerset Levels overland via Scotland, possibly Welney in East Anglia and the majority flying to the Somerset Levels would therefore not fly through the preferred corridor during migration (Section 4.6 of HRA, Para 4.6.63 – 4.6.64). Overall it is

considered that the risk of migrating Bewick's swan colliding with an overhead line in the preferred corridor is very low (Section 4.6 of HRA, Para 4.6.65).

b. No significant in-combination collision risks were identified for Bewick's swan (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA/Ramsar species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for Bewick's swan.

c. Based on the Vantage Point survey data, calculated annual collision mortalities for teal associated with the Somerset Levels and Moors Ramsar range from 0.19 birds (99.9% avoidance rate) to 0.93 birds (99.5% avoidance rate.) (Section 4.6 of HRA, Paras 4.6.76 and Table 4.7). A 99.7% avoidance rate for this species is considered realistic (Section 4.6 of the HRA, Paras 4.6.22 – 4.6.23), which would result in annual collision mortalities of 0.56 birds, representing 0.003% of the Ramsar population or an increase in background teal mortality of 0.006% (Section 4 of HRA, Table 4.7). The predicted number of annual collision mortalities for teal are very low and would not be significant in the context of the designated wintering population of the Somerset Levels and Moors Ramsar (Section 4.6 of HRA, Para 4.6.77). The calculated mortality from collision (based solely on VP data) is likely to be an overestimate. The proposed 400kV power line would replace the existing 132kV line and has a similar risk zone. Over 3km of the existing 132kV overhead line would be removed and not replaced by a similar length of new 400kV power line. It is therefore, on balance, unlikely to result in an increase in the overall level of potential collision risk compared to that which is likely to be currently occurring (Section 4.6 of HRA, Paras 4.6.77 – 4.6.79). A number of uncertainties exist, including the scale of movements of birds across the proposed connection corridor as indicated by the radar studies and the likely avoidance rate. National Grid will therefore install bird diverters in locations within the Proposed Development where movements of RAMSAR species are most likely in order to reduce potential collision risk and possible bird mortality and also undertake monitoring with the aim of ascertaining both the level of collision and whether further measures would be required (Section 4.6 of HRA, Paras 4.6.143 – 4.6.180 and Section 4.7). Based on the radar collision risk modelling exercise, it can be seen that post-mitigation the calculated increase in background mortality for teal would be below 1% (Section 4.6 of HRA, Para 4.6.180, Table 4.11). The level of collision risk would therefore not be of significance at the population level (Section 4.6 of HRA, Para 4.6.180). Prior to mitigation, no impact is predicted on teal associated with the Somerset Levels and Moors Ramsar that would be considered to be significant at the population level. Taking into account the proposed mitigation, then the level of impact at the population level would be further reduced (Section 4.6 of HRA, Para 4.6.180).

d. The small numbers of waterbirds observed to occur within the route corridor and adjacent habitats (ES Volume 5.8.2.4 Appendix F Section 4.5) indicate that if displacement were to arise, that any impacts at the designated species population level would not be significant (Section 4.5 of HRA, Paras 4.5.2-4.5.12). There are large areas of suitable habitat (e.g. other watercourses, grasslands, wetlands and estuarine habitats) in proximity to the corridor to which displaced birds could relocate. Given the extensive nature of these habitats and the small numbers of birds that could potentially be displaced at any one time it is considered highly unlikely that displacement would affect the capacity of these resources to support existing Ramsar designated populations of waterbirds.

The majority of the land within the corridor is assessed as being of low habitat value for wintering waders and wildfowl (Section 4.4 of HRA, Table 4.3 and ES Volume 5.8.2.4, Appendix 8F). A small number of fields were assessed as holding moderate potential for waders and wildfowl. Only 2 fields/field groups within the corridor were assessed as holding high potential for wildfowl. These included Portbury Wharf and Avonmouth Sewage Works. No areas were assessed as holding high potential for waders. Due to the very limited use of habitats within the corridor by Ramsar designated bird species, habitat loss as a result of the Proposed Development is highly unlikely to impact upon Ramsar designated bird populations.

e. No interactions with other projects screened into the assessment that would, in-combination, lead to significant in-combination disturbance or displacement impacts on the designated waterbird populations of the Somerset Levels and Moors Ramsar are predicted (Section 4.12 of HRA).

f. In-combination with the other wind farm projects that could potentially affect teal through collision mortality (Section 4.14 of HRA), and for which collision mortality for this species is predicted, a total of 0.92 teal representing 0.004% of the Somerset Levels and Moors SPA/Ramsar would be predicted to collide with either the proposed overhead line or proposed wind farms each year. Bird flight diverters will be fitted in sections of the Proposed Development overhead line where bird species such as teal are considered most likely to cross the overhead line. The predicted in-combination annual mortality, as a result of these measures, would therefore be further reduced to 0.70 teal or 0.003% of the Somerset Levels and Moors Ramsar teal population.

Calculations based on modelling of potential bird movements involving teal (Section 4.14 of HRA) show that 0.46% of the Somerset Levels and Moors Ramsar teal population would be affected by collision mortality based on a 99.7% avoidance rate. Following the provision of the proposed fitting of bird flight diverters on the Proposed Development overhead line, this would be likely to be reduced to 0.36% of the teal population of the Somerset Levels and Moors Ramsar. The predicted annual loss of 80.25 teal from the Ramsar would represent an increase in baseline mortality for the population of 0.77%.

This is less than the 1% increase in baseline mortality that is considered to represent a 'small number' and a figure that is used as a trigger above which further consideration of population level impacts might be undertaken.

g. Based on the Vantage Point survey data, calculated annual collision mortalities for lapwing associated with the Somerset Levels and Moors Ramsar range from 15.36 birds (99.9% avoidance rate) to 76.81 birds (99.5% avoidance rate.) (HRA, Table 4.9). A 99.7% avoidance rate for this species is considered realistic (Section 4.6 of HRA, Paras 4.6.22 – 4.6.24), which would result in annual collision mortalities of 46.09 birds, representing 0.12% of the Ramsar population or an increase in background mortality of 0.4% (Section 4.6 of HRA, Paras 4.6.99 – 4.6.102, Table 4.9, Table 4.11). The apportioning of the estimated collision mortality to the Ramsar is likely to be a significant overestimate as it includes for birds that form part of the wider, non-Ramsar, countryside population (Section 4.6 of HRA, Para 4.6.101). Even if it is assumed that the calculated total collision mortality is attributed solely to the Ramsar population, the predicted level of impact would not give rise to a detrimental effect at the designated population level (Section 4.6 of HRA, Paras 4.6.99 – 4.6.101, Table 4.11). As the increase in background mortality (stated as 0.3 – BTO Birdfacts) would also be less than 1%, this indicates that the predicted mortality loss due to collision would be unlikely to be significant at the population level (HRA, Section 4, Para 4.6.138). There is no evidence to indicate that lapwing collisions with the existing overhead power line network are occurring (Section 4.6 of HRA, Para 4.6.7). The proposed 400kV overhead line essentially replaces the existing 132kV transmission line and the overall network of electricity overhead transmission and distribution lines in the vicinity of the Somerset Levels and Moors Ramsar would slightly decrease through this project (Section 4.6 of HRA, Paras 4.6.79 – 4.6.80). In relation to the existing 132kV line, the collision risk zone of the T-pylon is approximately the same (Section 4.6 of HRA, Paras 4.6.11 – 4.6.19, Table 4.4). The overall potential for collision risk is therefore considered to be very similar to that associated with the existing 132kV overhead and it is therefore highly unlikely that the Proposed Development will increase lapwing mortality (Section 4.6 of HRA, Paras 4.6.99 – 4.6.101).

h. Based on the Vantage Point survey data, using a 99.7% avoidance rate considered realistic for this species, it is predicted that the overhead line could result in an annual mortality of 46.09 lapwing, representing 0.12% of the Somerset Levels and Moors Ramsar population. When combined with other plans and projects where collision risks have been quantified, the total predicted collision risk is only raised to 46.27 lapwing per year (0.12% of Somerset Levels and Moors Ramsar Population). When the likely effects of the proposed mitigation of installing flight diverters to key locations of the proposed overhead line are taken into account, this results in a total combined collision risk of 27.65 lapwing or 0.07% of the Somerset Levels and Moors Ramsar. This level of mortality is not considered to be significant at the designated population level (Section 4.14 of HRA).

i. Mute swan is not currently a qualifying species for the Somerset Levels and Moors Ramsar, but is under consideration for future designation. Based on the VP survey data, calculations indicate that the predicted number of annual collision mortalities for mute swan are low. The increase in background mortality, at 3.3%, is considered unlikely to be significant given that there is likely to be a healthy local/regional population of birds that does not form part of the Somerset Levels Ramsar population (Section 4.6.69 of HRA). The parameters of the existing pylons are similar to those of the proposed pylon/power line infrastructure which will replace it (Table 4.4 of HRA) meaning that the collision risk zone is very similar (Section 4.6 of HRA, Paras 4.6.11 – 4.6.19, Table 4.4). On balance, it is unlikely that the proposed infrastructure will result in an increase in the overall level of potential collision risk and that the calculated collision mortality for the proposed connection is representative of that which may already be occurring (Section 4.6 of HRA, Para 4.6.69 – 4.6.70).

j. No significant in-combination collision risks were identified for mute swan (Section 4.12 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for mute swan.

k. Field survey findings suggest that wigeon do not regularly fly within the collision risk zone where the preferred corridor crosses the Huntspill River when undertaking local flights between feeding sites within the study area (Section 4 of HRA, Paras 4.2.94 – 4.2.96 and 4.6.83). It is possible that some of the bird movements recorded by the EDF radar study (EDF 2012) were of wigeon (Section 4.6 of HRA, Para 4.6.84), however the extensive vantage point work carried out for the Hinkley Connection C project found no evidence to support the suggestion that regular daily movements of wigeon take place between these areas (Section 4.6 of HRA, Para 4.6.83). The proposed overhead line removal includes more than 3km of 132kV overhead line which would not be replaced to the south of the most southerly point of the proposed 400kV overhead line, the proposed 400kV overhead line would therefore result in a reduction in the overall length of overhead line to the south of the Mendips (Section 4.6 of HRA, Para 4.6.80). The 3km section of 132kV line that would not be replaced is located to the west of Bridgwater and potentially lies on the flight path of birds that may undertake movements between the southern part of the Somerset Levels and Moors Ramsar (notably Kings Sedgemoor) and Bridgwater Bay (Section 4.6 of HRA, Para 4.6.80). The proposed 400kV overhead line will have approximately the same collision risk zone to the existing 132kV line at a similar height and the overall collision risk for the existing and proposed line is therefore considered to be similar (Section 4.6 of HRA, Paras 4.6.11 – 4.6.19, Table 4.4). It is apparent from the available data (Section 4.6 of HRA, Para 4.6.144) that no discernible Ramsar population level impacts that could be attributed to collision mortality with the

existing overhead power line network are occurring. A number of uncertainties exist, including the scale of movements of birds across the proposed connection corridor as indicated by the radar studies and the likely avoidance rate. National Grid will therefore install bird diverters in locations within the Proposed Development where movements of Ramsar species are most likely in order to reduce potential collision risk and possible bird mortality and also undertake monitoring with the aim of ascertaining both the level of collision and whether further measures would be required (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180 and Section 4.7). Based on the radar collision risk modelling exercise, it can be seen that post-mitigation the calculated increase in background mortality for wigeon would be below 1% (Section 4.6 of HRA, Paras 4.6.180, Table 4.11). The level of collision risk would therefore not be of significance at the population level (Section 4.6 of HRA, Paras 4.6.180). Prior to mitigation, no impact is predicted on wigeon associated with the Somerset Levels and Moors Ramsar that would be considered to be significant at the population level. Taking into account the proposed mitigation, then the level of impact at the population level would be further reduced (Section 4.6 of HRA, Para 4.6.180).

l. No wigeon were recorded flying at risk height within 250m of the Proposed Development overhead line during vantage points undertaken for this project. Within the HRA undertaken for the Black Ditch wind farm only 4 individuals were recorded flying within the survey area during nocturnal vantage points undertaken. Based on the collision risk associated with wigeon flights observed during vantage point surveys undertaken for the Proposed Development or any of the wind farm projects, the predicted impact of collision risk on wigeon from these projects combined is negligible.

Calculations based on modelling of potential bird movements involving wigeon (Section 4.14 of HRA) show that, using an avoidance rate of 99.7%, 0.36% of wigeon associated with the Somerset Levels and Moors Ramsar would be affected through in-combination collision mortality each year. When the proposed mitigation is taken into consideration, assuming no mitigation undertaken at the proposed wind farms, this would be reduced to 0.28% of wigeon associated with the Somerset Levels and Moors Ramsar. The predicted annual loss of 80.25 wigeon from the Ramsar would represent an increase in background mortality for the population of 0.60%.

m. Field survey findings indicate that pintail do not undertake regular local flights between feeding sites across the study area. There is a possibility that pintail may move between the Severn Estuary and the Somerset Levels during their autumn and spring migrations, although there is no clear evidence to support this (Section 4 of HRA, Paras 4.2.123 and 4.6.89). Although it is considered highly unlikely that pintail are making regular movements over the location of the proposed overhead line at a height that would make them vulnerable to collision risk, it is considered that even if this were the case the proposed mitigation of fitting bird diverters in key locations would make any residual impact so low as to not be significant (HRA, Table 4.11).

n. The potential for any significant in-combination impact on the Ramsar pintail population as a result of collision mortality is considered to be very low. The collision risk for the Proposed Development for this species is considered to not be significant given the lack of regular local flights within the potential risk zone (Section 4.2 of HRA, Para 4.2.123). No other projects for which significant collision risk for pintail was determined were identified as part of the assessment. Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme population based mortality trigger and threshold levels have been set, including specific values for pintail.

o. In addition to the individual qualifying waterbird species for which collision risk calculations have been undertaken, significant collision mortality is not predicted for any other species that may contribute to the overall assemblage (ES Volume 5.8.2.4 Appendix 8F and Section 4.4 of HRA).

Stage 2: Matrix C: Severn Estuary SPA

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses

Name of European site: Severn Estuary SPA																		
Distance to NSIP 0km																		
European site features	**Likely Effects of NSIP**																	
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
A037 Cygnus columbianus bewickii; Bewick's swan *(over-wintering)*		**x a**															**x b**	
A048 Tadorna tadorna; Shelduck *(over-wintering)*		**x c**			**x c**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x f**	**x e**
A051 Anas strepera; Gadwall *(over-wintering)*		**x g**			**x g**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x h**	**x e**

A162 Tringa totanus; Redshank *(over-wintering)*		**x i**			**x i**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x j**	**x e**
A160 Numenius arquata; *Curlew (over-wintering)*		**x k**			**x k**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x l**	**x e**
A054 Anas acuta; Northern pintail *(over-wintering)*		**x m**			**x m**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x n**	**x e**
Under Article 4.2 Qualification, the Severn Estuary SPA regularly supports an overwintering population of 93,986 waterfowl (5-year peak mean 1991/2-1995/6). Contributing bird species include: Bewick's Swan, Curlew, Dunlin, Gadwall, Grey Plover, Lapwing, Mallard, Pintail, Pochard, Redshank, Shelduck, Shoveler, Teal, Tufted Duck, White-fronted Goose, and Wigeon.		**x a, c, g, i, k, m, o**			**x a, c, g, i, k, m, o**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x b, f, h, j, l, n, o**	**x e**

a. Consultations together with the findings of the literature review indicate that, although Bewick's swan are vulnerable to collisions with overhead lines, they generally manoeuvre better than whooper swan and are therefore more able to avoid aerial hazards such as overhead lines (Section 4 f HRA, Para 4.6.59). Desktop and field survey findings were that Bewick's swan did not use land within the Proposed Development for feeding or resting (Section 4.2 of HRA, Paras 4.2.16 – 4.2.29). Desktop and field survey findings also suggest that Bewick's swan do not undertake local flights between feeding sites within the study area (Section 4.6 f HRA, Para 4.6.60). There is little evidence to indicate that Bewick's swan undertake regular movements between Bridgwater Bay and the Somerset Levels (Section 4.6 of HRA, Para 4.6.61). There is strong evidence that Bewick's swan are visiting the west of the UK in far fewer numbers in comparison with other parts of the UK (Section 4.2 of HRA, Para 4.2.21 -4.2.23). Based on desktop and field survey findings during 2009 to 2011 there is little evidence to indicate that migrating Bewick's swan fly within the study area. It is likely that the majority of Bewick's swan migrate to the Severn Estuary overland via Scotland, possibly Welney in East Anglia and the majority flying to the Severn Estuary would therefore not fly through the preferred corridor during migration (Section 4.6 of HRA, Paras 4.6.63 – 4.6.64). Overall it is considered that the risk of migrating Bewick's swan colliding with an overhead line in the preferred corridor is very low (Section 4.6 of HRA, Para 4.6.65).

b. No significant in-combination collision risks were identified for Bewick's swan (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for Bewick's swan.

c. Field survey findings confirm that shelduck do occasionally fly along the River Avon within the risk zone (10 to 50 metres). However the majority of the shelduck flew within 10 metres of the water at a height which would allow these birds to fly below the proposed overhead line. The proposals also include the removal two sections of 132kV overhead line that cross Portbury Wharf Nature Reserve which currently provide a collision risk to shelduck using this area. Therefore the overall collision risk will be reduced further. Using a 99.7% collision risk avoidance rate it is calculated that 0.05% of the shelduck population associated with the Severn Estuary SPA would be affected by collision mortality each year (ES Volume 5.8.2.4 Section 4.5). This level of mortality is not considered to be significant at the designated population level.

d. The small numbers of waterbirds observed to occur within the route corridor and adjacent habitats (ES Volume 5.8.2.4 Appendix F Section 4.5) indicate that if displacement were to arise, that any impacts at the designated species population

level would not be significant (Section 4.5 of HRA, Paras 4.5.2-4.5.12). There are large areas of suitable habitat (e.g. other watercourses, grasslands, wetlands and estuarine habitats) in proximity to the corridor to which displaced birds could relocate. Given the extensive nature of these habitats and the small numbers of birds that could potentially be displaced at any one time it is considered highly unlikely that displacement would affect the capacity of these resources to support existing SPA designated populations of waterbirds.

The majority of the land within the corridor is assessed as being of low habitat value for wintering waders and wildfowl (Section 4.4 of HRA, Table 4.3 and ES Volume 5.8.2.4, Appendix 8F). A small number of fields were assessed as holding moderate potential for waders and wildfowl. Only 2 fields/field groups within the corridor were assessed as holding high potential for wildfowl. These included Portbury Wharf and Avonmouth Sewage Works. No areas were assessed as holding high potential for waders. Due to the very limited use of habitats within the corridor by SPA bird species, habitat loss as a result of the Proposed Development is highly unlikely to impact upon SPA designated bird populations.

e. No interactions with other projects screened into the assessment that would, in-combination, lead to significant in-combination disturbance or displacement impacts on the designated waterbird populations of the Somerset Levels and Moors SPA are predicted (Section 4.12 of HRA).

f. No significant in-combination collision risks were identified for shelduck (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for shelduck.

g. Although the Severn Estuary SPA is partly designated for its gadwall population, the SPA no longer supports national or internationally important numbers of this species. This species seems to have undergone a shift in winter distribution in recent years (Holt et al., 2012). During the winter bird surveys, a single gadwall was recorded using the Avonmouth Sewage Works pool on one occasion. This pool is located 250m from the closest proposed works associated with the Hinkley Point C Connection Project. Gadwall were recorded at Portbury Wharf during the 2011-2012 winter bird survey, where 12 gadwall were recorded within the pool at the northern edge of the preferred corridor. Small numbers of gadwall were also recorded within the pools to the south of this area within the reserve. A group of 14 gadwall was also observed at Avonmouth Pools. Two gadwall were observed flying within 250m of the Preferred Corridor during the VP surveys (ES Volume 5.8.2.4 Section

4.5). Desktop and field survey findings also confirm that gadwall do not undertake regular local flights between feeding sites across the study area and it is believed that many gadwall stay on the Estuary for the entire winter. Therefore gadwall are not considered to be at risk of collision with the proposed overhead line.

h. No significant in-combination collision risks were identified for gadwall (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for gadwall.

i. The rate of redshank flights recorded during the vantage point survey was very low and only 12 birds flew within the risk zone (ES Volume 5.8.2.4 Section 4.5). It is considered that the proposed overhead line has a very low, if not negligible potential to cause redshank collision mortality. Using a 99.7% collision risk avoidance rate it is calculated that 0.13% of the redshank population associated with the Severn Estuary SPA would be affected by collision mortality each year (ES Volume 5.8.2.4 Section 4.5). This level of mortality is not considered to be significant at the designated population level.

j. No significant in-combination collision risks were identified for redshank (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for redshank.

k. Desktop and field survey findings confirm that curlew do not undertake regular local flights within the risk zone between feeding sites within the study area. Curlew were only recorded at vantage point 7 during the 2009-2010 vantage point survey (ES Volume 5.8.2.4 Section 4.5). There is some evidence to suggest that curlew migrate across the study area along the River Avon. However only nine curlew observed at VP7 on the River Avon flew within the risk zone during winter 2009-2010. It is considered that the collision risk potential for curlew with the proposed overhead line is very low. A group of 7 curlew were recorded flying from the direction of the Gordano Valley to Portbury Wharf at risk height during the 2013- 2014 vantage point survey. These birds did not cross the proposed route however, and as this was the only flight line recorded, it

is unlikely that curlew make regular flights across this section of the proposed overhead line. No significant collision risk for this species is therefore predicted.

l. No significant in-combination collision risks were identified for curlew (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for curlew.

m. Field survey findings indicate that pintail do not undertake regular local flights between feeding sites across the study area. There is a possibility that pintail may move between the Severn Estuary and the Somerset Levels during their autumn and spring migrations, although there is no clear evidence to support this (Section 4 of HRA, Paras 4.2.123 and 4.6.89). Although it is considered highly unlikely that pintail are making regular movements over the location of the proposed overhead line at a height that would make them vulnerable to collision risk, it is considered that even if this were the case the proposed mitigation of fitting bird diverters in key locations would make any residual impact so low as to not be significant (HRA, Table 4.11).

n. The potential for any significant in-combination impact on the SPA pintail population as a result of collision mortality is considered to be very low. The collision risk for the Proposed Development for this species is considered to not be significant given the lack of regular local flights within the potential risk zone (Section 4.2 of HRA, Para 4.2.123). No other projects for which significant collision risk for pintail was determined were identified as part of the assessment. Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme population based mortality trigger and threshold levels have been set, including specific values for pintail.

o. In addition to the individual qualifying waterbird species for which collision risk calculations have been undertaken, significant collision mortality is not predicted for any other species that may contribute to the overall assemblage (ES Volume 5.8.2.4 Appendix 8F and Section 4.4 of HRA).

Stage 2: Matrix D: Severn Estuary Ramsar

Effect 1 = Collision during Daily Feeding Flights
Effect 2 = Collision during migratory flights
Effect 3 = Displacement/Displacement from feeding grounds
Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses

Name of European site: Severn Estuary Ramsar																		
Distance to NSIP 0km																		
European site features	**Likely Effects of NSIP**																	
	Effect 1			*Effect 2*			*Effect 3*			*Effect 4*			*Effect 7*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Cygnus columbianus bewickii; Bewick's swan *(over-wintering)*		**x a**															**x b**	
Tadorna tadorna; Shelduck *(over-wintering)*		**x c**			**x c**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x f**	**x e**
Anas strepera; Gadwall *(over-wintering)*		**x g**			**x g**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x h**	**x e**
Tringa totanus; Redshank *(over-wintering)*		**x i**			**x i**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x j**	**x e**

Anas crecca; Eurasian teal (winter) *(over-wintering)*		**x k**			**x k**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x l**	**x e**
Anas acuta; Northern pintail *(over-wintering)*		**x m**			**x m**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x n**	**x e**
Criterion 5 – wintering waterbird assemblage		**x a, c, g, i, k, m, o**			**x a, c, g, i, k, m, o**		**x d**		**x d**	**x d**		**x d**	**x d**		**x d**	**x e**	**x b, f, h, j, l, n, o**	**x e**

a. Consultations together with the findings of the literature review indicate that, although Bewick's swan are vulnerable to collisions with overhead lines, they generally manoeuvre better than whooper swan and are therefore more able to avoid aerial hazards such as overhead lines (Section 4.6 of HRA, Para 4.6.59). Desktop and field survey findings were that Bewick's swan did not use land within the Proposed Development for feeding or resting (Section 4.2 of HRA, Paras 4.2.16 – 4.2.29). Desktop and field survey findings also suggest that Bewick's swan do not undertake local flights between feeding sites within the study area (Section 4.6 of HRA, Para 4.6.60). There is little evidence to indicate that Bewick's swan undertake regular movements between Bridgwater Bay and the Somerset Levels (Section 4.6 of HRA, Para 4.6.61). There is strong evidence that Bewick's swan are visiting the west of the UK in far fewer numbers in comparison with other parts of the UK (Section 4.2 of HRA, Para 4.2.21 -4.2.23). Based on desktop and field survey findings during 2009 to 2011 there is little evidence to indicate that migrating Bewick's swan fly within the study area. It is likely that the majority of Bewick's swan migrate to the Severn Estuary overland via Scotland, possibly Welney in East Anglia and the majority flying to the Severn Estuary would therefore not fly through the preferred corridor during migration (Section 4.6 of HRA, Para 4.6.63 – 4.6.64). Overall it is considered that the risk of migrating Bewick's swan colliding with an overhead line in the preferred corridor is very low (Section 4.6 of HRA, Para 4.6.65).

b. No significant in-combination collision risks were identified for Bewick's swan (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of Ramsar species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for Bewick's swan.

c. Field survey findings confirm that shelduck do occasionally fly along the River Avon within the risk zone (10 to 50 metres). However the majority of the shelduck flew within 10 metres of the water at a height which would allow these birds to fly below the proposed overhead line. The proposals also include the removal two sections of 132kV overhead line that cross Portbury Wharf Nature Reserve which currently provide a collision risk to shelduck using this area. Therefore the overall collision risk will be reduced further. Using a 99.7% collision risk avoidance rate it is calculated that 0.05% of the shelduck population associated with the Severn Estuary Ramsar would be affected by collision mortality each year (ES Volume 5.8.2.4 Section 4.5). This level of mortality is not considered to be significant at the designated population level.

d. The small numbers of waterbirds observed to occur within the route corridor and adjacent habitats (ES Volume 5.8.2.4 Appendix F Section 4.5) indicate that if displacement were to arise, that any impacts at the designated species population level would not be significant (Section 4.5 of HRA, Paras 4.5.2-4.5.12). There are large areas of suitable habitat (e.g. other watercourses, grasslands, wetlands and estuarine habitats) in proximity to the corridor to which displaced birds could relocate. Given the extensive nature of these habitats and the small numbers of birds that could potentially be displaced at any one time it is considered highly unlikely that displacement would affect the capacity of these resources to support existing Ramsar designated populations of waterbirds.

The majority of the land within the corridor is assessed as being of low habitat value for wintering waders and wildfowl (Section 4.4 of HRA, Table 4.3 and ES Volume 5.8.2.4, Appendix 8F). A small number of fields were assessed as holding moderate potential for waders and wildfowl. Only 2 fields/field groups within the corridor were assessed as holding high potential for wildfowl. These included Portbury Wharf and Avonmouth Sewage Works. No areas were assessed as holding high potential for waders. Due to the very limited use of habitats within the corridor by Ramsar designated bird species, habitat loss as a result of the Proposed Development is highly unlikely to impact upon Ramsar designated bird populations.

e. No interactions with other projects screened into the assessment that would, in-combination, lead to significant in-combination disturbance or displacement impacts on the designated waterbird populations of the Somerset Levels and Moors

Ramsar are predicted (Section 4.11 of HRA).

f. No significant in-combination collision risks were identified for shelduck (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for shelduck.

g. During the winter bird surveys, a single gadwall was recorded using the Avonmouth Sewage Works pool on one occasion. This pool is located 250m from the closest proposed works associated with the Hinkley Point C Connection Project. Gadwall were recorded at Portbury Wharf during the 2011-2012 winter bird survey, where 12 gadwall were recorded within the pool at the northern edge of the preferred corridor. Small numbers of gadwall were also recorded within the pools to the south of this area within the reserve. A group of 14 gadwall was also observed at Avonmouth Pools. Two gadwall were observed flying within 250m of the Preferred Corridor during the VP surveys (ES Volume 5.8.2.4 Section 4.5). Desktop and field survey findings also confirm that gadwall do not undertake regular local flights between feeding sites across the study area and it is believed that many gadwall stay on the Estuary for the entire winter. Therefore gadwall are not considered to be at risk of collision with the proposed overhead line.

h. No significant in-combination collision risks were identified for gadwall (Section 4.11 of HRA). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for gadwall.

i. The rate of redshank flights recorded during the vantage point survey was very low and only 12 birds flew within the risk zone (ES Volume 5.8.2.4 Section 4.5). It is considered that the proposed overhead line has a very low, if not negligible potential to cause redshank collision mortality. Using a 99.7% collision risk avoidance rate it is calculated that 0.13% of the redshank population associated with the Severn Estuary Ramsar would be affected by collision mortality each year (ES Volume 5.8.2.4 Section 4.5). This level of mortality is not considered to be significant at the designated population level.

j. No significant in-combination collision risks were identified for redshank (HRA Report Section 4.11). Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for redshank.

k. Based on the Vantage Point survey data, calculated annual collision mortalities for teal associated with the Severn Estuary Ramsar range from 1.18 birds (99.9% avoidance rate) to 5.92 birds (99.5% avoidance rate.) (HRA, Section 4.6, Para 4.6.75 and Table 4.6). A 99.7% avoidance rate for this species is considered realistic (Section 4 of the HRA, Paras 4.6.22 – 4.6.23), which would result in annual collision mortalities of 3.55 birds, representing 0.07% of the Ramsar population or an increase in background teal mortality of 0.16% (HRA, Section 4.6, Table 4.6). The predicted number of annual collision mortalities for teal are very low and would not be significant in the context of the designated wintering population of the Severn Estuary (HRA, Section 4.6, Para 4.6.77). The calculated mortality from collision (based solely on VP data) is likely to be an overestimate. The proposed 400kV power line would replace the existing 132kV line and has a similar risk zone. Over 3km of the existing 132kV overhead line would be removed and not replaced by a similar length of new 400kV power line. It is therefore, on balance, unlikely to result in an increase in the overall level of potential collision risk compared to that which is likely to be currently occurring (HRA, Section 4, Paras 4.6.77 – 4.6.80). A number of uncertainties exist, including the scale of movements of birds across the proposed connection corridor as indicated by the radar studies and the likely avoidance rate. National Grid will therefore install bird diverters in locations within the Proposed Development where movements of Ramsar species are most likely in order to reduce potential collision risk and possible bird mortality and also undertake monitoring with the aim of ascertaining both the level of collision and whether further measures would be required (HRA, Section 4.6, Paras 4.6.145 – 4.6.180 and Section 4.7). Based on the radar collision risk modelling exercise, it can be seen that post-mitigation the calculated increase in background mortality for teal would be below 1% (HRA, Section 4, Paras 4.6.180, Table 4.11). The level of collision risk would therefore not be of significance at the population level (HRA, Section 4, Paras 4.6.180). Prior to mitigation, no impact is predicted on teal associated with the Severn Estuary Ramsar that would be considered to be significant at the population level. Taking into account the proposed mitigation, then the level of impact at the population level would be further reduced (Section 4 of HRA, Para 4.6.180).

l. Based on the Vantage Point survey data, using a 99.7% avoidance rate the calculated annual collision mortality for teal associated with the Severn Estuary SPA is 3.55 birds, representing 0.07% of the Ramsar population. In-combination with the Wessex Water wind farm, Black Ditch wind farm and Withy End wind farm this becomes a predicted annual mortality rate of

between 6.21 and 15.41 teal. This equals between 0.13% and 0.31% of the Severn Estuary Ramsar teal population. This is calculated from the range of predicted mortality rates provided in the Wessex Water wind farm assessment. By far the greatest proportion of this collision risk relates to the Wessex Water wind farm. This level of mortality is not considered to be significant at the SPA population level. Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of Ramsar species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme specific population based mortality trigger and threshold levels have been set, including specific values for teal.

m. Field survey findings indicate that pintail do not undertake regular local flights between feeding sites across the study area. There is a possibility that pintail may move between the Severn Estuary and the Somerset Levels during their autumn and spring migrations, although there is no clear evidence to support this (Section 4 of HRA, Paras 4.2.123 and 4.6.89). Although it is considered highly unlikely that pintail are making regular movements over the location of the proposed overhead line at a height that would make them vulnerable to collision risk, it is considered that even if this were the case the proposed mitigation of fitting bird diverters in key locations would make any residual impact so low as to not be significant (HRA, Table 4.11).

n. The potential for any significant in-combination impact on the Ramsar pintail population as a result of collision mortality is considered to be very low. The collision risk for the Proposed Development for this species is considered to not be significant given the lack of regular local flights within the potential risk zone (Section 4.2 of HRA, Para 4.2.123). No other projects for which significant collision risk for pintail was determined were identified as part of the assessment. Notwithstanding this, National Grid will install bird diverters in locations within the Proposed Development where movements of SPA species are most likely in order to reduce potential collision risk and possible bird mortality (Section 4.6 of HRA, Paras 4.6.145 – 4.6.180). Monitoring with the aim of ascertaining both the level of collision and whether further measures would be required will be undertaken (Section 4.7 of HRA). As part of this monitoring programme population based mortality trigger and threshold levels have been set, including specific values for pintail.

o. In addition to the individual qualifying waterbird species for which collision risk calculations have been undertaken, significant collision mortality is not predicted for any other species that may contribute to the overall waterbird assemblage (ES Volume 5.8.2.4 Appendix 8F and Section 4.4 of HRA).

Stage 2 Matrix E: North Somerset and Mendip Bats SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury

Name of European site: North Somerset and Mendip Bats SAC																					
Distance to NSIP 3km																					
European site features	**Adverse effect on integrity**																				
	Effect 4			*Effect 5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1303 *Rhinolophus hipposideros;* lesser horseshoe bat	**x a**		**x a**				**x b**	**x b**	**x b**	**x b**	**x b**	**x b**							**x c**		
S1304 *Rhinolophus ferrumequinum;* greater horseshoe bat	**x a**		**x a**				**x b**	**x b**	**x b**	**x b**	**x b**	**x b**							**x c**		

Evidence supporting conclusions

a. High light levels can delay or prevent emergence from roosts, can discourage use of commuting and foraging habitat, or conversely for some species can encourage bat foraging. The slower flying bats which include horseshoe bats tend to avoid street lighting (Bat Conservation Trust 2008). Research by Bristol University replicated street lighting (average 53.09 lux) along unlit hedgerows to identify behavioural responses. Bats flew through the lights on 42% of observations, 30% turned around, 26% flew over or through the hedge and only 2% flew wide or high around the lights (Bat Conservation Trust 2008) (Section 5.2 of HRA, Paras 5.2.85 – 5.2.86). Lighting is required for security reasons around main compound sites (which also includes through the night) throughout the construction phase and there is potential for impacts on SAC bat populations due to this (Section 5.2 of HRA, Paras 5.2.88 – 5.2.90). However, due to the limited locations where lighting will be required the range and extent of habitats that would be affected is considered unlikely to have an impact on either the overall foraging resource available to bats or the integrity of commuting routes such that effects at the population level would be likely to arise. The integrity of the lesser horseshoe and greater horseshoe bat populations of the North Somerset and Mendip Bats SAC would not be adversely affected by the effects of lighting (Section 6.3 of HRA, Paras 6.3.25 - 6.3.26).

b. National Grid would ensure that sufficient foraging habitat would be available through appropriate land management measures for lesser horseshoe and greater horseshoe bats during the construction of the Proposed Development. The provisions cover the 400kV undergrounding works within the bat consideration zone (i.e. the 400kV undergrounding through Mendip Hills Area of Outstanding Natural Beauty) – see Appendix D of Volume 5.26.3B. The Somerset Habitat Evaluation Procedure (HEP) Methodology (Somerset County Council, June 2014) is used to objectively quantify the mitigation provided for bats. Previously known as the Somerset Biodiversity Offsetting Method, HEP is a procedure founded on calculating species-specific, geographically-sensitive habitat values. HEP has been used to calculate the current value of the habitats for horseshoe bats and quantify the value of the proposed construction phase habitats. The results of the calculations demonstrate that the construction phase habitats within the Order Limits (along the 400kV undergrounding in the Mendip Hills) would provide: 124.5% of the current value for lesser horseshoe bats and 120.8% of the current value for greater horseshoe bats. This represents a default position which NG could implement within the order limits (secured by draft DCO Requirements 5 and 14).

There is potential for effects to arise from loss of greater and lesser horseshoe bats regular commuting habitat outside the SACs as a result of the permanent substation at Sandford and associated emergency access route, temporary losses of hedgerow and bankside vegetation on watercourses or temporary construction lighting (Section 5.4 of HRA, Para 5.4.7). There is also potential for effects to arise from loss of foraging habitat as a result of the permanent substation at

Sandford. However, the range and extent of habitats that would be affected is considered unlikely to have an impact on either the overall foraging resource available to bats or the integrity of commuting routes. No adverse effect on the integrity of the lesser horseshoe or greater horseshoe populations of this SAC would therefore arise (Section 6 of HRA, Paras 6.3.25 – 6.3.26).

c. NG has used Bat Consideration Zones, which are published species-specific habitat zones (Appendix 17.8a1.1) to identify potential in-combination effects on SAC bat populations. The approach taken to the in-combination assessment is in line with that set out in available guidance (e.g. PINS Advice Note 10) and inclusive with regard to the projects considered. The conclusions reached in the HRA (section 5.5) take into account the effects of the proposed projects on the same identified sensitivities as those of the HPCC project (i.e. bat foraging habitat, habitat connectivity) using the Bat Consideration Zones as a mechanism for understanding potential cumulative effects. Of the identified projects, those for which environmental information is available would incorporate mitigation measures to ensure that individually projects would not adversely impact upon bat populations. Using the HEP (see point b above), the amount and distribution of habitat enhancement and creation measures that would be implemented for the construction phase would at worst lead to a neutral effect on the availability of foraging habitat for greater horseshoe and lesser horseshoe bats. As such, given this conclusion, from an in-combination perspective the contribution of the HPCC to a cumulative effect on designated bat populations through habitat change would be negligible. Combined with similar conclusions for the other projects screened into the assessment, the overall impact on the designated bat populations is considered not to be significant. No adverse effect on the integrity of the greater horseshoe and lesser horseshoe populations of this SAC as a result of in-combination impacts would arise (Section 6.3 of HRA).

Stage 2 Matrix F: Mendip Limestone Grasslands SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury

Name of European site: Mendip Limestone Grasslands SAC																					
Distance to NSIP 0.2km																					
European site features	**Adverse effect on integrity**																				
	Effect 4			*Effect 5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1304 *Rhinolophus ferrumequinum;* Greater horseshoe bat	**x a**		**x a**				**x b**	**x b**	**x b**	**x b**	**x b**	**x b**							**x c**		

Evidence supporting conclusions

a. High light levels can delay or prevent emergence from roosts, can discourage use of commuting and foraging habitat, or conversely for some species can encourage bat foraging. The slower flying bats which include horseshoes tend to avoid street lighting (Bat Conservation Trust 2008). Research by Bristol University replicated street lighting (average 53.09 lux) along unlit hedgerows to identify behavioural responses. Bats flew through the lights on 42% of observations, 30%

turned around, 26% flew over or through the hedge and only 2% flew wide or high around the lights (Bat Conservation Trust 2008) (Section 5.2 of HRA, Paras 5.2.85 – 5.2.86). Lighting is required for security reasons around main compound sites (which also includes through the night) throughout the construction phase and there is potential for impacts on SAC bat populations due to this (Section 5.2 of HRA, Paras 5.2.88 – 5.2.90). However, due to the limited locations where lighting will be required the range and extent of habitats that would be affected is considered unlikely to have an impact on either the overall foraging resource available to bats or the integrity of commuting routes such that effects at the population level would be likely to arise. The integrity of the greater horseshoe bat populations of the Mendip Limestone Grasslands SAC would not be adversely affected by the effects of lighting (Section 6.3 of HRA, Paras 6.3.25 - 6.3.26).

b. National Grid would ensure that sufficient foraging habitat would be available through appropriate land management measures for lesser horseshoe and greater horseshoe bats during the construction of the Proposed Development. The provisions cover the 400kV undergrounding works within the bat consideration zone (i.e. the 400kV undergrounding through Mendip Hills Area of Outstanding Natural Beauty) – see Appendix D of Volume 5.26.3B. The Somerset Habitat Evaluation Procedure (HEP) Methodology (Somerset County Council, June 2014) is used to objectively quantify the mitigation provided for bats. Previously known as the Somerset Biodiversity Offsetting Method, HEP is a procedure founded on calculating species-specific, geographically-sensitive habitat values. HEP has been used to calculate the current value of the habitats for horseshoe bats and quantify the value of the proposed construction phase habitats. The results of the calculations demonstrate that the construction phase habitats within the Order Limits (along the 400kV undergrounding in the Mendip Hills) would provide: 124.5% of the current value for lesser horseshoe bats and 120.8% of the current value for greater horseshoe bats. This represents a default position which NG could implement within the order limits (secured by draft DCO Requirements 5 and 14).

There is potential for effects to arise from loss of greater horseshoe bats regular commuting habitat outside the SACs as a result of the permanent substation at Sandford and associated emergency access route, temporary losses of hedgerow and bankside vegetation on watercourses or temporary construction lighting (Section 5.4 of HRA, Para 5.4.7). There is also potential for effects to arise from loss of foraging habitat as a result of the permanent substation at Sandford. However, the range and extent of habitats that would be affected is considered unlikely to have an impact on either the overall foraging resource available to bats or the integrity of commuting routes.

No adverse effect on the integrity of the greater horseshoe population of this SAC would therefore arise (Section 6.3 of HRA).

c. NG has used Bat Consideration Zones, which are published species-specific habitat zones (Appendix 17.8a1.1) to identify potential in-combination effects on SAC bat populations. The approach taken to the in-combination assessment is in line with that set out in available guidance (e.g. PINS Advice Note 10) and inclusive with regard to the projects considered. The conclusions reached in the HRA (section 5.5) take into account the effects of the proposed projects on the same identified sensitivities as those of the HPCC project (i.e. bat foraging habitat, habitat connectivity) using the Bat Consideration Zones as a mechanism for understanding potential cumulative effects. Of the identified projects, those for which environmental information is available would incorporate mitigation measures to ensure that individually the projects would not adversely impact upon bat populations. Using the HEP (see point b above), the amount and distribution of habitat enhancement and creation measures that would be implemented for the construction phase would at worst lead to a neutral effect on the availability of foraging habitat for greater horseshoe bat. As such, given this conclusion, from an in-combination perspective the contribution of the HPCC to a cumulative effect on designated bat populations through habitat change would be negligible. Combined with similar conclusions for the other projects screened into the assessment, the overall impact on the designated bat population is considered not to be significant. No adverse effect on the integrity of the greater horseshoe population of this SAC as a result of in-combination impacts would arise (Section 6.3 of HRA).

Stage 2 Matrix G: Exmoor and Quantock Oakwoods SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury

Name of European site: Exmoor and Quantock Oakwoods SAC																					
Distance to NSIP - over 5km																					
European site features	**Adverse effect on integrity**																				
	Effect 4			*Effect5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1308 *Barbastella barbastellus;* Barbastelle bat	**x a**		**x a**																		

Evidence supporting conclusions

a. High light levels can delay or prevent emergence from roosts, can discourage use of commuting and foraging habitat, or conversely for some species can encourage bat foraging. The slower flying bats which include horseshoes tend to avoid street lighting (Bat Conservation Trust 2008). Research by Bristol University replicated street lighting (average 53.09 lux) along unlit hedgerows to identify behavioural responses. Bats flew through the lights on 42% of observations, 30%

turned around, 26% flew over or through the hedge and only 2% flew wide or high around the lights (Bat Conservation Trust 2008) (Section 5.2 of HRA, Paras 5.2.85 – 5.2.86). Lighting is required for security reasons around main compound sites (which also includes through the night) throughout the construction phase and there is potential for impacts on SAC bat populations due to this (Section 5.2 of HRA, Paras 5.2.88 – 5.2.90). No alteration to potential existing commuting corridors that could be used by barbastelle would occur. Therefore, it is concluded that the Proposed Development would not have an adverse effect on the integrity of the barbastelle population of the Exmoor and Quantock Oakwoods SAC (Section 6.3 of HRA, Para 6.3.24).

Stage 2 Matrix H: Mells Valley SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 5 = Deterioration in air quality
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury

Name of European site: Mells Valley SAC																					
Distance to NSIP 27km																					
European site features	**Adverse effect on integrity**																				
	Effect 4			*Effect5*			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**x a**	**x a**	**x a**							**x a**	**x a**	**x a**									

Evidence supporting conclusions

a. Surveys and data searches identified all 4 species of Annex II bats within or adjacent to the Order Limits of the Proposed Development. Greater horseshoe bats were the most prevalent extending from the south of the AONB to

Portbury Wharf Nature Reserve (Section 5.2 of HRA, Para 5.2.3). The Mells Valley SAC is located outside foraging range of the Proposed Development and direct impacts on roosts or daily foraging/commuting habitat (through either habitat loss or disturbance through artificial lighting) on greater horseshoe bat from this SAC is therefore not anticipated. No adverse effect on the integrity of the greater horseshoe population of this SAC would therefore arise (Section 6.3 of HRA, Para 6.3.27).

Stage 2 Matrix I: Bath and Bradford on Avon Bat SAC

Effect 4 = Disturbance (human activity, noise and artificial lighting)
Effect 7 = Habitat losses
Effect 8 = Loss/disturbance of bat foraging and commuting routes
Effect 9 = Loss of bat roosting habitat
Effect 10 = Risk of death/injury

Name of European site: Bath and Bradford on Avon Bat SAC																		
Distance to NSIP 30km																		
European site features	**Adverse effect on integrity**																	
	Effect 4			*Effect 7*			*Effect 8*			*Effect 9*			*Effect 10*			*In-combination effects*		
	C	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
S1304 Greater horseshoe bat *Rhinolophus ferrumequinum*	**x a**	**x a**	**x a**				**x a**	**x a**	**x a**									

Evidence supporting conclusions

a. Surveys and data searches identified all 4 species of Annex II bats within or adjacent to the Order Limits of the Proposed Development. Greater horseshoe bats were the most prevalent extending from the south of the AONB to Portbury Wharf Nature Reserve (Section 5.2 of HRA, Para 5.2.3). The Bath and Bradford on Avon SAC is located outside foraging range of the Proposed Development and direct impacts on roosts or daily foraging/commuting habitat (through either habitat loss or disturbance through artificial lighting) on greater horseshoe bat from this SAC is therefore not anticipated. No adverse effect on the integrity of the greater horseshoe population of this SAC would therefore arise (Section 6.3 of HRA, Para 6.3.27).

REFERENCES

Bats and Lighting in the UK – Bat Conservation Trust (2008)

Budgey, R., Ward, R., Johnson, L., Milborrow, J. & Plonczkier, P. (2012)a Withy End Windfarm Radar Study. The Food and Environmental Research Agency (FERA).

Budgey, R., Ward, R., Johnson, L., Milborrow, J. & Plonczkier, P. (2012)b Black Ditch Windpark Radar Monitoring Study January 2011. The Food and Environmental Research Agency (FERA).

Appendix 20C – Record of Consultation

Correspondence with Natural England and the RSPB

Date and type of correspondence	Consultee	Consultee Response	Response follow up
Meeting 19th March 2009	Natural England Adrian Jowitt Bob Corns Andrew Burns	Natural England raised concerns about impacts on protected areas and the Severn Estuary, not in terms of construction but in terms of bird strikes. NE stated that if a new overhead line heads north from Hinkley Point, it could obstruct known flyways that link the Somerset Levels and the Severn Estuary – a particular worry at night as birds don't have good night vision. Natural England stated that they had commissioned a night radar survey to ascertain bird movement in the area. This would tell Natural England the size of the bird, direction and height. Natural England has no real evidence that existing overhead lines are causing an issue in this respect but if Pawlett Hams floods, as it is predicted, more birds might use the flyway and as a result could encounter more problems.	Both daytime and nocturnal vantage point surveys over two winter periods (2009/2010 & 2010/2011) were undertaken to enable assessment of collision risk. These 2011/2012 survey was specifically designed to address potential movements between the Somerset Levels and Severn Estuary. The Natural England radar study as well as two additional radar studies are included within the HRA. The potential effects of climate change are also addressed within the HRA.
Email on 25th August 2009 to Chris Chadwick TEP	RSPB Richard Archer	RSPB stated that Oct - March is good in that it covers the core winter months and much of the autumn passage period. It doesn't cover spring passage, which should extend to the end of May to be safe. RSPB suggested that TEP specifically mention NE's radar project from previous year (Bob Corns). This could provide some important information on critical flight paths within the broader flyway. RSPB Suggested that it was discussed with NE the merits, logistics and costs of carrying out further radar work, especially between December and February. RSPB stated that the proposed desktop contained a limited range of species. Several other important species are likely to use the flyway between the Levels and the Severn, eg. wigeon, pintail. RSPB stated that as there was clearly a lot of ground to cover efforts should be concentrated on where there are known/potential waterbird movement, especially	Winter bird surveys were extended until the end of April. Natural England radar study has been referred to and included within assessment. Additional radar studies have been discussed within the HRA as well as analysis of how useful they are within the assessment. Additional important species such as wigeon and pintail have been included within desktop searches and analysis. Winter bird surveys were undertaken using discussed method. Additional nocturnal work was carried out during winter 2010/2011. Weather conditions and state of tide was recorded during surveys, and surveys were deliberately undertaken throughout a range of tidal/weather conditions. Flight heights and any avoidance behaviour was recorded during vantage point surveys.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
		between the Levels and the Severn. RSPB did not think three visits for swan counts (which should also include Mute swan) were sufficient. They also suggested weekly vantage point counts. RSPB stated that dawn and dusk surveys tied in with diurnal survey work might be sufficient and should give a lot of useful data. RSPB stated that enough data should be collected to show how different weather conditions and tidal states affect bird movement and behaviour in the route corridors. They also stated that it would be good to identify regular feeding or roosting sites for waterbirds within the route corridors. Vantage point work should identify as far as possible numbers of each species, flying heights and avoidance or other behaviour. It was agreed that the most important areas were being covered within the survey.	Revised methodology provided to RSPB on 23rd November 2009.
Email on 18th September 2009 to Chris Chadwick TEP	<u>Natural England</u> Bob Corns CC. Glen Gillespie	Natural England agreed that the potential impacts will arise during both the construction and operation phases but it is the operational phase that is likely to have by far the greatest impact. The lines will traverse the coastal plain between the Severn Estuary and the Somerset Levels two SPA site which support large numbers of waterbirds. Natural England Stated that it is known that there are regular movements of gulls between the two areas and that this tends to occur at dawn and dusk. As to the movements of ducks, swans and waders this is more of a mystery. As no great deal of observational evidence has been available the suggestion is that much of the movement occurs at night. Natural England stated that the surveys proposed by	Winter bird surveys (vantage point surveys) were undertaken using the agreed methodology, with greater emphasis placed on dusk and dawn survey effort.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
		TEP appear to be pretty comprehensive in respect of the daytime observation of bird movement and are being undertaken at the right places and reasonable frequency. NE did not however expect them to record a great deal. Natural England stated that it will be the surveys undertaken around dawn and dusk and during the night that have the potential to provide the most information. While it is suspected that much of the night time movement is along flight paths, hills or rivers/drains being the most obvious evidence to date is pretty scarce. Natural England stated that the methodology proposed by TEP appeared to offer the best opportunity to gain information on night time movements short of radar surveys. It was concluded by Natural England that they were happy with what is proposed and looked forward to seeing the results of the surveys.	
Meeting 10th November 2009	Natural England Bob Corns	Natural England confirmed that due to the extent of coverage and comprehensive survey effort proposed no further radar work would be required as part of assessments for the Proposed Development.	
Telephone conversation on 28th September 2010 with Chris Chadwick TEP	RSPB Richard Archer	TEP confirmed that wintering bird surveys had been undertaken in accordance with the methodology discussed in August 2009. TEP confirmed that the surveys provided a significant amount of data and that a report is currently being produced to set out the results and findings.	
Email on 25th October 2011 to Liz Seal	Natural England Bob Corns	Natural England confirmed that they had read the draft ornithological assessment and were happy with the conclusions drawn so far. They confirmed that It was clear from the observational evidence that the majority of the species considered do not use the corridors to any	Detailed nocturnal vantage point surveys were carried out as agreed with Natural England during winter 2010/2011. TEP provided details of surveys undertaken during 2010/2011 to Bob Corns on 18th January 2011.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
Principal Ecologist TEP		great extent. Natural England stated that it would seem that there would be a preference for Corridor 1 (the preferred corridor taken forward) but that Corridor 2 would not be likely to result in a significantly greater level of collision risk. Natural England stated that with regard to the additional 2010/11 winter survey looking for potential night time use of the corridors, this seems a useful addition to the existing survey data. Natural England stated that it would appear from previous observations that there may be some use made of the area by golden plover and it would be worthwhile to confirm the suspected lack of use by Bewick's swan.	
Meeting 20th February 2013 Liz Seal (Principal Ecologist –TEP) Mike Walker (Senior Ornithologist –TEP)	RSPB Richard Archer	RSPB discussed Ecology EIA scoping chapter provided on 17th March 2012. RSPB were happy with winter bird survey and breeding bird survey work as well as vantage point survey methods undertaken. However RSPB were concerned that the potential movements of birds between the Somerset Levels and Moors and the Severn Estuary which may contain SPA duck species were not being sufficiently considered. RSPB wished to be involved in regular consultation throughout the production of the HRA.	The radar studies and potential implications were considered within Radar study comparison document, Mitigation and Monitoring Strategy and within the HRA document itself. RSPB were consulted throughout the HRA process.
Meeting 8th July 2013 Liz Seal (Principal Ecologist –TEP) Mike Walker (Senior Ornithologist –TEP) Richard Cottle (Ecot Consulting) Aileen Smith (National Grid)	Natural England Glen Gillespie Richard Saunders	Natural England stated that there were no 'show stoppers' Natural England requested further consideration of the bird movements between the Somerset Levels and Severn Estuary indicated by radar studies undertaken by FERA. Bird diverters should be considered to account for unusual bird movements due to extreme weather events. Mitigation proposals for wind farms were discussed, It was recognised by Natural England that the only	Draft HRA incorporating further consideration of radar studies issued to Natural England prior to official S42/47 PEIR consultation on 13th August 2013. Effects of climate change were incorporated into HRA.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
		reasonable option for mitigation for the Proposed Development in this case was the fitting of bird diverters. Natural England confirmed they were happy with the bird survey effort undertaken for the Proposed Development.	
Meeting 2nd September 2013 Liz Seal (Principal Ecologist –TEP) Mike Walker (Senior Ornithologist –TEP) Richard Cottle (Ecot Consulting) Aileen Smith (National Grid)	Natural England Glen Gillespie Richard Saunders RSPB Richard Archer	Natural England Natural England requested that a document was produced comparing the bird survey work undertaken for the Proposed Development with the work and findings of the radar studies. Natural England requested further clarification of T-pylon and comparison with 132kV lattice pylon and 400kV lattice pylon.	Radar study comparison document produced and issued to Natural England on 9th October 2013. Document also Issued to RSPB on 30th October 2013. Draft HRA incorporating further consideration of radar studies issued to Natural England during official S42/47 PEIR consultation on 3rd September 2013. Details of pylon specifications as well as likely effects on collision risk are provided within HRA.
Teleconference on 28th November 2013 Liz Seal (Principal Ecologist –TEP) Mike Walker (Senior Ornithologist –TEP) Richard Cottle (Ecot Consulting) Aileen Smith (National Grid)	Natural England Glen Gillespie Richard Saunders RSPB Richard Archer	Due to uncertainty associated with radar studies and potential bird movements between Somerset Levels and Moors and Severn Estuary, Natural England and RSPB requested a greater level of mitigation/monitoring to be provided within southern section of Proposed Development where bird movements may be occurring.	Following the meeting TEP contacted FERA (Birdstrike) to discuss original findings of radar studies. Following consultation the authors of the original radar study undertook further analysis of flight speeds using the original radar data obtained for the Black Ditch wind farm project. This further analysis is presented and used to inform mitigation and monitoring within the HRA. Mitigation and monitoring strategy was submitted to Natural England on 16th January 2014 detailing proposed fitting of bird flight diverters and post construction monitoring. This was also issued to RSPB on 24th January 2014.
Email on 24th January 2014	RSPB Richard Archer	RSPB confirmed that they would review the monitoring and mitigation strategy provided to them on 24th January.	This comment was given prior to the mitigation and monitoring strategy being read by the RSPB. The mitigation and monitoring strategy addressed the

Date and type of correspondence	Consultee	Consultee Response	Response follow up
To Liz Seal Principal Ecologist TEP		Responding to additional flight speed analysis of the radar study carried out by FERA, RSPB stated that the radar study detected large numbers of birds that were not picked up by VPs. This is consistent with what Ecotricity found at Black Ditch, and suggests there remain significant difficulties with detecting flying birds at night. Though TEP conclude the presence of a functional link has not yet been confirmed, FERA conclude 'the data do suggest that such a link might exist'. RSPB stated that given the patterns of movement, it is fair to conclude that most/all of the radar tracks at dawn, dusk and during the night are probably from duck moving to and from the coast.	uncertainty resulting from the radar study regarding movements of ducks.
Email on 17th January To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie	Comments received on monitoring and mitigation strategy. Natural England stated that the 'three pronged approach' is welcomed and we consider that, in principle, it will be sufficient to address the residual uncertainly which currently remains. This is subject to the details of this mitigation package (particularly the proposed monitoring & mitigation strategy) being agreed – following consultation with our specialist ornithologist'.	Comments addressed and incorporated into monitoring and mitigation strategy.
Email on 31st January To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie	Initial comments on Draft HRA Natural England stated that 'In terms of SAC bats, we would suggest that NG presents a single document which: • Explains in detail (cross-referencing evidence) how the SAC feature bats are using the area of construction – including locations of key commuting routes and key areas for foraging. • Details how long the construction period/period of reinstatement are.	Comments from Natural England were addressed within four Topic Papers submitted to Natural England between 25th February and 10th March. These four Topic Papers were incorporated within the final HRA.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
		• Quantifies the amount of foraging habitat lost and where. • Quantifies the amount of replacement habitat that will be provided and where (considering '2' above). • Details which/how key commuting routes will be affected. • Explains (considering '4' above) how key commuting routes will be maintained throughout construction. • A single map of the relevant route sections (especially Mendips undergrounding) illustrating 1-6 above Regarding the in-combination assessment, Natural England stated 'Plans/projects that might put pressure on SPA birds around Avonmouth need to be included and considered together – i.e. leading to future increased usage of Hallen Marsh'. Natural England also stated: ▪ Local plan allocations (housing/commercial/industrial) need considering in this table. ▪ The existing 132kV line needs including – i.e. for where it exists (not yet taken down) alongside the new 400kV line. ▪ In terms of Withy Farm and Black Ditch wind farm proposals, it is important to note the agreed bird mortality thresholds for those projects will dictate the thresholds to be agreed for the HPC connection project monitoring and mitigation strategy.	
Letter from Natural England 17th February 2014 To Simon Pepper	Natural England Alice Walker	Comments on Draft HRA. Main comments included • further addressing collision risk issues relating to existing 132kV overhead line and proposed Withy End and Black Ditch wind farms.	Comments from Natural England were addressed within four Topic Papers submitted to Natural England between 25th February and 10th March. These four Topic Papers were incorporated within the final HRA.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
National Grid		• Increasing detail in bat impact assessment and mitigation package • Further addressing Hallen Marsh and Avonside within in-combination assessment including displacement and collision risk issues. • Further detail within in-combination assessment.	
Email on 28th February 2014 To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie	Natural England stated that bird mortality thresholds for fitting bird diverters as revealed by bird mortality monitoring should be agreed prior to DCO consent.	The thresholds will be agreed prior to DCO consent.
Emails and telephone conversations between 25th February and 13th March To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie	Various e-mail conversations between Liz Seal and Glen Gillespie between 25th February and 13th March 2014 regarding Topic Papers and progress of HRA. On 11th March Natural England stated that they were happy with the progress of the HRA documentation and 'no showstoppers' were uncovered. Natural England stated that National Grid currently proposes a 1 year monitoring programme and that Richard Saunders (NE) considers this to be insufficient.	Comments from Natural England were taken on board. Proposed length of monitoring increased.
Email on 12th March 2014 To Liz Seal Principal Ecologist TEP	Natural England Richard Saunders	Comments received on Topic Papers 1, 3 & 4	Comments given by Natural England were addressed within the HRA.
Teleconference on 13th March 2014 Liz Seal (Principal Ecologist –TEP) Mike Walker (Senior Ornithologist –TEP) Richard Cottle (Ecot	Natural England Glen Gillespie Richard Saunders	Natural England broadly happy with Topic Papers. Threshold levels will need to be agreed, however these may be agreed post submission to DCO. These will be agreed via discussions between TEP, Natural England and Ecot Consulting. Natural England stated that none of the levels of bird mortality predicted for the Proposed Development raised any 'alarm bells'.	Monitoring and Mitigation strategy as well as collision risk model re-issued to Richard Saunders at Natural England on 12th and 13th March.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
Consulting) Richard Walsh (National Grid)		Natural England requested Monitoring and Mitigation strategy as well as collision risk model to be re-issued to them.	
Email on 14th March 2014 To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie	Comments received on Topic Paper 4.	Comments addressed within HRA Amended HRA provided to Natural England on 20th March 2014. Additional document highlighting changes to HRA provided on 24th March 2014.
Telephone conversation on week commencing 17th March 2014. With Liz Seal Principal Ecologist	Natural England Glen Gillespie	Glen Gillespie noted that National Grid had increased the monitoring from 2 years to 3 and inquired if this had been agreed with Richard Saunders.	TEP confirmed that discussions between Richard Cottle and Richard Saunders had taken place but following consideration 3 winter periods monitoring approach is considered appropriate.
Email on 25th March 2014 To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie	Natural England provided comments on document provided by TEP on 24th March detailing the changes made to the HRA as a result of Natural England's comments. Natural England acknowledged that NG/TEP has done a lot of further work. Natural England requested further clarification of the location of hedgerow loss and the proposed mitigation. Natural England also requested further details of how mitigation for bats will be secured and how funding for mitigation at Hallen Marsh will be provided.	Further clarification of location of hedgerow loss and mitigation provided within HRA. Further details regarding Hallen Marsh and securing mitigation provided in HRA.
Email and telephone conversation on 27th March 2014 To Liz Seal Principal Ecologist TEP	Natural England Glen Gillespie (following consultation with Kat Walsh, bat specialist)	Comments provided by Natural England on draft HRA regarding bats. Natural England suggest DCO requirement that 'no construction works associated with Sandford substation shall commence until a detailed lighting strategy is submitted and agreed with the local authority'.	Comments were addressed within HRA document. Image of bat flyways is provided.

Date and type of correspondence	Consultee	Consultee Response	Response follow up
		Suggested DCO requirement 'no construction works shall commence in the section through the Mendips until a detailed bat mitigation strategy is submitted and agreed'. It is important that National Grid is able to demonstrate prior to DCO consent that the bat mitigation habitat is secured. Natural England required an image of the temporary bat flyways.	

Appendix 20D – Other Consents Requiring HRA

Other Consents Requiring Habitat Regulations Assessment

The following table lists out consents required for the Proposed Development, highlighting whether they form part of the DCO or will be applied for separately. The applicants report to support the HRA is intended to provide the necessary information for any assessment associated with the consents be they included within the DCO or not.

	Relevant legislation	Authority	Consent required?	Included in DCO?
Biodiversity / Habitat				
European Protected Species Licensing	Reg. 53 of Habitats and Species Regulations 2010p-	Natural England / PINS Consent Service Unit	Yes	No
Badger licence	s10 of Protection of Badgers Act 1992	Natural England / PINS Consent Service Unit	TBC	No
Other protected species licences	s16 of Wildlife & Countryside Act 1981	Natural England / PINS Consent Service Unit	TBC	No
Licence to affect protected Hedgerows or Trees with Tree Preservation Orders		LPAs	Yes	Yes
Assent to work in SSSI	s28E of Wildlife and Countryside Act 1981	Natural England	Yes	TBC
fish removal	s28 of Salmon and Freshwater Fisheries Act 1975	Environment Agency	Yes	No
Historic Environment				
Licence for removing human remains	s25 of Burial Act 1857		TBC	TBC
Traffic and transport				

Port/harbour authority consultation			Yes	No
Railway crossings		Network Rail	Yes	Yes
Water and hydrology				
Consent to discharge waste water to watercourse (main river).	Environmental Permitting Regulations 2010	EA / drainage authorities	Yes	No
Consent to discharge waste water to sewer.	Water Industry Act 1991	Sewerage undertakers	TBC	No
Abstraction licence.	s24 and s25 of Water Resources Act 1991	Environment Agency	TBC	No
Flood defence consent (crossing main rivers and works in floodplain).	s109 Water Resources Act 1991	Environment Agency	Yes	No
Land drainage consent (ordinary watercourses).	s23 Land Drainage Act 1991	IDBs / local drainage authorities	Yes	No
Consent to use pesticide in proximity of watercourse.		Environment Agency	TBC	No
Marine licence.	Marine and Coastal Access Act 2009	Marine Management Organisation	Yes	Yes
Discharge of Type I or II Listed Dangerous Substance.		Environment Agency	TBC	TBC

Impact on ground water / Source Protection Zones	Environmental Permitting Regulations 2010	Environment Agency	TBC	TBC
Environmental protection				
Noise / vibration consent	s61 of Control of Pollution Act 1974		TBC	No
Waste Management Licence	Environmental Permitting Regulations 2010	Environment Agency	Yes	No
Waste Exemptions		Environment Agency	TBC	TBC
Hazardous Waste Producer	Reg. 21 of Hazardous Waste Regulations 2005	Environment Agency	TBC	No
Control / removal of Invasive Species		Environment Agency	TBC	No
Services				
Connection of services			Yes	Yes
Diversion of services			Yes	Yes