



# **HABITATS REGULATIONS ASSESSMENT – VOLUME 3 - APPENDIX 4 (CLEAN)**

## **Adverse Effect Matrices**

### **Drax Bioenergy with Carbon Capture and Storage**

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations, 2009 - Regulation 5(2)(g)

Document Reference Number: 6.8.3.4

Applicant: Drax Power Limited

PINS Reference: EN010120



REVISION: 02

DATE: February 2023

DOCUMENT OWNER: WSP UK Limited

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PUBLIC

**Planning Inspectorate  
Advice Note 10  
Habitats Regulations Assessment**

**Appendix 2: Template for Integrity Matrices  
STAGE 2: EFFECTS ON INTEGRITY**

Likely significant effects have been identified for the following sites:

- [River Derwent Special Area of Conservation](#)
- [Lower Derwent Valley Special Area of Conservation](#)
- [Lower Derwent Valley Special Protection Area](#)
- [Lower Derwent Valley Ramsar](#)
- [Humber Estuary Special Area of Conservation](#)
- [Humber Estuary Special Protection Area](#)
- [Humber Estuary Ramsar](#)
- [Thorne Moor SAC](#)

These sites have been subject to further assessment in order to establish if the NSIP could have an adverse effect on their integrity. 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

HRA Integrity Matrix **1: River Derwent SAC**

Name of European site and designation: River Derwent SAC																		
EU Code: UK0030253																		
Distance to NSIP: 0.7km																		
European site features	Adverse Effect on Integrity																	
Effect	Loss or mechanical disturbance of functionally-linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation																		
river lamprey <i>Lampetra fluviatilis</i>							x(c)	x(c)	x(c)							x(f)	x(f)	x(f)
sea lamprey <i>Petromyzon marinus</i>							x(c)	x(c)	x(c)							x(f)	x(f)	x(f)
bullhead <i>Cottus gobio</i>																		
otter <i>Lutra lutra</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(f)	x(f)

Evidence supporting conclusions:

- a. This impact pathway is only relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the minor loss and disturbance of functionally-linked land that would occur in the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). As described in **Table 3.3** of the **HRA Report** (APP-185), potential loss and disturbance of functionally-linked habitat for otter, is limited to habitat enhancement measures in the Habitat Provision Area. These habitat enhancements are limited to hedgerow planting only. There would be no loss or modification of aquatic habitats or bankside vegetation, which provide the key functionally-linked land for otters within the Habitat Provision Area. The locations of the proposed hedgerow planting are set out on **Figure 1** of the **Outline Landscape and Biodiversity Strategy** (AS-094). The proposed habitat measures would not reduce availability of suitable otter habitat in and adjacent to the Habitat Provision Area and as such no adverse effects on the otter qualifying interest are predicted. This assessment is set out in full between **paragraphs 4.2.1 and 4.2.7** of the **HRA Report** (APP-185).
- b. Dust mitigation measures are described in **Section 1.3 of Appendix 6.2** (Construction Dust Assessment) of **Chapter 6** (Air Quality) in Volume 3 of the ES (APP-126). With application of dust mitigation measures as described, the residual effects of dust on all receptors are predicted to be negligible (see **Section 1.4 of Appendix 6.2** (Construction Dust Assessment) (APP-126) as such no adverse effects on the otter qualifying interest are predicted (see **paragraphs 4.2.42 and 4.2.44** of the **HRA Report** (APP-185)).

- c. This impact pathway is relevant to the otter, sea lamprey, and river lamprey qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for increased water-borne pollution of Carr Dyke and the River Ouse during construction, decommissioning, and operation of the Proposed Scheme. As described in paragraph **3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in Carr Dyke and River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for otter, river lamprey and sea lamprey. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.5** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26 to 4.1.28** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) also predicts that impacts on the Carr Dyke and River Ouse would be neutral. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.77 to 4.2.80** (construction and decommissioning) and **paragraphs 4.2.172 to 4.2.175** of the **HRA Report** for the full assessment.
- d. This impact pathway is relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for increased sediment loading of Carr Dyke during construction of the Proposed Scheme. As described in **paragraph 3.5.11** of the **HRA Report** (APP-185), increased sediment loading could impact water quality in Carr Dyke, potentially leading to LSE through reductions in the suitability of riparian habitats for otter. With mitigation measures in place (see paragraph **4.1.10** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.2 to 12.11.3** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) predicts that impacts on the Carr Dyke would be negligible. As such, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.45 to 4.2.48** of the **HRA Report** for the full assessment).
- e. This impact pathway is only relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for visual disturbance of otter that would occur in and around the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). As set out in **Table 3.5** of the **HRA Report** (APP-185), the risk of visual disturbance arises from the use of the woodyard Drax Power Station Site Construction Laydown Area, in the north of the Drax Power Station Site (see **Figure 3** of the **HRA Report**). This area may also be used for construction of the Carbon Dioxide Delivery Terminal Compound (see **paragraph 2.2.44** of **Chapter 2** (Site and Project Description) of Volume 1 of the ES (APP-038). A series of mitigation measures have been proposed, as set out between **paragraphs 4.1.14 to 4.1.19** of the **HRA Report**. With these mitigation measures in place, the potential for visual disturbance of otters during construction and decommissioning is considered to be negligible. As such no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.113 to 4.2.121** of the **HRA Report** for the full assessment).
- f. Several potential in-combination impact pathways and effects were identified in the HRA screening. Temporary loss and/or disturbance of minor watercourses for cable installation for Development 3 and from pipeline installation for Development 102 could occur, with affected watercourses potentially used by the population of otters associated with the River Derwent SAC (see **paragraph 4.3.2** of the **HRA Report** (APP-185). There could also be an increased risk of visual disturbance of otters arising from Development 6 and 102. Following analysis of the potential in-combination effects as set out in **Paragraph 4.3.10 to 4.3.12** of the **HRA Report** (APP-185, Rev02 submitted at Deadline 2), no adverse effects on integrity are predicted to arise. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction. Potential in-combination effects were identified in relation to Development 3 and 102 (see **Table 3.11** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1.1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures to be delivered by Development 3 and 102, effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction. Effects during operation are predicted to be neutral on the basis of the mitigation incorporated into the Proposed Scheme. As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. This analysis is set out in full between paragraphs **4.3.18 to 4.3.24** of the **HRA Report**.



HRA Integrity Matrix 2: [Lower Derwent Valley SAC](#)

Name of European site and designation: Lower Derwent Valley SAC																					
EU Code: UK0012844																					
Distance to NSIP: 4.3km																					
European site features	Adverse Effect on Integrity																				
Effect	Loss or mechanical disturbance of functionally-linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			Emissions of treated flue gas to air			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Lowland hay meadows ( <i>Alopecurus parentsis</i> , <i>Sanguisorba officinalis</i> )																	x(f)			x(g)	
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )																					
Otter <i>Lutra Lutra</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)				x(h)	x(g)	x(h)

Evidence supporting conclusions:

- a. This impact pathway is only relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the minor loss and disturbance of functionally-linked land that would occur in the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). As described in **Table 3.3** of the **HRA Report** (APP-185), potential loss and disturbance of functionally-linked habitat for otter, is limited to habitat enhancement measures in the Habitat Provision Area. These habitat enhancements are limited to hedgerow planting only. There would be no loss or modification of aquatic habitats or bankside vegetation, which provide the key functionally-linked land for otters within the Habitat Provision Area. The locations of the proposed hedgerow planting are set out on **Figure 1** of the **Outline Landscape and Biodiversity Strategy** (AS-094). The proposed habitat measures would not reduce availability of suitable otter habitat in and adjacent to the Habitat Provision Area and as such no adverse effects on the otter qualifying interest are predicted. This assessment is set out in full between **paragraphs 4.2.8 and 4.2.13** of the **HRA Report** (APP-185).
- b. Dust mitigation measures are described in **Section 1.3 of Appendix 6.2** (Construction Dust Assessment) of **Chapter 6** (Air Quality) in **Volume 3** of the ES (APP-126). With application of dust mitigation measures as described, the residual effects of dust on all receptors are predicted to be negligible (see **Section 1.4 of Appendix 6.2** (Construction Dust Assessment) (APP-126). As such no adverse effects on the otter qualifying interest are predicted (see **paragraphs 4.2.42 to 4.2.44** of the **HRA Report** (APP-185)).
- c. This impact pathway is relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for increased water-borne pollution of Carr Dyke and the River Ouse during construction, decommissioning, and operation of the Proposed Scheme. As described in paragraph **3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in Carr Dyke and River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for otter. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.5 of Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) construction and decommissioning phase impacts are predicted to be negligible. With

mitigation measures in place for the operational phase (see **paragraph 4.1.26 to 4.1.28** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) also predicts that impacts on the Carr Dyke and River Ouse would be neutral. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.81 to 4.2.84** (construction and decommissioning) and **paragraphs 4.2.176 to 4.2.179** of the **HRA Report** for the full assessment.

- d. This impact pathway is relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for increased sediment loading of Carr Dyke during construction and decommissioning of the Proposed Scheme. As described in **paragraph 3.5.11** of the **HRA Report** (APP-185), increased sediment loading could impact water quality in Carr Dyke, potentially leading to LSE through reductions in the suitability of riparian habitats for otter. With mitigation measures in place (see **paragraph 4.1.10** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.2 to 12.11.3** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) predicts that impacts on the Carr Dyke would be negligible. As such, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.49 to 4.2.52** of the **HRA Report** for the full assessment).
- e. This impact pathway is only relevant to the otter qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for visual disturbance of otter that would occur in and around the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). As set out in **Table 3.5** of the **HRA Report** (APP-185), the risk of visual disturbance arises from the use of the woodyard Drax Power Station Site Construction Laydown Area, in the north of the Drax Power Station Site. This area may also be used for construction of the Carbon Dioxide Delivery Compound (see **paragraph 2.2.44** of **Chapter 2** (Site and Project Description) of Volume 1 of the ES (APP-038). A series of mitigation measures have been proposed, as set out between **paragraphs 4.1.14 to 4.1.19** of the **HRA Report**. With these mitigation measures in place, the potential for visual disturbance of otters during construction and decommissioning is considered to be negligible. As such no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.122 to 4.2.130** of the **HRA Report** for the full assessment).
- f. The potential for Likely Significant Effects on the qualifying interests of the SAC was identified during the HRA Screening (see **paragraph 3.5.29 to 3.5.41** of the **HRA Report** (APP-185). Potential LSE were identified in relation to acid deposition only, with no exceedances of screening criterion for other pollutants. With the updated operational emissions mitigation measures (see **paragraph 4.1.22** of the **HRA Report**), the Proposed Scheme's acid deposition maximum impact over Lower Derwent Valley SAC and Ramsar Site reduces to 1.0% of the Critical Load, or 0.96% expressed to two decimal places (see **Appendix 5** to the **Applicant's Responses to Examining Authorities First Written Questions, Revised Emissions Abatement Technical Note** (document reference **8.9.5**). This is below the 1% significance screening threshold, and therefore no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.167 to 4.2.171** of the **HRA Report** for the full analysis).
- g. In-combination LSE in relation to operational emissions to air were identified for the lowland hay meadow qualifying features of the SAC. Potential LSE were identified in relation to acid deposition only, with no exceedances of screening criterion for other pollutants (see **Table 3.14** of the **HRA Report** (APP-185). A maximum in-combination impact equivalent to 1.6% of the critical load for acid deposition has been modelled following the application of emissions abatement to the Proposed Scheme operational emissions (see **Appendix 5** to the **Applicant's Responses to Examining Authorities First Written Questions, Revised Emissions Abatement Technical Note** (document reference **8.9.5**). The River Derwent has a high acid buffering capacity as per Environment Agency monitoring data. There have also been substantial reductions in SO<sub>2</sub> emissions and therefore their contribution to acid deposition from Drax in recent decades (see **paragraph 4.3.64 to 4.3.68** of the **HRA Report**). With the operational emissions mitigation measures (see **paragraph 4.1.22** of the **HRA Report**) and given the inherent conservatism and the suite of ecological factors considered in the air quality modelling no adverse effects on integrity are predicted to arise (see **paragraphs 4.3.54 to 4.3.71** of the **HRA Report** for the full analysis). The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to water-borne pollution during the operational phase. Potential in-combination effects were identified in relation to Development 3, 12, and 102 (see **Table 3.11** of the **HRA Report**), for the otter qualifying interest only. The cumulative assessment of effects on the Water Environment is presented in **Table 1.1** in **Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). The risk of significant effects during operation is predicted to be neutral, on the basis of the mitigation incorporated into the Proposed Scheme (see **paragraphs 4.1.26 to 4.1.28** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise.
- h. Several potential in-combination impact pathways and effects were identified in the HRA screening in relation to the otter qualifying interest. Temporary loss and/or disturbance of minor watercourses (functionally-linked habitat) for cable installation for Development 3 and from pipeline installation for Development 102 could occur, with affected watercourses potentially used by the population of otters associated with the Lower Derwent Valley SAC (see **paragraph 4.3.2** of the **HRA Report** (APP-185). Developments 3, 6, and 102 were also considered to have potential to contribute to an increased risk of visual disturbance in-combination effects relative to the Proposed Scheme alone. Following analysis of the potential in-combination effects as set out in **Paragraph 4.3.10 – 4.3.12** of the **HRA Report**, no adverse effects on integrity are predicted to arise. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction and decommissioning. Potential in-combination effects were identified in relation to Development 3 and 102 (see **Table 3.11** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1.1** in **Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures to be delivered by Development 3 and 102, effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction. As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. This analysis is set out in full between **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**.

### HRA Integrity Matrix 3: [Lower Derwent Valley SPA](#)

Name of European site and designation: Lower Derwent Valley SPA																		
EU Code: UK0006096																		
Distance to NSIP: 4.3km																		
European site features	Adverse effect on Integrity																	
Effect	Loss or mechanical disturbance of functionally-linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Northern Shoveler ( <i>Spatula clypeata</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Eurasian wigeon ( <i>AnasMareca clypeata</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Bewick's swan ( <i>Cygnus columbianus bewickii</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Golden plover ( <i>Pluvialis apricaria</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Ruff ( <i>Philomachus pugnax</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Teal ( <i>Anas cracca</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Lapwing ( <i>Vanellus vanellus</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Pochard ( <i>Aythya farina</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Shoveler ( <i>Spatula clypeata</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)

**Evidence supporting conclusions:**

- a. This impact pathway was identified in relation to the minor loss and disturbance of functionally-linked land that would occur in the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: Bewick's swan; teal; mallard; shoveler; wigeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.16** of the **HRA Report**). As described in **Table 3.3** of the **HRA Report** (APP-185), potentially significant loss and disturbance of functionally-linked habitat, is considered to be limited to habitat enhancement measures in the Habitat Provision Area. The locations of the proposed hedgerow planting are set out on **Figure 1** of the **Outline Landscape and Biodiversity**



**Strategy** (AS-094). Only limited use of areas in and adjacent to the Habitat Provision Area by qualifying interest bird species has been recorded (see **paragraph 4.2.19** of the **HRA Report**). Given the minor change in land use within the Habitat Provision Area, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.14 to 4.2.20** of the **HRA Report** for the full analysis.

- b. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: Bewick's swan; teal; shoveler; widgeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.16** of the **HRA Report**). Dust mitigation measures are described in **Section 1.3** of **Appendix 6.2** (Construction Dust Assessment) of **Chapter 6** (Air Quality) in Volume 3 of the ES (APP-126). With application of dust mitigation measures as described, the residual effects of dust on all receptors are predicted to be negligible (see **Section 1.4** of **Appendix 6.2** (Construction Dust Assessment) (APP-126). As such, no adverse effects on the bird qualifying interests are predicted to arise (see **paragraphs 4.2.42 to 4.2.44** of the **HRA Report** (APP-185)).
- c. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: Bewick's swan; teal; shoveler; widgeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.16** of the **HRA Report**). This impact was identified in relation to the potential for increased water-borne pollution of Carr Dyke and the River Ouse during construction, decommissioning, and operation of the Proposed Scheme. As described in paragraphs **3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in Carr Dyke and River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.4** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) also predicts that impacts on the Carr Dyke and River Ouse would be negligible. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.85 to 4.2.90** (construction and decommissioning) and **paragraphs 4.2.180 to 4.2.185** of the **HRA Report** for the full assessment.
- d. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: Bewick's swan; teal; shoveler; widgeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.16** of the **HRA Report**). This impact was identified in relation to the potential for increased sediment loading of Carr Dyke during construction of the Proposed Scheme. As described in **paragraph 3.5.11 to 3.5.14** of the **HRA Report** (APP-185), increased sediment loading could impact water quality in Carr Dyke, potentially leading to LSE through reductions in the suitability of riparian habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.10** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.2 to 12.11.3** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) predicts that impacts on the Carr Dyke would be negligible. As such, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.53 to 4.2.58** of the **HRA Report** for the full assessment).
- e. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: Bewick's swan; teal; shoveler; widgeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.16** of the **HRA Report**). This impact was identified in relation to the potential for visual disturbance of qualifying interest bird species, in the event that they use habitats in and adjacent to the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188)). Human activity, including visual disturbance by the presence of plant and in particular people, can result in disturbance of birds. Breeding and wintering bird survey work has recorded minimal activity by SPA and Ramsar species, including no evidence of breeding (see **Table 3.5** of the **HRA Report**) and a series of mitigation measures have been proposed to further minimise the risk of disturbing qualifying interest bird species (see **paragraphs 4.1.14 to 4.1.19** of the **HRA Report**). Mitigation measures include the provision of solid hoarding around the Woodyard Drax Power Station Construction Laydown Area, which would limit intervisibility between potential functionally-linked land and construction and decommissioning activities. With these mitigation measures in place and given the limited potential for significant disturbance even in their absence, no adverse effects on integrity are predicted to arise. The full assessment is presented between **paragraphs 4.2.131 to 4.2.139** of the **HRA Report**.
- f. Several potential in-combination impact pathways and effects were identified in the HRA screening. Temporary loss and/or disturbance of minor watercourses and farmland (functionally-linked habitats) for cable installation for Development 3 and from pipeline installation for Development 102 could occur, with affected watercourses and farmland potentially used by the bird qualifying interests (see **paragraph 4.3.2** of the **HRA Report** (APP-185)). Development 6 could also lead to loss and disturbance of habitats on Barlow Mound in the vicinity of the Proposed Scheme that could be used by qualifying interest bird species (i.e. functionally-linked land) (see **paragraph 4.3.3** of the **HRA Report**). Development 9 could also lead to effective loss of farmland habitats that could be used by wintering birds (see **paragraph 4.3.4** of the **HRA Report**). Following analysis of the potential in-combination effects as set out in **Paragraph 4.3.2 to 4.3.9** of the **HRA Report**, no adverse effects on integrity are predicted to arise. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction. Potential in-combination effects were identified in relation to Development 3 and 102 (see **Table 3.11** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures assumed to be delivered by Development 3 and 102, effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction (see **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. Potential in-combination LSE were also identified in relation to increased risk of visual disturbance of bird qualifying interests in relation to Development 6 and 102 and combined impacts on potential functionally-linked land associated with the Habitat Provision Area and off-site Habitat Provision Area. There would be no intervisibility between Development 6 and the off-site Habitat Provision Area due to an intervening dense band of scrub. As such, no adverse effects on integrity are predicted to arise. The low magnitude of Proposed Scheme impacts, with minimal evidence of use of relevant habitats by SPA bird species in the vicinity of the Habitat Provision Area and mitigation measures incorporated into the Proposed Scheme and Development 102 also support a finding of no adverse effects on integrity in relation to Development 102. The HRA



screening also identified the potential for in-combination visual disturbance effects between the works associated with Work No. 8 and Developments 44, 52, 99, and 100. These are determined not to trigger adverse effects on integrity due to the short-term (~four weeks) and limited extent of Work No. 8, combined with mitigation measures to be delivered by the Proposed Scheme and the other developments (see **paragraphs 4.3.25 to 4.3.35** of the **HRA Report** for full analysis).

- g.** The in-combination HRA screening assessment identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to water-borne pollution. Potential in-combination effects were identified in relation to Developments 3, 12, and 102 (see **Table 3.17** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1.1** in **Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177). The risk of significant effects during operation is predicted to be negligible, on the basis of the mitigation incorporated into the Proposed Scheme (see **paragraph 4.3.23** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise. The full analysis of this is presented between **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**.

**HRA Integrity Matrix 4: Lower Derwent Valley Ramsar**

Name of European site and designation: Lower Derwent Valley Ramsar																					
EU Code: UK11037 (301)																					
Distance to NSIP: 4.3km																					
European site features	Adverse Effect on Integrity																				
Effect	Loss or mechanical disturbance of functionally-linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			Emissions of treated flue gas to air			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Traditionally managed species-rich alluvial flood meadow																	x(f)			x(h)	
Rich assemblage of wetland invertebrates (including <i>Cicadula ornata</i> )																	x(f)			x(h)	
Ruff ( <i>Philomachus pugnax</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)				x(g)	x(i)	x(g)
Whimbrel ( <i>Numenius phaeopus</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)				x(g)	x(i)	x(g)
Wigeon ( <i>Mareca penelope</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)				x(g)	x(i)	x(g)
Teal ( <i>Anas cracca</i> )	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)				x(g)	x(i)	x(g)
Assemblage of international importance – peak counts in winter: 31,942 waterfowl	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)				x(g)	x(i)	x(g)

**Evidence supporting conclusions:**

- a. This impact pathway was identified in relation to the minor loss and disturbance of functionally-linked land that would occur in the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188)). Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: teal and wigeon. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.23** of the **HRA Report**). As described in **Table 3.3** of the **HRA Report** (APP-185), potentially significant loss and disturbance of functionally-linked habitat, is considered to be limited to habitat enhancement measures in the Habitat Provision Area. The locations of the proposed hedgerow planting are set out on **Figure 1** of the **Outline Landscape and Biodiversity Strategy** (AS-094). Only limited use of areas in and adjacent to the Habitat Provision Area by qualifying interest bird species has been recorded (see **paragraph 4.2.26** of the **HRA Report**). Given the minor change in land use within the Habitat Provision Area, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.21 to 4.2.27** of the **HRA Report** for the full analysis.
- b. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: teal and wigeon. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.23** of the **HRA Report**). Dust mitigation measures are described in **Section 1.3** of **Appendix 6.2** (Construction Dust Assessment) of Chapter 6 (Air Quality) in Volume 3 of the ES (APP-126). With application of dust mitigation measures as described, the residual effects of dust on all receptors are predicted to be negligible (see **Section 1.4** of **Appendix 6.2** (Construction Dust Assessment) (APP-126)). As such, no adverse effects on the bird qualifying interests are predicted to arise (see **paragraphs 4.2.42 to 4.2.44** of the **HRA Report** (APP-185)).
- c. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: teal and wigeon. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.23** of the **HRA Report**). This impact was identified in relation to the potential for increased water-borne pollution of Carr Dyke and the River Ouse during construction and operation of the Proposed Scheme. As described in **paragraph 3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in Carr Dyke and River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.4** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) also predicts that impacts on the Carr Dyke and River Ouse would be negligible. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.91 to 4.2.96** (construction and decommissioning) and **paragraphs 4.2.186 to 4.2.191** of the **HRA Report** for the full assessment.
- d. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: teal; and wigeon. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.23** of the **HRA Report**). This impact was identified in relation to the potential for increased sediment loading of Carr Dyke during construction of the Proposed Scheme. As described in **paragraph 3.5.11 to 3.5.13** of the **HRA Report** (APP-185), increased sediment loading could impact water quality in Carr Dyke, potentially leading to LSE through reductions in the suitability of riparian habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.10** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.2 to 12.11.3** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) predicts that impacts on the Carr Dyke would be negligible. As such, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.59 to 4.2.64** of the **HRA Report** for the full assessment).
- e. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: teal and wigeon. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.23** of the **HRA Report** (APP-185)). This impact was identified in relation to the potential for visual disturbance of qualifying interest bird species, in the event that they use habitats in and adjacent to the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188)). Human activity, including visual disturbance by the presence of plant and in particular people, can result in disturbance of birds. Breeding and wintering bird survey work has recorded minimal activity by SPA and Ramsar species, including no evidence of breeding (see **Table 3.5** of the **HRA Report**) and a series of mitigation measures have been proposed to further minimise the risk of disturbing qualifying interest bird species (see **paragraphs 4.1.14 to 4.1.19** of the **HRA Report**). Mitigation measures include the provision of solid hoarding around the Woodyard Drax Power Station Construction Laydown Area, which would limit intervisibility between potential functionally-linked land and construction and decommissioning activities. With these mitigation measures in place and given the limited potential for significant disturbance even in their absence, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.140 to 4.2.148** of the **HRA Report** for the full analysis.
- f. The potential for Likely Significant Effects on the qualifying interests of the SAC was identified during the HRA Screening (see **paragraph 3.5.29 to 3.5.41** of the **HRA Report** (APP-185)). Potential LSE were identified in relation to acid deposition only, with no exceedances of screening criterion for other pollutants. With the updated operational emissions mitigation measures (see **paragraph 4.1.22 to 4.1.24** of the **HRA Report**), the Proposed Scheme's acid deposition maximum impact over Lower Derwent Valley SAC and Ramsar Site reduces to 1.0% of the Critical Load, or 0.96% expressed to two decimal places (see **Appendix 5** to the **Applicant's Responses to Examining Authorities First Written Questions, Revised Emissions Abatement Technical Note** (document reference **8.9.5**)). This is below the 1% significance screening threshold, and therefore no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.176 to 4.2.179** of the **HRA Report** for the full analysis).
- g. Several potential in-combination impact pathways and effects were identified in the HRA screening. Temporary loss and/or disturbance of minor watercourses and farmland (functionally-linked habitats) for cable installation for Development 3 and from pipeline installation for Development 102 could occur, with affected watercourses and farmland potentially used by the bird qualifying interests (see **paragraph 4.3.2** of the **HRA Report** (APP-185)). Development 6 could also lead to loss and disturbance of habitats on Barlow Mound in the vicinity of the Proposed Scheme that could be used by qualifying interest bird species (i.e. functionally-linked land). Development 9 could also lead to effective loss of farmland habitats that could be used by wintering birds. Following analysis of the potential in-combination effects as set out in **Paragraph 4.3.4 to 4.3.9** of the **HRA Report**, no adverse effects on integrity are predicted to arise. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction. Potential in-combination effects

were identified in relation to Development 3 and 102 (see **Table 3.11** of the HRA Report). The cumulative assessment of effects on the Water Environment is presented in **Table 1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures to be delivered by Development 3 and 102, effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction (see **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. Potential in-combination LSE were also identified in relation to increased risk of visual disturbance of bird qualifying interests in relation to Development 6 and 102 and combined impacts on potential functionally-linked land associated with the Habitat Provision Area and off-site Habitat Provision Area. There would be no intervisibility between Development 6 and the off-site Habitat Provision Area due to an intervening dense band of scrub. As such, no adverse effects on integrity are predicted to arise. The low magnitude of Proposed Scheme impacts, with minimal evidence of use of relevant habitats by Ramsar bird species in the vicinity of the Habitat Provision Area and mitigation measures incorporated into the Proposed Scheme and Development 102 also support a finding of no adverse effects on integrity in relation to Development 102. The HRA screening also identified the potential for in-combination visual disturbance effects between the works associated with Work No. 8 and Developments 44, 52, 99, and 100. These are determined not to trigger adverse effects on integrity due to the short-term (~four weeks) and limited extent of Work No. 8, combined with mitigation measures to be delivered by the Proposed Scheme and the other developments (see **paragraphs 4.3.25 to 4.3.35** of the **HRA Report** for full analysis).

- h. In-combination LSE in relation to operational emissions to air were identified in relation to acid deposition only, with no exceedances of screening criterion for other pollutants (see **Table 3.14** of the **HRA Report** (APP-185). A maximum in-combination impact equivalent to 1.6% of the critical load for acid deposition has been modelled following the application of emissions abatement to the Proposed Scheme operational emissions (see **Appendix 5** to the **Applicant's Responses to Examining Authorities First Written Questions, Revised Emissions Abatement Technical Note** (document reference **8.9.5**). With the operational emissions mitigation measures (see **paragraph 4.1.22** of the **HRA Report**), and given the inherent conservatism in the air quality modelling no adverse effects on integrity and consideration of relevant ecological factors are predicted to arise (see **paragraphs 4.3.54 to 4.3.71** of the **HRA Report** for the full analysis).
- i. The in-combination HRA screening assessment identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to water-borne pollution during the operational phase. Potential in-combination effects were identified in relation to Developments 3, 12, and 102 (see **Table 3.11** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1.1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). The risk of significant effects during operation is predicted to be negligible, on the basis of the mitigation incorporated into the Proposed Scheme (see **paragraphs 4.1.26 to 4.1.28** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise. The full analysis of this is presented between **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**.

### HRA Integrity Matrix 6: [Thorne Moor SAC](#)

<b>Name of European site and designation: Thorne Moor SAC</b>						
<b>EU Code: UK0012915</b>						
<b>Distance to NSIP: 9.1 km</b>						
<b>European site features</b>	<b>Adverse effects on Integrity</b>					
<i>Effect</i>	<i>Emissions of treated flue gas to air</i>			<i>In combination effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
Degraded raised bogs still capable of natural regeneration		<b>x(a)</b>			<b>x(b)</b>	

**Evidence supporting conclusions:**

- a. In the absence of mitigation, the potential for Likely Significant Effects on the qualifying interests of the SAC was identified during the HRA Screening (see **paragraph 3.5.35 to 3.5.59** of the **HRA Report** (APP-185). Potential LSE were identified in relation to acid deposition only, with no exceedances of screening criterion for other pollutants. With the application of the updated mitigation measures described in **Appendix 5** to the **Applicant's Responses to Examining Authorities First Written Questions, Revised Emissions**

**Abatement Technical Note** (document reference **8.9.5**), impacts reduce from 1.3% of critical load, to 0.6% of critical load. Given this reduces the impact to below the 1% screening criterion threshold, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.167 to 4.2.170** of the **HRA Report**).

- b.** In the absence of mitigation, the potential for Likely Significant Effects on the qualifying interests of the SAC was identified during the HRA Screening (see **Table 3.14** of the **HRA Report** (APP-185). Potential LSE were identified in relation to in-combination exceedances of screening criterion for acid deposition (2.1% of critical load) and nitrogen deposition (1.2% of critical load). There are no in-combination exceedances of the 1% screening criteria for other pollutants. The detailed results of the air quality modelling are presented in **Appendix 5** to the **Applicant's Responses to Examining Authorities First Written Questions, Revised Emissions Abatement Technical Note** (document reference **8.9.5**) Following the updates to the dispersion (air quality) modelling, there would be a cumulative impact of up to 1.3% of critical load for nitrogen deposition, with the Proposed Scheme contributing up to 0.4%. This level of deposition falls within the bounds of natural variation and is predicted to lead to negligible (and imperceptible) vegetative change across the SAC. As highlighted in **paragraph 4.3.47** of the **HRA Report** (APP-185, REV02 submitted at Deadline 2) the in-combination impact has also been modelled based on several conservative assumptions, and in reality, deposition rates would be lower. With the updates to the dispersion modelling and the Proposed Scheme's air quality mitigation measures applied, the maximum in-combination impact for acidification is up to 1.5% of the critical load. Again, no perceptible vegetative changes of the SAC degraded raised bog habitat are predicted to arise from this level of deposition, in the context of the baseline deposition levels, the magnitude of the in-combination air quality impacts, and in light of the significant reductions in SO<sub>2</sub> emissions and their contribution to acid deposition from Drax Power Station and other UK sources in recent decades. In light of the above, no adverse effects to integrity are predicted to arise. This analysis is set out in full in **paragraphs 4.3.72 to 4.3.85** of the **HRA Report**.



HRA Integrity Matrix 7: [Humber Estuary SAC](#)

Name of European site and designation: Humber Estuary SAC						
EU Code: UK0030170						
Distance to NSIP: 6.3 km						
European site features	Adverse effect on Integrity					
Effect	Accidental releases of waterborne pollutants			In combination effects		
Stage of Development	C	O	D	C	O	D
Estuaries						
Mudflats and sandflats not covered by seawater at low tide						
Sandbanks which are slightly covered by sea water all the time						
Coastal lagoons						
Salicornia and other annuals colonising mud and sand						
Atlantic salt meadows						
Embryonic shifting dunes						
Shifting dunes along the shoreline with Ammophila arenaria "white dunes"						
Fixed coastal dunes with herbaceous vegetation "grey dunes"						
Dunes with Hippopha rhamnoides						
Sea lamprey Petromyzon marinus	x(a)	x(a)	x(a)	x(b)	x(b)	x(b)
River lamprey Lampetra fluviatilis	x(a)	x(a)	x(a)	x(b)	x(b)	x(b)

<b>Name of European site and designation: Humber Estuary SAC</b>						
<b>EU Code:</b> UK0030170						
<b>Distance to NSIP: 6.3 km</b>						
<b>European site features</b>	<b>Adverse effect on Integrity</b>					
<i>Effect</i>	<i>Accidental releases of waterborne pollutants</i>			<i>In combination effects</i>		
Grey seal <i>Halichoerus grypus</i>						

**Evidence supporting conclusions:**

a. This impact pathway is relevant to the sea lamprey, and river lamprey qualifying interest of the SAC, with no LSE predicted for other qualifying interests. This impact was identified in relation to the potential for increased water-borne pollution of the River Ouse during construction, decommissioning and operation of the Proposed Scheme. As described in paragraph **3.5.13** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in the River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for river lamprey and sea lamprey. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.4** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26 to 4.1.28** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048) also predicts that impacts on the Carr Dyke and River Ouse would be negligible. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.97 to 4.2.100** (construction and decommissioning) and **paragraphs 4.2.192 to 4.2.195** of the **HRA Report** for the full assessment.

b. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction, decommissioning, and operation. Potential in-combination effects were identified in relation to Development 3, and 102 during construction (see **Table 3.11** of the **HRA Report** (APP-185)), with the addition of Development 12 for operation (see **Table 3.17** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1.1** in **Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, REV02 updated at Deadline 2). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in paragraph **4.1.11 to 4.1.13** of the HRA Report) and standard good construction practice measures to be delivered by Development 3 and 102, effects during construction are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction. Effects during operation are predicted to be neutral on the basis of the mitigation incorporated into the Proposed Scheme (as set out in **paragraphs 4.1.24 to 4.1.26** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. This analysis is set out in full between **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**.

**HRA Integrity Matrix 8: Humber Estuary SPA**

Name of European site and designation: Humber Estuary SPA																		
EU Code: UK9006111																		
Distance to NSIP: 6.3km																		
European site features	Adverse effect on Integrity																	
Effect	Loss or mechanical disturbance of functionally linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Eurasian teal <i>Anas crecca</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Eurasian wigeon <i>Meraca penelope</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Mallard <i>Anas platyrhynchos</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Turnstone <i>Arenaria interpres</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Common pochard <i>Aythya farina</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Greater scaup <i>Aythya marila</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Brent goose <i>Branta bernicla bernicla</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Common goldeneye <i>Bucephala clangula</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Sanderling <i>Calidris alba</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Avocet <i>Recurvirostra avosetta</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Bittern <i>Botaurus stellaris</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Hen harrier <i>Circus cyaneus</i>	x(a)		x(a)	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)

<b>Name of European site and designation: Humber Estuary SPA</b>																		
<b>EU Code: UK9006111</b>																		
<b>Distance to NSIP: 6.3km</b>																		
<b>European site features</b>	<b>Adverse effect on Integrity</b>																	
<i>Effect</i>	<i>Loss or mechanical disturbance of functionally linked land</i>			<i>Emission of dust</i>			<i>Accidental releases of waterborne pollutants</i>			<i>Increased risk of pollution from sediment load</i>			<i>Visual disturbance</i>			<i>In combination effects</i>		
Golden plover <i>Pluvialis apricaria</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Bar-tailed godwit <i>Limosa lapponica</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Ruff <i>Philomachus pugnax</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Marsh harrier <i>Circus aeruginosus</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Little tern <i>Sternula albifrons</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Common ringed plover <i>Charadrius hiaticula</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Eurasian curlew <i>Numenius arquata</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Whimbrel <i>Numenius Phaeopus</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Greenshank <i>Tringa nebularia</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Lapwing <i>Vanellus vanellus</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Shelduck <i>Tadorna tadorna</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>
Knot <i>Calidris canutus</i>	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(d)</b>		<b>x(d)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>	<b>x(g)</b>	<b>x(f)</b>



Name of European site and designation: Humber Estuary SPA																		
EU Code: UK9006111																		
Distance to NSIP: 6.3km																		
European site features	Adverse effect on Integrity																	
Effect	Loss or mechanical disturbance of functionally linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			In combination effects		
Dunlin <i>Calidris alpina</i> (passage and wintering)	xa		xa	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Redshank <i>Tringa totanus</i>	xa		xa	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Black-tailed godwit <i>Limosa limosa</i>	xa		xa	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Eurasian oystercatcher <i>Haematopus ostralegus</i>	xa		xa	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)
Grey plover <i>Pluvialis squatarola</i>	xa		xa	x(b)		x(b)	x(c)	x(c)	x(c)	x(d)		x(d)	x(e)		x(e)	x(f)	x(g)	x(f)

**Evidence supporting conclusions:**

- a. This impact pathway was identified in relation to the minor loss and disturbance of functionally-linked land that would occur in the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; marsh harrier; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.30** of the **HRA Report**). As described in **Table 3.3** of the **HRA Report** (APP-185), potentially significant loss and disturbance of functionally-linked habitat, is considered to be limited to habitat enhancement measures in the Habitat Provision Area. The locations of the proposed hedgerow planting are set out on **Figure 1** of the **Outline Landscape and Biodiversity Strategy** (AS-094). Only limited use of areas in and adjacent to the Habitat Provision Area by qualifying interest bird species has been recorded (see **Table 3.5** of the **HRA Report**). Given the minor change in landuse within the Habitat Provision Area, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.28 to 4.2.34** of the **HRA Report** for the full analysis.
- b. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; marsh harrier; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.30** of the **HRA Report**). Dust mitigation measures are described in **Section 1.3** of **Appendix 6.2** (Construction Dust Assessment) of **Chapter 6** (Air Quality) in Volume 3 of the ES (APP-126). With application of dust mitigation measures as described, the residual effects of dust on all receptors are predicted to be negligible (see **Section 1.4** of **Appendix 6.2** (Construction Dust Assessment) (APP-126). As such, no adverse effects on the bird qualifying interests are predicted to arise (see **paragraphs 4.2.42 to 4.2.44** of the **HRA Report** (APP-185)).
- c. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; marsh harrier; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.30** of the **HRA Report**). This impact was identified in relation to the potential for increased water-borne pollution of Carr Dyke and the River Ouse during construction and operation of the Proposed Scheme. As described in **paragraph 3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in Carr Dyke and River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.4** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26 to 4.1.28** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) also predicts that impacts on the Carr Dyke and River Ouse would be negligible. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.101 to 4.2.106** (construction and decommissioning) and **paragraphs 4.2.196 to 4.2.201** (operation) of the **HRA Report** for the full assessment.

- d. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; marsh harrier; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.30** of the **HRA Report**). This impact was identified in relation to the potential for increased sediment loading of Carr Dyke during construction of the Proposed Scheme. As described in **paragraph 3.5.11 to 3.5.14** of the **HRA Report** (APP-185), increased sediment loading could impact water quality in Carr Dyke, potentially leading to LSE through reductions in the suitability of habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.10** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.2 to 12.11.3** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048 predicts that impacts on the Carr Dyke would be negligible. As such, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.65 to 4.2.70** of the **HRA Report** for the full assessment).
- e. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; marsh harrier; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.30** of the **HRA Report** (APP-185). This impact was identified in relation to the potential for visual disturbance of qualifying interest bird species, in the event that they use habitats in and adjacent to the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). Human activity, including visual disturbance by the presence of plant and in particular people, can result in disturbance of birds. Breeding and wintering bird survey work has recorded minimal activity by SPA and Ramsar species, including no evidence of breeding (see **Table 3.5** of the **HRA Report**) and a series of mitigation measures have been proposed to further minimise the risk of disturbing qualifying interest bird species (see **paragraphs 4.1.14 to 4.1.18** of the **HRA Report**). Mitigation measures include the provision of solid hoarding around the Woodyard Drax Power Station Construction Laydown Area, which would limit intervisibility between potential functionally-linked land and construction and decommissioning activities. With these mitigation measures in place and given the limited potential for significant disturbance even in their absence, no adverse effects on integrity are predicted to arise. The full assessment is presented between **paragraphs 4.2.149 to 4.2.157** of the **HRA Report**.
- f. Several potential in-combination impact pathways and effects were identified in the HRA screening. Temporary loss and/or disturbance of minor watercourses and farmland (functionally-linked habitats) for cable installation for Development 3 and from pipeline installation for Development 102 could occur, with affected watercourses and farmland potentially used by the bird qualifying interests (see **paragraph 4.3.2** of the **HRA Report** (APP-185)). Development 6 could also lead to loss and disturbance of habitats on Barlow Mound in the vicinity of the Proposed Scheme that could be used by qualifying interest bird species (see **paragraph 4.3.3** of the **HRA Report**). Development 9 could also lead to effective loss of farmland habitats that could be used by wintering birds (see **paragraph 4.3.4** of the **HRA Report**). Following analysis of the potential in-combination effects as set out in **Paragraph 4.3.4 to 4.3.12** of the **HRA Report**, no adverse effects on integrity are predicted to arise. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction and decommissioning. Potential in-combination effects were identified in relation to Development 3 and 102 (see **Table 3.11** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures assumed to be delivered by Development 3 and 102, effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction (see **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. Potential in-combination LSE were also identified in relation to increased risk of visual disturbance of bird qualifying interests in relation to Development 6 and 102 and combined impacts on potential functionally-linked land associated with the Habitat Provision Area and off-site Habitat Provision Area. There would be no intervisibility between Development 6 and the off-site Habitat Provision Area due to an intervening dense band of scrub. As such, no adverse effects on integrity are predicted to arise. The low magnitude of Proposed Scheme impacts, with minimal evidence of use of relevant habitats by SPA bird species in the vicinity of the Habitat Provision Area and mitigation measures incorporated into the Proposed Scheme and Development 102 also support a finding of no adverse effects on integrity in relation to Development 102. The HRA screening also identified the potential for in-combination visual disturbance effects between the works associated with Work No. 8 and Developments 44, 52, 99, and 100. These were determined not to trigger adverse effects on integrity due to the short-term (~four weeks) and limited extent of Work No. 8, combined with mitigation measures to be delivered by the Proposed Scheme and the other developments (see **paragraphs 4.3.25 to 4.3.41** of the **HRA Report** for full analysis).
- g. The in-combination HRA screening assessment identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to water-borne pollution during operation. Potential in-combination effects were identified in relation to Developments 3, 12 and 102 (see **Table 3.17** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1.1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177). The risk of significant effects during operation is predicted to be negligible, on the basis of the mitigation incorporated into the Proposed Scheme (see **paragraphs 4.1.26 to 4.1.28** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise. The full analysis of this is presented between **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**.

**HRA Integrity Matrix 9: Humber Estuary Ramsar**

<b>Name of European site and designation: Humber Estuary Ramsar</b>																		
<b>EU Code: UK0012915</b>																		
<b>Distance to NSIP: 6.3 km</b>																		
<b>European site features</b>	<b>Adverse effects on Integrity</b>																	
<i>Effect</i>	<i>Loss or physical disturbance of functionally linked land</i>			<i>Emission of dust</i>			<i>Accidental releases of waterborne pollutants</i>			<i>Increased risk of pollution from sediment load</i>			<i>Visual disturbance</i>			<i>In combination effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
Dune systems and humid dune slacks																		
Estuarine waters																		
Intertidal mud and sand flats																		
Saltmarshes																		
Coastal brackish/saline lagoons																		
Grey seals ( <i>Halichoerus grypus</i> )																		
Natterjack toad ( <i>Bufo calamita</i> )																		
Assemblages of international importance – 153,934 waterfowl (non-breeding season)	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>
Eurasian golden plover ( <i>Pluvialis apricaria latifrons</i> )	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>
Red knot ( <i>Calidris canutus islandica</i> )	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>
Dunlin ( <i>Calidris alpina alpina</i> )	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>
Black-tailed godwit ( <i>Limosa limosa islandica</i> )	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>
Redshank ( <i>Tringa totanus brittanica</i> )	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>
Common shelduck ( <i>Tadorna tadorna</i> )	<b>x(a)</b>		<b>x(a)</b>	<b>x(b)</b>		<b>x(b)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(c)</b>	<b>x(e)</b>		<b>x(e)</b>	<b>x(f)</b>		<b>x(f)</b>	<b>x(g)</b>	<b>x(i)</b>	<b>x(g)</b>

Name of European site and designation: Humber Estuary Ramsar																		
EU Code: UK0012915																		
Distance to NSIP: 6.3 km																		
European site features	Adverse effects on Integrity																	
Effect	Loss or physical disturbance of functionally linked land			Emission of dust			Accidental releases of waterborne pollutants			Increased risk of pollution from sediment load			Visual disturbance			In combination effects		
River lamprey ( <i>Lampetra fluviatilis</i> )							x(d)	x(d)	x(d)							x(h)	x(h)	x(h)
Sea lamprey ( <i>Petromyzon marinus</i> )							x(d)	x(d)	x(d)							x(h)	x(h)	x(h)

- a. This impact pathway was identified in relation to the minor loss and disturbance of functionally-linked land that would occur in the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.37** of the **HRA Report**). As described in **Table 3.3** of the **HRA Report** (APP-185), potentially significant loss and disturbance of functionally-linked habitat, is considered to be limited to habitat enhancement measures in the Habitat Provision Area. The locations of the proposed hedgerow planting are set out on **Figure 1** of the **Outline Landscape and Biodiversity Strategy** (AS-094). Only limited use of areas in and adjacent to the Habitat Provision Area by qualifying interest bird species has been recorded (see **Table 3.3** of the **HRA Report**). Given the minor change in landuse within the Habitat Provision Area, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.35 to 4.2.41** of the **HRA Report** for the full analysis.
- b. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.37** of the **HRA Report**). Dust mitigation measures are described in **Section 1.3** of **Appendix 6.2** (Construction Dust Assessment) of **Chapter 6** (Air Quality) in Volume 3 of the ES (APP-126). With application of dust mitigation measures as described, the residual effects of dust on all receptors are predicted to be negligible (see **Section 1.4** of **Appendix 6.2** (Construction Dust Assessment) (APP-126). As such, no adverse effects on the bird qualifying interests are predicted to arise (see **paragraphs 4.2.42 to 4.2.44** of the **HRA Report** (APP-185)).
- c. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.37** of the **HRA Report**). This impact was identified in relation to the potential for increased water-borne pollution of Carr Dyke and the River Ouse during construction, decommissioning and operation of the Proposed Scheme. As described in **paragraph 3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in Carr Dyke and River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for qualifying interest bird species. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.4** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) also predicts that impacts on the Carr Dyke and River Ouse would be negligible. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.107 to 4.2.112** (construction and decommissioning) and **paragraphs 4.2.202 to 4.2.207** of the **HRA Report** for the full assessment.
- d. This impact pathway is relevant to the sea lamprey and river lamprey qualifying interest of the Ramsar. This impact was identified in relation to the potential for increased water-borne pollution of the River Ouse during construction, decommissioning, and operation of the Proposed Scheme. As described in **paragraph 3.5.15 to 3.5.17** of the **HRA Report** (APP-185), increased water-borne pollution could impact water quality in the River Ouse, potentially leading to LSE through reductions in the suitability of riparian habitats for river lamprey and sea lamprey. With mitigation measures in place (see **paragraph 4.1.13** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.4** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) construction and decommissioning phase impacts are predicted to be negligible. With mitigation measures in place for the operational phase (see **paragraph 4.1.26 to 4.1.28** of the **HRA Report** (APP-185)), the assessment of effects on the Water Environment (see **paragraph 12.11.14** of **Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048)) also predicts that impacts on the Carr Dyke and River Ouse would be negligible. As such, no adverse effects on integrity are predicted to arise. See **paragraphs 4.2.107 to 4.2.112** (construction and decommissioning) and **paragraphs 4.2.202 to 4.2.207** of the **HRA Report** for the full assessment.
- e. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.37** of the **HRA Report**). This impact was identified in relation to the potential for increased sediment loading of Carr Dyke during construction and decommissioning of the Proposed Scheme. As described in **paragraph 3.5.11** of the **HRA Report** (APP-185), increased sediment loading could impact water quality in Carr Dyke, potentially leading to LSE through reductions in the suitability



of riparian habitats for qualifying interest bird species. With mitigation measures in place (see paragraph **4.1.10** of the **HRA Report**) the assessment of effects on the Water Environment (see **paragraph 12.11.2 to 12.11.3 of Chapter 12** (Water Environment) of Volume 1 of the ES (APP-048 predicts that impacts on the Carr Dyke would be negligible. As such, no adverse effects on integrity are predicted to arise (see **paragraphs 4.2.71 to 4.2.76** of the **HRA Report** for the full assessment).

- f. Based on their habitat preferences, these species could potentially use habitats within the Zone of Influence of the Proposed Scheme: lapwing; curlew; shoveler; mallard; wigeon; and golden plover. Other qualifying interest bird species are not expected to use habitats within the ZoI of the Proposed Scheme (see **paragraph 4.2.37** of the **HRA Report**). This impact was identified in relation to the potential for visual disturbance of qualifying interest bird species, in the event that they use habitats in and adjacent to the Habitat Provision Area (see **Figure 3** of the **HRA Report** (APP-188). Human activity, including visual disturbance by the presence of plant and in particular people, can result in disturbance of birds. Breeding and wintering bird survey work has recorded minimal activity by Ramsar species, including no evidence of breeding (see **Table 3.3** of the HRA Report) and a series of mitigation measures have been proposed to further minimise the risk of disturbing qualifying interest bird species (see **paragraphs 4.1.14 to 4.1.18** of the HRA Report). Mitigation measures include the provision of solid hoarding around the Woodyard Drax Power Station Construction Laydown Area, which would limit intervisibility between potential functionally-linked land and construction and decommissioning activities. With these mitigation measures in place and given the limited potential for significant disturbance even in their absence, no adverse effects on integrity are predicted to arise. The full assessment is presented between **paragraphs 4.2.158 to 4.2.166** of the **HRA Report**.
- g. Several potential in-combination impact pathways and effects were identified in the HRA screening. Temporary loss and/or disturbance of minor watercourses and farmland (functionally-linked habitats) for cable installation for Development 3 and from pipeline installation for Development 102 could occur, with affected watercourses and farmland potentially used by the bird qualifying interests (see **paragraph 4.3.2 and 4.3.5** of the **HRA Report** (APP-185)). Development 6 could also lead to loss and disturbance of habitats on Barlow Mound in the vicinity of the Proposed Scheme that could be used by qualifying interest bird species (see **paragraph 4.3.3** of the **HRA Report**). Development 9 could also lead to effective loss of farmland habitats that could be used by wintering birds (see **paragraph 4.3.4** of the **HRA Report**). Following analysis of the potential in-combination effects as set out in **Paragraph 4.3.2 to 4.3.13** of the **HRA Report**, no adverse effects on integrity are predicted to arise. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction. Potential in-combination effects were identified in relation to Development 3 and 102 during construction (see **Table 3.11** of the HRA Report). The cumulative assessment of effects on the Water Environment is presented in **Table 1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures assumed to be delivered by Development 3 and 102, effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction (see **paragraphs 4.3.14 to 4.3.24** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. Potential in-combination LSE were also identified in relation to increased risk of visual disturbance of bird qualifying interests in relation to Development 6 and 102 and combined impacts on potential functionally-linked land associated with the Habitat Provision Area and off-site Habitat Provision Area. There would be no intervisibility between Development 6 and the off-site Habitat Provision Area due to an intervening dense band of scrub. As such, no adverse effects on integrity are predicted to arise. The low magnitude of Proposed Scheme impacts, with minimal evidence of use of relevant habitats by Ramsar bird species in the vicinity of the Habitat Provision Area and mitigation measures incorporated into the Proposed Scheme and Development 102 also support a finding of no adverse effects on integrity in relation to Development 102. The HRA screening also identified the potential for in-combination visual disturbance effects between the works associated with Work No. 8 and Developments 44, 52, 99, and 100. These were determined not to trigger adverse effects on integrity due to the short-term (~four weeks) and limited extent of Work No. 8, combined with mitigation measures to be delivered by the Proposed Scheme and the other developments (see **paragraphs 4.3.25 to 4.3.41** of the **HRA Report** for full analysis).
- h. The in-combination HRA screening assessment also identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to accidental releases of water-borne pollutants during construction. Potential in-combination effects were identified in relation to Development 3 and 102 (see **Table 3.11** of the **HRA Report** (APP-185)). The cumulative assessment of effects on the Water Environment is presented in **Table 1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). This identifies that with mitigation measures in place from the Proposed Scheme (as set out in **paragraph 4.1.11 to 4.1.13** of the **HRA Report**) and standard good construction practice measures to be delivered by Development 3 and 102 effects are expected to be temporary, short-term, with a slight adverse (and hence not significant) effect during construction. Effects during operation are predicted to be neutral on the basis of the mitigation incorporated into the Proposed Scheme (as set out in **paragraphs 4.1.26 to 4.1.28** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise in relation to water-borne pollution. This analysis is set out in full between **paragraphs 4.3.14 to 4.3.24** of the **HRA Report**.
- i. The in-combination HRA screening assessment identified the potential for combined impacts with other plans and projects to worsen the impacts and hence effects of the Proposed Scheme alone, in relation to water-borne pollution during operation. Potential in-combination effects were identified in relation to Developments 3, 12, and 102 (see **Table 3.17** of the **HRA Report**). The cumulative assessment of effects on the Water Environment is presented in **Table 1 in Appendix 18.5** (Cumulative Effects Assessment Matrix) in Volume 3 of the ES (APP-177, Rev02 submitted at Deadline 2). The risk of significant effects during operation is predicted to be neutral, on the basis of the mitigation incorporated into the Proposed Scheme (see **paragraphs 4.1.26 to 4.1.28** of the **HRA Report**). As such, no adverse effects on integrity are predicted to arise. The full analysis of this is presented between **paragraphs 4.3.18 to 4.3.24** of the **HRA Report**.