East Anglia TWO Offshore Windfarm

Appendix 22.2

Onshore Ecology Cumulative Impact Assessment with the Proposed East Anglia ONE North Project

Environmental Statement
Volume 3

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Glossary of Acronyms

AIS	Air Insulated Switchgear
CCS	Construction Consolidation Sites
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
ES	Environmental Statement
GIS	Gas Insulated Switchgear
ha	Hectares
HDD	Horizontal Directional Drilling
MW	Megawatt
PEIR	Preliminary Environmental Information Report
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
HDD temporary working area	Temporary compounds which will contain laydown, storage and work areas for HDD drilling works.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Mitigation areas	Areas captured within the onshore Development Area specifically for mitigating expected or anticipated impacts.

National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid.
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre–planting of landscaping works, archaeological

	investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

22.2 Onshore Ecology Cumulative Impact Assessment with the proposed East Anglia ONE North Project

22.1 Introduction

1. This appendix covers the Cumulative Impact Assessment (CIA) of the proposed East Anglia TWO project with the proposed East Anglia ONE North project in relation to onshore ecology.

2. The East Anglia ONE North offshore windfarm project (the proposed East Anglia ONE North project) is also in the application phase. The proposed East Anglia ONE North project has a separate Development Consent Order (DCO) which has been submitted at the same time as the proposed East Anglia TWO project. The two projects share the same landfall location and onshore cable corridor and the two onshore substations are co-located, and connect into the same National Grid substation.

3. The onshore ecology proposed East Anglia TWO project CIA will therefore initially consider the cumulative impact with only the proposed East Anglia ONE North project against two different construction scenarios (i.e. construction of the two projects simultaneously and sequentially). The realistic worst case scenario of each impact is then carried through to the main body of the CIA which considers other developments which have been screened into the CIA.

4. For a more detailed description of the CIA please refer to ***Chapter 5 EIA Methodology***.

22.2 Construction Scenarios Realistic Worst Case

5. This appendix considers the proposed East Anglia TWO project and the proposed East Anglia ONE North project under two construction scenarios:

   - Scenario 1 - the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously; and
   - Scenario 2 - the proposed East Anglia TWO project and the proposed East Anglia ONE North project are constructed sequentially.

6. As discussed in ***section 22.1***, the realistic worst case (based on the assessment of these two construction scenarios) for each impact is then carried

through to the wider CIA which considers other developments, projects or plans which have been screened into the CIA for the proposed East Anglia TWO project.

7. It should be noted that the operational phase impacts on onshore ecology will be the same irrespective of the construction scenario. Therefore, operational impacts identified in scenario 1 will be the same as those for scenario 2.

8. Embedded and additional mitigation measures for the proposed East Anglia TWO project and proposed East Anglia ONE North project will be the same. These are detailed in ***Chapter 22 Onshore Ecology.***

22.2.1 Scenario 1

9. ***Table A22.1*** presents the realistic worst case parameters of scenario 1. In this instance, the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously. Areas provided for onshore infrastructure are maximum footprints with indicative dimensions provided in brackets.

Table A22.1 Scenario 1 Realistic Worst Case

Impact	Parameter	Notes
Construction		
Impacts related to the landfall	Horizontal Directional Drilling (HDD) temporary working area: 13,300m^2 (70m x 190m) Transition bay temporary working area (for 4 transition bays): 3,108m^2 (37m x 42m) Landfall Construction Consolidation Site (CCS) (x1): 14,080m^2 (88m x 160m)	
Impacts related to the onshore cable route	Onshore cable route: 581,824m^2 (9,091m x 64m) Jointing bay temporary working area: 570m^2 (30.6m x 18.6m). Total for 76 jointing bays: 43,320m^2 (570m^2 x 76) HDD (retained as an option to cross Special Protection Area (SPA) / Site of Special Scientific Interest (SSSI)): Entrance pit temporary working area (x1): 12,250m^2 (175m x 70m) Exit pit temporary working area (x1): 5,250m^2 (175m x 30m) Onshore cable route large CCS (1): 33,000m^2 (165m x 200m).	Refer to ***Chapter 22 Onshore Ecology section 22.3.3*** for instances of onshore cable route adopting a narrower width

Impact	Parameter	Notes
	Onshore cable route medium CCS (2): 28,160m^2 total (88m x 160m per each medium CCS) Onshore cable route small CCS (2): 12,000m^2 total (120m x 50m per each small CCS) Total footprint of all onshore cable route CCS: 73,160m^2 Onshore cable route laydown area: 1,000m^2 Onshore cable route haul road between landfall and Snape Road (7,331m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 40,435m^2 Onshore cable route and substation access haul road (1,570m in length x 9m wide): 14,130m^2 Temporary access roads (957m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 5,231m^2	
Impacts related to the onshore substations	Onshore substation CCS (x2): 34,200m^2 (190m x 90m per each onshore substation) Permanent footprint (used as CCS during construction) (x2): 72,200m^2 (190m x 190m per each onshore substation) Substation operational access road: 13,600m^2 (1,700m x 8m)	
Impacts related to the National Grid Infrastructure	National Grid CCS: 23,350m^2 National Grid operational substation (air insulated switchgear (AIS) technology) (used as a CCS during construction): 44,950m^2 (310m x 145m) Temporary pylon/mast temporary working area (x4): 10,000m^2 (2,500m^2 per each temporary pylon) Permanent pylon permanent footprint (x4): 1,600m^2 (400m^2 per each permanent pylon) Permanent pylon temporary working area (x4): 8,400m^2 (2,100m^2 per each permanent pylon) Overhead line realignment temporary working area: 5,000m^2 Cable sealing end/cable sealing end (with circuit breaker) compounds permanent	AIS technology is assessed as the worst case due to a larger footprint. Further detail regarding gas insulated switchgear (GIS) technology is provided in ***Chapter 6 Project Description***.

Impact	Parameter	Notes
	footprint: 10,000 m^2 (total for three compounds) Cable sealing end/Cable sealing end (with circuit breaker) compounds temporary working area: 30,000m^2 (for three compounds) Temporary access road (for pylon works): (1,100m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 5,629m^2 Permanent access road to sealing end compound: 1,850m^2 (500m x 3.7m)	
Operation		
Impacts related to the landfall	No above ground infrastructure	
Impacts related to the onshore cable route	No above ground infrastructure	
Impacts related to the onshore substation	Operational footprint (x2): 72,200m^2 (190m x 190m) Substation operational access road: 13,600m^2 (1,700m x 8m)	The operational footprint does not include the additional landscaping footprint.
Impacts related to the National Grid Infrastructure	National Grid operational substation (AIS technology): 44,950m^2 (310m x 145m) Pylon operational footprint (x4): 1,600m^2 (20m x 20m per each permanent pylon) Cable sealing end compound operational footprint: 10,000m^2 (for three sealing end compounds) Permanent access road to sealing end compound: 1,850m^2 (500m x 3.7m)	Four permanent pylons include up to three reconstructed/ relocated pylons and up to one additional new pylon. The operational footprint does not include the additional landscaping footprint. AIS technology is assessed as the worst case due to a larger footprint. Further details regarding GIS technology is provided in ***Chapter 6 Project Description***.
Decommissioning		
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice rules and legislation change overtime. An Onshore Decommissioning Plan will be provided, as secured under the requirements of the draft DCO. The onshore substation will likely be removed and reused or recycled. It is anticipated that the onshore cable would be decommissioned (de-energised) and either the cables and jointing bays left *in situ* or removed depending on the requirements of the Onshore Decommissioning Plan approved by the Local Planning Authority. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, for the purposes of worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.		

22.2.2 Scenario 2

10. Scenario 2, and ***Table A22. 2,*** represents the realistic worst case in the eventuality that the proposed East Anglia TWO project and proposed East Anglia ONE North project are constructed sequentially. Areas provided for onshore infrastructure are maximum footprints with indicative dimensions provided in brackets. Under scenario 2, it has been assumed as a worst case that all habitats would be fully reinstated and recovered following the construction of the proposed East Anglia TWO project, prior to the start of construction for the proposed East Anglia ONE North project.

11. Under scenario 2, either the proposed East Anglia TWO project or the proposed East Anglia ONE North project could be constructed first. However, there will be no difference in impact regardless of which project is constructed first. The CIA presented in this ES is presented using the intended development strategy of the proposed East Anglia TWO project being constructed first. However, in the eventuality that the proposed East Anglia ONE North project is constructed first, the impacts presented would be the same. Further detail regarding the sequential construction is provided in ***Chapter 5 EIA Methodology***.

Table A22. 2 Scenario 2 Realistic Worst Case

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Construction			
Impacts related to the landfall	HDD temporary working area: 7,000m^2 (70m x 100m) Transition bay temporary working area (for 2 transition bays): 1,554m^2 (37m x 42m) Landfall CCS (x1): 7,040m^2 (88m x 80m)	HDD temporary working area: 7,000m^2 (70m x 100m) Transition bay temporary working area (for 2 transition bays): 1,554m^2 (37m x 42m) Landfall CCS (x1): 7,040m^2 (88m x 80m)	
Impacts related to the onshore cable route	Onshore cable route: 290,912m^2 (9,091m x 32m) Jointing bay temporary working area: 570m^2 (30.6m x 18.6m). Total for 38 jointing bays: 21,660m^2 (570m^2 x 38)	Onshore cable route: 290,912m^2 (9,091m x 32m) Jointing bay temporary working area: 570m^2 (30.6m x 18.6m). Total for 38 jointing bays: 21,660m^2 (570m^2 x 38)	Refer to ***Chapter 22 Onshore Ecology section 22.3.3*** for instances of onshore cable route adopting a narrower width

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
	HDD (retained as an option to cross SPA / SSSI): Entrance pit temporary working area (x1): 6,300m^2 (90m x 70m) Exit pit temporary working area (x1): 2,700m^2 (90m x 30m) Onshore cable route large CCS (1): 16,500m^2 (165m x 100m). Onshore cable route medium CCS (2): 14,080m^2 total (88m x 80m per each medium CCS) Onshore cable route small CCS (2): 6,000m^2 total (60m x 50m per each small CCS) Total footprint of all onshore cable route CCS: 36,580m^2 Onshore cable route laydown area: 1,000m^2 Onshore cable route haul road between landfall and Snape Road (7,331m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 40,435m^2 Onshore cable route and substation access haul road (1,570m in length x 9m wide): 14,130m^2 Temporary access roads (957m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 5,231m^2	HDD (retained as an option to cross SPA / SSSI): Entrance pit temporary working area (x1): 6,300m^2 (90m x 70m) Exit pit temporary working area (x1): 2,700m^2 (90m x 30m) Onshore cable route large CCS (1): 16,500m^2 (165m x 100m). Onshore cable route medium CCS (2): 14,080m^2 total (88m x 80m per each medium CCS) Onshore cable route small CCS (2): 6,000m^2 total (60m x 50m per each small CCS) Total footprint of all onshore cable route CCS: 36,580m^2 Onshore cable route laydown area: 1,000m^2 Onshore cable route haul road between landfall and Snape Road (7,331m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 40,435m^2 Onshore cable route and substation access haul road (1,570m in length x 9m wide): 14,130m^2 Temporary access roads (957m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 5,231m^2	

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Impacts related to the onshore substation	Onshore substation CCS: 17,100m^2 (190m x 90m) Permanent footprint (used as CCS during construction): 36,100m^2 (190m x 190m) Substation operational access road: 13,600m^2 (1,700m x 8m)	Onshore substation CCS: 17,100m^2 (190m x 90m) Permanent footprint (used as CCS during construction): 36,100m^2 (190m x 190m)	Substation operational access road will be constructed as part of the proposed East Anglia TWO project
Impacts related to the National Grid Infrastructure	National Grid CCS: 23,350m^2 National Grid operational substation (AIS technology) (used as a CCS during construction): 44,950m^2 (310m x 145m) Temporary pylon/mast temporary working area (x4): 10,000m^2 (2,500m^2 per each temporary pylon) Permanent pylon permanent footprint (x4): 1,600m^2 (400m^2 per each permanent pylon) Permanent pylon temporary working area (x4): 8,4000m^2 (2,100m^2 per each permanent pylon) Overhead line realignment temporary working area: 5,000m^2 Cable sealing end/cable sealing end (with circuit breaker) compounds permanent footprint: 10,000 m^2 (total for three compounds) Cable sealing end/cable sealing end (with circuit breakers) compounds temporary working area: 30,000m^2 (for three compounds)	National Grid infrastructure will be constructed as part of the proposed East Anglia TWO project	AIS technology is assessed as the worst case due to a larger footprint. Further details regarding GIS technology is provided in ***Chapter 6 Project Description***.

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
	Temporary access road (for pylon works): (1,100m in length x 4.5m wide with additional 4m for passing places at approximately 90m intervals): 5,629m^2 Permanent access road to sealing end compound: 1,850m^2 (500m x 3.7m)		
Operation			
Impacts related to the landfall	No above ground infrastructure	No above ground infrastructure	
Impacts related to the onshore cable route	No above ground infrastructure	No above ground infrastructure	
Impacts related to the onshore substation	Operational footprint: 36,100m^2 (190m x 190m) Substation operational access road: 13,600m^2 (1,700m x 8m)	Operational footprint: 36,100m^2 (190m x 190m)	The operational footprint does not include the additional landscaping footprint. Substation operational access road will be constructed as part of the proposed East Anglia TWO project
Impacts related to the National Grid Infrastructure	National Grid operational substation (AIS technology): 44,950m^2 (310m x 145m) Pylon operational footprint (x4): 1,600m^2 (20m x 20m per each permanent pylon) Cable sealing end compound operational footprint: 10,000m^2 (for three sealing end compounds) Permanent access road to sealing end compound: 1,850m^2 (500m x 3.7m)	National Grid infrastructure will be constructed as part of the proposed East Anglia TWO project	Four permanent pylons include up to three reconstructed/ relocated pylons and up to one additional new pylon. The operational footprint does not include the additional landscaping footprint. AIS technology is assessed as the worst case due to a larger footprint. Further details regarding GIS technology is provided in ***Chapter 6 Project Description***.

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Decommissioning			
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice rules and legislation change overtime. An Onshore Decommissioning Plan will be provided, as secured under the requirements of the draft DCO. The onshore substation will likely be removed and reused or recycled. It is anticipated that the onshore cable would be decommissioned (de-energised) and either the cables and jointing bays left *in situ* or removed depending on the requirements of the Onshore Decommissioning Plan approved by the Local Planning Authority. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, for the purposes of worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.			

22.3 Cumulative Impact Assessment During Construction

12. The following sections discuss which of the two construction scenarios detailed in ***section 22.1*** will be the realistic worst case in terms of impacts to onshore ecology.

22.3.1 Impact 1: Impacts on Designated Sites

13. The assessed mitigated impacts (negligible or above) for the proposed East Anglia TWO project alone are:

- Onshore cable corridor construction - Sandlings SPA (and the component nationally designated Leiston-Aldeburgh SSSI) - direct temporary loss of habitat and disturbance effects. High importance receptor, negligible magnitude following mitigation. **Minor adverse** significance.

14. Under scenario 1 and scenario 2 for the onshore cable corridor works the total area of habitat subject to temporary habitat loss (assuming a similar level of mitigation is committed to for both projects) would double from 0.483ha to 0.966ha. The doubling works footprint represents an increase from 0.014% to 0.028% of total area of the SPA temporarily affected. However, given that the same mitigation measures outlined for the proposed East Anglia TWO project alone are the same for the proposed East Anglia ONE North project, the magnitude of the residual effect would remain negligible, representing a residual cumulative impact of **minor adverse** significance related to direct and indirect impacts to Sandlings SPA.

15. Traffic flows have been calculated under the worst case for traffic and transport which is scenario 1. Following assessment of construction traffic under scenario 1 impacts associated with nutrient nitrogen deposition are below the 1% Critical Load range at all transect locations, including those closest to the road network at all designated sites. Further detail is provided in ***Chapter 19 Air Quality***. As such, no changes are proposed from indirect impacts to designated sites.

22.3.2 Impact 2: Impacts to Arable Habitats

16. The assessed mitigated impacts (negligible or above) for East Anglia TWO alone are:

- Onshore development area – temporary and permanent loss of arable habitat. Low importance receptor, negligible magnitude. Negligible significance.

17. Under scenario 1, the total area of arable habitat potentially affected could approximately double. Areas of arable land habitat taken by potential ecological mitigation areas and landscaping surrounding the onshore substation and National Grid substation would not increase from those required for the proposed East Anglia TWO project alone. . Cumulative impacts would be temporary and reversible (due to reinstatement upon completion of construction) and, given the extent of arable land in the surrounding area it is considered that increasing of the area affected remains an effect of negligible magnitude, representing a cumulative impact of **negligible** significance.

18. Under scenario 2 the temporal effect of two separate construction exercises would not represent a greater magnitude of effect compared to scenario 1. Given the low importance of this feature it is not considered that an overlap of construction footprints would represent a greater magnitude of effect. As such any potential cumulative impact remains no greater than for scenario 1, i.e. a cumulative impact of **negligible** significance.

22.3.3 Impact 3: Impacts to Grassland Habitats

19. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area – temporary and permanent loss of improved and semi-improved grassland habitat. Low importance receptor, negligible magnitude. Negligible significance.

20. The assessment for proposed East Anglia TWO project alone assumes that all the improved grassland (6.4ha) and all the semi-improved grassland habitat (9.4ha) within the onshore development area could be temporarily impacted by

the construction of a single project (with a footprint of 77ha) as the worst case scenario. The addition of the proposed East Anglia ONE North project cannot increase the total area of grassland within the onshore development area therefore the project alone worst case cannot be exceeded. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone (and the magnitude will not differ than that for the proposed East Anglia TWO project alone) under either scenario 1 or scenario 2, i.e. an impact of **negligible** significance.

22.3.4 Impact 4: Impacts to Woodland and Trees

21. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area – unavoidable loss of broadleaved woodland. Medium importance receptor, low magnitude following mitigation. Minor adverse significance.

22. Under scenario 1 the total area of broadleaved woodland that would be unavoidably lost would increase from approximately 1ha to approximately 2ha. However, for the proposed East Anglia TWO project alone the Applicant has committed to a reduced onshore cable route width of 16.1m when crossing the woodland north of Fitches Lane. Under scenario 1, the Applicant has additionally committed to a reduced width for both the proposed East Anglia TWO and proposed East Anglia ONE North projects of 27.1m (reduced from 32.2m). Cumulative impacts would be temporary and reversible (due to replacement of trees upon completion of construction) and, given the extent of similar habitat in the surrounding area it is considered that doubling of the area of woodland affected remains an effect of low magnitude, representing a cumulative impact of **minor adverse** significance. There are not predicted to be any temporal cumulative effects (even in the case of overlapping footprints) as trees could not be lost twice. As such, cumulative impacts can be no worse than those reported for either scenario 1, i.e. cumulative impact of **minor adverse** significance.

22.3.5 Impact 5: Impacts to Hedgerows

23. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area – temporary loss of hedgerow. High importance receptor, negligible magnitude following magnitude. Minor adverse significance.

24. The assessment for proposed East Anglia TWO project alone assumes that the majority of hedgerows within the onshore development area could be temporarily impacted by the construction of the proposed East Anglia TWO as the worst-case scenario. The addition of the proposed East Anglia ONE North project cannot increase the total length of hedgerow within the onshore development area and therefore the project alone worst case cannot be exceeded. As such, cumulative impacts can be no worse than those reported for proposed East Anglia TWO project alone under either scenario 1 or scenario 2, i.e. an impact of **minor adverse** significance.

22.3.6 Impact 6: Impacts to Coastal Habitats

25. No changes were identified for proposed East Anglia TWO project alone, therefore there is no mechanism for a cumulative impact.

22.3.7 Impact 7: Impacts to Watercourses and Ponds

26. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area – disturbance to watercourses at cable crossings. High importance receptor, negligible magnitude following mitigation. Minor adverse significance.

27. Under scenario 1, whilst the footprint of the works will increase to accommodate two construction footprints, the magnitude of effect on any given watercourse would remain negligible. It is assumed that temporary dams and culverts would remain in place for the same amount of time for proposed East Anglia TWO and proposed East Anglia ONE North projects as they would for the proposed East Anglia TWO project alone. As such, any cumulative impacts would be no greater than those described for the proposed East Anglia TWO project alone, i.e. minor adverse significance.

28. Under scenario 2, the temporary dams and culvert will be removed following construction of the proposed East Anglia TWO project, and the channel will be reinstated. A new set of temporary dams and a temporary culvert will then be installed in a similar location as part of the proposed East Anglia ONE North project. This is likely to occur several years after the initial period of disturbance, and the river and its associated habitats could either be still recovering or may have only recently recovered. As a result, the magnitude of the effect resulting from the proposed East Anglia TWO and proposed East Anglia ONE North projects being constructed in succession has the potential to increase. However, the lack of geomorphological diversity observed in the system suggests that any impacts are likely to be highly localised and of negligible

magnitude. The residual cumulative impact is therefore considered to remain as **minor adverse** significance.

22.3.8 Impact 8: Badgers

29. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area – Disturbance to badgers and foraging habitat. Low importance receptor, low magnitude following mitigation. Minor adverse significance.

30. The assessment for the proposed East Anglia TWO project alone assumes that all the active and disused badger setts within the onshore development area may need to be destroyed, under the appropriate licensing regime.

31. Under scenario 1 the addition of the proposed East Anglia ONE North project cannot increase the total number of badger setts present within the onshore development area. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone, i.e. an impact of minor adverse significance.

32. Under scenario 2, following the completion of construction works, badgers may return to the onshore development area and create new setts. The proposed East Anglia ONE North project will then require these setts to be destroyed. On this basis, there is a risk that the same badger populations may be disturbed twice. This has the potential to increase the originally mitigated magnitude of effect from low to medium on a low importance receptor. This represents a cumulative residual impact of **minor adverse** significance. No additional mitigation is proposed beyond those identified for the proposed East Anglia TWO and proposed East Anglia ONE North projects in isolation.

22.3.9 Impact 9: Bats

33. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area short term– disturbance to roosting, commuting or foraging bats. High importance receptor, low magnitude following mitigation. Moderate adverse significance in the short term.

- Onshore development area long term– disturbance to roosting, commuting or foraging bats. High importance receptor, negligible magnitude following mitigation. Minor adverse significance in the long term.

34. Under scenario 1 the addition of the proposed East Anglia TWO project cannot increase the total number of these features present within the onshore development area. As such, cumulative impacts can be no worse than those reported for proposed East Anglia TWO project alone, i.e. an impact of moderate adverse significance.

35. Under scenario 2, lost trees and hedgerows within the proposed East Anglia TWO project construction footprint will have been replaced and bat commuting and foraging routes re-established. The proposed East Anglia ONE North project will then require the removal of an equivalent length of hedgerows and trees adjacent to those removed for the proposed East Anglia TWO project. This is likely to occur several years after the initial period of disturbance, and the habitats could either be still recovering or may have only recently recovered. As a result, the magnitude of the effect resulting from the proposed East Anglia TWO and proposed East Anglia ONE North projects being constructed in succession has the potential to increase overall disturbance effects. However, with the implementation of the same set of mitigation measures any cumulative effect related to the disturbance of bats is considered to be an effect of low magnitude. The residual cumulative impact is therefore considered to remain as **moderate adverse** significance.

36. This temporary magnitude of effect will further reduce (to negligible) over time as hedgerows fully recover. As such, this represents a long term residual impact significance reduced to **minor adverse** within 3-7 years once hedgerows have fully recovered.

22.3.10 Impact 10: Great Crested Newts

37. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

    - Onshore development area – construction presence within 250m of great crested newt ponds. High importance receptor, negligible magnitude following mitigation. Minor adverse significance.

38. The assessment for the proposed East Anglia TWO project alone assumes that whilst all ponds will be avoided, all the terrestrial habitat within 250m of ponds supporting great crested newts may have a construction presence.

39. Under scenario 1 the addition of the proposed East Anglia ONE North project cannot increase the total area of potential terrestrial habitat for great crested newts within the onshore development area. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone, i.e. an impact of minor adverse significance.

40. Under scenario 2, great crested newts may have required relocation and any disturbed terrestrial habitat will have been reinstated following the completion of the proposed East Anglia TWO project alone. The proposed East Anglia ONE North project will then require the removal of an equivalent area of terrestrial habitat adjacent to that removed for the proposed East Anglia TWO project and potentially a second translocation exercise for great crested newts. On this basis, there is a risk that the same great crested newt populations may be disturbed twice. This has the potential to increase the originally mitigated magnitude of effect from negligible to low; increasing the potential cumulative impact to great crested newt populations from minor to moderate adverse significance.

41. In the event that the onshore cable corridors of the proposed East Anglia TWO and proposed East Anglia ONE North projects are present within 250m of ponds known to support great crested newts under scenario 2 additional mitigation measures would be required. Mitigation measures will be identified once detailed design is completed and the exact nature of impacts is known, but could include habitat enhancement at the receptor sites and habitat manipulation within the construction footprint to reduce the risk of great crested newts re-entering the affected areas between the two project construction phases.

42. Following the implementation of agreed additional mitigation measures the magnitude of effect is expected to reduce from low back down to negligible, representing a temporary residual cumulative impact of **minor adverse** significance.

22.3.11 Impact 11: Reptiles

43. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

    - Onshore development area – Disturbance to reptile habitat. Medium importance receptor, low magnitude following mitigation. Minor adverse significance.

44. The assessment for the proposed East Anglia TWO project alone assumes that all the suitable reptile habitat within the onshore development area may be impacted during the construction works.

45. Under scenario 1 the addition of the proposed East Anglia ONE North project cannot increase the total area of suitable reptile habitat present within the onshore development area. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone, i.e. an impact of minor adverse significance.

46. Under scenario 2, following the completion of construction works any suitable reptile habitat that was removed would be reinstated and in time any reptiles present may return to the area. The proposed East Anglia ONE North project may require the removal an equivalent area of suitable reptile habitat adjacent to the proposed East Anglia TWO project. This is likely to occur several years after the initial period of disturbance, and the habitats could either be still recovering or may have only recently recovered. However, given that there is very little suitable reptile habitat within the onshore development area, the total area affected is relatively small and magnitude of effect would remain unchanged (low) and any cumulative impact would be of **minor adverse** significance.

22.3.12 Impact 12: Invasive Non-Native Species

47. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore development area – risk of spreading Himalayan balsam present at the Hundred River, upstream of the onshore development area. Medium importance receptor, negligible magnitude following mitigation. Minor adverse significance.

48. The mitigation measures identified for the proposed East Anglia TWO project alone based on good site practice remain sufficient to mitigate this risk under either scenario 1 or scenario 2, i.e. any cumulative impacts remain of **minor adverse** significance.

22.4 Cumulative Impacts during Operation

49. Operational impacts on onshore ecology will be the same irrespective of the construction scenario.

22.4.1 Impact 1: Disturbance Effects Associated with Maintenance Activities

50. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore substation and National Grid infrastructure – disturbance effects related to human presence. High importance receptor, negligible magnitude. Minor adverse significance.

51. Whilst the frequency of potential maintenance visits would be expected to double, this would be an increase from one visit per week requiring a single vehicle, to two visits per week. The magnitude of effect would remain negligible, representing an impact of **minor adverse** significance.

22.4.2 Impact 2: Disturbance to Fauna from Operational Lighting and Noise

52. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore substation – disturbance effects related to noise and lighting. High importance receptor, negligible magnitude. Minor adverse significance.

53. Whilst the frequency of potential maintenance visits would be expected to double, this would only represent an increase from one visit per week to two visits per week, and the magnitude of this effect would remain negligible. In addition, the cumulative operational noise threshold of both the proposed East Anglia TWO and East Anglia ONE North projects will be no greater than for East Anglia TWO alone, and same lighting requirements of the East Anglia TWO substation (***section 22.6.2.2*** of ***Chapter 22 Onshore Ecology***) would be imposed on the East Anglia ONE North substation. Therefore, the magnitude of the disturbance effect would remain negligible. Overall any cumulative impacts remain unchanged from the proposed East Anglia TWO project alone, i.e. **minor adverse** significance.

22.5 Summary

54. ***Table A22.3*** gives an overarching summary of which of the two construction scenarios, detailed above, will be the realistic worst case in terms of impacts relating to onshore ecology.

Table A22.3 Summary of Scenario 1 and Scenario 2 Realistic Worst Case Assumptions

Impact	Worst Case	Notes
Impacts to designated sites	N/A	Under both scenarios, the area of the SPA impacted is small, leading to minor adverse significance.
Impacts to arable habitats	N/A	Under both scenarios, the area of land disturbed doubles, and neither represents a greater effect than the other.
Impacts to grassland habitats	N/A	Under either scenario, the addition of a second project will not increase the total area of grassland within the onshore development area, and the same area of grassland would not be disturbed twice.
Impacts to woodland and trees	N/A	No temporal cumulative effects associated with a second construction phase under scenario 2 as the two projects will not share a construction footprint.
Impacts to hedgerows	N/A	Cumulative impacts can be no worse than those reported for East Anglia TWO alone under either scenario 1 or scenario 2.
Impacts to coastal habitats	N/A	No mechanism for a cumulative impact as no change is identified.

Impact	Worst Case	Notes
Impacts to watercourses and ponds	Scenario 2	Second disturbance to watercourses associated with scenario 2 may occur when the river and its associated habitats are still recovering.
Impacts to badgers	Scenario 2	The same badger populations may be disturbed twice under scenario 2, potentially increasing the magnitude of effect.
Impacts to bats	Scenario 2	The same habitats suitable for bats will be disturbed in succession, potentially whilst still recovering, therefore scenario 2 is deemed the worst case.
Impacts to great crested newts	Scenario 2	Disturbed terrestrial habitat will have been reinstated following completion of East Anglia TWO. East Anglia ONE North may then require a second translocation exercise, increasing mitigated impacts.
Impacts relating to reptiles	N/A	Magnitude of effect remains unchanged depending on scenario as area affected will remain unchanged as little suitable reptile habitat.
Impacts relating to invasive non-native species	N/A	Mitigation measures mean that impacts under both scenarios remain the same.

55. Overall, construction scenario 2 creates a realistic worst case in terms of impacts to onshore ecology. Therefore, scenario 2 will be carried through into the wider CIA with other developments, see ***section 22.7*** in ***Chapter 22 Onshore Ecology***.