East Anglia
Offshore Wind

VATTENFALL

SCOTTISHPOWER RENEWABLES

East Anglia THREE

Chapter 30

Summary and Conclusions

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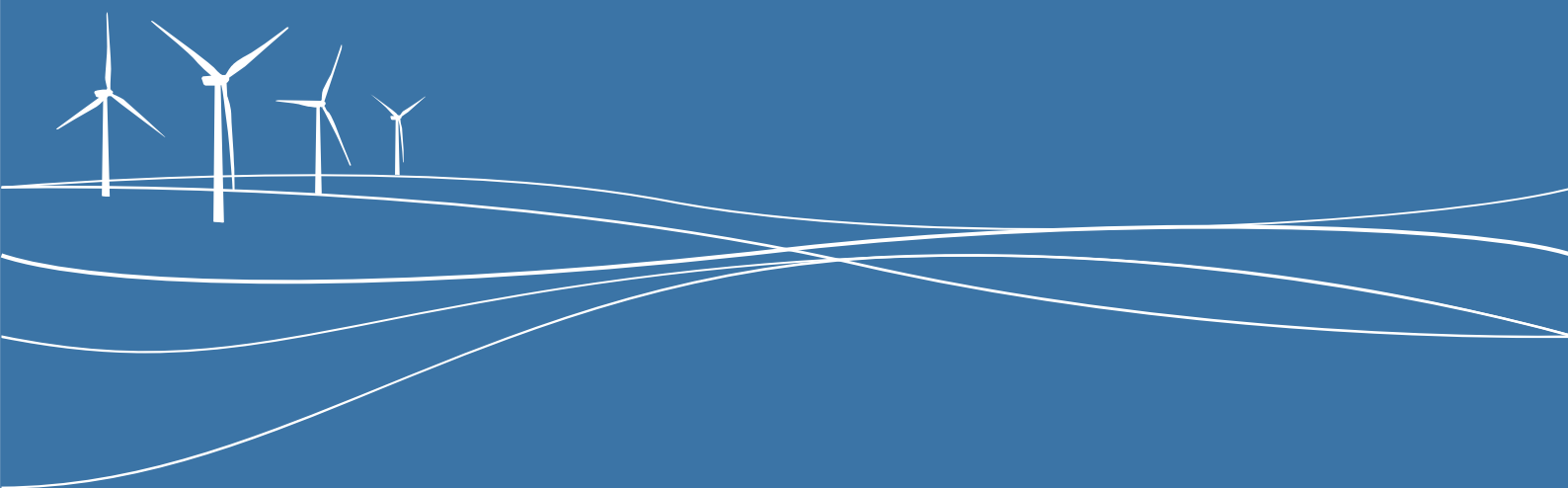

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30 SUMMARY AND CONCLUSIONS

30.1 Introduction

1. This chapter of the Environmental Statement (ES) provides a summary of the ES chapters and the impact assessments undertaken for each receptor topic for each of the development phases of the proposed East Anglia THREE project.

30.2 Offshore

2. The ES covers a wide range of physical, ecological and human environmental receptors for which potential impacts have been assessed. Inter-relationships are a significant component of most offshore assessments and these linkages are highlighted below.

30.2.1 Chapter 7 Marine Geology, Oceanography and Physical Processes

3. The construction, operation and decommissioning phases of the proposed East Anglia THREE project would cause a range of effects on the marine geology, oceanography and physical processes. The magnitude of these effects has been assessed using expert assessment, drawing from a wide evidence base that includes project-specific surveys and previous numerical modelling activities.

4. The receptors that have been specifically identified in relation to marine geology, oceanography and physical processes are the sensitive 'East Anglia' coastline, the 'Norfolk' Natura 2000 site, the 'Suffolk' Natura 2000 site, and nearby 'non-designated sandbanks'.

5. The effects that have been assessed are mostly anticipated to result in **negligible** impacts to the above-mentioned receptors because they are located remotely from the zones of influence of potential effects and no impact pathways were identified. In general the effects of the proposed project will be small scale, localised and temporary. There is potential for **minor adverse** impacts upon the 'East Anglia' coastline and the 'Suffolk' Natura 2000 site receptors during operation from morphological and sediment transport effects. These impacts could be reduced further at the detailed design stage by a reduction in cable protection measures from the worst case assumptions.

6. No cumulative impacts have been identified on the marine geology, oceanography and physical processes receptor groups between the proposed East Anglia THREE project and other nearby marine developments and activities (including other windfarm developments, marine aggregate dredging and marine disposal) with one exception. There is potential for **minor adverse** cumulative impact on the 'Suffolk

Natura 2000' site (particularly parts of the Outer Thames Estuary SPA located in proximity to the nearshore section of the offshore cable corridor) and the 'East Anglia' coast should the offshore cables and cable crossings of East Anglia ONE and the proposed East Anglia THREE project require cable protection works in line with the worst case assumptions. As with the project specific impacts above, the cumulative impacts could be reduced further at the detailed design stage by a reduction in cable protection from the worst case assumptions.

7. No transboundary impacts have been identified upon the marine geology, oceanography and physical processes receptors.

8. The marine geology, oceanography and physical processes assessment does not rely on other topics, therefore there are no inter-relationships considered within the assessment. However, it should be noted that this chapter is key to the assessments of many of the following offshore topics.

30.2.2 Chapter 8 Marine Water and Sediment Quality

9. This chapter discusses the existing marine water and sediment quality within the vicinity of the proposed East Anglia THREE project. The impact assessment has taken into account the general requirements of key European and national legislation and policy concerning environmental quality standards for chemical contaminants and guideline values to determine sediment quality.

10. A review of existing literature, as well as data obtained from a site specific survey, has determined that sediment and water quality throughout the East Anglia THREE site and offshore cable corridor is considered to be generally good, with the offshore sample stations having lower levels of contamination than the nearshore stations. With the exception of one location, the baseline contamination levels were not significant for any contaminant. This one location had elevated levels of arsenic, and if dredging or sea bed levelling works are required during construction, that would potentially result in resuspension of contaminated sediment, EATL would then undertake further testing of the sediment and develop a mitigation plan to be agreed with the Marine Management Organisation (MMO). The assessment required consideration of the marine geology, oceanography and physical processes assessment in relation to understanding likely effects from sediment transport and morphological effects on the sea bed.

11. No significant impacts on marine water and sediment quality have been identified in the assessment, and through the implementation of the embedded mitigation, all potential impacts are considered to be **negligible**.

12. The impacts of the proposed project will be small scale, localised and temporary, for the proposed East Anglia THREE project. Given the distances to other activities in the region (e.g. other offshore windfarms, aggregate extraction) and the localised nature of the impacts there is no pathway for interaction between impacts cumulatively. Whilst it is recognised that across the East Anglia Zone or southern North Sea there would be additive impacts, the overall combined magnitude of these would be **negligible** relative to the scale of the wider area.

13. No transboundary impacts have been identified on the marine water and sediment quality receptors.

30.2.3 Chapter 9 Underwater Noise, Vibration and Electromagnetic Fields

14. Pile driving of foundations is expected to be the prevalent source of underwater noise during the construction phase of the East Anglia THREE site. Underwater noise modelling has been completed for a number of locations within and around the windfarm boundary and the likely effects have been assessed on the basis of risk of physical injury (hearing damage) and behavioural disturbance to receptors. This modelling is presented in detail in *Appendix 9.1* and the resulting impacts on fish and marine mammals are presented in Chapter 11 Fish and Shellfish Ecology and Chapter 12 Marine Mammal Ecology, respectively.

15. There are a number of cabling designs being considered for the East Anglia THREE project, which include alternating current (AC) and direct current (DC) cables of different voltage ratings. The chapter introduces the background and potential effects from electromagnetic field (EMF) changes from the proposed project; however, resulting impacts on benthic ecology and fish and shellfish ecology are presented in Chapter 10 Benthic Ecology and Chapter 11 Fish and Shellfish Ecology respectively.

30.2.4 Chapter 10 Benthic Ecology

16. Site specific data sets from the East Anglia Zone, East Anglia ONE offshore cable corridor and East Anglia THREE site and offshore cable corridor were combined and analysed to undertake this assessment. The benthos was found to be typical of southern North Sea sandy and gravelly habitats with no ecologically sensitive areas identified.

17. The receptors that have been identified include a number of benthic habitats and species of interest due to wider ecosystem value and the value to commercial fishermen. The Outer Thames Estuary SPA was also identified as an indirect receptor due to the fact that its primary designation (red-throated diver) feeds on benthic species. The impact assessment required consideration of the marine geology,

oceanography and physical processes and marine water and sediment quality assessments.

18. The effects of the proposed project would mostly be temporary, small scale and localised and are anticipated to result in impacts of **negligible** or **minor adverse** significance. No additional mitigation measures, other than those which form part of the embedded mitigation, are suggested. Micro-siting of foundations and cables would be employed in accordance with the marine licence to avoid Habitats of Principal Importance as far as is practicable.

19. Given the distances to other activities in the region (e.g. other offshore windfarms and aggregate extraction), and the highly localised nature of the impacts on the benthos, it is considered that there is **no pathway** for interaction between impacts cumulatively, in regard to the windfarm site. Whilst it is recognised that across the East Anglia Zone and wider southern North Sea there would be additive impacts, the overall combined magnitude of these would be **negligible** relative to the scale of the habitats affected. In addition, given the ubiquity and low ecological sensitivity of habitats across the southern North Sea (and indeed across areas deemed suitable for development), sensitivity is also likely to be low or negligible at a cumulative scale.

20. There is potential for cumulative impacts to occur during construction and operation between the proposed East Anglia THREE project export cable and export cables from other windfarms as well as interactions with aggregate extraction sites. These impacts were assessed as being **minor adverse** at worst and highly localised and temporary.

21. No transboundary impacts were identified.

30.2.5 Chapter 11 Fish and Shellfish Ecology

22. Numerous existing data sources, as well as site-specific surveys, have been used to characterise the species of fish and shellfish that could be impacted by the proposed East Anglia THREE project. These data show that over 100 species of fish and shellfish may be present within the area. Of these species, only those which were considered to have potential to be impacted were taken forward for assessment.

23. The receptors that have been identified include a number of species of interest due to ecosystem value and the value to commercial fishermen. Other species such as salmon and lamprey were taken forward for assessment due to their conservation value. The impact assessment required consideration of the marine geology, oceanography and physical processes, marine water and sediment quality,

underwater noise and electromagnetic fields, benthic ecology, and commercial fisheries assessments.

24. The effects that have been assessed are anticipated to result in impacts of **negligible** or **minor adverse** significance to all receptors. No additional mitigation measures, other than those which form part of the embedded mitigation, are suggested.

25. As with the benthic assessment most impacts are localised, small scale and temporary and therefore pathways for cumulative impacts are limited. The key cumulative impacts which were considered with regard to fish ecology were from underwater noise, largely from piling for other offshore windfarms. Given the distance of the proposed project from other offshore windfarms, there is no pathway for cumulative impact upon the identified receptors as noise footprints do not overlap.

26. No transboundary impacts were identified.

30.2.6 Chapter 12 Marine Mammal Ecology

27. Marine mammals were recorded as part of the high resolution aerial surveys conducted over two years (24 consecutive months) over the East Anglia THREE site and a 4km buffer. The site specific surveys recorded very low numbers of marine mammals, such that only three species occurred in numbers sufficient to justify assessment. The species assessed were the harbour porpoise and the harbour and grey seal. The impact assessment required consideration of the underwater noise, fish and shellfish ecology and shipping and navigation assessments.

28. At a project level the impacts from the proposed East Anglia THREE project are assessed as negligible, with the exception of construction stage impacts upon harbour porpoise which are **minor adverse** at worst. The conclusions of the assessment are largely a reflection of the area being used relatively little by marine mammals.

29. There are potential significant cumulative impacts from underwater noise (largely from offshore windfarms) upon harbour porpoise. However, it should be noted that the contribution of the proposed East Anglia THREE project to this cumulative total is very small due to the very low densities of harbour porpoise in the East Anglia THREE site and offshore cable corridor.

30. The cumulative assessment includes a significant amount of uncertainty, especially in consideration of which other offshore windfarms could be pile driving at the same time as the proposed East Anglia THREE project. In dealing with uncertainty and low confidence in the data used in the cumulative assessment a precautionary worst

case approach has been taken. It should be noted however that this approach is likely to result in an overestimate of predicted impacts on receptors.

31. Due to the highly mobile nature of the marine mammals considered in this assessment there are potential transboundary impacts for each receptor; these are part of the main assessment and these are highlighted within the chapter.

30.2.7 Chapter 13 Offshore Ornithology

32. Detailed consultation and iteration of the overall approach to the impact assessment on ornithology receptors was conducted through the Evidence Plan process for the proposed East Anglia THREE project. An Ornithology Expert Technical Group was convened which involved Natural England and the Royal Society for the Protection of Birds (RSPB) for the offshore ornithology discussions.

33. A study area was defined that was relevant to the consideration of potential impacts on offshore ornithological receptors. This study area includes the East Anglia THREE site and a 4km buffer placed around it within which a series of high resolution aerial surveys were conducted over two years (24 consecutive months) to define the abundance and assemblage of birds using or passing across the area. In addition to the area subject to aerial survey, the offshore cable corridor to Mean Low Water Spring (MLWS) at its landfall location at Bawdsey has been included within this assessment. Birds were screened in for assessment taking into account their abundance on the windfarm site and their potential sensitivity to windfarm development.

34. During the construction phase of the proposed project no impacts have been assessed to be greater than of **minor adverse** significance for any bird species. Similarly, no species is subject to an impact of greater than **minor adverse** significance from the potential effects of the proposed project during the 25 year operational lifetime.

35. Displacement effects on red-throated divers, gannets, guillemots, razorbills and puffins would not create impacts of more than **minor adverse** significance during any biological season.

36. The risk to birds from collisions with wind turbines from the proposed East Anglia THREE project alone is assessed as no greater than **minor adverse** for all species when considered for all biological seasons against the most appropriate population scale.

37. Potential plans and projects have been considered for how they might act cumulatively with the proposed project and a screening process carried out.

38. The cumulative assessment identified that most impacts would be temporary, small scale and localised. Given the distances to other activities in the region (e.g. other offshore windfarms and aggregate extraction), and the highly localised nature of the impacts above, it concluded that there is no pathway for interaction between most impacts cumulatively, which were screened out.

39. The cumulative collision risk impact and displacement impact assessment follows the tiered approach in its presentation of mortality predictions for the identified projects. The risk to birds from cumulative collisions with wind turbines across all windfarms considered is assessed as no greater than **minor adverse** for all species with the exception of kittiwake, for which a **minor** to **moderate adverse** impact is predicted.

30.2.8 Chapter 14 Commercial Fisheries

40. The commercial fisheries activities of relevance to the proposed East Anglia THREE project are largely Dutch beam trawling in the East Anglia THREE site with UK static gear fisheries more dominant in the inshore areas covered by the offshore cable corridor.

41. The impact assessment required consideration of the benthic ecology and shipping and navigation assessments.

42. For the East Anglia THREE site there are no significant impacts predicted, as closure of the site will be localised to areas of active construction and the site will be open to fisheries during operation. UK vessels operating static gear are the only receptors which may sustain significant impacts, and then only during the construction phase, in relation to installation of the offshore export cable. If necessary appropriate mitigation would be decided through the Commercial Fisheries Working Group. Therefore, the residual impact is reduced to **minor adverse**. Other impacts are assessed to be, at worst, **minor adverse**, and as such no further significant impacts are expected to result from any phase of the proposed East Anglia THREE project.

43. There is a potential for cumulative impacts to occur on the commercial fisheries receptors identified in the vicinity of the proposed East Anglia THREE project if all of the other potential developments, regulated activities and conservation areas being considered are implemented. The likelihood of significant impacts occurring, however, depends largely on the operational practices of a given fleet and location and the extent of fishing grounds relative to other potential windfarms, other installed infrastructure, regulated activities and conservation measures and the timing of their construction phases, activities and implementation. In particular it is worth noting that fishing is not permitted in Dutch and Belgian offshore windfarms.

44. With regard to cumulative effects associated with developments within the East Anglia Zone, under currently planned construction schedules it is not expected that there would be temporal overlap in the construction phases of the East Anglia ONE and the proposed East Anglia THREE project. Therefore it is not expected that there will be a cumulative effect associated with construction phases within the East Anglia Zone.

45. The assessment covers other member state's fleets within the main impact assessment, therefore transboundary impacts are not considered separately. Transboundary impacts relate mainly to potential impacts upon Dutch and Belgian activities.

30.2.9 Chapter 15 Shipping and Navigation

46. The southern North Sea is an area of significant shipping and navigation activity. Shipping activity in the East Anglia Zone includes the passage of merchant vessels, ferries, fishing vessels, recreational craft, military vessels, and vessels engaged on specialist operations such as aggregate dredgers. The East Anglia THREE site is located between several shipping routes and buffers between the site boundary and these routes have been identified and applied through consultation with relevant stakeholders to minimise potential disruption and risks to vessel safety. This has led to significant reduction in the site area.

47. The impact assessment required consideration of the commercial fisheries and infrastructure and other users assessments.

48. Following consideration of the outputs of the hazard workshop, desk top assessments and modelling, six different receptors were identified within this chapter that had the potential to be impacted by the development of the proposed East Anglia THREE project. The assessment identifies suitable mitigation for each impact during each phase of the proposed project lifetime to ensure that these are reduced to acceptable levels.

49. Overall, given the separation distance from Rounds 1 and 2 windfarms and consideration of cumulative routeing with regard to other Round 3 zones, cumulative impacts are considered to be broadly acceptable for the East Anglia THREE site and therefore within ALARP parameters and **no residual impacts** are predicted.

50. Transboundary impacts are considered within the assessment, although, given the inherently international nature of shipping, this is integral to the assessment to some degree. It is noted that a number of transboundary routes stay within the

established shipping routes and therefore are not impacted by the proposed project. There is potential for transboundary ports to be impacted by offshore developments, however due to the distance from the coastline and the assessment of routes transiting through the East Anglia THREE site, impacts are considered to be within tolerable limits.

30.2.10 Chapter 16 Aviation and MOD

51. The aviation interests considered of relevance to the East Anglia THREE project include those of the United Kingdom (UK) Civil Aviation Authority (CAA), Ministry of Defence (MoD), regional airports, local aerodromes and NATS (that currently comprises NATS (En-Route) plc [NERL] and NATS (Services) Limited [NSL]), other UK aviation stakeholders and, where necessary, overseas authorities. The assessment includes a description of the potential effects on aviation activities with respect to effects on radar and physical effects in both UK and overseas airspace.

52. No significant impacts were identified for the construction and decommissioning phases following implementation of appropriate mitigation (i.e. charting, marking and lighting of all wind turbines consistent with UK regulations). The potential impacts during operation include those upon helicopter operations whereby embedded mitigation and pilot compliance with CAA regulations would negate any potential impact. Wind turbines would cause permanent interference on civil and military radars during the operational phase and therefore the assessment recommends that a technical solution for those radar facilities will be required at-source in order to mitigate the impact fully.

53. Potential for cumulative impacts with other UK offshore and onshore windfarms were considered. Due to the distances between projects there will be **no impacts** on radar.

54. Transboundary impacts with the Netherlands were considered and the assessment concludes that there would be no significant impacts.

30.2.11 Chapter 17 Offshore Archaeology and Cultural Heritage

55. The construction, operation and decommissioning phases of the proposed East Anglia THREE project will result in a range of effects upon the marine archaeological and cultural heritage environment. The significance of these effects has been assessed based on best practice, consultation and professional judgement. The impact assessment for this topic built on marine geology, oceanography and physical processes assessment in relation to understanding likely effects from sediment transport and morphological effects on the sea bed, which may have indirect impacts upon archaeological receptors.

56. Impacts upon known archaeological receptors will be avoided due to appropriate mitigation or avoidance and will therefore be of **negligible** significance. There is potential for impacts to potential archaeological receptors (i.e. those as yet unidentified), however, the significance of any effects can be reduced by adherence to appropriate mitigation strategies. Likewise for cumulative impacts, mitigation measures will be put in place for all projects to avoid impacts on known archaeological receptors and suitable protocols established for dealing with potential archaeological receptors, resulting in **negligible** and **minor adverse** impacts respectively.

57. While the impacts upon potential archaeological receptors are essentially adverse, the benefits associated with mitigation geared towards chance discoveries (i.e. the accumulation of archaeologically interpreted data and an overall contribution to a greater understanding of the offshore archaeological resource) represents a positive cumulative effect that cannot be discounted.

58. The assessment concludes that through the implementation of safety zones, direct transboundary impacts to known archaeological receptors are not expected to occur during the lifetime of the proposed East Anglia THREE project.

30.2.12 Chapter 18 Infrastructure and Other Users

59. The assessment looked at potential impacts upon the following other users of the sea (note that commercial fisheries, shipping and aviation are all assessed separately elsewhere), covering:

- Other UK and European windfarm developments;
- Existing cables and pipelines;
- Disruption of oil and gas activities;
- Disruption to marine aggregate activities;
- Military practice and exercise areas; and
- Disturbance of unexploded ordnance.

60. Impacts would largely be avoided as there is a requirement for industries to cooperate and operate in a safe manner. For instance, EATL will be required to undertake crossing agreements with operators of other cables and pipelines to ensure that these crossings are made safely and without damage to other infrastructure. It is therefore predicted that there will be **minor adverse** to **negligible** impacts upon other users.

30.3 Onshore

61. The ES covers a wide range of onshore physical, ecological and human environmental receptors for which potential impacts have been assessed.

62. Ducts (including all horizontal directional drilling (HDD) operations) for the onshore cables for the proposed East Anglia THREE project will be installed during the construction of East Anglia ONE. This means that for the proposed East Anglia THREE project works would be limited to pulling cables through the pre-installed ducts, jointing cables and construction of the substation. Works along the onshore cable route would therefore be limited to discrete locations where sections of cables would be joined and where new accesses are required to get to these locations. The use of pre-installed ducts therefore greatly reduces the potential for impacts across all the onshore topics considered below.

63. Given that the majority of impacts identified are temporary and localised within the area of the onshore electrical transmission works, the key cumulative impacts arise from the construction of the three proposed East Anglia Offshore Wind projects. No transboundary impacts are considered for the onshore assessments.

30.3.1 Chapter 19 Soils, Geology and Ground Condition

64. The data and primary analysis makes use of the work undertaken by the proposed East Anglia ONE project. The assessment required consideration of the water and flood risk assessment.

65. The landfall footprint lies within a statutory designated site (Bawdsey Cliffs SSSI) which could lead to significant impacts upon the site. In particular, where the SSSI is to be crossed with haul roads and ramps, the significance is considered to be **moderate adverse**. Impact can be reduced to **minor adverse** following the implementation of suggested mitigation measures. No statutory or non-statutory designated sites are crossed by the onshore cable route or the substation.

66. There are no soils of significant environmental value identified within the landfall and onshore cable route. The onshore cable route passes across agricultural land which presents a low risk to the health and safety of construction workers and a number of potential contaminant issues have been identified within the study area.

67. Three landfill sites encroach on the onshore cable route at Culpho Hall, Bramford Dairy and Tuddenham St Martin. The exact content of the landfills is unknown and a variety of contaminants may be present with the potential to produce leachate and landfill gases. **Minor adverse** impact is anticipated during construction.

68. Operationally, where maintenance is required, there is the potential for **minor adverse** impacts for the onshore cable route. Adhering to the mitigation outlined in the chapter and to be set out in an outline Code of Construction Practice (OCoCP) to be submitted with the DCO application, it is anticipated that there would be a **negligible** to **minor adverse** residual impact on soil, geology and ground conditions during operation.

69. It is anticipated that the impacts during decommissioning would be similar to those identified for construction although these are likely to be of lower magnitude.

70. Given that that East Anglia ONE and the proposed East Anglia THREE and any future EAOW projects will not overlap in terms of construction, and that the highest magnitude impacts will be associated with East Anglia ONE, cumulative impacts are not considered to be greater than those assessed for construction.

30.3.2 Chapter 20 Air Quality

71. Construction works associated with the onshore electrical transmission works have the potential to impact on local air quality conditions through emissions of dust, exhaust pollutants and of NO_2 and PM_{10} from non-road mobile machinery. The assessment was based on desk-top studies, utilising existing air quality data and required consideration of and data from the traffic and transport assessment. The mapped background concentrations of dust are 'well below' the annual mean PM_{10} Objective of 40µg.m^{-3}. It is highly unlikely that the short-term construction operations would cause the annual mean Objective to be exceeded within the vicinity of the proposed East Anglia THREE project. The risk of dust impacts on ecological sites, human health and dust settling are high, but with appropriate mitigation measures, as outlined in the OCoCP, the overall impact will be **not significant**.

72. Onshore operational phase impacts were scoped out of the assessment, as agreed in the Scoping Opinion, and therefore they have not been considered. It is anticipated that the impacts during decommissioning would be similar to those identified for construction, although these are likely to be of lower magnitude.

73. Given that East Anglia ONE and the proposed East Anglia THREE and future EAOW projects will not overlap in terms of construction there will be **no pathway** for cumulative impacts between them.

74. The potential air quality impacts arising from the construction, operation and decommissioning of the offshore elements of the proposed East Anglia THREE

project are considered to be of **negligible** significance and were scoped out of this assessment.

30.3.3 Chapter 21 Water Resources and Flood Risk

75. The data and primary analysis makes use of the work undertaken by the proposed East Anglia ONE project. The assessment required consideration of the soils, geology and ground condition assessment.

76. Two statutory designated sites, the Deben Estuary Ramsar site SPA and SSSI, and Suffolk Coast and Heaths AONB, are crossed by the onshore electrical transmission works. The Deben Estuary, Martlesham Creek and wetland areas of the AONB will be crossed using pre-installed ducts placed by East Anglia ONE, which will avoid direct impact upon the designated areas from cable installation for the proposed East Anglia THREE project, and therefore there will be **no impact**.

77. Only one non-statutory designated site lies within the study area, but due to its distance from the onshore electrical transmission works, **no impact** is anticipated from the construction activities.

78. The dominant geology at landfall is the Red Crag Formation which is classed as a Secondary A Aquifer. No SPZs are present at the landfall, nor are there any licensed private groundwater abstractions.

79. The impact of the excavation works from the landfall to Great Bealings is considered to have a low magnitude of impact, given that any changes to groundwater quality would only have a short term impact. As such, the significance of impact is considered to be **minor adverse**. From Great Bealings to the substation(s), despite the presence of SPZs, the level of construction activity means that any changes to groundwater quality would be of negligible magnitude. Therefore the significance of the impacts is considered to be a **minor adverse**.

80. In accordance with the embedded mitigation the storage of potentially contaminative materials would be away from the edge of any watercourses and compliant with Environment Agency Pollution Prevention Guidance series and the OCoCP.

81. Use of sustainable drainage systems at the substation to be designed in agreement with the relevant authorities will prevent surface water problems during construction and operation.

82. It is anticipated that the onshore cable would be decommissioned and the cables and jointing bays left in-situ. For removal of the substation(s), impacts are likely to

be similar to those identified during construction**, minor adverse**, but a phased approach would further reduce the significance of any potential impacts.

83. A Flood Risk Assessment is included as *Appendix 21.2*.

84. Given that that the East Anglia ONE and the proposed East Anglia THREE and future EAOW projects will not overlap in terms of construction and that the highest magnitude impacts will be associated with East Anglia ONE, cumulative impacts are not considered to be greater than those assessed for the construction of the proposed East Anglia THREE project.

30.3.4 Chapter 22 Land Use

85. The onshore electrical transmission works including access would cross land in agricultural use. This land is predominantly of low agricultural land classification grade (between grades 2 and 3), with the substation(s) located in grade 2 land. The majority of the land at landfall, along the onshore cable route and at the substation(s) is included under environmental stewardship schemes (ESS). The haul road may need to cross land drains. These receptors are considered to be highly sensitive. An agricultural liaison officer would be employed to undertake pre-construction land surveys to provide a baseline for reinstatement following the works, as well as to assist with appropriate micro-siting of works. Due to embedded mitigation no significant impacts are predicted to land take, ESS or land drains.

86. Several different soil types would be crossed by the onshore transmission works, however the value of these soils was considered to be low. The CoCP would be produced, incorporating a number of requirements to apply best practice techniques to all aspects of the project. This document would ensure that the potential risks relating to ground or groundwater contamination do not result in a significant impact during the project. Key aspects of the CoCP would include removal, storage and reinstatement of topsoil and subsoil layers; vehicle control to prevent soil damage by traffic movements; pollution control measures; fuel and materials storage and waste management. Following adherence to the CoCP, no significant impacts are predicted to soils as a result of the proposed East Anglia THREE project.

87. The onshore electrical transmission works cross a number of public rights of way (PRoW) which may be disrupted during construction depending on the extent of haul roads and location of infrastructure (e.g. jointing bays) determined during detailed design. PRoWs would be temporarily closed or diversions put in place if necessary, avoiding disturbance to users and avoiding any significant impacts.

88. The landfall and onshore cable route cross a number of utilities related to domestic services for gas, electricity, water and sewerage connections. EATL would identify services on the ground prior to construction in consultation with utility providers, and undertake utility crossings or diversions in accordance with the appropriate standards for such crossings or works, avoiding any potential impacts to utilities.

89. A **moderate adverse** impact was predicted at the local level for the construction and operation of the onshore substation(s), since it would result in permanent land take; this is not significant at the county scale.

90. The potential effects arising from EMF of the cables during operation were considered, and the embedded mitigation within the design of the cables and cable installation process are considered to reduce any potential impacts to **negligible**.

91. No impacts during operation were considered to result in more than a **minor adverse** impact.

92. Impacts for decommissioning were predicted to be similar to construction in the absence of further information on the likely process of decommissioning at this time

30.3.5 Chapter 23 Ecology

93. Potential impacts have been assessed for a number of ecological receptors, including designated sites, flora and fauna. Impacts have been assessed with respect to embedded mitigation including receptor specific measures where required (e.g. for bats, badgers and trees) which would be included in the outline landscape and ecological management strategy (OLEMS). The majority of impacts that have been assessed are not significant but for some receptors locally significant impacts are expected to occur.

94. Careful route selection has ensured that most designated sites (both statutory and non-statutory) are avoided by the onshore electrical transmission works. The landfall is within the Suffolk Coast and Heaths AONB and the onshore cable route crosses the Deben Estuary Ramsar, SPA and SSSI and Suffolk Coast and Heaths AONB. However, direct impacts upon these sites are avoided by the use of HDD by East Anglia ONE to pre-install ducts for the proposed East Anglia THREE project. **No impacts** are predicted to these sites with the exception of temporary noise disturbance to invertebrates found within them.

95. **Minor adverse** impacts are predicted at landfall and along the onshore cable route for woodland, scrub and arable land mainly of a temporary nature as a result of increased disturbance, habitat loss and noise. Arable field margins are UK BAP and

Suffolk LBAP Priority Habitat but the examples here do not qualify as they are species-poor and heavily affected by agricultural input.

96. Installation of cables along the onshore cable route would result in a loss of small sections of hedgerow to new haul routes; however considerable recovery would be achieved through re-planting. Additionally for coastal habitats, direct habitat loss during the cable installation could lead to a **moderate adverse** at the local level impact on cliffs and slopes.

97. **Moderate adverse** impacts upon notable plants were predicted under a Two Phase approach. No other impacts upon species were assessed as being significant in EIA terms (of moderate or greater significance).

98. With the exception of the impacts described in the paragraphs above no impacts during construction were considered to result in more than a **minor adverse** impact. Impacts for decommissioning were predicted to be similar to construction in the absence of further information on the likely process of decommissioning at this time.

99. Given that the East Anglia ONE and the proposed East Anglia THREE project and any future EAOW projects will not overlap in terms of onshore construction and that the highest magnitude impacts will be associated with East Anglia ONE, cumulative impacts are not considered to be greater than those assessed for construction of the East Anglia THREE project.

30.3.6 Chapter 24 Onshore Ornithology

100. The ornithological interest along the onshore cable route has been identified through desk study and surveys in the bird breeding season and in the winter. Breeding Cetti's warbler and marsh harrier and non-breeding brent goose, avocet and other waterbirds associated with the Deben Estuary were identified to be the focus of the impact assessment.

101. Avoidance and mitigation measures have been embedded through project design. This includes particular measures during the construction stage to avoid or mitigate impacts on breeding Cetti's warbler and marsh harrier and non-breeding brent goose, avocet and other waterbirds. A particular risk identified by consultees of disturbance to brent goose has been avoided by proposing a restriction on intrusive construction activities between the Queens Fleet and the jointing bay compound on the east bank of the Deben Estuary crossing, from 1st November to the end of February.

102. No impacts were identified of greater than **minor adverse** significance. Those identified impacts of **minor adverse** significance occurred to marsh harrier, brent

goose and the other wildfowl and waders and related primarily to disturbance / displacement effects.

103. No cumulative impacts were identified of greater than **minor adverse** significance. These impacts were due to cumulative construction impacts for East Anglia ONE, the proposed East Anglia THREE project and a future East Anglia Offshore Wind project.

30.3.7 Chapter 25 Onshore Archaeology and Cultural Heritage

104. There is potential for archaeological sites or artefacts from the prehistoric period through to the modern day to be present within the onshore electrical transmission works and these remains may range in value and sensitivity from low to high. However it is anticipated that the majority of the potential disturbance of buried archaeological remains will occur during the works for East Anglia ONE with only minimal further groundworks required beyond the already disturbed footprint.

105. The proposed East Anglia THREE project would commit to a written scheme of investigation (WSI). This embedded mitigation strategy would ensure that any intrusive groundworks beyond the already disturbed footprint would be identified with all identified heritage assets either preserved in situ or subject to preservation by record through an appropriate scheme of archaeological recording. This would result in impacts of **minor adverse** or **negligible** significance.

106. There is potential for as yet unknown buried archaeological remains to be present within the onshore electrical transmission works and the extent and significance of some recorded assets is uncertain. The agreed WSI would allow the presence and nature of any archaeological features or deposits to be confirmed, avoided if necessary or, where more appropriate, preserved by record through a scheme of archaeological recording. This embedded mitigation strategy would reduce the impact on these assets to a **minor** or **negligible** effect.

107. Some loss of historic hedgerows is anticipated during the construction phase, however mitigation measures such as re-instatement will be considered and set out in the OLEMS and would result in a **negligible** impact.

108. Potential effects to the setting of a heritage asset were only identified at the substation location and this can be effectively mitigated by enhancement of existing screening vegetation. This was the only impact anticipated during the operational phase.

109. Impacts for decommissioning were predicted to be similar to construction in the absence of further information on the likely process of decommissioning at this time, although, if similar mitigation measures are employed, only **minor adverse** impacts

should result. Where intrusive groundworks lie within the already disturbed footprint no further impacts will occur.

110. While there is a cumulative effect on buried archaeological remains within the wider area as a result of many of the developments considered in the Chapter, assuming appropriate preservation by record, or where possible, preservation in situ, is achieved, then this potential loss will be mitigated in line with the National Planning Policy Framework and other relevant policy. There may also be considered to be a potential cumulative positive impact as archaeological knowledge and understanding of the locality is improved.

30.3.8 Chapter 26 Noise and Vibration

111. The assessment was based on desk-top studies, utilising existing noise study data and required consideration of and data from the traffic and transport assessment. A cumulative impact assessment has been presented which looks at up to three proposed East Anglia Offshore Windfarm projects being developed and considers the impact of the concurrent operation of their onshore project components.

112. By following the implementation of standard mitigation measures all noise impacts during construction would be reduced to a **non-significant** level.

113. The only noise impact during operation of the proposed East Anglia THREE project is the noise emissions from the substation. The substation is located away from houses and buildings and the operational noise is not considered to be of significant impact due to the requirements set for operational noise in the draft DCO as submitted with the application.

30.3.9 Chapter 27 Traffic and Transport

114. This chapter assessed the potential impacts of the onshore elements of the proposed East Anglia THREE project on the surrounding traffic sensitive receptors. Traffic demand has been calculated with regard to an access strategy that has been adopted for the project and based upon projections of future baseline traffic demand for the area.

115. In accordance with national guidance (GEART) a study area was identified, baseline conditions established, and sensitive receptors within the study identified. The study area was screened to identify routes that could be potentially impacted by the projects' traffic generation.

116. The assessment concluded no residual significant impact was identified, with all impacts being at either **minor** adverse or **negligible** levels. EATL would manage the traffic impacts through embedded mitigation which would be implemented through

an Access Management Plan, a Traffic Management Plan and Travel Plan post-consent. No significant impacts were identified for the operational phase. Decommissioning impacts are dependent upon the decommissioning strategy, however, it is anticipated that the impacts during decommissioning would be similar to those identified for construction, although these are likely to be of lower magnitude.

117. A review of projects, activities and plans relevant to traffic and transport has been undertaken (including a high level assessment of base port traffic) and the likelihood for cumulative impacts assessed. This assessment concluded that there would not be a change to the residual impacts assessed for the proposed East Anglia THREE project.

30.3.10 Chapter 28 Socio-economics

118. The ES chapter includes a socio-economic and tourism policy review and baseline profile and an impact assessment of the tourism and recreation impacts, as well as a socio-economic impact assessment of the onshore construction elements of the proposed East Anglia THREE project. An impact assessment of the offshore construction elements has also been completed. The assessment considers the construction, operation and decommissioning phases of the project in relation to the labour markets around potential deployment ports or base ports and tourism in coastal areas, as well as in the vicinity of the onshore electrical transmission works.

119. No significant tourism and recreation impacts are predicted as a result of the proposed East Anglia THREE project, and its associated offshore and onshore electrical infrastructure. Tourism and recreation receptors will experience minimal visual impacts and only temporary physical obstruction, noise and traffic impacts.

120. The project delivered as Single Phase or a Two Phase project will provide beneficial but not significant employment impacts. The offshore construction phase will provide **moderate beneficial** impacts while the onshore construction element will provide a temporary **minor beneficial** impact. The operation and maintenance phase is likely to provide an on-going **minor beneficial** residual impact.

121. A programme of up-skilling and training programmes is being developed, supported by regional initiatives central government. These initiatives would mitigate any potential adverse labour market pressures. The project and up-skilling initiatives will also provide further support to develop the offshore renewables industry in East Anglia.

30.3.11 Chapter 29 Seascape, Landscape and Visual Amenity

122. The majority of the landscape and visual receptors assessed would experience effects which would be **not significant**. Where significant impacts would arise, they would typically be short term, localised and reversible. Potential long term impacts relating to the substation, would be reduced to medium term by the effects of mitigation planting. These impacts would also be localised and reversible.

123. Embedded mitigation has reduced significant impacts in many aspects of the proposed project. Careful site selection for the landfall location and substation, and sensitive routeing of the onshore cable route at the design stage has ensured that especially sensitive landscapes and landscape features have largely been avoided. It has also ensured that existing landscape features, such as the existing woodland around the substation, have been used to best effect, as well as provided for additional planting which will supplement the existing and collectively screen almost every aspect of the substation. The assessment includes consideration of the potential for ash die-back in the region to affect the screening potential of existing woodland.

124. The contained extents of the construction and decommissioning works, and operational components of the proposed East Anglia THREE project, have ensured that all significant impacts occur within the close range of the substation and the spread of significant effects beyond this close range is avoided.

125. While significant effects would arise in relation to the construction of the landfall location, onshore cable route and substation, and the operation of the substation, these effects would all be either short or medium term, localised and reversible.

30.4 Conclusions

126. For all offshore topics the assessments conclude that the proposed East Anglia THREE project will not result in significant impacts. In many cases this is the result of sensitive siting of the East Anglia THREE site and offshore cable corridor to avoid adverse impacts altogether. Where any potentially significant impacts have been identified, mitigation has been proposed to reduce the impacts to not significant. Potentially significant cumulative impacts have been identified for one species of marine mammal (harbour porpoise), however the contribution by the proposed project is minimal and it is considered that this assessment is highly precautionary. With regard to offshore ornithology, there is a potentially significant impact from collision risk on one species only (kittiwake).

127. For all onshore topics the assessments conclude that the proposed East Anglia THREE project will not result in significant impacts once appropriate mitigation has been implemented. Again the site selection, particularly of the onshore cable route, resulted in many potential impacts being avoided completely. EATL has committed to complementing the mitigation agreed to for East Anglia ONE, which ensures that impacts are minimised.

Chapter 30 Ends Here