EAST SUFFOLK COUNCIL AND SUFFOLK COUNTY COUNCIL JOINT LOCAL IMPACT REPORT

East Anglia One North & East Anglia Two OFFSHORE WINDFARMS

Planning Inspectorate's References:

EA1N – EN010077 & EA2 – EN010078

November 2020

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Acronyms

AIS – Air Insulated Substation
AONB – Area of Outstanding Natural Beauty
AQMA – Air Quality Management Plan
BEIS – Department of Business, Energy and Industrial Strategy
CCS – Construction Consolidation Site
CIA – Cumulative Impact Assessment
CoCP – Code of Construction Practice
CRoW Act – Countryside and Rights of Way Act 2000
DCLG – Department of Communities and Local Government
DCO – Development Consent Order
DMRB – Design Manual for Roads and Bridges
EA – Environment Agency
EA1 – East Anglia One Offshore Windfarm
EA1N – East Anglia One North Offshore Windfarm
EA2 – East Anglia Two Offshore Windfarm
EA3 – East Anglia Three Offshore Windfarm
EA4 – East Anglia Four Offshore Windfarm
EIA – Environmental Impact Assessment
EMP – Ecological Management Plan
ES – Environmental Statement
ESC – East Suffolk Council
ETG – Expert Topic Group
FRA – Flood Risk Assessment
GIS – Gas Insulated Substation
HDD – Horizontal Directional Drilling
HER – Historic Environment Record
HGV – Heavy Goods Vehicles
HRA – Habitat Regulations Assessment
HVDC – High Voltage Direct Current
IAQM – Institute of Air Quality Management
LCMS – Landfall Construction Method Statement
LCT – Landscape Character Type
LIR – Local Impact Report
LLFA – Lead Local Flood Authority
LPA – Local Planning Authority
LMP – Landscape Mitigation Plan
LVIA – Landscape and Visual Impact Assessment
MU – Management Units
MoU – Memorandum of Understanding

NG-ESO – National Grid Electricity Systems Operator
NGET – National Grid Electricity Transmission
NGV – National Grid Ventures
NOA – Network Options Assessment
NPPF – National Planning Policy Framework
NRMM – Non-Road Mobile Machinery
OCTMP – Outline Construction Traffic Management Plan
OLEMS – Outline Landscape and Ecological Management Strategy
OLMP – Outline Landscape Mitigation Plan
OPCAEP – Outline Pre-Commencement Archaeology Execution Plan
OTNR – Offshore Transmission Network Review
OTP – Outline Travel Plan
OWSI – Outline Written Scheme of Investigation
PEIR – Preliminary Environmental Information Report
PINS – Planning Inspectorate
PRoW – Public Right of Way
SCC – Suffolk County Council
SFRMS – Suffolk Flood Risk Management Strategy
SLVIA – Seascape, Landscape and Visual Impact Assessment
SMP – Shoreline Management Plan
SoCG – Statement of Common Ground
SPA – Special Protection Area
SPR – ScottishPower Renewables
SSSI – Site of Special Scientific Interest
SuDS – Sustainable Drainage System
SWMP – Surface Water Management Plan
TP – Travel Plan
WSI – Written Scheme of Investigation
WW2 – World War 2

1. Terms of Reference

Introduction

1.1. This report comprises the Joint Local Impact Report (LIR) of East Suffolk Council (ESC) and Suffolk County Council (SCC), referred to as "the Councils". On the 1 April 2019 East Suffolk Council was created by parliamentary order, covering the former districts of Suffolk Coastal District Council and Waveney District Council.

1.2. Each of the main topics are ascribed to a Lead Authority for example SCC is the Lead Authority for Traffic and Transport.

1.3. This LIR has been prepared in accordance with s60(3) of the Planning Act 2008 (as amended) and having regard to the guidance in the Planning Inspectorate's Advice Note One: Local Impact Reports and the DCLG Guidance for the examination of applications for development consent.

1.4. East Anglia One North Ltd and East Anglia Two Ltd, which are subsidiaries of ScottishPower Renewables (SPR) have submitted two applications for Development Consent Orders (DCO) for two offshore wind farms; East Anglia One North (EA1N) and East Anglia Two (EA2). This LIR relates to both DCO applications and the comments provided within the LIR address the local impacts of both projects unless explicitly stated otherwise.

Scope

1.5. The LIR only relates to onshore impacts of the proposed schemes as they affect the administrative areas of ESC and SCC. This includes the potential impacts of the proposed offshore infrastructure upon areas within the Councils jurisdiction above the mean low water mark including visual and landscape impacts.

1.6. The report specifically describes the impact of Works (described in the Development Consent Orders (DCO); namely:

- 800mw wind farm minimum 36km from shore (Lowestoft) – EA1N;
- 900mw wind farm minimum 33km from shore (Southwold) – EA2
- Up to two export cables laid underground landing at Thorpeness and connecting to up to two transition bays for each project;
- Up to six electrical cables laid underground between the landfall and the substation location north of Friston with associated cable jointing bays for each project;

- EA1N substation, EA2 substation, National Grid substation and associated grid connection works immediately north of Friston,
- Temporary construction consolidation sites for each project and;
- Other onshore construction activities and temporary works associated with the above works.

1.7. This LIR does not describe the schemes any further, relying on the Applicants' descriptions as set out in the DCO application documents.

1.8. Only a brief description of the development area is provided to highlight specific features within the onshore Order Limits. The Applicants' Environmental Statements (ES) otherwise provide acceptable descriptions.

1.9. The Councils have experience of the DCO process and post consent phases of other windfarm projects. East Anglia One (EA1) windfarm was consented in 2014 and is due to be completed in 2021 and the East Anglia Three (EA3) windfarm was consented in 2017 but has not yet commenced.

1.10. There is no relevant planning history to be described, the Order Limits largely encompass greenfield land other than where they encompass watercourses, woodlands or the public highway.

1.11. The Councils have taken into consideration the responses the Applicants have provided in relation to their Relevant Representation in the drafting of the LIR (Document reference ExA.RR3.D0.V1 - ESC RR-02 and SCC RR-07).

1.12. The Councils continue to engage with the Applicants through the Statement of Common Ground (SoCG) process, with a view to narrowing the issues in dispute.

Purpose and structure of the LIR

1.13. S60 (3) of the 2008 Planning Act defines Local Impact Reports as:

> "a report in writing giving details of the likely impact of the proposed development on the authority's area."

1.14. This LIR provides details of the likely impact of the two schemes under topic-based headings reflecting the likely nature of the impacts. The key issues for the Councils and the local community under each topic are identified, followed by commentary on the extent to which the Applicants address these issues by reference to the

application documentation, including the DCO articles, requirements and obligations, as relevant.

2. Description of the Area

2.1. The onshore cable corridor for both schemes passes through approximately 9km of countryside on its route from the landfall at Thorpeness to the substations site at Friston/Knodishall. The entire onshore Order Limits are within ESC's administrative boundaries.

2.2. The cables come ashore within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) and Heritage Coast at Thorpeness. The cliffs in the area of the landfall comprise weakly cemented Pleistocene rocks and sediments with the coastline suffering from episodic coastal erosion. The landscape is typical of the Coastal Dunes and Shingle Ridge landscape character type (LCT) as defined by the Suffolk County Landscape Character Assessment. To the north of the settlement of Thorpeness, the section of the coastline is relatively undeveloped and uncluttered with the Suffolk Coast Path following the coast northwards.

2.3. In addition to being within the defined Heritage Coast and AONB, the landfall area also lies partly within the Leiston-Aldeburgh Site of Special Scientific Interest (SSSI).

2.4. Once under the unconsolidated cliffs, the cables run under Thorpeness Common and part of the Leiston-Aldeburgh SSSI and then head north within the Suffolk Coast and Heaths AONB. The cable corridor travels through the flat landscape of the Estate Sandlands (SCC LCT), comprising agricultural land with light sandy soils, crossing a number of hedgerows. The corridor passes between small areas of woodland and runs to the east of the Sandlings Special Protection Area (SPA) and main Leiston-Aldeburgh SSSI which provides important heathland habitat for both flora and fauna. The route also requires the crossing of a byway open to all traffic, a public right of way (PRoW) and a bridleway. Along this coastal stretch the cable corridor passes very close to a cluster of residential properties.

2.5. Approximately 1.5km from the landfall, the onshore cable corridor turns to head eastwards, crossing the Sandlings SPA and Leiston-Aldeburgh SSSI. Once crossed, the route leaves the AONB and travels in a south-westerly direction through agricultural land requiring the crossing of further hedgerows, public footpaths, and bridleways.

2.6. The cable corridor crosses Thorpeness Road (B1353) and immediately heads into the Hundred River Valley Special Landscape Area where the landscape character changes as it crosses the Coastal Levels landscape character type. The Hundred River is crossed, and the route continues west crossing Aldeburgh Road (B1122) and then through a protected woodland (Tree Preservation Order SCDC/87/00030) to the south of Aldringham Court, a Grade II listed building. In this location the cable corridor

runs close to Gypsy Lane and parallel to Fitches Lane which host a number of residential properties. The route passes back into the Estate Sandlands LCT, leaving the Coastal Levels LCT.

2.7. Once through the woodland, the route crosses PRoWs and continues westwards for approximately 1km leaving the Special Landscape Area and passing through agricultural land to the south of Coldfair Green requiring the crossing of hedgerows.

2.8. The route continues west crossing Sloe Lane and Snape Road (B1069). After crossing Snape Road, the route heads north-westerly through agricultural land for a further 1.5km until crossing Grove Road to the south of Grove Wood, an ancient woodland. Once across Grove Road, the Order Limits open out to form the substations location. The cable route will need to cross further PRoWs (footpath and bridleway) and multiple hedgerows between Grove Road and the substations site.

2.9. In terms of landscape character, the western section of the cable corridor at the substations site and just to the east of Grove Road straddles two character areas; the Estate Sandlands and Ancient Estate Claylands LCTs. Full descriptions of all Landscape Character Types are given at www.suffolklandscape.org.uk.

2.10. The substations location sits immediately to the north of the main settlement of Friston village. Once across Grove Road, the landscape has a more intimate arrangement of fields with hedgerows marking the field boundaries with a more open character towards the northern section of the substations site. The landscape has surviving elements of a historic landscape. Friston features common-edge settlement, in-filling of common land, isolated moats and dispersed isolated farmsteads. The overhead electricity cables transmitting electricity from Sizewell to Bramford pass through the landscape immediately to the north of the proposed substations location. The height and light structure of the overhead lines and pylons allow them to pass through relatively discretely. The Order Limits provide a large area either side of the overhead lines for realignment work and National Grid infrastructure.

2.11. The parish boundary shared by Friston and Knodishall was altered in 1958, however there is a track/public footpath which marks the historic parish boundary. This track runs north-south between the village and properties to the north of the Order Limits. The boundary likely originated as early as the 10th century when this boundary line defined the later Anglo-Saxon division of Plomesgate and Blything Hundreds. There are several residential properties which sit along the boundary of the Order Limits, some of which are Grade II listed. There is also a Grade II* church adjacent to the southern boundary of the Order Limits within Friston village.

2.12. The woodland of Laurel Covert lies within the Order limits to the north of Friston.

2.13. The Order Limits are shown below in Figure 1 with the landfall shown on the eastern edge of the plan and the substations location in the centre of the irregular shape on the western side of the plan.

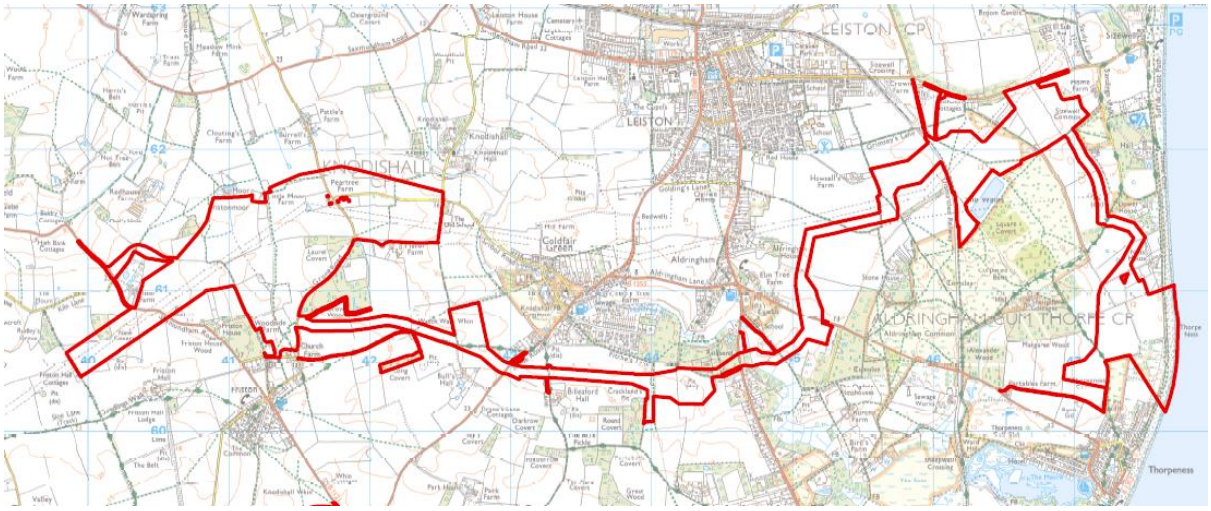


Figure 1: Extract of EA1N/EA2 Onshore Location Plan (APP-008)

3. Statutory Development Plan

3.1. The LIR primarily focuses on local planning policy but in some sections of the report reference is made to the National Planning Policy Framework (NPPF) and the National Policy Statements where relevant. Noting the guidance in Advice Note One, this LIR does not undertake an assessment of compliance with the relevant National Policy Statements, as this would duplicate the Examining Authority's role.

3.2. The relevant documents that comprise the Development Plan are identified below. Other relevant policy documents are also identified below. There are no made Neighbourhood Plans affected by these proposals.

ESC Local Plan

3.3. The new Local Plan (covering the former Suffolk Coastal area) was submitted to PINS for examination on Friday 29 March 2019, the Examination took place between 20 August and the 20 September 2019. The Inspector's final report finding the plan sound was received on 8 September 2020. The Suffolk Coastal Local Plan was adopted by Full Council on 23 September 2020.

3.4. The Suffolk Coastal Local Plan wholly supersedes the following documents which are no longer part of the development plan:

- Suffolk Coastal Local Plan (incorporating first and second alterations (2001 and 2006)
- Core Strategy and Development Management Policies (2013)
- Site Allocations and Area Specific Policies (2017)
- Felixstowe Peninsula Area Action Plan (2017)

3.5. The Waveney Local Plan was adopted on 20 March 2019 and forms part of the Development Plan relating to the former Waveney local planning authority area.

3.6. The relevant Local Plans for the District therefore consists of:

- East Suffolk Council – Suffolk Coastal Local Plan 2020,
- East Suffolk Council – Waveney Local Plan 2019

3.7. The relevant policies of the Local Plans will be referred to within this LIR where appropriate.

SCC Minerals and Waste Local Plan

3.8. SCC adopted the Suffolk Minerals and Waste Local Plan on 9 July 2020. The SCC Development Plan now comprises:

- Suffolk Minerals and Waste Local Plan 2020

Summary

3.9. In summary, the statutory Development Plan for the district is comprised of:

- East Suffolk Council's Suffolk Coastal Local Plan 2020,
- East Suffolk Council's - Waveney Local Plan 2019,
- Suffolk Minerals and Waste Local Plan 2020.

4. Other Relevant Local Policy

4.1 SCC as Highways Authority published the Suffolk's Local Transport Plan 2011-2031, a 20 year strategy that highlights the Council's long term ambitions for the transport network. A four-year implementation plan is also published indicating how the County Council are proposing to address the issues within the longer-term transport strategy.

4.2 SCC has also published a Green Access Strategy, which is a rights of way improvement plan, covering the period 2020 to 2030.

4.3 The Suffolk Shoreline Management Plan (SMP) 7 was published in 2012. The preparation of an SMP is the duty of the operating authorities responsible for managing the coastline. Suffolk Coastal District Council now ESC, adopted the SMP in November 2011, this document was endorsed by SCC.

4.4 East Suffolk Strategic Plan 2020-2024 recognises the energy sector as a key selling point for East Suffolk and identifies renewable energy as a key priority.

4.5 East Suffolk Economic Growth Plan 2018-2023 sets out how ESC and its partners will achieve economic growth through maximising the competitive advantage in key sectors such as energy. The plan identifies the opportunities and potential that exists in the energy sector as key to working towards the vision that businesses across East Suffolk have the confidence to invest and grow, creating opportunities for people of all ages and improving further the quality of life in an outstanding environment.

4.6 New Anglia Local Enterprise Partnership (NALEP) which covers Norfolk and Suffolk published The Economic Strategy for Norfolk and Suffolk in 2017. The document sets out the ambition for Norfolk and Suffolk to be a centre for the UK's clean energy sector and outlines the plans for future growth identifying the Norfolk and Suffolk coast as an energy coast - a priority place where evidence shows there are significant opportunities and commitments for continued growth.

4.7 NALEP is working to develop a Local Industrial Strategy for Norfolk and Suffolk which is currently in draft form. The Local Industrial Strategy is the next stage in the evolution and implementation of the Norfolk and Suffolk Economic Strategy and supports and builds upon this published document.

4.8 The AONB Management Plan 2018-2023, has been produced in accordance with the Countryside and Rights of Way Act 2000. It seeks to conserve and enhance the special landscape (and seascape) characteristics of the AONB and ensure that they are taken into account and enhanced by the planning process, with impacts of major

infrastructure development avoided, mitigated or offset. It promotes and recognises the importance of sustainable recreation and tourism within the AONB and seeks to enhance the understanding of its historic and cultural assets. The Suffolk Heritage Coast is largely contained within the AONB and there are no specific statutory requirements or powers associated with the Heritage Coast definition.

4.9 The AONB - Natural Beauty and Special Qualities Indicators document was published on 20 November 2016. It identifies the features that constitute the natural beauty and special qualities of the whole of the AONB. The document follows a rigorous criteria-based approach for establishing and identifying the special qualities of this nationally important landscape.

4.10 The marine environment (up to the high-water mark) in the plan area is covered by the East Inshore and East Offshore Marine Plans. These plans need to be considered alongside this Local Plan for developments which are within the marine plan areas and for developments which could impact upon the marine plan areas. The Marine Plans contain policies relating to a range of marine related issues including economy, tourism and recreation and culture.

Summary

4.11 These are several additional documents produced and endorsed by the relevant authorities which represent local policy on specific topics, which the Councils consider of relevance to the proposed developments.

5. Assessment of Impacts and Adequacy of Response

Introduction

5.1. The following sections identify the relevant policies within the Development Plan and other local policy, the key issues raised by the proposed development and the extent to which the DCO submissions address them and thus the degree of policy compliance.

6. The Principle of the Development

ESC Local Plan

6.1. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects sets out the matters which the local authority will take into consideration including the nature, scale, extent, and potential impact of proposals in addition to the cumulative impacts. The policy seeks to ensure that major energy projects deliver significant local benefits and provide an ongoing legacy for the local community.

6.2. Policy SCLP9.1: Low Carbon & Renewable Energy recognises the need to transition to a low carbon future and supports low carbon and renewable energy developments where they are within a suitable area or satisfy specific criteria which includes consideration of the existing environment and avoiding significant adverse impacts. This policy however focuses on onshore wind turbines as opposed to offshore turbines with onshore infrastructure, but it is of some relevance.

Other Relevant Local Policy

6.3. The Suffolk Growth Strategy provides particular support for offshore wind development based on the likely local economic benefits.

6.4. ESC Strategic Plan 2020-2024 identifies renewable energy as a key priority stating that the Council will explore new ways of encouraging and investing in the use of renewable energy, both in terms of the Council's consumption and supporting residents and businesses as part of addressing climate change.

6.5. East Inshore and East Offshore Marine Plans support proposals which will help the marine plan areas to contribute to offshore wind generation.

Commentary

6.6. The ESC Strategic Plan recognises the energy sector as being one of the district's key economic strengths and selling points. The plan is supportive of maximising opportunities in relation to the renewable energy sector.

6.7. The Local Plan recognises that the Suffolk Coast is at the forefront of electricity energy generation across the country both in respect of onshore and offshore energy. The Plan highlights the importance of delivering major energy infrastructure in a planned way which takes account of the potential impact of constructing, operating, and

decommissioning large nationally significant infrastructure. The Plan commits to working collaboratively with all stakeholders to ensure this is achieved.

6.8. The need to increase renewable energy provision is a key issue identified within the Local Plan, which supports the priorities set by the business and strategic plans. The Local Plan also recognises that the former Suffolk Coastal area can contribute towards the generation of renewable energy. It recognises that this could be achieved through the accommodation of wind turbines and landing points to serve offshore energy provision.

6.9. In the text associated within Policy SCLP3.4, a variety of local issues have been identified which may be relevant when considering energy infrastructure proposals. The policy and explanatory text highlights that the Council will take into consideration the nature, scale, extent, and potential impacts of proposals, including cumulative impacts throughout their lifetime, including decommissioning.

6.10. The policy states that major energy infrastructure projects will need to mitigate the impacts arising and identifies several policy requirements which applications should have regard to, including:

- appropriate packages of local community benefit to mitigate the impacts of disturbance experienced by the local community for hosting major infrastructure projects.
- Requirement for robust
    - Environmental Impact Assessment (EIA),
    - Habitat Regulations Assessment (HRA),
    - Heritage Impact Assessment,
    - Assessment of impacts on the AONB.
- Appropriate flood and erosion defences.
- Appropriate road and highway measures.
- The development and associated infrastructure proposals should seek to deliver positive outcomes for the local community and surrounding environment.
- Maximisation of economic and community benefits through agreement of strategies in relation to employment, education, and training opportunities for the local community.
- Measures to ensure the successful decommissioning and restoration of the site
- Appropriate monitoring measures to ensure mitigation measures remain relevant and effective.
- Cumulative impacts.

6.11. The explanatory text of Policy SCLP3.4 also highlights the cumulative impact of energy proposals. The policy identifies the potential significant impacts which could occur on

the East Suffolk countryside and states that the Council will be working closely with Government and other agencies to ensure issues related to the National Grid are considered comprehensively and not incrementally. It is stated that opportunities to co-locate infrastructure may reduce impacts.

6.12. In addition to Policy SCLP3.4, Policy SCLP9.1 is of some relevance. Policy SCLP9.1 provides that the Council will support low carbon and renewable energy developments, where it is proposed within an area identified as suitable for renewable or low carbon energy or satisfy the above criteria. However, the policy makes it clear that such development should be complementary to the existing environment without causing any significant adverse impacts on residential amenity, landscape and visual impact, the natural beauty and special qualities of the AONB, transport, flora and fauna, noise and air quality, unless those impacts can be appropriately mitigated. The onshore Order Limits do not fall within an area specifically identified for renewables and therefore the developments are not compliant with Policy SCLP9.1. The policy is however aimed at onshore wind developments.

Adequacy of the Applications/DCOs

6.13. The EA1N and EA2 projects will provide 800MW and 900MW of renewable energy, respectively. The provision of 1.7GW of renewable energy will contribute to the achievement of the UK's renewable energy targets and contribute to the UK's efforts to reduce the effects of climate change. The Councils welcome this. The Suffolk Coastal Local Plan supports the principle of the provision of renewable energy, Policy SCLP3.4 however clearly identifies the need for applicants to have regard to several policy requirements which have been summarised in paragraph 6.10. Those requirements are considered below.

6.14. *Appropriate packages of local community benefit to mitigate the impacts of disturbance experienced by the local community for hosting major infrastructure projects* – It is understood that the Applicants intend to provide a community benefits fund. This will provide a sum of money in recognition of the impacts experienced by the local community because of the projects. This fund is however separate from the DCO process and does not form a relevant consideration for the purposes of determining the DCO applications, although the Councils welcome this commitment.

6.15. Separate from the community benefit fund, the Councils continue to engage with the Applicants to ensure that appropriate and sufficient mitigation is provided in relation to the impacts identified by the ESs, and additional impacts the Councils

have identified. The Councils have set out within the LIR where further mitigation measures are required. Where the provision of mitigation is not possible, the Councils are seeking appropriate compensation.

6.16. *Requirement for robust Environmental Impact Assessment (EIA)* – The LIR has been divided into sections which each address a different topic area of the ES. The Councils have identified at the end of each of these sections where it is considered that further work is required.

6.17. *Robust HRA* – The Councils will defer to the expertise of Natural England on this matter.

6.18. *Robust Heritage Impact Assessment* – The Councils have carefully considered the assessment within the ES and provided detailed comments in Section 12 of the LIR.

6.19. *Robust Assessment of the impacts on the AONB* – The Councils have considered this matter in Sections 15 and 16, but also recognise the remit and responsibilities of Natural England in terms of the protected landscape of the AONB.

6.20. *Appropriate flood and erosion defences* – The Councils have considered the implications of the projects for flood risk in Section 11 and for coastal erosion and processes in Section 10 of the LIR.

6.21. *Appropriate road and highway measures* – The Councils have considered the impacts of the projects on traffic and transport in Section 21 of the LIR.

6.22. *Applicants should seek to deliver positive outcomes for the local community and surrounding environment* – The Councils continue to engage with the Applicants regarding the provision of adequate mitigation and compensation and also the provision of measures to deliver environmental enhancements. These discussions are ongoing.

6.23. *Maximisation of economic and community benefits though agreement of strategies in relation to employment, education and training opportunities for the local community* – The Councils have considered the impacts of the projects in relation to these matters in the Section 20 of the LIR. SPR and the Councils have signed a Memorandum of Understanding (MoU) which establishes a commitment for all parties to work together to maximise the education, skills and economic benefits of the East Anglia Offshore Wind Projects. The Councils welcome this commitment through the MoU.

6.24. *Measures to ensure the successful decommissioning and restoration of the site* –The Councils have discussed post construction restoration of the cable route and mitigation planting in relation to the substations site in the LIR (Sections 9 and 15). The Councils have raised concerns regarding the predicted growth rates detailed in the ES and the speed in which this would occur in reality. The Councils are continuing to engage with the Applicants to look at measures which could be adopted to improve the timeliness of restoration and mitigation planting. Decommissioning of the infrastructure has not been covered in any significant detail in the ESs. The Councils however recognise that there are controls within the draft DCOs through Requirements 30 and 37, which ensure ESC would need to approve any decommissioning plan.

6.25. *Appropriate monitoring measures to ensure mitigation measures remain relevant and effective* – The Councils recognise the importance of ensuring appropriate monitoring and control measures are incorporated within the draft DCOs and management plan documents. The need for further measures has been highlighted in Sections 7 and 21. The Councils are engaging with the Applicants in relation to this matter.

6.26. *Cumulative Impacts* – Ensuring that the full cumulative impacts of the projects are considered prior to any decision being taken in relation to theses DCOs is of paramount importance to the Councils. EA1N and EA2 will have cumulative impacts with each other, in addition to cumulative impacts with other known developments. The paragraphs below consider the extent to which the cumulative impacts of the EA1N and EA2 have been minimised, in addition to whether the ESs have considered the full cumulative impacts of the projects with other developments.

Sharing of Infrastructure

6.27. The supporting text to Policy SCLP3.4 states that *'where possible companies and developers will be encouraged to work collaboratively and share infrastructure and facilities that serve other requirements to reduce any potential impacts during construction, operation and decommissioning stages of projects'*. The cumulative impacts of EA1N and EA2 together could be minimised by sharing infrastructure.

6.28. The two projects share the same onshore Order Limits and substations location. The principle of this is welcomed by the Councils, notwithstanding the Councils' concerns regarding the impacts of the permanent substations at Friston, identified within this LIR. The EA1N and EA2 projects, although proposed to share the same onshore Order Limits are not proposed to share any project specific infrastructure. Each project will provide up to two transition bays at the landfall to connect the onshore and offshore

cables, up to six onshore cables, up to two fibre optic cables, up to two distributed temperature sensing cables and an onshore substation, cable connection between the onshore substation and National Grid substation. The only sharing of infrastructure relates to the National Grid substation and associated infrastructure.

6.29. It is understood that the Applicants' reluctance to consolidate the infrastructure between EA1N and EA2 is due to commercial and regulatory considerations.

6.30. The Department of Business, Energy and Industrial Strategy (BEIS) has launched a review (Offshore Transmission Network Review (OTNR)) into the existing offshore transmission regime to address the barriers it presents to further significant deployment of offshore wind. The review recognises that in light of achieving net zero ambitions, the current approach to designing and building offshore transmission with point to point connections for each offshore wind farm, which results in considerable environmental and local impacts, is not fit for purpose. The Terms of Reference for the review have been published, and it is apparent from them that projects such as EA1N and EA2 would fall within the scope of the medium term workstream which focuses on projects expected to connect to the onshore network after 2025. This workstream will seek to:

- *identify and implement changes to the existing regime to facilitate coordination in the short-medium term;*
- *assess the feasibility and costs/benefits of centrally delivered, enabling infrastructure to facilitate the connection of increased levels of offshore wind by 2030;*
- *explore early opportunities for coordination through pathfinder projects, considering regulatory flexibility to allow developers to test innovative approaches;*
- *focus primarily on projects expected to connect to the onshore network after 2025.*

6.31. The long-term workstream will seek to design and implement a new enduring regime that enables and incentives coordination while seeking to minimise environmental, social and economic costs. This will also consider the role of multi-purpose interconnectors and focus on projects expecting to connect after 2030.

6.32. The Terms of Reference for the medium term workstream state that the review is seeking pathfinder projects and that regulatory flexibility will be considered to allow the testing of innovative approaches. It would appear therefore that that through the review there may be ways to address the Applicants' commercial and regulatory concerns relating to the sharing of infrastructure. It is considered that any finding from the review that emerges during the examination should be explored further when considering the Applicants' approach to infrastructure consolidation.

Coordination and Method of Working

6.33. In addition to there being the potential to minimise cumulative impacts through infrastructure consolidation, there is also the potential to reduce the onshore construction impacts through a greater level of coordination in the method of working.

6.34. The Applicants are bringing forward two schemes as two separate projects that can be implemented simultaneously or consecutively. In the latter circumstance, the first scheme could be implemented, and the land restored before the second project commences, disrupting the same communities and environment again. The onshore Order Limits run through the AONB and countryside affecting important landscapes, trees and hedgerows, crossing a SPA/SSSI, in addition to numerous PRoWs, and are located in close proximity to a number of residential properties. The level of disruption caused by the construction works and the impacts on the environment as a result is a key concern and therefore any possibility to minimise this should be fully explored and appropriate measures incorporated.

6.35. Iberdrola group, parent company to SPR, previously announced that they intend to combine, if consented, EA1N, EA2 and the consented EA3 wind farm into one single delivery programme creating the East Anglia Hub. It is identified on their website that the offshore windfarms will be developed in parallel by means of a continuous installation program to take advantages of economies of scale (https://www.iberdrola.com/about-us/lines-business/flagship-projects/east-anglia-hub-offshore-wind-complex). The Councils welcome this announcement. However, as the simultaneous construction of the projects is not secured through the draft DCOs, there is no ability for the Councils to ensure this approach is undertaken. The Councils would like to see controls included in the DCOs to ensure simultaneous construction in order to minimise impacts on the environment and local community.

6.36. If it is determined and accepted by the Examining Authority that the simultaneous construction of EA1N and EA2 cannot be secured, then at the very least the Councils would wish to see greater coordination between the delivery of the projects. This could be achieved by the first project providing infrastructure for the second project, for example laying the cable ducting. This process was successfully undertaken in relation to SPR's consented EA1 offshore windfarm projects. The DCO for EA1 included the powers to lay additional ducts onshore to create capacity for future offshore wind farms and provided compulsory acquisition powers over the land needed for that purpose. At the time of the EA1 examination, it was envisaged that the ducting would accommodate EA3 and potentially East Anglia Four (EA4). This

decision helped to reduce the inefficiencies and lessen impacts on the environment and communities caused by construction works associated with the onshore infrastructure.

6.37. DCLG's Guidance on associated development applications for major infrastructure projects notes that one of the core principles that the Secretary of State will take into account in determining whether something is in fact associated development will be whether it supports "the construction or operation of the principal development, or help address its impacts". The guidance therefore allows for the inclusion of infrastructure for a future project under the first as shown by the earlier EA1 and EA3 schemes. The fact that the EA1N and EA2 projects are proposed by the same promotor, share onshore Order Limits and have been submitted at the same time, should only serve to make such coordination easier.

6.38. The Councils have continued to urge the Applicants to commit to a more integrated and efficient approach to developing the two projects to lessen the detrimental effects which will be experienced during construction.

6.39. Section 1.4 of the Scheme Implementation Report (APP-596) details the "Early Implementation of Sections of the Onshore Cable Route". Requirement 11 "Stages of authorised development onshore" allows the stages of works to be approved by ESC. It is understood for example, that one project could lay the 'discrete sections' of ducting for another, providing all the requirements in relation to both projects which would allow the works, had been discharged. The Applicants have also detailed that this would only be undertaken where 'it is of the benefit to the applicant'. It is agreed that this allows a degree of flexibility and does not prevent the ability for a level of greater coordination between the projects, however the current approach leaves this entirely to the Applicants to determine whether to implement this type of coordination and does not secure a coordinated delivery of the projects.

6.40. The Councils welcome the flexibility provided within the siting of the onshore substations, which facilitates the possibility that the more appropriate siting for the onshore substations could be utilised, should one project be consented and one not.

6.41. If infrastructure consolidation or sharing cannot be realised, the Councils consider greater coordination of the construction works should be secured within the draft DCOs. This could either be achieved by a requirement securing the simultaneous construction of EA1N and EA2 or a requirement requiring the first project to lay cabling for the second.

6.42. Infrastructure consolidation and greater coordination of construction works would help to minimise the cumulative impacts of EA1N and EA2 with each other, however the Councils are also concerned about the cumulative impacts of the projects with other future projects.

Sizewell C

6.43. NNB Generation Company (SZC) Limited submitted a DCO application for Sizewell C on 27 May 2020 and PINS confirmed the acceptance of the application on 24 June 2020. The period for registering to be an Interested Party closed on 30 September 2020 and it is anticipated the examination will commence early 2021.

6.44. The submission documents identify 2021 as the earliest start for construction. The construction period is predicted to 9-12 years. The earliest construction year identified for EA1N and EA2 is 2023. If the three projects are all consented, the construction phases of the projects would overlap, resulting in East Suffolk experiencing the disruption of four nationally significant infrastructure projects (including the consented EA3) being constructed at the same time. It is therefore essential that the full cumulative impacts of the projects are fully assessed with adequate and appropriate mitigation secured as required.

6.45. The EA1N and EA2 ESs acknowledge the need to cumulatively assess the impacts of the projects with those identified in the ES for Sizewell C. The current Cumulative Impact Assessments (CIAs) are based on the material published by EDF Energy during their pre-application phase, as this was the information available to the Applicants at the time of drafting the ESs. The Applicants have committed to providing updates regarding the cumulative impacts of the projects with SZC in relation to noise and vibration, landscape and visual impact including PRoWs, traffic and transport including air quality and availability of tourist accommodation. Where appropriate the cumulative impacts with Sizewell C have been identified in the LIR. One of the most significant areas where cumulative impacts will be experienced is in relation to traffic and transport.

6.46. The Councils are engaging with the Applicants in relation to the above updates and will review this information as it becomes available.

6.47. In addition to Sizewell C, the Councils consider there are other nationally significant infrastructure projects (NSIPs) which the Applicants should have considered within their CIAs. The Planning Inspectorate's Advice Note 17: Cumulative Effects Assessment indicates that the CIA should consider other projects under construction; permitted but not yet implemented; submitted for consent but not yet determined;

included in the Planning Inspectorate's Programme of Projects; identified in development plans and emerging plans; and identified in other plans and programmes which set the framework for future development consents/applications where such development is reasonably likely to come forward. The objective of the CIA is to consider the combined effects of the project subject to the application together with other projects that have been approved or are reasonably likely to come forward.

Future Energy projects and Future Expansion of the proposed National Grid Substation at Friston

6.48. National Grid Electricity Systems Operator (NG-ESO) has offered grid connections to several projects which are anticipated in the future. The NG-ESO TEC Register (as of 8 October 2020) identifies a connection offer for Galloper Extension Offshore Wind Farm (now known as Five Estuaries), promoted by RWE. The existing Galloper Wind Farm has an onshore substation and connects into the national grid at Sizewell. The Interconnector Register (as of 8 October 2020) also identifies connection offers for Nautilus and Eurolink Interconnectors, promoted by National Grid Ventures (NGV). It is understood from the NGV questions and answers document that the intention is for these projects to connect to the National Grid substation at Friston, which is part of the EA1N and EA2 applications. The connection of these projects to the National Grid substation would result in the enlargement/extension of the infrastructure.

6.49. NGV's Relevant Representation confirms that NG-ESO has offered grid connections for the Nautilus and Eurolink Interconnectors at the National Grid substation proposed at Friston. NGV has submitted comments regarding the need to safeguard unfettered and timely access to the proposed new National Grid substation. NGV has also published a Q&A document on the Nautilus project webpage confirming that extensions to the National Grid substation would be necessary to accommodate the Nautilus and Eurolink connections. The document details that the site area required for these connections would be a maximum of 1.3 hectares (https://www.nationalgrid.com/document/132456/download).

6.50. In addition to the projects outlined above, the Councils are concerned that SSE will be seeking a connection offer in relation to the Greater Gabbard Extension (now known as North Falls) and this could result in a further connection offer being granted in the locality. The projects all have connections offers for dates pre-2030.

6.51. NG-ESO published the Network Options Assessment (NOA) earlier this year in January 2020. This document describes the major projects NG-ESO are considering to meet the future needs of the Great Britain's electricity transmission system and

recommends which investments in the year ahead would best futureproof the network. The NOA identified that due to network constraints in East Anglia network, reinforcements were necessary. One of the options recommended was an offshore High Voltage Direct Current (HVDC) link (SCD1) between Suffolk and Kent which would bypass the most constrained areas. The NOA also identified a second HVDC link between Suffolk and Kent (SCD2) but recommended this should be put on hold for now. National Grid Electricity Transmission (NGET) published their Network Development Policy Decisions document on 30 June 2020. This document describes the investment options NGET has selected to progress. Within the document, NGET confirmed that they will be looking to take forward the SCD1 Link. This is a further project due to be constructed and connected to the grid before 2030.

6.52. The numerous projects anticipated to need to make landfall and require the accommodation of onshore infrastructure in East Suffolk is a significant concern for the Councils and local community. It is of vital importance that the full impacts of these projects are properly understood and taken into consideration at the earliest opportunity.

6.53. The National Grid substation should be designed and proposed to accommodate the anticipated grid connections. It is clearly considered by NG-ESO to be a strategic grid connection location for future infrastructure projects and therefore the full implications of this should be considered upfront. The guidance on Associated Development also makes it clear that the core principles have been written as not to prevent "associated infrastructure development (such as a network connection) that is on a larger scale than is necessary to serve the principal development if that associated infrastructure provides capacity that is likely to be required for another proposed major infrastructure project".

6.54. The current applications do not consider the impact of future connections and associated expansions required to the National Grid substation and the proposed substation has not been designed to accommodate the expansion that would be required to accommodate those projects. The Councils consider at the very least, the necessary extensions to the National Grid substation, required by virtue of existing connection offers, should be considered as part of the CIA. The National Grid substation is being considered by NG-ESO as a strategic connection point therefore, the implications of this strategic role, and the impacts of specific works where they are known in outline, should be fully considered, and understood by the public, consultees and the Examining Authority. While full information may not yet be available, sufficient information is available regarding the future expansion necessary to the National Grid substation to accommodate Nautilus and Eurolink Interconnector connections. National Grid is also likely to be able to provide

information on the size of the extension required to the National Grid substation to accommodate the Galloper Extension/Five Estuaries project. The Councils consider that this information is likely to affect the local impacts of the proposal, inform consideration of site capacity, and inform the design of, and technology chosen for, the proposed substation.

Permitted Development Rights

6.55. The Town and Country Planning (General Permitted Development) Order 2015 provides statutory undertakers such as National Grid and other electricity providers rights to undertake certain development under the Order without the need for planning permission from the local authority. The Councils are concerned the National Grid substation could be extended, subject to the size of the addition, without the proposal going through a formal consultation or consenting process. This further emphasises the need to consider the future connections and associated expansions required to the National Grid substation upfront.

6.56. The Councils are also concerned about the ability to extend the Applicants substations under permitted development rights given the constrained nature of the site and proximity to residential properties.

6.57. The Councils consider that permitted development rights should be removed to prevent the extension or alteration of the substations under Schedule 2, Part 15, Class B of the Town and County Planning (General Permitted Development) Order 2015 without prior consent

Summary

6.58. The Local Plan is supportive of the principle of renewable energy. Policy SCLP3.4 however identifies several policy requirements which projects should have regard to. The remaining sections of the LIR will discuss in more detail the adequacy of the assessments undertaken in relation to specific matters and provide commentary in terms of policy compliance.

6.59. One of the policy considerations is cumulative impacts, the importance of which is stressed within the policy and explanatory text and discussed above. The policy and text make it clear that the cumulative impacts of projects should be considered comprehensively and not incrementally. The Applicants have assessed the cumulative impacts of EA1N and EA2, but the Councils are concerned that not all reasonable measures are being taken in order to reduce the in-combination effects of the two projects.

6.60. Furthermore, although the Applicants have committed to providing further information in relation to the cumulative impacts of the projects with Sizewell C, the cumulative impacts with other known future projects have not been considered. The DCOs, if consented, would result in the construction of a strategic connection point for National Grid at Friston, the implications of which have not fully identified or assessed, contrary to policy.

Further Work Required

6.61. The Councils recommend the Applicants explore opportunities for infrastructure consolidation and sharing, particularly in light of the BEIS OTNR. If this cannot be achieved and robust explanations have been provided to justify this, the Councils request that at the very least, greater coordination is employed in terms of the construction of the projects. This could either be achieved by a requirement securing the simultaneous construction of EA1N and EA2 or a requirement requiring the first project to lay ducting to accommodate the cabling of the second project.

6.62. The Councils also consider that the design of the National Grid substation should reflect its intended purpose as a strategic connection hub. The Councils consider that as a minimum, the CIA in the ESs should be updated to consider the known requirements in relation to the National Grid substation necessary to accommodate the connection offers that have been granted by NG-ESO.

6.63. The Councils recommend that permitted development rights are removed as part of the DCOs to prevent the ability of National Grid, the Applicants or future site operators to extend the substations without the need for planning permission from the local planning authority.

7. Air Quality – Emissions and Dust

Lead Authority ESC

ESC Local Plan

7.1. Policy SCLP10.3: Environmental Quality, clearly states the expectation that development proposals will protect the quality of the environment and minimise and, where possible, reduce all forms of pollution and contamination including air quality pollution.

7.2. Policy SCLP11.2: Residential Amenity, identifies air quality and other forms of pollution as a key consideration the local authority will take into consideration when assessing the impact of development.

Key Local Issues

7.3. The main impacts on air quality are those associated with the construction phase and specifically dispersion of materials from the works areas into neighbouring communities and those associated with the emissions from construction vehicles, particularly heavy goods vehicles (HGVs).

7.4. The Stratford St Andrew Air Quality Management Area (AQMA) at Long Row, Main Road was declared in June 2014 following monitoring of the air quality in this area of the A12 which showed an exceedance of the annual mean nitrogen dioxide (NO_2) Air Quality Objective (set at 40 µg/m^3). The highest annual mean NO_2 concentrations within the AQMA were 44ug/m^3 recorded in 2015. The Air Quality Action Plan, required following declaration of any AQMA, received approval from the Department of Environment, Food and Rural Affairs (DEFRA) in March 2018 and consists of two short term priority action measures and six longer term aspirational measures. The main priority measure, movement of the 30/50mph change of speed limit further south out of the village was undertaken by SCC in December 2017. NO_2 concentrations in the AQMA showed a decrease for the first time in 2016 and fell just below the objective in 2017 (39µg/m3), with a further reduction seen in 2018 (38µg/m3) and in 2019 (36µg/m3). The initial reduction of 1µg/m3 following movement of the speed limit was lower than modelling had predicted. Speed surveys undertaken following the move have shown a reduction in speeds at all locations surveyed except on the southbound carriageway within the AQMA where speeds appear to have increased slightly. ESC is continuing to monitor in this location and the Steering Group will be looking at the aspirational measures within the Action Plan.

7.5. Wind blow dust is also a concern locally by virtue of the light sandy soils. The development will result in long stretches of stockpiled topsoil which could be subject to wind whipping. Wind entrainment is commonly seen in the Suffolk Sandlings area and presents a risk to both residential and ecological receptors.

Adequacy of Applications/DCOs

Scope of Works

7.6. The Applicants' air quality assessment scope of works only includes the construction phase impacts upon dust nuisance (dust soiling on property and habitats) and air quality concentrations (NO_2, PM_{10} and $PM_{2.5}$). The following aspects have been scoped out:

- Dust nuisance generated during the operational phase;
- Operational phase impact upon air quality concentrations, given the small number of vehicle trips generated;
- Cumulative impacts of traffic upon air quality concentrations during the operational phase; and
- The impact of shipping emissions upon local air quality.

7.7. The Applicants have stated that *'it is not expected that maintenance of the onshore cable route or substation would lead to significant dust generation of fine particulates, as there would be no earthworks or ground disturbance'*. Additional nuisance may occur during the decommissioning phase, but a separate decommissioning assessment is included as a proposed requirement in the draft DCOs. The Councils agree that scoping out dust nuisance during routine operational maintenance from this air quality assessment is reasonable.

7.8. There is no reference to the volumes of surface access traffic generated from port activities within the air quality assessment. Chapter 26 of the ESs (Traffic and Transport) states that *"facilities would be provided or brought into operation by means of one or more planning applications or as port operations with permitted developments".* The assessment of surface access transport on air quality to ports should be secured through a requirement in the DCOs. The Applicants have agreed to include an air quality assessment as part of the Port Travel Plan secured by Requirement 36 of the draft DCOs. It is understood that the Applicants will provide an Outline Port Travel Plan which will confirm this.

7.9. There are road improvements at the A12/A1094 junction, A1094/B1069 junction and Marlesford Bridge. Whilst some explanation has been provided for screening these out from assessment for dust nuisance, it does not fully justify screening out an

assessment of re-routed traffic during the construction phase. The assessment of re-routed traffic is important as substantial works duration, typically those greater than six months, have the potential to cause a material impact upon local air quality. The Applicants' statement in paragraph 20 of Chapter 19 air quality assessment, that these works will not generate more HGV movements than those already assessed is reasonable, however the impact of rerouted traffic and duration has not been assessed. The Applicants have issued a draft clarification note which sets out a commitment to assess impacts of re-routed traffic. This will be issued when relevant data becomes available. This issue is outstanding until an assessment of re-routed traffic is presented and confirmed as satisfactory.

Application of Guidance within Assessment

Establishing Study Area

7.10. Best practice guidance Design Manual for Roads and Bridges (DMRB) and Institute for Air Quality Management (IAQM)) has been used to identify roads which will experience a change in traffic flow which require a detailed air quality assessment. The Applicants' transport consultant has used a Gravity model for the transport assessment, and whilst this is acceptable for the transport assessment, this methodology does not capture the effects of varying journey times upon route choice and rerouting. Consequently, there are concerns that air quality impacts of existing traffic rerouted by EA1N and EA2 has not been captured. In particular, vehicles which would otherwise use the A12 could divert via the B1119 and pass through Leiston and Saxmundham.

7.11. In addition, the air quality assessment mentions that traffic data has been taken from Chapter 26, Traffic and Transport. However, the peak construction phase annual average daily traffic flows presented within Table 26.23 of Chapter 26 are higher than those presented within Table 19.10 of Chapter 19. The reasonable worst-case traffic flows should be used from the transport assessment. Initially it appeared that the project construction phase which generates a smaller volume of vehicles has been used. Using a different scenario's traffic data to identify roads for assessment could alter the study area. The Applicants have since issued a clarification note which explains that traffic data from the transport assessment (Table 26.23) is higher as it represents annual average weekday traffic flows (5-day), whereas the traffic flows used in the air quality assessment (Table 19.10) represent annual average weekly traffic flows (7-day). The Councils are satisfied this response resolves the query.

Assumptions for Emission Calculations

7.12. The key guidance documents which should be used to develop assumptions for emission calculations are: Local Air Quality Management Technical Guidance 2016 (LAQM.TG (16)) and the IAQM Land Use and Management. These guidance documents have been considered within the Applicants' assessment.

7.13. The essential assumption inputs for emission calculations are traffic flow, speed and fleet mix. The essential components are the volume % between light ≤3.5 tonnes) and heavy (>3.5 tonnes), with optional extras on fleet mix improving confidence in calculations such as greater granularity in vehicle type with light vehicles being disaggregated into passenger cars, taxis, vans and their associated Euro standards. The Emissions Factor Toolkit has default fleet mixes for certain regions in the UK, which may or may not be representative of the local fleet mix. Alternatively, a customised fleet can be entered to represent the local fleet mix. The Applicants have included minimum assumptions of light/heavy vehicle % splits for non-construction traffic and detailed Artic/Rigid Euro standard assumptions for construction vehicles. The approach used for non-construction traffic is acceptable given the lack of local fleet information and for construction vehicles it is beyond the minimum requirements.

7.14. 2023 is the assumed year for the air quality assessment. The choice of assessment year should be commended as an older assessment year will result in an older fleet mix with higher emissions assumed. Within IAQM it is stated that the first year of the proposed scheme going live should be assessed, and the Applicants' approach complies with this. In theory, the combination of the earliest possible construction year with conservative emission assumptions and peak construction traffic will result in the most conservative assessment. Initially the Councils were concerned that this may not represent the worst-case assessment, due to the query regarding the traffic presented in the air quality assessment compared to the transport assessment. The Applicants' clarification note demonstrates that the Applicants have used worst-case traffic flows in the assessment.

7.15. In the absence of speed data from a traffic model, the use of speeds from a survey and 20km/h for junctions which experience congestion is reasonable. The assumption of 20km/h is a standard assumption recommended within LAQM.TG (16), therefore speed assumptions are compliant with best practice guidance.

Dispersion Modelling Parameters

7.16. The key guidance documents for dispersion modelling are LAQM.TG (16). This has been incorporated within the Applicants' assessment.

7.17. Initial model verification; the process of comparing estimates with measured concentrations to review the need for model adjustment; showed that it met LAQM.TG (16) requirements. Further amendments were undertaken to better reflect heightened concentrations within Stratford St Andrew. To achieve this the Applicants have created two model adjustment zones for locations within the Stratford St Andrew AQMA and those outside. This approach is considered acceptable to improve model performance. A years' worth of meteorological data was taken from the Wattisham weather station, it is agreed that this location is representative of the study area.

Air Quality Assessment at SSSI and SPA Habitats

7.18. Not all industry standard guidance has been used within the designated sites assessment. IAQM's Guide on the Assessment of air quality impacts at designated sites went live in June 2019 and should be used to inform the assessment. The Applicants have since issued a clarification note assessing ecological impacts following IAQM's latest ecological guidance note. This closes out the query regarding assessment in accordance with latest ecological guidance and impacts of NOx emissions upon ecological habitats. The Applicants have captured relevant ecological receptors within their assessment such as Leiston-Aldeburgh SSSI, Sizewell C Marshes and Sandlings SPA. The assessment of nutrient nitrogen impacts from EA1N and EA2 in isolation was carried out satisfactorily but require further consideration in the cumulative scenario. Chapter 22 of the ESs provides a more detailed assessment of the >1% increase in nutrient nitrogen deposition with satisfactory justification that the distance of sensitive habitats from emission source means that they would not experience significant effects.

7.19. There are no results which show the estimated NOx concentrations at ecological receptors. As well as being important in its own right, this also prevents any conclusions being drawn on whether there should be further assessment of acid deposition. In Chapter 22 of the ESs, it is mentioned that neutral grassland is the closest habitat to the affected area of Sizewell Marshes. Given that acid deposition has the potential to impact this habitat, further information needs to be presented to support the current position that air quality will have no adverse impacts upon habitats.

7.20. The Applicants have subsequently presented NOx and acid deposition impacts at habitats in a clarification note. However, this excluded a sensitivity test of governmental projections of background pollution in 2023. The Councils maintain that a sensitivity test should be provided, particularly as it has not been established that trends in vehicle emissions in the local area will match national projections. There are ongoing discussions with the Applicants regarding acid deposition. The Councils' position will be reviewed upon receipt of additional information. Whilst only a qualitative assessment of cumulative impacts with Sizewell C has been presented, the Applicants have committed to provide further justification for not undertaking a quantitative assessment of in-combination impacts with the Sizewell C development. The Councils' position on cumulative assessments will be reviewed once additional information has been received.

Construction Dust Nuisance

7.21. The main guidance document for construction dust nuisance assessment is IAQM's guidance on the assessment of dust from demolition and construction. The assessment follows best practice guidance. This guidance is excellent for most developments' construction programme, but this is a nationally significant infrastructure project where the magnitude of earthworks involved are substantially greater than most projects this guidance is intended for. Consequently, there are concerns that the standard mitigation measures within it would not be commensurate for the impacts arising from these projects.

7.22. Large impacts within the guidance are defined as those with an earthworks area > 10,000 m^2, but Table 19.20 of Chapter 19 of the ESs suggests the project is orders of magnitude greater than IAQM's large threshold. It is considered that construction dust nuisance impacts can be directly mitigated. However, these will need to go beyond standard mitigation measures within the guidance. This is a particularly important given the high coastal winds and concerns regarding wind whipping, identified from previous consultations within paragraph 127 of Chapter 19 of the ESs.

7.23. The Applicants have assessed the construction dust nuisance impact, but there is conflicting information on how soil stockpiles will be dealt with. The Code of Construction Practice (CoCP) establishes the construction management practices adopted to minimise impacts upon air quality concentrations and dust nuisance. Within the Outline CoCP it is mentioned that soil stockpiles will be covered, seeded or fenced. Paragraph 127 of Chapter 19 of the ESs only references seeding stockpiles. Seeding in isolation is not sufficient. These stockpiles should ideally be turfed, fenced or covered. If seeding is required, stockpiles should be fenced to prevent wind whipping during germination of seed. It would be preferable to have precise

mitigation measures within the DCOs. The Councils are engaging with the Applicants to seek updates to the Outline CoCP to clarify matters but recognise that Requirement 22 requires the CoCP to be agreed with the relevant planning authority. It is therefore considered that these dust nuisance impacts can be directly mitigated post-consent through consultation with the Councils.

7.24. It is mentioned within the Outline CoCP that hard surface haul routes will be implemented. However, it is unclear exactly where the haul routes will be positioned. Taking this on a worst-case basis and assuming impacts could occur from the onshore works boundary, onshore earthwork sections pass through Leiston-Aldeburgh SSSI and are close to residential areas. Given the level of detail submitted so far there are concerns regarding dust nuisance impacts, however these can also be mitigated with the Councils post-consent through engagement in relation to the CoCP.

7.25. The review, management and reporting duties of the construction dust nuisance will place additional strains upon the Councils' Environmental Protection team. In section 19.3.5, the Applicants have mentioned they will agree any monitoring locations with the local planning authority (LPA) post-consent. This is satisfactory on the basis that enough funds are set aside to finance monitoring equipment and staff cost for the LPA.

Assessment of Non-Road Mobile Machinery (NRMM) Emissions

7.26. There is limited guidance on how to assess NRMM emissions, with LAQM.TG (16) being the main reference document. The inclusion of NRMM within air quality assessment is not prescriptive.

7.27. The guidance states '*in the vast majority of cases they will not need to be quantitatively assessed*'. These schemes could require considerably more NRMM than most construction projects and potential impacts should have been quantitatively assessed. Instead, monitoring and action plans for key sensitive receptors to establish if NRMM poses any exceedance risks could be agreed with the Councils within the CoCP. Specific areas of concern for ecological receptors are the Leiston-Aldeburgh SSSI and for human health, residential areas in the following:

- Thorpeness;
- Aldringham; and
- Knodishall Common.

7.28. The Applicants sought to demonstrate that works involving NRMM should be screened out of a detailed air quality assessment for ecological receptors. Emissions from plant and equipment at this site can be effectively mitigated by ensuring that

NRMM conforms with Stage V controls (i.e. as set out in Annex II of regulation (EU) 2016/1628, as referred to in the Outline CoCP), and ensuring that any HGVs used at the site conform with Euro VI emission limits. However, in view of the presence of this activity within the protected area, it is requested that the lack of significant impacts on the SPA/SSSI should be demonstrated by the Applicants (e.g. through the means of a screening model calculation). This should include a sensitivity test to investigate the potential effects of higher background levels on the study conclusions in relation to acid deposition, particularly as it has not been established that trends in vehicle emissions in the local area will match national projections.

Assessment of Significance

7.29. The Applicants have assessed the schemes' impacts against the following guidance:

- NPS EN-1 (Department of Energy and Climate Change (DECC) 2011a); and
- IAQM, Land-use Planning and Development Control: Planning for air quality.

7.30. The guidance for NPS EN-1 and IAQM has been fully incorporated within this assessment. It should be noted that conclusions of significance are not prescriptive within IAQM's guidance, instead they are based upon professional judgement.

7.31. Concentration of PM_{10} and $PM_{2.5}$ from vehicular emissions are substantially below the air quality objectives. Consequently, these discussions will focus around NO_2.

7.32. Table 19.24 within Chapter 19 of the ESs estimates concentrations of 29.08 µg/m^3 with only one project's contributions to NO_2 concentrations. These concentrations seem very low, especially when compared to concentrations within the Preliminary Environmental Information Report (PEIR) Chapter 19, Table 19.24. Within this report estimated concentrations at R1 are 39.00 µg/m3 with only EA1N contributions, 9.92 µg/m3 more than reported in the final ES. The Applicants should explain why there is such a large difference between concentrations reported in the earlier PEIR report and the final air quality chapter.

7.33. The Applicants show in EA1N/EA2 Chapter 19 of the ESs that the construction traffic will not cause any exceedance of air quality objectives, assuming that UK government projections on vehicle fleet mixes in 2023 are realised. The emission sensitivity test in EA1N/EA2 Appendix 19.4 shows that if there are no improvements upon the 2018 vehicle fleet, that the Stratford St Andrew AQMA could potentially still be in exceedance when the construction programme is under way. As a result, the impact from EA1N/EA2, constructed both in isolation and simultaneously could potentially result in a 'moderate adverse' impact upon NO_2 concentrations. As the estimated decrease in NO_2 concentrations within the Applicants' modelling is more optimistic

than the observed trend, the Councils consider that there are reasonable grounds for uncertainty regarding the forecasted air quality improvements in Table 19.24 of Chapter 19. In summary, if air quality improvement forecasts for 2023 are not realised the emission sensitivity chapters show a risk that EA1N and EA2's construction vehicles could cause a 'moderate adverse' impact.

7.34. Should EDF Energy's Sizewell C DCO application be successful, cumulative construction traffic impacts from EA1N/EA2 and Sizewell C pose a risk to achieving the NO_2 annual mean air quality objective within the Stratford St Andrew AQMA. This risk has not been addressed by the Applicants but could be managed through mitigation measures. The Councils have suggested the monitoring of NO_2 concentrations within the AQMA and the creation of a monitoring group which would review concentrations and manage construction traffic in an attempt to prevent air quality objective exceedances. The group would involve collaboration between the Councils, Applicants and Nuclear New Builds (NNB (subsidiary of EDF Energy)). This construction collaboration group should be secured through a requirement.

7.35. One reason for the relatively high levels of air pollution in the AQMA is that traffic has a greater engine load when accelerating in the southbound lane, which results in higher emissions. The provision of a vehicle activated sign in this location would help achieve low emission driving behaviour in the AQMA, therefore if found to be required by the proposed monitoring group, funding should be secured to finance this measure.

7.36. Risks associated with schemes operating concurrently, could be exacerbated by any delays to the two-village bypass which is key in bypassing vehicles from the AQMA for Sizewell C. The Applicants in their response to the Councils Relevant Representations agree that monitoring air quality is important. It is noted within the Applicants' clarification note that they will quantitatively assess impacts with Sizewell C. The Councils' position on cumulative impacts will be reviewed once further information is provided.

7.37. In view of this risk of exceedance due to EA1N and EA2 alone identified in the emission sensitivity test, and the potential in-combination effects with Sizewell C, the Councils request that funding should be provided by Applicants to finance operation of a continuous analyser within Stratford St Andrew and any necessary mitigation. This will identify early warnings of exceedance and inform construction traffic management with the Applicants/EDF to reduce emissions within the Stratford St Andrew AQMA

7.38. The Applicants suggest that EA1N and EA2's contribution to NO_x from construction vehicles will be reduced with the requirement that all vehicles will be Euro VI standard compliant. Impacts from EA1N or EA2 in isolation could be imperceptible if construction vehicles are limited to Euro VI vehicles, although there are also risks to air quality even with complete use of Euro VI within the construction fleet. There are concerns that these Euro standard ambitions will not be realised. A study into Euro standards found that only 47% of HGVs achieved the target Euro standard (Impacts Assessment Unit, Oxford Brookes University, 2019). The implication of this study is that air quality impacts could be greater than demonstrated by the Applicants, which increases uncertainty surrounding air quality impacts and subsequently risk. Consequently, Euro VI standard for vehicles should be secured through the CoCP with sufficient contractual obligations put in place by the Applicants to enforce this standard across all tiers of contractors.

Summary

7.39. The ESs do not consider the effect of re-routing existing traffic. Further consideration should be given to re-routing through Leiston and Saxmundham.

7.40. Shipping emissions have been screened out from the air quality assessment which is considered acceptable. Although there are concerns regarding emissions from vehicles accessing the port. Instead, Chapter 26 of the ESs (Traffic and Transport) referenced separate planning applications or permitted development for port activity, consequently more detailed assessment of the impacts of ports' surface access upon air quality should be secured through a requirement.

7.41. Construction dust nuisance impacts have been assessed in accordance with best practice guidance. However, this scheme has much greater nuisance potential than the schemes this guidance is intended for. Additional information should be presented within the mitigation section for a scheme of this scale. However, on the basis that funding is set aside for equipment and time to monitor construction and that the CoCP is agreed with ESC post-consent, the Councils are satisfied that these impacts can be mitigated.

7.42. Relevant local policy has been considered within the assessment. With reference SCLP10.3, the assessment shows that there will be 'negligible' impacts if the projected improvements in the overall vehicle fleet are realised. Conversely the emission sensitivity test shows that without an improvement upon 2018's fleet there is a risk that EA1N and EA2's NO2 contribution could be significant. Should EDF Energy's Sizewell C DCO application be successful, cumulative construction traffic impacts from EA1N/EA2 and Sizewell C pose a risk to achieving the NO_2 annual mean air

quality objective within the Stratford St Andrew AQMA. These risks can be managed through active monitoring of NO_2 concentrations within the AQMA and management of construction traffic. A requirement is recommended to ensure that an action group proactively manages construction traffic to minimise exceedance risks. This would need to be secured through the CoCP and Air Quality Management Plan to ensure a monitoring group proactively manages construction traffic to minimise exceedance risks. This should include funding for monitoring of nitrogen dioxide in the Stratford St Andrew AQMA, and if found to be required, funding for a vehicle activated sign to encourage low emission driving behaviour in the AQMA.

7.43. A commitment to the effective enforcement of Euro VI standards for construction vehicles is required within the Outline CoCP.

Compliance with Local Policy

7.44. The assessment has mostly been undertaken in accordance with best practice guidance. Relevant local policies have been considered within the assessment. With reference to Policy SCLP10.3, the Applicants' assessment shows that there is a risk of adverse impacts to residential amenity and environmental quality. The Councils have proposed measures to ensure that the projects alone do not give rise to significant impacts in air quality through air quality monitoring and setting up a group to manage impacts from construction traffic. Additional information to demonstrate that adverse impacts due to the projects alone and in combination with other construction projects have been completely mitigated and managed is required. Until the Councils have received and reviewed that detail, the proposals are not considered to be compliant with local policy.

Further Work or Mitigation Required

7.45. The Councils are of the view that that the following further work is required to allow full assessment of the impacts of the projects:

- Justification for the decision to screen out re-routed traffic due to the road improvements at the A12/A1094 junction, A1094/B1069 junction and Marlesford Bridge from the air quality assessment.
- Screening model calculation in relation to NRMM and the impact of emissions on ecological receptors. This should include a sensitivity test to investigate the potential effects of higher background levels on the study conclusions in relation to acid deposition.
- Assessment of emissions from re-routed traffic, particular areas of concern for effects are Leiston, Saxmundham and Yoxford.

- Assessment of the effects of emissions from haul road construction traffic on ecological receptors and human health.
- Quantitative assessment of the cumulative impacts of EA1N and EA2 with Sizewell C.

7.46. The Councils are of the view that the following mitigation is required in order to adequately address the potential air quality impacts caused by the projects:

- Submission of Outline Port Travel Plan detailing commitment that this will include an air quality assessment of port related traffic.
- Commitment to funding monitoring and mitigation measures, if required, in the Stratford St Andrew AQMA, including consideration of a construction action group.
- Update the Outline CoCP in relation to measures to address dust nuisance and provide a commitment to and compliance monitoring of Euro VI Standards for construction vehicles and Stage V for NRMM.

8. External Lighting

Lead Authority ESC

East Suffolk Local Plan Policies

8.1. Policy SCLP10.3: Environmental Quality, clearly states the expectation that development proposals should protect the quality of the environment and minimise and, where possible, reduce all forms of pollution and contamination including light pollution.

8.2. Policy SCLP10.4: Landscape Character, states that development should protect and enhance the tranquillity and dark skies across the District. Exterior lighting in development should be appropriate and sensitive to protecting the intrinsic darkness of rural and tranquil estuary, heathland and river valley landscape character.

Key Local Issues

8.3. The onshore cable corridor is routed through rural areas which currently benefit from dark skies with little intrusion from light sources. Any lighting during construction and at the substations during both construction and operation has the potential to cause light pollution and appear intrusive in this rural dark locality.

Adequacy of Applications/DCOs

8.4. Within Chapter 6 of the ESs, it is stated that no 24-hour lighting is anticipated along the length of the cable route except that associated with any Horizontal Directional Drilling (HDD) operations and security lighting at the Construction Consolidation Sites (CCS). Requirement 22 of the DCOs secures the CoCP. The Outline CoCP stipulates that the final document must include an artificial light emissions plan. The Outline CoCP states that the management plan will detail appropriate management and mitigation measures. The documents detail how the lighting will be carefully designed to avoid or minimise impact on both human and ecological receptors.

8.5. Chapter 6 identifies a need for security lighting around the perimeter fence of the substation compounds in addition to car park lighting. This lighting is identified to potentially be motion sensitive. The submissions make it clear that no additional lighting will be proposed along Grove Road or along the access roads within the substations location. Requirement 25 of the DCO controls artificial lighting during the operational phase of the development by securing the submission of an artificial light

emissions management plan in relation to the project substations or National Grid substation prior to their operation.

Compliance with Local Policy

8.6. Subject to the artificial lighting schemes for both the construction phase and operational phase of the development being detailed appropriately, the proposals would be compliant with local policy. It will however be crucial that the lighting schemes recognise the rural nature of the site and the existing limited intrusion from external lighting.

9. Ecology and Ornithology

Lead Authority ESC

East Suffolk Local Plan Policies

9.1. Policy SCLP10.1: Biodiversity and Geodiversity, states that development will be supported where it can be demonstrated that it maintains, restores, or enhances the existing green infrastructure network and positively contributes towards biodiversity and/or geodiversity. Proposals which result in direct or indirect adverse impact alone or in combination with other projects, on locally designated sites, will not be supported unless it can be demonstrated that the benefits of the proposal outweigh the biodiversity loss. The policy also makes it clear that new development should provide environmental net gains in terms of both green infrastructure and biodiversity. Development with the potential to affect a European designated site must be supported by sufficient information to enable a Habitat Regulations Assessment (HRA) to be undertaken.

Other Relevant Local Policy

9.2. The Suffolk Coast and Heaths AONB Management Plan 2018-2023 sets out the intention to conserve and enhance the landscape including biodiversity, noting the specific importance of habitat connectivity in responding to climate change.

Key Local Issues

9.3. The proposed development has the potential to result in a range of adverse impacts on a number of ecological receptors, including sites of international nature conservation importance; sites of national conservation importance; protected species and habitats of UK conservation priority (species and habitats identified as UK Priority under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)). Designated sites which the development interacts with and which are of particular importance are the Sandlings SPA (site of international importance); Leiston-Aldeburgh SSSI (site of national importance) and Grove Wood County Wildlife Site (CWS) (site of at least county importance). Several UK Priority habitats will be affected, including hedgerows, lowland mixed deciduous woodland and rivers. A number of protected and/or UK Priority species are also likely to be affected, including bats (protected species; some UK Priority species; all Suffolk Priority species); great crested newts (protected species; UK Priority species); breeding birds (protected species; some UK Priority species); reptiles (protected species; UK Priority species) and badgers (protected species).

9.4. The following construction elements of the developments have the potential to impact on the ecological receptors identified above:

- Landfall – damage to, and disturbance of, Leiston-Aldeburgh SSSI as a result of HDD;
- Cable route – disturbance of Sandlings SPA/Leiston-Aldeburgh SSSI due to construction proximity;
- Cable route – damage to, and disturbance of, Sandlings SPA/Leiston-Aldeburgh SSSI during construction (where cable route crosses designated sites);
- Cable route and substations – loss of hedgerows and trees during construction. Impacts on bat roosting; foraging and commuting habitats; great crested newt habitats; reptile habitats; breeding bird habitats and badger habitats (including setts).
- Cable route and substations – loss of woodland and trees during construction. Impacts on bat roosting; foraging and commuting habitats; great crested newt habitats; reptile habitats; breeding bird habitats and badger habitats (including setts).
- Cable route and highways improvements – damage to, and disturbance of, watercourse during construction. Impacts on bat foraging and commuting habitats; great crested newt habitats; reptile habitats; breeding bird habitats; badger habitats; otter and water vole habitats and eels.

9.5. The following operational elements of the developments have the potential to impact on the ecological receptors identified above:

- Substation noise – disturbance of protected and/or UK Priority species (particularly bats) due to operational noise of the proposed substations

9.6. In all developments the Councils seek the delivery of Ecological Enhancements and are disappointed to see that little is proposed as part of these developments.

Adequacy of Applications/DCOs

9.7. Subject to the comments above, whilst it is considered that the ES Chapters 22 (Onshore Ecology) and 23 (Onshore Ornithology) adequately assess and provide mitigation/compensation measures for County Wildlife Sites; watercourses; great crested newts; reptiles; non-SPA/SSSI breeding birds and badgers, the following ecological receptors are either not considered to have been fully assessed or have insufficient mitigation/compensation measures identified within the ES and secured

within the draft DCOs. The Councils note the response provided by the Applicants to the Relevant Representations, however we remain of the opinion that the matters set out below are not fully considered in the submitted documents.

Cable route (construction) crossing the Sandlings SPA/Leiston-Aldeburgh SSSI

9.8. The ESs (Chapters 22 and 23) identify two potential techniques for use where the cable route crosses the Sandlings SPA and Leiston-Aldeburgh SSSI, to the south of Sizewell Gap. Either open cut trenching or HDD are proposed for use. Whilst it appears that open cut trenching is the Applicants' preferred method (ES Chapter 22, Table 22.4), neither technique is definitively selected. Whilst both have the potential for adverse impacts on the designated sites, based on the information available the Councils would at present prefer the open cut trenching method as it is considered that on balance this will result in the least adverse ecological impact due to the reduced working time (decreasing likely disturbance impacts), minimised working width and potential to reinstate any habitats impacted upon. Open cut would also appear likely to result in less disturbance impacts in the surrounding area compared with HDD and is likely to have non-ecological benefits as well. This is subject to an acceptable method statement for this part of the construction being agreed by Natural England, the Councils, and other relevant stakeholders. The Councils have engaged with the Applicants in relation to a draft SPA Crossing Method Statement.

Cable route and substations (construction) impacts on bats

9.9. The ESs Chapter 22 identifies that the loss of habitat suitable for bat foraging and commuting (primarily hedgerows and areas of woodland) would result in a "moderate adverse" impact on this receptor in the "short term" after mitigation measures have been applied (22.6.1.9.3). The Councils have significant concerns about the magnitude of this residual impact.

9.10. The Councils are also concerned that the duration of the impact has been under assessed. If the proposed replacement planting does not proceed as planned or does not develop as quickly as anticipated (see our comments in Section 15 on landscaping for further information on our concerns about this) a minimum of a "medium term" duration of impact will occur rather than the "short term" identified in the ESs. This could then lead to greater impacts on local bat populations as the length of the works and lack of mitigation/compensation will have potentially resulted in less food availability (e.g. by severance of connections to feeding areas) which in turn will result in poorer breeding success and population declines.

9.11. There is an assumption in the Applicants' ESs that destroyed, damaged or disturbed hedgerows will be ecologically functioning features again in a period of three to seven years from the start of construction. This is considered to be optimistic and is dependent on good growing conditions in all years. Given the varying "quality" of growing seasons experienced in Suffolk in recent years a longer period to achieve ecological functionality may well be required.

9.12. Survey work undertaken by the Applicants has identified the apparent presence of lesser horseshoe bat (*Rhinolophus hipposideros*) (a European Protected Species listed on Annex II and Annex IV of the Habitats Directive) at a location south of Knodishall, east of Snape Road (B1069) and west of Billeaford Hall. This species has never been recorded in East Suffolk, with the only known record being from the west of the County, with its UK range being largely restricted to the south-west. Given the recording of this species (alongside a suite of other bat species including barbastelle (*Barbastella barbastellus*) which is also listed on Annex II and Annex IV of the Habitats Directive) it is essential that adequate mitigation and compensation measures are delivered.

9.13. Finally, there is only limited assessment of the impacts of this development on bats in-combination with the adjacent Sizewell C nuclear power station proposal. The Council has significant concerns about the harm to bat populations which will arise during the construction of Sizewell C. Impacts arising from the construction of EA1N and EA2 occurring at the same time pose a significant risk of extinctions of local bat populations, particularly if one project displaces bats (particularly foraging and commuting activities) into the area occupied by the other project. It is therefore essential that adequate mitigation is implemented for EA1N and EA2 to ensure that any cumulative impacts are not exacerbated.

9.14. During SoCG discussions, the Applicants have committed to use hurdles or similar links during construction and early implementation of replacement planting to maintain the commuting routes bats use for navigating through and across the site. The Outline Landscape and Ecological Management Strategy (OLEMS) documents need to be updated to reflect this new commitment. The use of hurdles or similar links is welcomed, but the Councils' concerns regarding planting growth rates remain, as this will directly affect the speed at which the functionality for commuting and particularly foraging bats will return. The Applicants have advised the Councils they will consider possible measures which could be utilised temporarily during construction to help to maintain foraging routes for bats. The Councils are continuing to engage with the Applicants on these matters.

Cable route and substations (construction) impacts on hedgerows

9.15. In addition to the above comments on bats, the ESs conclude that impacts on hedgerows (a UK Priority habitat) is "Minor Adverse" subject to the proposed mitigation measures being implemented (22.6.1.5.2). As set out in the Councils comments on landscape, we have concerns about the likely speed and success of the planting mitigation proposed. There is therefore the potential that the identified effect could be present over a greater length of time and therefore be greater than that predicted.

9.16. We also note that the ES chapters only provides for hedgerow mitigation plans to be agreed with Natural England; however, we welcome the commitment in the draft DCOs that such plans will also be agreed with ESC.

Cable route and substations (construction) impacts on woodland and trees

9.17. The ESs conclude that with the proposed mitigation impacts on woodland and trees will be reduced to a temporary residual "Minor Adverse" (22.6.1.4.3). However, as set out in the Councils' comments in Section 15 on landscape, we have concerns about the growth rates proposed. If the proposed growth rates are not achieved then the ecological functionality of the replacement planting will take longer to achieve and therefore the identified residual impact will be in effect for longer, thus potentially increasing it from "Minor Adverse".

9.18. Also, as with hedgerows, we note that the ES chapters only provides that woodland and tree mitigation plans will be agreed with Natural England, however we welcome the commitment in the draft DCOs that such plans will also be agreed with ESC. Further, it is proposed that only "...at least an equivalent area of lost woodland is replanted…" (22.6.1.4 190). Whilst this will provide compensation at a spatial scale, it will not necessarily deliver an equivalent quality of habitat, nor will it allow for the decline in habitat quality which will be experienced whilst new planting matures.

9.19. Notwithstanding the Councils views regarding growth rates set out in the Section 15, the Councils have requested that the Applicants utilise adaptive planting maintenance with monitoring against agreed objectives with the option to suspend/extend the maintenance periods in cases where the planting does not establish satisfactorily. This is currently being discussed between the Councils and Applicants. This adoption of this adaptive planting maintenance would provide the Councils with greater confidence that if the growth rates are not achieved, there will be measures in place to address this.

9.20. The Councils seek a commitment, secured through the DCOs, to adaptive woodland maintenance and aftercare, which would provide the ability to pause the maintenance period for the woodland planting if the required standard of mitigation is not achieved. The draft DCOs through Requirement 15 also only commits to replacing failed woodland planting for a period of five years, this is considered insufficient. The Councils would like to see the replacement woodland benefiting from a ten-year period in line with the woodland planting proposed at the substations site detailed in the OLEMS.

9.21. It is also not clear how the permanence and long-term management of the woodland will be secured beyond the maintenance period secured through the draft DCOs and Requirement 15. The Councils would like to Applicants to commit to providing a long-term management plan for the woodland, this would need to be secured through an update to the OLEMS.

Air quality (construction)

9.22. As set out in our comments in the Air Quality section of this LIR, the assessment of NOx and nutrient nitrogen deposition upon habitats from construction vehicles does not include a satisfactory assessment of haul road emissions or NRMM. The Councils have requested that best available technology (BAT) Stage V are adopted. In addition, even with BAT, a quantitative assessment should be provided to demonstrate insignificant impacts. The Councils will review their position on this point after receiving further information from the Applicants.

9.23. Additionally, habitats within nearby designated sites are potentially vulnerable to acid deposition. Whilst an assessment of acid deposition upon habitats from construction vehicles has been provided, further information has been requested. A sensitivity test of NOx and acid deposition should be provided to investigate the potential effects of higher background levels on the study conclusions in relation to acid deposition, particularly as it has not been established that trends in vehicle emissions in the local area will match national projections. Further information is therefore required to demonstrate that there will be no adverse impacts on habitats within designated sites.

Substation noise (operation)

9.24. The ES chapter concludes that operational noise will at worst result in a “Minor Adverse” ecological impact (22.6.2.2 251). However, this appears to be based on assessment undertaken in relation to human noise receptors. Whilst we have a number of concerns in relation to the assessment of impacts on human noise

receptors (please see comments within Section 19 Noise and Vibrations), using the results of assessment for impacts on human receptors is not directly comparable as high frequency noise is not directly assessed. This has significant ramifications for a range of ecological receptors, particularly bats (protected species; some UK Priority Species) which rely on echolocation (using high frequencies) for foraging, commuting and socialising.

9.25. The Councils are discussing this issue with the Applicants through our SoCG meetings.

Whole project Ecological Enhancement

9.26. The Councils are disappointed that little in the way of ecological enhancement is proposed as part of the development. Policy SCLP10.1 seeks to ensure new development secures ecological enhancements as part of its design and implementation and should provide ecological enhancement that is proportionate to the scale and nature of the proposal.

9.27. During SoCG discussions, the Applicants have stated that the landscape mitigation presented in the OLEMS document will deliver ecological enhancements. However, this has not been formally identified or quantified in the submission documents as ecological enhancement.

Pre-commencement surveys

9.28. The OLEMS recognises the need for further pre-commencement surveys, however it is not considered that the need for these is adequately reflected in the wording of the draft DCOs. Requirement 21 of the draft DCOs states that the Ecological Management Plan (EMP) should reflect the survey results in the ES rather than up to date survey results based on the pre-construction surveys. The Councils are engaging with the Applicants on this matter.

Cumulative Impacts

9.29. The Councils agree that, in relation to cumulative impact, Scenario 2 is likely to result in greatest ecological harm (ES Volume 3, Appendix 22.2).

Compliance with Local Policy

9.30. A number of ecological receptors have been identified above which the Councils consider have either not been fully assessed or where insufficient mitigation is proposed to address the impacts, contrary to the requirements of local policy. The

lack of commitment to ecological enhancements also conflicts with local policy. As indicated above, the Councils are engaging with the Applicants on the concerns identified and have set out below further work necessary.

Further Work or Mitigation Required

9.31. In summary, the Councils are of the view that the following work is required before the effects of the projects on ecology can be fully understood:

- Screening model calculation in relation to NRMM and the impact of emissions on ecological receptors. This should include a sensitivity test to investigate the potential effects of higher background levels on the study conclusions in relation to acid deposition.
- Assessment of the effects of emissions from haul road construction traffic on ecological receptors.
- Assessment of cumulative effects of the construction works of EA1N and EA2 with Sizewell C on bats.
- Greater commitment to and assessment of the ecological enhancements provided by the projects.

9.32. The Councils would like to see the following documents updated:

- Requirement 15 of the draft DCOs to commit to a ten-year replacement planting period for replacement woodland rather than the five-year period currently proposed and provide for the maintenance period for the woodland and substation mitigation planting to the suspended or extended if the agreed objectives set out as part of the adaptive planting maintenance are not met.
- Requirement 21 of the draft DCOs should be updated to remove the reference to the survey results from the ES and updated to identify that the EMP will be based on up-to-date ecological survey work through the use of pre-construction surveys.
- OLEMS to reflect the following revisions:
    - commitment to provide hurdles or similar links during construction to help maintain the commuting routes bats use for navigating through and across the site.
    - Commitment to provide measures to help maintain foraging areas bats use during construction.
    - Commitment to a ten-year maintenance period for the replacement woodland and provision of a management plan detailing how the woodland will be managed for the life of the infrastructure.
    - Commitment to adaptive planting maintenance and aftercare for the replacement woodland and substation mitigation planting.

10. Coastal Change

Lead Authority ESC

ESC Local Plan Policies

10.1. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects, seeks to ensure that appropriate erosion defences, including the effects of climate change are incorporated into the project to protect the site during the construction, operational and decommissioning stages.

10.2. Policy SCLP9.3: Coastal Change Management Areas, seeks to highlight areas where the rates of shoreline change are significant over the next 100 years. Although there is a presumption against some forms of development, essential infrastructure will be permitted where no other sites outside the area are feasible and there is a management plan in place to manage the impact of coastal change including their future removal and replacement. The point at which the offshore cables come ashore lies within a Coastal Change Management Area.

Other Relevant Local Policy

10.3. The landfall zone is within Policy Development Zone 4 (Dunwich to Thorpeness) of the SMP 7. It spans two Management Units (MU) MIN 13.2 and MIN13.3. The policy statements for each are shown in the table below.

SMP MU	**1st epoch until 2025**	**2nd epoch 2025-2055**	**3rd epoch 2055-2105**
MIN 13.2	No Active Intervention	No Active Intervention	No Active Intervention
MIN 13.3	Managed Realignment with the current alignment maintained at existing defences.	Managed Realignment with review of maintaining the current alignment at existing defences.	Managed Realignment

10.4. In MU MIN 13.3 the intent to `manage realignment' applies only to the currently defended part of the frontage below property in North End Avenue that is outside the landfall zone. There is no intention to actively manage the part of MU MIN 13.3 north of the existing defences that is within the landfall zone.

10.5. The policy headlines above provide brief summaries of the underlying Intent for Management for sections of coastline which are described in detail in the SMP documents. Over this locality the underlying policy objective is to manage the coast

in a fashion that maintains a process of long-term natural change and for the built environment to adapt to that change. This Intent for Management is a key guiding principle that is reflected in the Council's issues and objectives that follow.

Key local Issues

Coralline Crag Outcrop

10.6. It is important to ensure that the permanent installation and temporary works required to both install and maintain the cable landing, do not cause a significant negative impact on coastal processes. The main point of concern is the potential for significant damage to be caused to the exposed coralline crag outcrop located in the nearshore area between Thorpeness and Sizewell that has an important role in stabilising the coastline over the Thorpeness to Dunwich frontage.

Exposure of Structures

10.7. The proposed structures (ducts, cables and buildings) required to be installed at or close to the shoreline (defined here as cliff top to Mean Low Water Mark) must be designed with a full understanding of the consequences of coastal change. It is important to ensure the proposed structures are not exposed by coastal change within their predicted service life, with an allowance for risk if the service life is extended.

Destabilisation of Cliff

10.8. It is important that the cable and duct installation methods minimise disturbance to the shoreline. The objective is to encourage the use of HDD as opposed to open cut trenching. A further concern is the potential for HDD to cause vibration that destabilises the cliff face that it passes under. The local community has also raised questions and concerns regarding the potential impacts of the cable landing site linked to its location close to the northern extent of Thorpeness village. The Thorpeness frontage has suffered significant coastal erosion pressure over recent years. The community are similarly concerned regarding the drilling under the currently near-vertical and unstable Thorpeness cliff will cause vibration leading to increased cliff erosion and the fact the cable landing infrastructure in this location will be at risk from coastal erosion.

Cumulative Impacts

10.9. It must be ensured that the site-specific and cumulative effect of the offshore windfarm array on coastal processes does not create a significant negative impact at the shoreline.

Adequacy of Applications/DCOs

Coralline Crag

10.10. The Councils' concerns in relation to the projects' interaction with the coralline crag outcrop were addressed by the Applicants in a report that assessed several potential cable landing locations. The report concluded that the landing site should be at the southern extent of the coastal frontage within which it is allowed, which will avoid, or minimise to an acceptably low level, any negative impact on the crag outcrop notably from open cut trenching.

10.11. This has been agreed in principle by the Applicants however the final cable HDD line, break out location and transition bay location is subject to the outcome of a further site investigation of the plan extent of, and thickness of sand coverage over, the southern coralline crag outcrop. The final plan position of the HDD line and breakout point and transition bay locations are to be agreed with ESC based upon data from further site investigation. The Applicants have provided the Councils with a draft Outline Landfall Construction Method Statement (LCMS). This confirms the LCMS secured by Requirement 13 of the draft DCOs will provide both outstanding design and construction method details in relation to the HDD drill line, profiles entry and break out locations. The Outline LCMS should be certified within the DCOs and Requirement 13 should be updated to commit to the final LCMS being in accordance with the Outline LCMS. Subject to the modifications to the draft DCOs, the Councils consider there is an appropriate mechanism to secure the outstanding details post consent and address the Councils concerns.

Exposure and Decommissioning of Structures

10.12. The Councils' concerns regarding the potential exposure of the proposed structures installed close to the shoreline were partly addressed by the Applicants in a report that assessed potential future coastal change scenarios. This has been used to identify a sustainable location for the transition bay building and will be used to design the duct installation profile. An outstanding task is for the Applicants to present a final design profile for the cable duct and transition bay installation that demonstrates compliance with this objective.

10.13. The final design profile for the cable duct is to be agreed with ESC to demonstrate that when installed, the infrastructure is not at risk of exposure from coastal change within the predicted service life. This must take account of tolerances in HDD techniques. This will follow on from action for further site investigation described in the section on the coralline crag above. The submission of the LCMS secured under Requirement 13provides an acceptable mechanism to secure this detail post consent.

10.14. A further recommendation is that the proposed structures (excluding ducts) are removed at the end of the landfall site design life (25 years following completion of construction), and that any proposed extension of the design life beyond 25 years is subject to a new erosion risk assessment and evidence of no significant negative impact of such an extension on coastal processes. To achieve this the Councils, request an amendment to Requirement 37 so that it not only includes work number 8 but also the elements of work no.6 which are up to the point of the mean low water mark. The combination of Requirements 30 and amended Requirement 37 will provide the Councils with the security that the landfall infrastructure can be removed at the point of decommissioning.

Destabilisation of Cliff

10.15. HDD has been agreed by Applicants as the preferred method of duct installation at the landfall. Full details of the Applicants' approach to management of vibration risk to the cliff stability is not yet agreed. The HDD shall be designed and managed to ensure the risk to cliff stability from vibration, or other cause linked to HDD, is as low as reasonably practical. The Applicants have detailed in their draft Outline CLMS that details of vibration monitoring for the HDD works will be included in the CLMS. The Councils are satisfied with this approach.

Cumulative Impacts

10.16. The Councils are satisfied the site-specific and cumulative effect of the offshore windfarm array on coastal processes has been adequately addressed by SPR studies that demonstrate the worst-case potential change scenario is unlikely to produce a significant negative impact.

10.17. The Councils believe that the risk of a cumulative impact will increase as the number and extent of windfarms in the North Sea increases and recommends the assumption of no significant negative impact be kept under review as part of a post-installation strategic windfarm impact monitoring programme.

Summary

10.18. The Applicants' response to the Councils Relevant Representation states that sufficient information has been provided to demonstrate that the proposed works would not cause local cliff destabilisation or damage the sub-sea crag outcrop. Although the Councils do not agree that at present sufficient information has been supplied to demonstrate this, we are satisfied that there is a process in place through Requirement 13 and the CLMS, supported by the Outline CLMS, to ensure adequate information can be supplied to ensure this is the case.

10.19. When measured against the overarching policy objectives for Coastal Change management the potential impacts of the current development are negative to neutral in that they may alter natural change. There are no positive impacts. The scale and significance of the potential negative impacts varies from low to negligible when put into context of the potential for variability in natural environmental change.

Further Amendments Required

10.20. The Councils recommend that the following amendment is required to the draft DCOs:

- Inclusion of the Outline LCMS in the list of certified documents.
- Update the wording of Requirement 13 to reflect that the LCMS should be in accordance with the Outline LCMS.
- Requirement 37 to be updated to include infrastructure associated with work no.6 up to the point of the mean low water mark.

11. Flood Risk

Lead Authority SCC

National Policy Statements

11.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, and the onshore elements of offshore windfarms in EN-5 (see para 2.6.41 of EN-3), flood risk is addressed as a generic impact in section 5.7 of EN-1 (see paras 1.3.2, 2.4.1, and 2.4.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

East Suffolk Local Plan Policies

11.2. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects, seeks to ensure that appropriate flood risk measures which include the effects of climate change are incorporated into projects to protect the site during the construction, operational and decommissioning stages.

11.3. Policy SCLP9.5: Flood Risk, states that proposals for new development will not be permitted in areas at high risk from flooding, i.e. Flood Zones 2 and 3, unless the applicant has satisfied the safety requirements in the Flood Risk National Planning Policy Guidance (NPPG). The policy emphasises that developments should exhibit the three main principles of flood risk, in that, they should be safe, resilient and should not increase flood risk elsewhere.

11.4. Policy SCLP9.6: Sustainable Drainage Systems (SuDS), requires this development to utilise sustainable drainage systems which should be integrated into the landscaping scheme, contribute to the design quality of the scheme and deliver sufficient and appropriate water quality and aquatic biodiversity improvements, wherever possible. The policy states runoff rates should be restricted to greenfield runoff rates wherever possible.

Other Relevant Local Policy

11.5. The Suffolk Flood Risk Management Strategy (SFRMS) sets out guiding principles on tackling flooding and integrates the issue of flooding from surface water runoff and from ordinary watercourses. One of the key objectives is to prevent an increase in flooding as a result of new development by ensuring SuDS are properly considered and incorporated into works. The document notes the importance of aligning with the content of SMPs and River Basin Management Plans to ensure a holistic approach

is taken to flood and coastal management and water quality. Appendix A of the Strategy is a local SuDS guide.

11.6. SFRMS Objective 3 states that planning decisions should be *"based on up-to-date information about all flood risks".*

Key Local Issues

Surface water flooding in Friston

11.7. A key issue for the Councils and communities relates to the cable corridor, substations site and implications for flood risk in the locality. Friston village has been subject to surface water flooding on several occasions, most recently on 6 October 2019 when water internally flooded several properties, with one property being internally flooded on a second occasion, 21 October 2019. An up-to-date Flood Incident Map for Friston is provided in Plan A which can be found at the end of this section of the report.

11.8. SCC as Lead Local Flood Authority (LLFA) have completed two Section 19 Investigations in Friston under the Flood & Water Management Act 2010;

- Multiple properties flooded internally on 6 October 2019.
- Single property flooded on multiple occasions.

11.9. Rainfall data from nearby Thorpeness identified the event on 6 October 2019 as a 1 in 40-year rainfall event. This return figure may be too high due to a lack of historic rainfall records in the area.

11.10. Evidence suggests recent surface water flooding originated from farmland to the west, east and north east of Friston, an area through which the cable corridor is proposed to pass. The surface water flooding was heavily laden with silt from these fields. In this instance, surface water flooding is thought to have been a result of multiple flow paths, converging on Friston, and was not a direct result of surface water runoff from land associated with the proposed site of the onshore substations or the National Grid Infrastructure.

11.11. Existing Environment Agency (EA) National Mapping for surface water flood risk is not representative of the surface water flow paths which resulted in the internal flooding of properties in October 2019, as above.

11.12. BMT, working on behalf of SCC, have developed a Surface Water Management Plan (SWMP) for the catchment of Friston village. This includes a detailed assessment of

the catchment topography and characteristics to accurately model surface water flow paths. This has been verified using rainfall data and photographs taken by residents during the flooding on 6 October 2019 to increase model confidence. Plan B is taken from the SWMP and illustrates the predicted depth of surface water flooding during the 1 in 100 + 40% CC rainfall event (1%AEP CCU). Model outputs (depth/hazard/velocity mapping) for additional rainfall events is available on request.

11.13. There is the potential for the proposed developments to interact with some of the identified surface water flow paths. The impacts of this interaction, both during construction and operation, have not been adequately assessed. As such, it is unclear if sufficient mitigation has been provided to prevent a direct increase in onsite or offsite flood risk, which could be further exacerbated by mismanagement of suspended sediment in construction surface water runoff.

11.14. The flow path which runs north to south through Friston originates from a series of upstream watercourses and land drainage outfalls. The watercourses function well in providing interception of regular rainfall with this flow path understood to only be active after prolonged periods of wet weather or during exceptional rainfall. A positive discharge from the proposed SuDS system with a discharge to the Main River through Friston in all rainfall events would represent an increase in flows compared to present day. This would inherently represent an increase in surface water flood risk. This could also exacerbate existing surface water flooding issues in the village.

11.15. The Applicants propose a SuDS pond to intercept the flow path north of Friston, attenuate and release at a reduced rate. This could reduce surface water flood risk in Friston during higher return period rainfall events. However, it is unclear how these watercourses would be diverted to facilitate this. The potential loss of watercourses delivering interception could give rise to an increase in downstream flood risk. It is also unclear how this significant flow path would be managed during construction. The area required to attenuate it would be significant. Unless the SuDS pond is established prior to construction, this flow path could interact with construction activities and increase the amount of sediment mobilised and transported downstream. If flows through the watercourse were not preserved, there is a possibility that offsite flood risk could be increased.

11.16. CCSs are proposed within the Friston Catchment. The submission states these will not have their own SuDS ponds. It is therefore unclear if the proposal is not to drain these sites, which would result in an increase in surface water flood risk to Friston and other areas, or if they will drain into a strategic surface water drainage system, for which we have no details.

11.17. Due to the nature of the works there is a risk of ground water flooding in areas of excavation, specific areas of concerns are around Coldfair Green and Aldringham.

Adequacy of Applications/DCOs

11.18. The draft DCOs have no explicit requirements for the submission of a permanent surface water drainage strategy in relation to the onshore substations. Reference is made within the OLEMS which would be split into two documents and secured via Requirements 14 and 21, but this is not very clear. This approach concerns the Councils who insist on a requirement specific to the provision of a permanent surface water drainage strategy, as is common for other DCOs (such as SPR EA1 requirement 16, Sizewell C draft DCO requirement 5, Hinkley Point C Requirement P10 & MS30, and Norfolk Vanguard Requirement 32). This is especially relevant considering the identified existing surface water flooding in Friston. The Councils understand the Applicants have no objections to this revision to the draft DCOs.

11.19. Requirement 22 ensures a surface water and drainage management plan must be submitted for each stage of construction works prior to commencement. The principles contained within the Outline CoCP are generally acceptable to manage surface water flood risk during construction, although greater reference could be made to the prioritisation of open SuDS, as per local policy. However, some of the details contained within the Outline CoCP require further clarification:

1. The document contains some contradictory statements regarding the storage of materials within the vicinity of watercourses (Paras 38 & 102);
2. Outline CoCP Paragraph 106 states *"the controlled runoff rate will be at least the equivalent to the greenfield runoff rate".* This should read "at most". Runoff rates must not exceed greenfield runoff rates, as per local policy; and
3. Outline CoCP Paragraph 108 details how surface water flow paths (identified or otherwise) intercepted by the development would be dealt with. However, there is no demonstration that these volumes could be contained and managed within the red line boundary using open SuDS, without increasing off site flood risk or pollution, as per local policy.
4. There is serious concern as to whether enough space has been provided within the red line boundary and more specifically, the cable corridor, to prioritise a SuDS strategy for managing surface water. The implementation of EA1 encountered problems with regards to space for SuDS during construction which resulted in the use of reactive & proprietary measures to manage surface water drainage. There is nothing to suggest that additional space has been provided on this scheme in comparison to EA1.

11.20. The Applicants, through the production of a Flood Risk Assessment (FRA) for the proposed developments (ES Volume 3, Chapter 20, Appendix 20.3), satisfy the policy requirements of the Local Plan. Whilst the FRA satisfies policy requirements, we query the level of confidence that can be assigned to the assessment of surface water flood risk in the Friston Watercourse Catchment based on Environment Agency mapping, which is now superseded by the Friston SWMP.

11.21. The applications do not consider recent surface water flooding in Friston, contrary to local policy. The Councils accept that due to the timings of the event events and date of submission of documents this was not feasible, but further work post submission should be undertaken.

11.22. The FRA proposes to comply with the surface water disposal hierarchy. However, no infiltration testing has been undertaken within the red line boundary. This is contrary to local policy. A review of publicly available information and drainage features on site suggests infiltration may be feasible. A discharge to the Main River in Friston is proposed, however the consequence of increased flood risk presented by such an outfall (as per 11.14) has not been assessed and is a concern.

11.23. The principles of surface water drainage for the cable corridor and substations sites during construction and operation have been outlined in Volume 1, Chapter 20. However, it has not been demonstrated this is achievable within the red line boundary, prioritising the use of SuDS. The sizing of the SuDS is assumed to be based on design assumptions that are not stated within the application and have not been seen by or agreed with SCC as the Lead Local Flood Authority. This is contrary to local policy.

11.24. Despite not having a date for decommissioning the proposed developments, the applications only apply an increase in rainfall intensity due to climate change of 20%. This is only appropriate for developments expected to be present until 2069, as per current Environment Agency Climate Change Allowances. Given there is no commitment to remove the proposed impermeable areas prior to 2069, a rainfall intensity increase of 40% should be applied, in line with the principles of the Rochdale Envelope.

11.25. Volume 1, Chapter 5 states that a confidence value will be assigned to each assessment once undertaken. None of the assessments made under Volume 1, Chapter 20 have been assigned confidence values. Confidence has only been assigned to data sources and we query the confidence level assigned to these data sources, for example, Environment Agency National Mapping is assigned a high confidence value.

11.26. ES Volume 1, Chapter 20 does not consider the Human Environment. Specifically, no consideration is given to the impacts on the residents of Friston as a receptor.

11.27. The impact of an increase in sediment supply does not consider the inter-relationship with, and the subsequent increase in surface water flood risk, due to the reduction of channel and culvert capacity from to sedimentation. The impact of this in the upper reaches of the Friston Watercourse Catchment, particularly in Friston village, could be greater if the residents of Friston (Human Environment) were considered as a receptor.

11.28. Friston village is part of the Friston Watercourse Catchment. However, it is in the upper reaches of the catchment. The ES considers all 6km^2 of the catchment in the assessment. Friston village has a catchment of approx. 3km^2. Thus, the impacts in Friston village are potentially a lot more concentrated than set out in the ES which dilutes the impacts on Friston village by considering the entire downstream extent of the catchment.

11.29. For example, Table 20.14 of the ES states the estimated total area of disturbed ground during construction is 4.15% of the catchment. When considering the catchment of Friston village only, as above, the estimated total area of disturbed ground is 8.36% ((250,700 / 3,000,000) x 100). The potential impacts of this in terms of sediment supply and the inter-relationship with the subsequent increase in surface water flood risk on the Human Environment in Friston has not been assessed.

11.30. Similarly, from Table 20.18 of the ES, the total area of permanent development is stated as 1.5%, but is at least 3.22% using the above methodology (likely higher as this uses the area of development number from Table 20.18 which is less than the sum of relevant numbers provided in Table 20.2).

Compliance with Local Policy

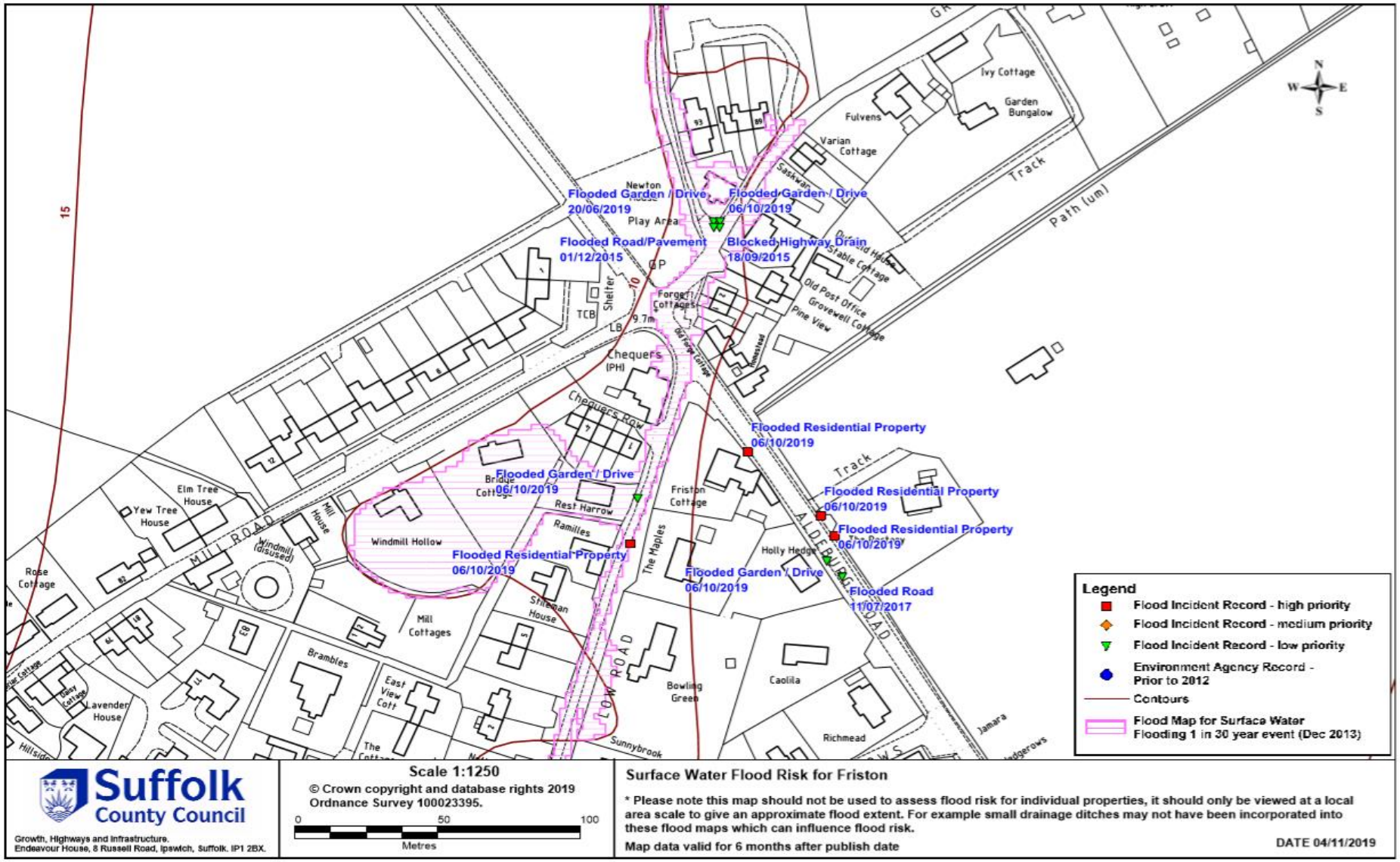
11.31. Based on the information currently available, the schemes are not considered compliant with local policy for the reasons set out above.

Further Work Required

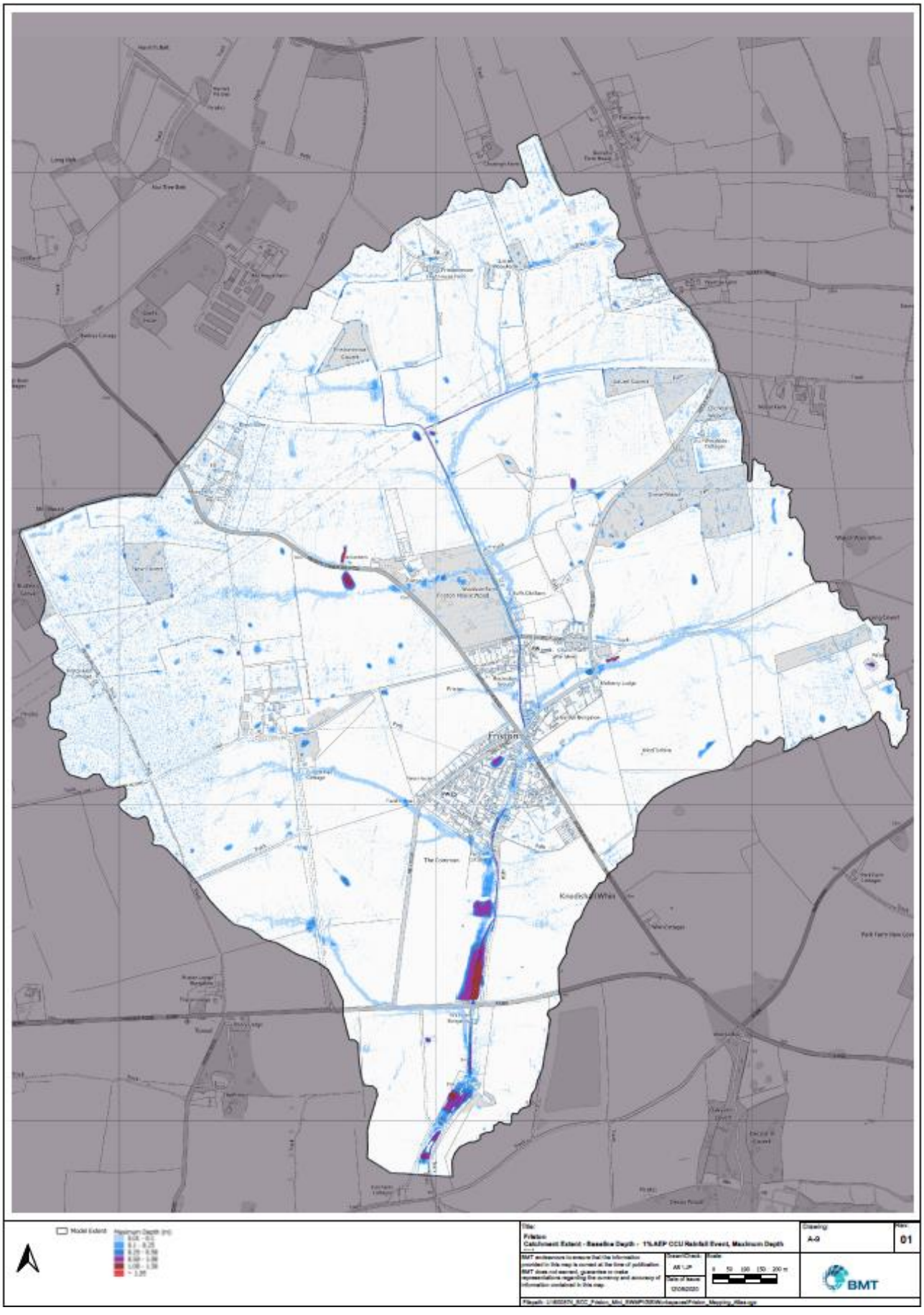
- Review the baseline environment assessed in the ESs in light of The Friston Surface Water Management Plan published June 2020.
- Clarification that all impermeable areas are accounted for in the worst case scenario including the impermeable surface of the basins themselves.

- Commitment to assess the impact on human receptors in Friston from the projects specifically looking at the watercourse located in the village and associated catchment.
- Application of an increase in rainfall intensity due to climate change of 40%.
- Commitment to undertake appropriate infiltration testing pre-construction and provide sufficient information prior to consent, to demonstrate that there is sufficient space within the Order Limits to accommodate infiltration features with a worst case infiltration rate. In addition to demonstrating that there is sufficient space within the Order Limits for attenuation features at an agreed discharge rate.
- Update the draft DCOs to provide a separate new requirement in relation to operational surface water and foul drainage.
- Clarification on the content of the Outline CoCP in relation to matter highlighted in paragraph 11.19 above.
- Assign confidence values to the assessments undertaken in Volume 1, Chapter 20, as per EIA Methodology (6.1.5), Paragraph 59.

Plan A – 04/11/2019 Flood Incident Map



Plan B – Friston SWMP, Drawing A9, 1%AEP CCU Maximum Depth



12. Built Heritage

Lead Authority ESC

ESC Local Plan Policies

12.1. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects, requires a robust Heritage Impact Assessment to be submitted. The text associated with the policy also states that impact on the historic environment should be avoided, and if not possible, minimised.

12.2. Policy SCLP11.3: Historic Environment, promotes the conservation and enhancement of the historic environment. The policy requires all development which has the potential to impact on historic assets or their settings to be supported by a Heritage Impact Assessment and/or an Archaeological Assessment.

12.3. Policy SCLP11.4: Listed Buildings, details a clear set of criteria which must be met if development which affects the setting of listed buildings is to be supported. These include the need to demonstrate a clear understanding of the significance of the building and/or its setting alongside an assessment of the potential impact of the proposal on that significance.

12.4. Policy SCLP11.5: Conservation Areas, states that development which has the potential to affect the setting of conservation areas will be assessed against the relevant Conservation Areas Appraisals and Management Plans.

12.5. Policy SCLP11.6: Non-Designated Heritage Assets, provides that new uses which result in harm to a Non-Designated Heritage Asset or its setting will be considered based on the wider balance of the scale of any harm or loss.

Other Relevant Policies

12.6. The Conservation Area Appraisals for Aldeburgh, Thorpeness, Dunwich, South Lowestoft, and Southwold are relevant.

Key Local Issues

Onshore – Built Heritage

12.7. The cable route crosses through a protected woodland to the south of Aldringham Court, a Grade II listed building. The building and its grounds were designed by Cecil Lay and the historic and architectural interest that comes from this association with a well-known local architect contributes to the significance of the asset. The development would require the removal of a section of the woodland to accommodate the development and the Councils have previously raised concerns regarding the implications of the works on the setting of Aldringham Court. The grounds are part of Lay's original design and therefore this designed garden setting contributes to the understanding of the significance of the building. The loss of part of the original design would therefore alter this setting as part of the original design would be lost. However, it is recognised that there is currently a high degree of visual separation between the building and this piece of land due to the large laurel hedge that forms a boundary to the formal gardens to the front and side of Aldringham Court. The Councils therefore do not consider that the loss of part of the garden design would amount to harm to the significance of the designated heritage asset.

12.8. The Councils have significant concerns regarding the harm the development will cause to the significance of a number of listed buildings which surround the substations site due to the impact of the development on their setting. In particular, there are three Grade II listed 17th Century farmhouses (Little Moor Farm, High House, Woodside Farm) which are well preserved examples of local vernacular building tradition. These farmhouses have direct and proximate relationship to their agricultural setting and have a special, long established, relationship with the traditional farmed landscape. The continuing productive agricultural use of the surrounding land, its character and openness contribute significantly to the setting of the listed buildings.

12.9. The relationship between these buildings and their farmland setting will be fundamentally changed by the introduction of industrial development of the scale proposed. The scale and prominence of the proposed development in that setting is striking; the substation buildings would be within 500m of all of these assets. The existing pylons do not disrupt this setting to anywhere near the same extent as the proposals, the landscape is still fundamentally rural in character and the farmhouses can be appreciated in their rural setting surrounded by open, productive farmland. The developments involve a transformation of the landscape character of the site to that of an industrial or other essentially urban, built up use of land. As well as the

visual impact of the substations infrastructure, harm will also be caused by virtue of the loss of agricultural use over a wide area within the farmhouses' setting.

12.10. The Church of St Mary is Grade II* listed. The Councils are concerned that the substation developments to the north would challenge the dominance of the church as a landmark building in the village and would therefore cause harm to the significance of the asset. Village churches were built as landmark buildings within settlements; the tallest building which would be a prominent feature in views from within and around the village. Due to its height the church also helps to connect the outlying farmhouses and other buildings to the core of the village, the inter-visibility between the church and other buildings surrounding the village centre is an important part of the church's significance. The proposed development lies to the north of the church and would block views of the church from the farmhouses that lie to the north of the settlement core on the edge of the historic common land.

12.11. The historic parish/Hundred boundary between Friston and Knodishall runs directly through the middle of the proposed substations locations. This is represented on the ground by a trackway that is a PRoW. This route connects the historic common land to the north to the village core surrounding the church. There are clear views of the church when approaching the village from the north following the PRoW. Further research has been completed to ascertain the age and significance of this feature and the Councils have subsequently identified it as a non-designated heritage asset (see Appendix 1 of this report). The PRoW is proposed to be re-routed. The Councils are concerned about the destruction of this historic route and loss of an important view of the Grade II* listed church. The loss of the historic route between the village core and the common land will dramatically reduce the legibility of the historic connection between the village core and the common land to the north. The destruction of the historic parish/Hundred boundary and footpath will therefore result in the loss of a non-designated heritage asset and will cause harm to the significance of the Grade II* listed church.

12.12. The Councils consider that the proposed Outline Landscape Mitigation Plan (LMP) will not mitigate the harm caused by locating the substations in the setting of High House Farm, Little Moor Farm, Woodside Farm, and the Church of St Mary. The harm is caused by the destruction of the open, agricultural landscape within which these buildings have always been situated and through the obstruction of views of the church. While some historic field boundaries are proposed to be reinstated to the south of the site the large areas of woodland have no historic precedent and merely have the effect of further severing the relationship between these historic assets and their open agricultural setting. Some changes have been made to the landscape mitigation plan to reduce further impact on the setting of the listed buildings which

are welcomed, however this has reduced the impact from the mitigation itself rather than the harm caused by substations.

Offshore – Impact on Onshore Built Heritage

12.13. In relation to offshore, the main issue relates to the impact of the presence of the turbines on the uncluttered seascape and the importance/contribution this uncluttered seascape has on the onshore heritage assets. The Councils are concerned about the impact on the setting of the listed buildings and parts of conservation areas that were specifically designed as seaside holiday resorts to take in the open vistas and natural beauty of the Suffolk coast. Qualitative change in the nature of the sea view diminishes the contribution that this setting makes to a historic seaside resort. The introduction of turbines into this setting will introduce a man-made addition to the seascape. The seascape, especially at the horizon, is an unchanged part of the historic setting of the assets. The introduction of a large number of fixed structures that stretch across the horizon with little respite would therefore be a change to the setting of these assets. However, given that the seascape only makes up part of the setting of these designated assets the Councils consider that this would only cause a very minor level of harm to their significance. The harm could be further mitigated if the turbines did not stretch across the horizon, as with previous turbine arrays which have been more tightly grouped, which would allow at least some views of the unchanged seascape.

Adequacy of Applications/DCOs

Onshore – Built Heritage

12.14. In Appendix 24.7 Assessment of the Impact of Onshore Infrastructure in the Setting of Heritage Assets the author(s) make an attempt to define the setting of the heritage assets in spatial terms (e.g. paragraph 45 *'the positive contribution that setting makes to the significance of Little Moor Farm is therefore largely limited to the area within 200m-300m of the farmhouse')*. This is not considered to be useful or appropriate as the NPPF defines setting as: *'the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve.'*

12.15. The assessment of the impact on High House Farm states that the *'lack of close public access following the diversion of the Public Right of Way (PRoW) means that there are no informative close-range views of the farmhouse from where its architectural interest can be appreciated' (paragraph 60)*. This statement is inaccurate as the significance of a listed building does not depend on views from the public realm and

there are informative close-range views of the farmhouse; from within its own curtilage. The assessment of this asset is further flawed by the statement '*Screening by vegetation and surrounding buildings and the absence of close-range views means that the historic character of the Listed Building cannot be readily appreciated from its setting, diminishing the value of the views affected by the proposed East Anglia TWO and East Anglia ONE North projects.' (paragraph 69).* By definition, the setting of a heritage asset is the surroundings in which it is experienced so it is not clear what point this statement is trying to make. Given that paragraph 67 states that *'The presence of the onshore substations and National Grid substation, only 450m to the south-east, would represent a significant change in the character of the landscape in views looking south-east in the setting of High House Farm'* the Councils consider that the proposal would result in adverse impact of medium magnitude giving rise to an effect would be of moderate significance in EIA terms.

12.16. Cultural Heritage Viewpoint 5 purports to show the predicted visual impact on the setting of Woodside Farm. However, the angle of the viewpoint selected means that the building itself blocks any views of the proposed location of the eastern substation. There is therefore no baseline or indicative views from which an informed opinion can be formed. The eastern substation location is still within 450m of the farmhouse cutting off what are currently extensive views of the agricultural landscape and inserting large scale industrial structures.

12.17. The Councils consider that there would be an adverse impact of medium magnitude on Woodside Farmhouse even if just the eastern substation was constructed. The Councils also disagree that the proposed mitigation planting would reduce the impact of the proposals. The new woodland planting to the north is not a historic feature of the landscape and would create further separation of the farmhouse from the agricultural landscape setting. The land only rises very slightly and there are currently long-range views all the way across to Laurel Covert. The statement that the *'farm would be retained in an area of fields sufficient to provide an appropriate setting' (161)* is meaningless. It is not clear how it has been decided that this is an 'appropriate setting' or on what evidence this conclusion has been based. The setting of the farm will be changed from an expansive agricultural landscape broken up with hedgerows and hedgerow trees to a few small fields between the farmhouse and large-scale industrial structures partially screened by a large new section of woodland. The Councils therefore do not consider that the proposed landscape mitigation would mitigate the harm to the heritage asset. The impact should be considered to be moderate in EIA terms even after mitigation.

12.18. Given that it is stated in assessment that the substations *'would entirely obstruct the sequential longer-range views of the church tower from the north when approaching*

Friston on the public footpath from Little Moor Farm' (paragraph 108) the Councils consider that the adverse impact on the Church of St Mary is of medium magnitude. This is a key view of the church from a PRoW that is thought to have been in existence in some form since the 10th century. The view from the historic common land at Friston Moor back towards the village core is a vital one in being able to understand how the settlement developed. The church tower is an important landmark and is key to connecting the dispersed parts of the village back to the core. Blocking this PRoW and associated views of the church from the various farmhouses that were built on the edge of the common land substantially diminishes the ability to understand this historic relationship.

Offshore – Built Heritage

12.19. The assessment of the impact of the offshore infrastructure on coastal assets is sound (Appendix 24.8). However, the Councils wish to highlight the number of listed buildings that will be impacted by the proposals. A low level of harm has been identified to buildings and conservation areas designed as seaside holiday resorts, the assessment of the impact on Lowestoft describes the proposals as impacting 10 listed buildings. A number of the listings are group listings of large terraces; 1-24(cons) Wellington Esplanade, 16-28(cons) Victoria Terrace, 3-19(cons) Kirkley Terrace. This means that in fact over 50 listed buildings in Lowestoft will be impacted.

Summary

12.20. The Councils have identified harm in relation to the setting of the heritage assets which should be considered against paragraph 196 of the NPPF. The Councils have identified harm in relation to the setting of the heritage assets which should be considered against paragraph 196 of the NPPF. It should also be considered against the relevant paragraphs of NPS EN-1 namely paragraphs 5.8.12 – 5.8.18 which state that there should be a *presumption in favour of the conservation of designated heritage assets* (5.8.14) and that the IPC *should take into account the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets* (5.8.13). The Councils consider that the Applicants' assessment of harm is flawed by their assessment of the extent of the setting of the designated heritage assets which is contrary to the definition in the NPPF and through the inflation of the benefits of the proposed mitigation measures. This has resulted in their assessment underplaying the level of harm the project would cause to the significance of a number of designated heritage assets.

Compliance with Local Policy

12.21. For the reasons set out in the summary the proposal is not considered compliant with local policy specifically Policies SCLP3.4, 11.3 and 11.4.

Compensation

12.22. It is the Councils view that the effects on the settings and significance of the heritage assets identified previously cannot be adequately mitigated by virtue of the planting proposed. The developments will result in residual harm to the setting of a number of listed buildings. Given that it is not considered possible to directly mitigate the harm caused to the significance of these assets, the Councils have requested that the Applicants provide appropriate compensation to offset this heritage harm. The Councils have discussed with the Applicants the provision of a fund for heritage assets which would provide the opportunity for funding to be made available to pay for works to be undertaken to the affected heritage assets, particularly the church. The intention is that these works would contribute to the long-term conservation of these important designated heritage assets.

12.23. The Councils have also recommended that the fund also contribute towards compensation measures in relation to the effects on archaeology (discussed in the next section of the LIR) and the historic landscape character of the locality. The historic landscape character of the substations site has been discussed within multiple sections of the LIR as it crosses over into a number of different topic areas including heritage, archaeology and landscape and visual.

12.24. The Councils have been engaging with the Applicants on the matters raised above.

Further Work and Compensation Required

12.25. Notwithstanding the Councils concerns regarding the significance of the impact on a number of the listed buildings at Friston, the Councils recognise that this is a difference of professional opinion which there is not likely to be further agreement on. The Councils however request that further work be undertaken by the Applicants in relation to the historic character of the landscape at Friston specifically considering the historic parish/Hundred boundary.

12.26. The Councils also request that the Applicants provide appropriate compensation in acknowledgement of the residual impacts caused by the projects on the heritage assets.

13. Archaeology

Lead Authority SCC

National Policy Statements

13.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, archaeology is addressed as a generic impact in section 5.8 of EN-1 (see para 1.3.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

ESC Local Plan Policies

13.2. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects, requires a robust Heritage Impact Assessment to be submitted. The text associated with the policy also states that impact on the historic environment should be avoided, and if not possible, minimised.

13.3. Policy SCLP11.3: Historic Environment, promotes the conservation and enhancement of the historic environment. The policy requires all development which has the potential to impact on historic assets or their settings to be supported by a Heritage Impact Assessment and/or an Archaeological Assessment.

13.4. Policy SCLP11.7: Archaeology, requires a full archaeological assessment to be provided where a development is affecting areas of known or suspected archaeological importance to ensure provision is made for the preservation of important archaeological remains. The policy makes it clear that preference will be given to preservation in situ unless it can be shown that recording of remains, assessment, analysis report and/or deposition of archive is more appropriate.

Other Relevant Policy

13.5. In addition, sector-specific advice and guidance should be used to frame the decision-making processes – see Historic England Good Practice Advice, and Historic England Advice Notes (https://historicengland.org.uk/advice/planning/planning-system/).

Key Local Issues

13.6. The schemes will affect an area with known and potential sites or artefacts dating from the Prehistoric period to the Second World War. All pre-commencement and construction groundworks have the potential to impact archaeological remains.

Specific issues identified in response to and in addition to ES chapters are set out here, but general detail of the character of archaeological remains across the scheme and of impacts identified in the ESs is not repeated.

Landfall

13.7. Geophysical anomalies in the landfall area are interpreted predominantly as features relict of a Post-medieval landscape. However, there appear to be tracks and boundaries which sit on a different alignment to more recent field systems, and the Historic Environment Record (HER) data includes a record for a possible late prehistoric double ditched enclosure. It is probable that there are multiperiod remains present beyond the interpretation made of the geophysical survey, which has yet to be ground-truthed through trial trench evaluation. Large areas of mitigation may be required.

13.8. Generally, at landfall and across the application area, World War 2 (WW2) features have been assigned 'low' (local) importance, although this assessment needs testing against the wider context of the Suffolk coast in WW2. The Earthwork Survey commissioned by the Applicants adds detail to the knowledge base of these, within the limits of areas that were accessible at this stage.

Cable Route - Hundred River Area

13.9. There is a complex site on the valley slopes overlooking the Hundred River, to the east of School Plantation opposite Aldringham Court, with features showing on geophysical survey. The post-medieval plantation may mask the earlier topography, but the site appears as a prominent landscape feature, and the initial trial trenching undertaken in the area in November/December 2019 indicates a focus of activity centred on the 11th-14th centuries AD, with some earlier activity. A draft report on the trial trench evaluation results in this area has been made available. The indications are that there are well-preserved remains in land that is pasture, with stratified sequences of archaeological features and deposits. The logistics of archaeological mitigation at this point should be considered in terms of costs, timescales and spoil management and it should be noted that mitigation may be relatively complex. In areas where deep, wet deposits are anticipated, palaeo-environmental assessment (for example a bore hole survey) is recommended as a next stage of evaluation works to confirm the depths of deposits of interest. Funerary monuments visible as barrows may have continued along this contour from where they survive just to the north on Aldringham Green.

13.10. Falling between Areas of Archaeological Activity identified in the ESs (AAA1 and AAA2), there are HER records for military sites in particular, as well as a possible late prehistoric double ditched enclosure. The later activity may have had an impact on archaeological remains but should also be considered of heritage interest on its own merit. There is also a possible Bronze Age ring ditch (funerary monument) with potential satellite features which could be associated graves of prehistoric or potentially Anglo-Saxon date. Only invasive excavation would confirm the significance of this site.

13.11. Anomalies in AAA4 identified in the ESs indicate underlying remains relating to past settlement and landscape, including trackways, field boundaries, ladder-like small enclosures (which could be Medieval or Roman) and smaller enclosures suggesting settlement or industrial activity. There are possible ring ditches, one of which was close to a trench from which Early/Mid Saxon pottery was recovered from an archaeological feature. This may indicate activity of this date in the vicinity of an earlier monument.

Cable Route – Friston Area

13.12. There is a large area of evidence for past activity, apparent on geophysical survey, including a cluster of enclosures south west of and apparently pre-dating Grove Wood, and possible medieval roadside settlement. Within this area also are the possible suggested sites of Buxlow church/chapel. The features showing on the geophysical survey that are interpreted as roadside settlement could actually represent Buxlow hamlet, which may have then been encroached upon by expansion or development of the wood. Inconclusive geophysical survey for both possible church sites in the vicinity showed magnetic disturbance which may have natural origins or represent spread material. If there is a church site with a cemetery, there would be high potential for evidence relating to questions of Anglo-Saxon to Post-medieval land use, settlement and religious and funerary practice - whether this is regional or higher importance cannot be understood without trenching. Excavation of a church and burial ground would require potentially extensive, time-consuming and delicate archaeological excavation. It is suggested in the ESs that there will be scope for avoidance should a chapel site with associated human remains prove to be present. However, there is another potential pinch-point in the cable route in the area into which geophysical anomalies extend, on the northern side of the road, to the north of Friston Church and this key location has not been subject to archaeological evaluation or metal detecting.

13.13. There is also an area of curvilinear ditches southwest of Friston Moor Covert which SCC Archaeological Service suggest may represent a Roman site with subsidiary enclosures.

Substations

13.14. An apparently discrete site was identified through geophysical survey north of Manor Farm. This is within the area of temporary land uptake, and measures may need to be put in place to avoid it as appropriate.

13.15. Possibly reflecting its topographic location, the geophysical survey did indicate a generally lower density of extensive sub-surface remains across the substations site, in contrast with elsewhere on the scheme, which has been also suggested by the c2% trenched evaluation of the substations site at this stage. It will require further ground-truthing but for a large part (but not all) of the substations area the Councils would have no objection to further work being undertaken post-consent. Additionally, however, the former parish boundary runs through the site in the form of a track and is also identified as the Anglo Saxon Hundred Boundary. The importance of this feature has been further assessed by SCC (see Appendix 1) subsequent to the production of the ESs, which highlights the significance of the boundary and trackway beyond significance as a parish boundary. This further assessment also highlights the less tangible cultural history of the feature, as a long-standing significant element of the landscape and routeway linking heritage assets. Boundaries, particularly meeting points between parishes, are often the location for archaeological remains relating to liminal activities, such as execution sites and deviant burial grounds.

13.16. To the west of the main substations site, masked by the electronic interference from pylons, there are two foci with evidence for enclosures and discrete features. Remains here are within the hypothesised extent of Friston Hall and gardens, which has medieval origins as a manor owned by Snape Priory before it passed into the hands of Cardinal Wolsey.

Offsite Highway Works

13.17. There is a pill box of a Suffolk-square type in the area of proposed works to improve the A1094 which should be preserved in situ. It is not flagged in the ESs.

Adequacy of Applications/DCOs

Assessment of Importance and Heritage Significance

13.18. The sound basis of non-intrusive archaeological investigation work presented in the submission should be acknowledged. However, the ESs note that 'heritage importance (and associated heritage significance) is based on professional judgement and experience rather than any fully substantiated and established levels of heritage significance, such as would be obtained through ground-truthing. The Councils therefore cannot fully support the conclusions in the Environmental and Planning Statements that Chapter 24 of the ESs gives a full, robust and comprehensive assessment.

The Extent of Ground Truthing using Trial Trenching

13.19. Best practice is for geophysical survey to be ground-truthed and used as part of a suite of evaluation techniques. There is still potential for more extensive remains or for remains in apparently blank areas for reasons that include, for example, lower magnetic contrasts and varied responses from different soils and geologies. Geophysical survey may have picked up large and significant features – such as ring ditches and complex settlement areas - but is less likely to have defined smaller features, burials, unenclosed settlements (e.g. from perhaps the Anglo-Saxon and prehistoric periods). As has been raised at an early stage and throughout Expert Topic Group (ETG) discussion, in order to accurately assess impacts of the proposal and fully inform planning decisions, the survey data should be ground-truthed through trial trenched evaluation. At present less than 1% of the onshore Order Limits has been investigated through intrusive trenching. There is some risk to sites as yet unknown, as preservation would not be fully guaranteed once consent is granted, and the residual impacts of the potential destruction of sites where preservation in situ would be more appropriate than preservation by record cannot be fully confirmed at this stage.

13.20. The ESs refer to the additional suite of pre-consent field surveys commissioned by the Applicants, including targeted trial trenching, metal detecting and earthwork survey. At a high level, the surveys provide information on the character of archaeological remains at the substations site and pinch points on the route (with one exception discussed below), and of potential earthwork features, sufficient to inform decision. However, the metal detecting survey and full implementation of the intended initial targeted trial trenching was not undertaken, with the Grove Wood crossing not covered by the works. The Councils acknowledge that the Applicants cite issues with access permission. The Councils understand that there are powers of

site investigation available to the Applicants which do not appear to have been used. The sensitivities of this area are therefore not fully established.

13.21. Deferring evaluation to post-consent also means that the scope of excavations and groundworks associated with archaeological investigations is unknown, which could affect other elements of project planning. The Outline Pre-Commencement Archaeology Execution Plan (OPCAEP) is intended to establish the logistical considerations in delivering archaeological work with other constraints (for example, sections 3 and 4 cover links with ecology, spills, drainage, dust, waste, hazards, contamination, flooding, traffic, welfare, transport, health and safety etc). At this stage, however, the required timetables and issues such as required excavation depths and scale and spoil volumes, for example, which may affect construction approaches, dust management, water and sediment management and spoil management are unknown. Archaeology is not clearly addressed in the initial high-level project timescales as presented in the ESs. The Applicants have broadly indicated a commitment to undertake this work early on post-consent and discussions are still ongoing. The Councils highlight that deferring the work to a post consent stage means that the full extent of potential impacts remains unclear and that risks to the projects in relation to accommodating archaeological mitigation are deferred to post-consent project planning.

DCO requirements and Programme of Archaeological Work

13.22. The proposed DCOs wording relies on an Outline Written Scheme of Investigation (OWSI) to shape the archaeological mitigation, accompanied by an OPCAEP. At present, the Councils do not fully support the wording of DCO requirements 19 and 20, OWSI and OPCAEP and Appendix 2 of this LIR sets out required revisions to the documents. The Applicants have indicated a general commitment to address these comments, although agreement on the scope of archaeological evaluation has not been reached through the ETG process. The Councils' position on the wording of the DCOs, OWSI and OPCAEP will be reviewed once additional information has been received. Further, the ES chapters refer throughout to the production of a final Written Scheme of Investigation (WSI) for archaeological work although more accurately there is likely to be a need for a suite of WSIs for pieces of work undertaken within the broader scope of the OWSI. This is, however, captured in paragraph 142 of the OWSI.

Public outreach

13.23. Finally, the ESs make little reference to outreach/public benefit as part of mitigation beyond appropriate publication of the results and archiving. The DCOs and WSIs

should demonstrate a commitment to delivering enhanced public understanding. This may stretch to long term management of assets, provision of outreach opportunities such as blog, site visits, visits to schools, temporary displays/'pop-up' museums, newsletters and updates, talks, popular publication, displays to be hosted in areas relevant to the scheme, community involvement, and strategic linking of archaeology with any other landscape/tourism initiatives and public space works.

Compliance with Local Policy

13.24. The submitted archaeological information falls short of the level of detail required and contrary to the advice provided to the Applicants by the County Archaeology Service and therefore is contrary to local policy.

Further Work Required

- Demonstration of consideration of the archaeological significance of the Hundred Boundary as part of a cross-disciplinary appraisal which looks at the varied heritage significances of it as a non-designated asset.
- Development of a programme of outreach work through S111, to include community engagement with mitigation for impacts on the Hundred Boundary
- Submission of the reports from the Earthwork Survey and Targeted Upfront Trial Trenched Evaluation
- Amendment to the Outline WSI (see Appendix 2 and SOCG)
- Amendments to the OPCAEP (see Appendix 2 and SOCG)
- Amendment of wording of DCO Requirements 19 and 20 (see Appendix 2 and SOCG)
- Clearer indications of timescales for archaeological work in high level project timescales
- Metal detecting and trial trenched evaluation, particularly around the crossing point near Grove Wood and more systematic archaeological evaluation
- Advance proposals for early fuller and systematic archaeological evaluation as best practice to characterise archaeological remains and inform logistics and timescales (dialogue captured in the Archaeology SoCG).

14.Design and Masterplan

Lead Authority ESC

ESC Local Plan Policies

14.1. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects states the Council will take into consideration the nature, scale, extent and potential impact of proposals for Major Energy Infrastructure Projects, including cumulative impacts throughout their lifetime. The supporting text also highlights that developers will be encouraged to work collaboratively and share infrastructure to help reduce potential impacts.

14.2. Policy SCLP11.1: Design Quality, seeks to encourage high quality design that responds to the local character, setting out criteria that proposals should meet. The policy seeks to ensure development is designed appropriately responding to local context in terms of factors including the overall scale and character, layout and making use of high-quality materials.

Key Local Issues

Design

14.3. One of the main concerns of the local community and the Councils is the design of the substations and whether adherence to the Design Principles Statement would deliver a development of acceptable standards. The Councils want to ensure that all reasonable endeavours have been made to minimise the size and scale of the substations, through the parameters of the buildings themselves and through their siting, including whether they could be lowered into the ground.

14.4. Another significant way to reduce the overall impact of the onshore elements of the projects would be through consolidation and sharing of infrastructure. This has been highlighted previously in Section 6 of the LIR. The Councils and local community recognise the opportunity that has been presented through the BEIS OTNR to considered greater coordination and consolidation in the design of EA1N and EA2.

Adequacy of Applications/DCOs

Outline Onshore Substation Design Principles Statement

14.5. The Outline Onshore Substation Design Principles Statement (document 8.8) sets out the design principles which will underpin the design of the operational substations. Requirement 12(2) ensures that the details provided by the Applicants accord with the Outline Onshore Substation Design Principles Statement (APP-585). It is understood that this document should also be read in association with the principles for the overall substations site design set out in the OLEMS.

14.6. Requirement 12 however does not include the same constraint in relation to the National Grid substation which would, by virtue of the current wording of the DCOs, not be required to accord with the Outline Onshore Substation Design Principles Statement or any other similar document. The Councils consider that the design principles should relate to all the substations and therefore the wording of the draft DCOs should be amended accordingly. The Councils would also welcome the National Grid infrastructure having its own Outline Design Principles.

14.7. Insufficient detail has however been provided by the Applicants for the Councils to adequately assess the design of the development. The submission material does not include details of the existing and proposed site levels, finished floor levels of the substations or any cross section through the substations site. Two finished floor level figures 19.8m and 21.4 AOD have been provided within the Outline Onshore Substation Design Principles Statement (APP-585, paragraph 11) but it is not clear which point on the platforms these figures relate to and whether the platforms are one uniform level. This matter is further confused as different finished floor level figures are provided in the OLEMS (APP-584, paragraph 104) where the levels are stated to be 18.2m and 20.7m AOD. It is also understood that some cut and fill will be required on the site but details of this are not clear.

14.8. The Outline Onshore Substation Design Principles Statement (APP-585, Paragraph 9) states "*Appropriate building design and materials will be actively sought as part of the procurement process. The onshore substation building for the proposed EA1N/EA2 should be sensitively placed, with visual impacts minimised as far as possible by the use of appropriate design, building materials, shape, layout, coloration and finishes".* The Councils welcome this but the outline design principles do not include a clear commitment to reducing the overall size of the substations and height of the buildings and equipment during the design refinement process post consent. This is of vital importance given the significant effects identified within the

ESs and the significant concerns expressed within Section 15 on Landscape and Visual.

14.9. It should also be noted that the wording in the outline principles does not reflect the wording in the Design and Access Statement (APP-580, Paragraph 34) which states, "The general premise in the design and selection of components would be to minimise the potential impacts by reducing the size and scale of the components as far as practicable". It is stated in the Design and Access Statement (APP-580, paragraph 33) that the majority of the components of the infrastructure would be designed in more detail and procured post-consent. It is for this reason that the EIA presented in the ESs have been undertaken based on assumptions made about the components based on a worst-case scenario. Although this is accepted in relation to the EIA, the actual aim post consent should be to try to design and procure components to provide the best-case infrastructure. This is essential to ensure the impacts of the developments are minimised for the community, in addition to the environment.

14.10. The Outline Onshore Substation Design Principles Statement as drafted does not provide the Councils with sufficient confidence that the Applicants will seek to secure a substation design where every effort has been made to reduce the overall size of the structure. The commitment within the document to continued engagement with Parish Councils, local residents and the relevant authorities on the design and landscape proposals is welcomed. It is however considered that this engagement must be more than a single consultation. Good design is a process which the key stakeholders, particularly the affected local community should be part of. The Councils therefore wish for the outline document to be updated to provide a more detailed outline of the engagement proposed. This would provide greater transparency and articulate in outline form, the process through which the local community would be involved, and at which stages in the design process this would be.

14.11. Without appropriate changes to the Outline Onshore Substation Design Principles Statement the Councils consider that there is insufficient control in relation to the engagement process and design of the Applicants' and National Grid's onshore substations to ensure that the development would comply with local policy.

14.12. The Councils have been engaging with the Applicants on the matters raised above.

National Grid - Air Insulated Substation (AIS) or Gas Insulated Substation (GIS)

14.13. In terms of the National Grid infrastructure the worst-case option presented is considered by the Applicants to be the use of AIS technology. This would result in a substation with a footprint 145m by 310m, which is almost three times the size of the footprint of a National Grid substation which utilised GIS technology (with a footprint of 140m by 120m). The ESs are however based on the worst-case scenario, and therefore the AIS substation has been utilised in the assessments provided. This has limited the ability to compare the impacts of the two technologies and assess the degree to which one technology is beneficial over the other. The Councils support the design of a National Grid substation which would minimise its detrimental impacts on the surrounding environment and local community. In the absence of a detailed assessment on the use of GIS technology in the National Grid substation, the Councils can in principle see benefits associated with the use of GIS technology in the following areas resulting from the significant reduction in the substation's footprint:

- a greater degree of separation from some residential properties which would help in terms of visual intrusion and noise disturbance,
- provide greater available space for mitigation planting,
- Reduce the impermeable footprint of the site and provide more space for SuDS,
- Potential reduction in the impact on the setting of built heritage particularly to the north,
- Reduction in the impact on any below ground heritage assets,
- Reduction in the impact visually and on the character of the landscape,
- Potential improvements in the experience of the new permanent PRoW through increased separation from infrastructure,
- Potential to avoid loss of a section of the historic parish/Hundred boundary,
- Greater availability of land for the provision of ecological enhancement measures,
- Greater flexibility in the design of the substation.

14.14. It is for the above reasons that the Councils support the use of a National Grid GIS at Friston in preference to the use of a National Grid AIS.

Future Connection Offers to National Grid Substation

14.15. In addition to the outline design principles providing insufficient control for the proposed development, neither the design principles nor the Outline Landscape Mitigation Plan (OLMP) adequately considers the potential of future development.

As highlighted in Section 6, National Grid has clearly shown through their connection offers for Nautilus and Eurolink interconnectors and preliminary connection offer for Five Estuaries (formerly known as Galloper Extension), that the substation proposed under this application will provide a strategic connection offer for future projects. The OLMP or an alternative masterplan document should therefore address the potential future expansion needs of the National Grid substation at the very least. The status and treatment of the National Grid substation needs further consideration taking into consideration the principles of good design.

14.16. National Grid Ventures has provided further information in relation to their Nautilus and Eurolink Interconnector projects and the land take required to facilitate their connections to the National Grid substation. The extract below was taken from their FAQ document dated May 2020 which is available on National Grid Venture's website (https://www.nationalgrid.com/document/132456/download).

"For Nautilus and EuroLink to connect to the proposed NGET substation at Friston, the proposed substation would require an extension for each additional project. NGV understand that typically the maximum land take required to facilitate extensions to NGET substations is approximately 1.3 hectares (3 acres) for each connection offered at a location. NGET has indicated that provision for the land required to extend its substation at Friston has been provided for as part of ScottishPower Renewables proposals for East Anglia ONE North (EA1N) and East Anglia TWO (EA2). Decisions on changes and upgrades to the NTS are made by NGET in its role as the Transmission Owner. NGV remain in dialogue with NGET to understand if any changes or upgrades may be required to the NTS as a result of NGV's connection agreements."

14.17. The land take required for the extensions to the National Grid substation are therefore known and information could easily be obtained from National Grid regarding the maximum height of the infrastructure. There is sufficient information available for the future connections to be included in the masterplan considerations.

Infrastructure Sharing and Consolidation

14.18. The Councils have set out in Section 6 the opportunity that is available through the BEIS OTNR for the Applicants to explore options for greater coordination with onshore infrastructure with the potential of regulatory flexibility. The consolidation of infrastructure would significantly reduce the onshore impacts of the projects, especially at Friston and therefore this should be fully explored.

Compliance with Local Policy

14.19. The Councils do not consider that the applications as submitted comply with local policy which emphasises the need for development to relate well to the scale and character of its surroundings. There is insufficient commitment to minimise the scale of the substations or address the known future intentions of the site. The Councils also consider that the options for infrastructure consolidation have not been fully explored.

Further Work Required

- Outline Onshore Substation Design Principles Statement
    - Submission of an outline Onshore Substation Design Principles Statement for the National Grid infrastructure either through an update to the current document or through a separate document.
    - Commitment within the Outline Onshore Substation Design Principles Statement for both the Applicants' substations and also the National Grid infrastructure to make every effort to reduce the size and scale of the substations during the post consent refinement process.
    - Expansion of the document to include further details regarding the design process and engagement measures.
- Amendment to the wording of Requirement 12(6) in the draft DCOs to include the need for the design details of the National Grid infrastructure to comply with the Outline Onshore Substation Design Principles Statement relevant to this infrastructure.
- Provision of an assessment of the use of a GIS National Grid substation.
- Exploration of the opportunity to consolidate and share infrastructure in association with the BEIS OTNR.
- Acknowledgement of the known future projects with agreement from NG-ESO to connect to the grid at Friston, in the CIAs. These connections should be taken into account within the siting and design considerations of the proposed substations.

15.Landscape and Visual Impacts

Lead Authority ESC

ESC Local Plan Policies

15.1. Policy SCLP3.4: Proposals for Major Energy Infrastructure Projects, states that the Council will take into consideration the nature, scale, extent and potential impact of proposals for major energy infrastructure projects. The policy states that projects will need to mitigate their landscape and visual impacts.

15.2. Policy SCLP10.4: Landscape Character, requires development to be informed by, and sympathetic to, the special qualities and features described in the Suffolk Coastal Landscape Character Assessment (2018) and Settlement Sensitivity Assessment (2018). The policy sets out an expectation that proposals demonstrate how they will protect and enhance a number of factors including the special qualities and features of an area, the visual relationship and environment around settlements and their landscape setting, distinctive landscape elements, seascapes, river valleys and significant views. Development will not be permitted where it will have a significant adverse impact on sensitive landscapes. Conserving and enhancing the landscape and scenic beauty of the AONB is identified as being of particular importance.

15.3. SCLP11.1: Design Quality, this policy makes it clear that good design should consider important landscape or topographic features and retain and/or enhance existing landscaping and natural semi-natural features on site.

Other Relevant Local Policy

15.4. The Suffolk Coast and Heaths AONB Management Plan draws attention to the special landscape characteristics of the AONB and that they should be protected and enhanced. These are set out in detail in the Character and Special Qualities document.

Key Local Issues

15.5. The principal issues of concern are twofold:

1. The landscape and visual impacts of the onshore elements of the project, including the cumulative impacts between EA1N and EA2.

2. The visual, landscape and seascape impacts of the offshore turbines on the Suffolk coast generally, as well as the AONB and its setting, including the cumulative impacts between the projects.

15.6. In addition, the secondary concerns are:

1. Cumulative effects with other projects - the in-combination effects between the construction and operation of the proposed projects and the construction and operation of Sizewell C Nuclear Power Station.

2. Construction effects - The Councils have also identified landscape and visual impacts associated with temporary development, particularly cable corridor works at Sizewell Gap and Aldringham which are a significant concern.

3. Loss of hedgerow and woodland trees - The residual impacts associated with the loss of hedgerows and woodland in the cable corridor and the associated constraints on replanting (and consequential impacts for landscape character and visual amenity). The Councils expect residual impacts on the character of the landscape in the cable corridor because of the loss of woodland at Aldringham, specifically on the east side of the B1122 adjacent to Gypsy Lane, as well as on the west side of the B1122 south of Aldringham Court (Aldringham Nursing Home, formerly Raidsend). Woodland will also be lost at Laurel Covert in association with the substation development.

Adequacy of Applications/DCOs

Design Assessment and Mitigation of the Substations at Friston

15.7. At the substations site immediately north of Friston, it will be particularly important to understand whether all reasonable endeavours have been made to minimise the scale, both through the parameters of the buildings themselves and through their siting, specifically whether they could be lowered into the ground. This is not sufficiently clear at present. This matter has been further discussed in Section 14 of this report.

15.8. Furthermore, it will be important to understand whether the proposed mitigation planting and suggested growth rates are capable of being delivered and that management of the site and associated planting is adequately secured for the long term, given the significant visual envelope of the development. In addition to the visual impacts there will be significant and permanent change to the character of the

landscape at the substations site including the surroundings and amenity of the village of Friston.

15.9. These matters have been a key concern of Friston Parish Council (in East Suffolk District) and residents in this area.

The Character of the Landscape at the Substations Site

15.10. The Applicants have not fully understood the character and significance of some of the features and landscape elements of the site, especially regarding the historic landscape character. Therefore, it has not been possible for the ESs to fully recognise the degree of harm caused by the development. An additional study of the site and its historic landscape features has been prepared by SCC Archaeological Service (Appendix 1). In summary the findings are as follows:

Extant historic landscape features, of local and regional importance, will be permanently destroyed as a result of the substation development. This will include the permanent destruction of part of the track as part of the historic Hundred and parish boundary, as well as of historic field boundaries. As such the landscape context of the regionally and potentially nationally significant moated site and associated land will be affected.

15.11. The report highlights that the extant historic landscape features, of local and regional importance, which would be affected by the EA1N and EA2 developments include:

- The permanent destruction of a track which is a landscape feature marking part of an Anglo-Saxon Hundred boundary and historic parish boundary. This is locally and regionally significant.
- Permanent destruction of locally significant historic field boundaries.
- Damage to the setting of a regionally and potentially nationally significant moated site and associated land.
- Impact on the character and spatial significance of the dispersed settlement pattern, and breakup of the physical and visual connectivity with Friston Church, as well as across the landscape as a whole.

15.12. The Councils recognise that the historic landscape features identified above, cross over several different topic areas covered by different chapters within the ESs submitted with the applications (Archaeology, Built Heritage, LVIA and PRoW).

15.13. Looking specifically at the track as one feature identified, the importance of the trackway is multifaceted, it is a Hundred and historic parish boundary, forms part of

a system of features related to the moor and moorside settlements, contributes to the setting of the church and Little Moor Farm and provides significant amenity value as a PRoW. This feature would therefore be considered differently within each chapter of the ESs.

15.14. From a built heritage perspective, the Councils are of the view that it would be best to address the track as a feature which contributes to the setting of the Grade II* listed church, contributing to the legibility of the historic landscape and how the church was connected to and experienced from the historic common land to the north of the village. The track also reflects an historic functional relationship between Little Moor Farm and the trackway which links the main village to the later settlement on the edges of Friston Moor. For this reason, the trackway is considered to contribute to the understanding of Little Moor Farm as a green farmstead (Peter Warner (1987) *Greens, Commons and Claylands Colonisation*). There is also a potential that Little Moor Farm was the site of a parsonage with tracks linking it to the churches, as detailed in the report in Appendix 1 (pages 18-20).

15.15. From an archaeological perspective, the track is clearly a Non-Designated Heritage Asset (NDHA) as a route and a feature. The Councils consider the track feature should be included as part of the baseline, which is referenced as missing from the Applicants' within report (paragraph 7.2 of Appendix 1). The track forms part of a long-standing, significant element of the landscape which can be traced beyond the, and the report also notes that nationally we do not have a picture of the survival and form of Hundred boundaries which should also be acknowledged as an additional consideration to existing baseline data.

15.16. In terms of assessment/impact and mitigation on its physical form as a monument present within the site, it has 'evidential value' with potential (once investigated) to see if it has a clearer form, and also for associated activity (e.g. burials at locations on boundaries, including 'deviant' burials).

15.17. From a LVIA perspective, Guidelines for Landscape and Visual Assessment (GLVIA3) makes it clear that the relationship between landscape and historic landscape matters is a close one. One complements the other. Landscape history, its historic character, the interaction between people and places through time, and the surviving features and their setting may be relevant to the LVIA baseline, and historic landscape characterisation and current landscape character assessment should both form part of the evaluation. There is an expectation that effective use should be made of existing historic landscape information.

15.18. There is an expectation that the Applicants should incorporate the SCC Friston and Knodishall Historic Landscape Assessment into the baseline for the overall LVIA for the substations and cable corridor development proposals. Without such incorporation, the LVIA cannot be considered complete. The historic landscape features identified could then have implications for the sensitivity identified for the site.

15.19. Finally, from a PRoW perspective the Anglo Saxon Hundred boundary and historic parish boundary is a PRoW which has significant amenity value resulting from its presence and its local, historical, and cultural importance as a right of way.

15.20. The Councils are concerned that even if all the historic landscape features are identified in this manner, this may still result in the historic landscape as a whole not being adequately captured. It is considered that a more holistic approach should be utilised with one document looking at the historic landscape character and features taking into account the interplay between the different disciplines. For example, disaggregating the assessment of the trackway as set out above could result in the assessments missing the importance of this feature as part of a wider network of features.

15.21. Although discussions are occurring within the various SoCG meetings on the topic of the historic landscape character, the Councils have suggested to the Applicants that it would be beneficial to bring these discussions together in one place and address the issue holistically. The Applicants have advised that they will provide a Clarification Note to address this issue. The Councils will continue to engage with the Applicants on this matter and await sight and review of the Clarification Note.

Proposed Mitigation Planting and Visual Impacts

15.22. The submitted applications have not adequately justified the effectiveness of the onsite planting at the substations site. The proposed growth rates are not considered reasonably likely to be achievable in the local conditions which include relatively light, free draining soils, and prolonged dry spells with little or no effective rainfall through the critical spring and summer periods.

15.23. The described growth rates are based on an Institute of Environmental Management and Assessment (IEMA) article titled 'Predicting the Growth of Trees and Hedge Planting when Determining the Effectiveness of Mitigation' and understood to be dated 2019. From this article the Applicants seem to be relying on predicted *national average* growth rates for newly planted mitigation planting. Being averages, it logically follows that within the range of growth rates recorded across the country,

some must have been higher than average (where growing conditions are particularly favourable such is in the West Country or Welsh Marches), and others must have been below average (where growing conditions are limiting such as East Anglia). It is well established that East Anglia has some of the lowest rainfall amounts in the UK, and soils towards the coast tend to be light and free draining. Given that the Applicants are relying on a national average figure, and that East Suffolk clearly is below average ideal growing conditions, it seems highly likely that the predicted growth rates will not be achieved. Please see Appendix 3 of this report for further supporting information.

15.24. It is worth noting that at the time of writing this LIR (September 2020) the arable harvest yields this year in the local area are down by 30% because of the long dry Spring period from March to June when no effective rainfall was recorded. If newly planted trees suffer such limiting conditions in the early years after planting, they rarely ever recover the lost growth.

15.25. The claim in the ESs that new planting will be approaching maturity after 15 years is not accepted by the Councils, and therefore neither are some of the claims of effective mitigation after 15 years. As a result, some the findings of the LVIA regarding the visual impacts of the substations site are not sound, particularly in relation to views and impacts in the wider landscape. The species set out in the OLEMS (APP-584, p25-26) although substantially agreed, should remain open for discussion and final agreement when the Landscape Management Plan (LMP) is agreed at requirements discharge.

15.26. We are engaging with the Applicants on this matter. It would be the Councils preferred option for the Applicants to update the LVIA, including the visualisations, based on agreed, realistic growth rates. Notwithstanding the Councils position on growth rates, we have suggested possible measures which the Applicants could adopt in order to reduce the concerns the Councils have expressed in relation to the growth rates and deliverability of the mitigation in a timely manner. The Councils have sought the Applicants' commitment to the use of adaptive maintenance and aftercare. This would allow the aftercare and maintenance period in relation to the substation mitigation planting to be suspended if specified parameters were not achieved. Targeted management measures could then be agreed to address the issues identified and only upon agreement with the local authority, would the aftercare/maintenance period re-commence. Therefore, if parts of the planting suffered delayed growth, or failed, the supervised aftercare period would effectively extend beyond 10 years. This approach to aftercare and monitoring has been deployed successfully for many years by SCC to manage the aftercare of planting schemes on former minerals sites.

The Substation Visualisations

15.27. The reliability of the submitted visualisations is compromised by the inclusion of areas of advanced planting which suggest the possibility of four years growth by the first year of operation, but with the risk of this advanced planting not actually being guaranteed or even likely to be deliverable.

15.28. Generally, the representation of planting particularly that said to illustrate 15 years of growth is not accurate or reliable. Some of the illustrative material in the LVIA appears to show trees and vegetation of significantly greater maturity, including features present which are indicative of vegetation around 50-60 years of age or older (see Appendix 3 of this report). Following discussions with the Applicants, subsequent information and graphics been supplied which offered greater clarity on this. It is acknowledged that they offer an improved understanding of how the mitigation planting may work, subject to the achievement of the predicted growth rates. That said, the Councils still do not accept the predicted growth rates as discussed above.

15.29. The LVIAs identify significant residual impacts on landscape character and visual amenity. The Councils have requested that further offsite planting should be provided in order to help offset the impacts identified. The Councils consider that offsite planting should be provided in strategic locations to reinforce field boundaries and PRoWs in the locality. The Councils also considered that a fund should be provided which members of the local community could utilise to provide private planting to help screen the views from individual properties. Discussions with the Applicants are ongoing in relation to this matter.

Assessment of Impacts and Mitigation in the Cable Corridor

15.30. The Councils accept that the undergrounding of the cabling in its entirety provides significant mitigation against visual and landscape impacts. The Councils would not accept the over grounding of the cabling from the landfall to the substations site.

15.31. The issue of hedgerow loss from an ecological perspective is discussed in Section 5.3 of the OLEMS. The ESs (Chapter 22, Summary Table 22.26 and Annex 1) concluded that there would initially be Major Adverse Effects resulting from hedgerow crossings in several locations although these can be mitigated through replacement planting with residual effects reducing to Minor Adverse. However, it is the view of the Councils that because these hedgerows were characterised by substantial trees

within them that would be removed and not replaced, significant adverse effects on landscape character will persist.

15.32. The OLEMS notes that there are 65 hedgerows within the onshore development area that fulfil qualifying criteria (including ecological) for classification as 'Important' under the 1997 Hedgerow Regulations. Whilst the Councils note the intention to reduce working width to 16.1m. wherever possible, this still represents a notable impact on the existing historic hedgerow pattern which is a key characteristic of the prevailing landscape character types. The proposal to carry out a detailed pre-construction hedgerow survey in order to have a detailed inventory of hedgerow characteristics to aid reinstatement is welcomed, as is the intention to install root protection areas for retained hedgerows during construction. The Councils seek the appointment of a suitably qualified arboricultural clerk of works by the developer as detailed in the OLEMS. The outline replanting proposals are acknowledged and at this stage are accepted as a positive move towards restoration of key landscape features.

15.33. Deer fencing is essential for effective establishment and protection of new woodland planting. It is welcomed that there is a commitment in the OLEMS to provide details of protection measures within the LMP.

Long Term Management of the Substation Site

The applications currently contain insufficient detail regarding the long-term management of the substations site. The draft DCOs, secure through Requirement 15, a period of ten years during which any planting which dies must be replaced. The Councils have previously set out their recommended for the inclusion of an adaptive maintenance and aftercare regime in place of the measures out currently. There is however no provision for the long-term management of the site. The Applicants' substations will remain on site for at least 25 years with the National Grid substation likely to remain significantly longer by virtue of its use as a strategic connection point for multiple projects. A management plan should be provided to detail how the site will be managed in the long-term.

15.34. In addition to a management plan, the Councils consider there is a need to establish a community liaison group. This group would provide a forum for communication between the site operators and interested local parties, including local residents, and the relevant local authorities, regarding the management and operation of the National Grid substation and the Applicants substations (or their successors in title). This community liaison group is considered particularly important considering the potential future expansion of the National Grid substation.

15.35. The long-term management of the site should be secured through the DCOs either by a commitment in the OLEMS or through a separate requirement.

Compliance with Local Policy

15.36. The projects, by virtue of their significant landscape and visual effects, are not considered compliant with local policy.

Further Work Required

15.37. The Councils considered that the following additional work or measures are required:

- Provision of a clarification note on the historic landscape character and features taking into account the interplay between the different disciplines.
- Submission of updated visualisations illustrating a more realistic depiction of 15 years of planting growth.
- Commitment to the use of adaptive maintenance and aftercare in relation to the substations' mitigation planting and replacement woodland planting.
- Commitment to the provision of strategic offsite planting and a fund to provide private planting to offset and compensate for the significant residual impacts identified in the ESs.
- Commitment to provide details regarding the long-term management of the site which would be secured through the DCOs. This would involve the commitment to produce a long-term management plan and the commitment to establish of a community liaison group.
- The commitments sought in relation to Section 14 (Design) are also relevant.

16.Seascape and Visual Effects

Lead Authority Natural England

ESC Local Plan Policies

16.1. Policy SCLP10.4: Landscape Character, sets out the importance of protecting and enhancing the special qualities and features of areas including the contribution made by the seascape.

Other Relevant Local Policy

16.2. The AONB Management Plan draws attention to the special landscape characteristics of the AONB and that they should be protected and enhanced. These are set out in detail in the Character and Special Qualities document.

Key Local Issues

EA1N Project

16.3. The offshore wind turbines of the EA1N project will have significant adverse effects in-combination with those of EA2. There are no significant impacts of the project alone on the AONB arising from EA1N. Cumulatively, there will be significant adverse landscape and visual effects on the coast of Suffolk from these projects cumulatively, including on the character and special qualities of the AONB. These impacts have been identified by the Applicants in the Seascape Landscape and Visual Impact Assessment (SLVIA). The Councils however recognise that EA1N is not considered to contribute significantly to the cumulative effect with EA2 in terms of visual impacts on the AONB.

EA2 Project

16.4. The offshore wind turbines of the EA2 project will have significant adverse impacts on the coastline between Covehithe and Orford. In addition, they will have significant in-combination effects with EA1N. Overall there will be significant adverse landscape and visual effects on the coast of Suffolk from these projects, including on the character and special qualities of the Suffolk Coast and Heaths AONB. These impacts have been identified by the Applicants in the SLVIA. The Councils consider that the proposals for the offshore turbines will have a direct and long-term negative impact on the nationally designated landscape and, given the design of the submitted scheme, that this cannot be fully mitigated.

16.5. The Councils are not satisfied, given the sensitivity and designation of the receiving landscape and seascape in general, that the Applicants have demonstrably exhausted all reasonable mitigation measures in terms of design of the scheme, including the height of the turbines.

EA1N and EA2 Projects

16.6. The horizon and sea views along this coastline are largely uncluttered and as such make a significant contribution to the character of place and the setting of the AONB and Heritage Coast. The nationally designated landscape of the AONB including its character and condition is much valued by visitors and residents alike and makes a key contribution in the local economy.

16.7. The Councils recognise that the principal consultee in respect of the impacts of the development on the AONB and their significance is Natural England. However, the Councils are seeking to meet their duties under section 85 of the Countryside and Rights of Way Act 2000 and to reflect the concerns of local communities.

Adequacy of Applications/DCOs

EA1N - Design, assessment and mitigation of the offshore turbines

16.8. The Applicants have identified significant cumulative effects between the two projects which will give rise to significant adverse impacts on the coastline and coastal waters including on the character and Special Qualities of the AONB. It is however recognised that the significance of the cumulative impact is primarily as a result of the contribution of EA2's impacts.

16.9. The Applicants have confirmed that they will be committing to a reduction in the maximum tip height of the turbines of both EA1N and EA2 from 300m to 282m. It is understood that the draft DCOs will be updated to reflect this commitment. The Councils welcome any reduction in the maximum height of the turbines but without an updated assessment cannot provide further comments at this stage.

EA2 - Design, assessment, and mitigation of the offshore turbines

16.10. The Applicants have identified significant effects from the EA2 project, and also in combination with EA1N, and that there will be significant adverse impacts on the coastline and coastal waters including on the character and Special Qualities of the AONB. Despite this finding they have concluded that it is not possible for these

impacts to be mitigated. The Councils acknowledge the commitment to reduce the maximum tip height of the turbines to 282m but understand this is not a form of mitigation but rather the result of further design refinement and supply chain engagement work. The effect of this reduction in tip height on the significance of the impact of EA2 is not known without the submission of an updated assessment. The ability for the Councils to provide further comment on this is therefore limited.

16.11. Given the sensitivity and designation of the receiving landscape and seascape, the Applicant has not demonstrated that all reasonable mitigation measures in terms of the design of the scheme, including a further reduction in the height of the turbines has been explored.

16.12. The Councils consider that if further mitigation is not deemed possible, the Applicant should seek to compensate/offset the harm caused. The Councils have been engaging with the Applicant on this matter.

The Statutory Purpose of the Area of Outstanding Natural Beauty

16.13. The Councils consider that the EA2 array undermines the purposes of the AONB designation as defined by s82(1) of the Countryside and Rights of Way Act 2000 (CRoW Act), that is, "conserving and enhancing the natural beauty of the area". The Applicant's design modifications include the modestly extended separation of the EA2 and EA1N arrays, and the reduction of turbine heights to 282 metres. In terms of the precise height and layout that would avoid unacceptable harm to the AONB, the Councils defer to Natural England on this matter and will be guided by them.

Compliance with Local Policy

16.14. The development of EA2 by virtue of the significant adverse effects identified in the ES on the AONB is not considered compliant with local policy.

Further Work Required

16.15. The Applicants should update their SLVIAs to take into consideration the reduction in the tip height of the turbines if the effect on the significance of the impacts of the projects is to be fully considered.

16.16. The Applicants should engage with Natural England regarding further modifications necessary to the height and layout of EA2.

16.17. The Councils will continue to engage with the Applicant for EA2 to seek appropriate compensation for the significant impacts identified as a result of the EA2 project.

17.Land Use

Lead Authority ESC

ESC Local Plan Policies

17.1. Policy SCLP10.3: Environmental Quality, seeks to protect the quality of the environment. The policy states that development proposals will be considered in relation to impacts on soils and the loss of agricultural land.

Other Relevant Local Policy

17.2. The East Economic Growth Plan 2018-2023 and NALEP Economic Strategy for Norfolk and Suffolk in 2017 identifies agriculture as an important and long-established sector in East Suffolk.

Key Local Issues

17.3. The main issue relates to the loss of agricultural land and disruption to agricultural activities. The majority of the land within the onshore Order Limits is arable although there are some non-agricultural areas comprising woodland and waterbodies.

17.4. The onshore development area covers Grade 2 (very good), Grade 3 (good to moderate) and Grade 4 (poor) agricultural land. The onshore substations and National Grid infrastructure will result in the permanent loss of agricultural land of Grade 2 and Grade 3 quality. It is important therefore that the loss of agricultural land is minimised through good design. The construction works at the landfall and along the cable route involve the temporary loss of land out of agricultural production. Agricultural land is vulnerable to structural damage, erosion, compaction, and introduction of notifiable weeds. The works may also degrade the soil quality and future agricultural productivity.

17.5. The principle of whether the applications are an appropriate use of land has been discussed within Section 6 Principle of Development. The impact of the applications on PRoWs is discussed within the next section of the report (Section 18).

Adequacy of Applications/DCOs

The ESs identify that the impact on agricultural land is minor adverse at a regional level during both construction and operation phases. Requirement 22 of the draft DCOs secures the production of a Soil Management Plan as a sub-document of the

CoCP. The Outline CoCP states that this Soil Management Plan will describe methods to avoid mixing of subsoil, minimise soil compaction and disturbance to the surrounding areas and reinstatement of soils in general accordance with their original structure and location. The Soil Management Plan will also include Method Statements for soil handling. A pre-construction land survey will be undertaken by a qualified Agricultural Liaison Officer to record details of crop regimes, position and condition of field boundaries, existing drainage and access arrangements and private water supplies.

17.6. The Applicants have stated in Chapter 21 of the ESs that it is not possible at this stage to calculate the area of land which would become isolated or inaccessible, but that it is likely to be a relatively small area. The Councils urge the Applicants to make every effort to keep such areas to an absolute minimum and to fully engage with individual farmers to ensure this is the case. Agricultural land is an important resource and prevailing characteristic of the landscape.

17.7. Although it is acknowledged that the Applicants will seek to minimise disruption to farming practices via good management measures secured through the CoCP, greater coordination between the construction phases of the projects would also assist. This has been discussed in Section 6, where the Councils requested a commitment to simultaneous construction of EA1N and EA2, or if sequential construction occurs the first project should lay ducting for the second. A more coordination method of construction between the two projects would help to lessen the disruption to land use activities.

17.8. In addition to the temporary loss of agricultural land, the development will also result in the permanent loss of an area of Grade 2 and Grade 3 agricultural land by virtue of the choice of substations site. The Councils have sought clarification from the Applicants as to why the significance of the impact on permanent changes to land use from such a substantial loss of Grade 2/3 agricultural is only identified as a minor adverse at a regional level and moderate adverse at a site level (Chapter 21, 21.6.2.1.2, paragraph 163). The ESs identify that the total permanent operational land take attributed to the onshore substations and National Grid infrastructure would be 33.59 hectares (Chapter 21, 21.6.2.1.2, Paragraph 162). Using the definitions in Table 21.8 this would be defined as a high magnitude of change, and the sensitivity of land has been defined as medium. This would result in an impact of major significance at a local site level. The Councils are currently discussing this matter with the Applicants, and it is understood that a clarification note will be provided.

17.9. The permanent loss of agricultural land this could potentially be reduced by measures to consolidate the infrastructure on site which have been highlighted in Section 6. The use of a GIS National Grid substation would also help to reduce the land take associated within the substation infrastructure.

Compliance with Local Policy

17.10. The Councils acknowledge that the ESs consider the effect of the projects on land use and agricultural land which is required by policy. The Councils however consider that through design choices and coordinated methods of construction, impacts on land uses and agricultural land could be reduced. Notwithstanding these points, to the best of the Councils understanding, the measures outlined in the Outline CoCP and secured through the final CoCP will help to minimise the impacts on agricultural activities.

Further Work Required

17.11. The Councils will review the clarification note regarding the impacts on agricultural land once it is received. The Councils will also continue to seek commitment from the Applicants to:

- Explore all opportunities for greater consolidation of infrastructure,
- Reduce the size and scale of the substations, including the commitment to the use of GIS for the National Grid infrastructure.
- Provide greater coordination within the delivery of the projects if consented.

18.Public Rights of Way

Lead Authority SCC

National Policy Statements

18.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, Public Rights of Way are not directly addressed as a generic impact in section 5 of EN-1 although they may be considered in terms of their relationship to the Historic Environment in para 5.8, Landscape and Visual in para 5.9, Socio-Economic Value in para 2.12 and Green Infrastructure in para 5.10 (see para 1.3.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

East Suffolk Local Plan Policies

18.2. Policy SCLP10.4: Landscape Character, recognises the importance of the PRoW network in relation to supporting health, wellbeing and social interaction and seeks to protect and enhance the provision.

Other Relevant Local Policy

18.3. Suffolk Green Access Strategy (Rights of Way Improvement Plan - ROWIP) is a statutory Plan produced by SCC as required by the CRoW Act 2000 (Section 60 and 61). It provides a clear direction as to how the rights of way and access network is managed, maintained, and improved to meet the needs of all users.

18.4. Improving the quality of the experience on urban and rural rights of way has become increasingly important politically and strategically and the Green Access Strategy highlights the importance of the rights of way and access network for health and wellbeing, safe and sustainable travel, leisure activity and economic growth. It represents SCC's commitment to making the very most of this asset and to provide our residents, our business community, and our visitors with an array of different and innovative opportunities to use, enjoy and benefit from.

18.5. Objectives within the Strategy include protecting the network from adverse impacts from new developments and to create a more connected network.

Key Local Issues

18.6. The onshore works associated with the cable route will affect 26 PRoWs in the locality during construction, whilst the substations works will require the permanent

stopping up of a section of PRoW to the north of the village of Friston. The access network serves both residents, visitors, and tourists.

18.7. Around the village of Friston, the access network will be severely compromised by the construction of the substations site and residents, and others, will suffer both temporary disruption and permanent loss of a key public footpath.

18.8. The access network including PRoWs, open access and common land are also key features of the visitor experience of Suffolk. The quality of the coastal landscape, its high level of accessibility and its connectivity to coastal towns, villages, and hinterland, are the draw for visitors. A third of Suffolk's residents say the countryside is the best thing about living in Suffolk, making green access a key driver in growing the visitor economy (Destination Research, Economic Impact of Tourism Suffolk 2016).

18.9. The Councils therefore want to ensure the disruption to the PRoW network is minimised and where impacts cannot be avoided, appropriate and timely mitigation needs to be provided.

Adequacy of Applications/DCOs

Amenity and Quality of user experience on PRoW affected by the developments

18.10. The impact of the developments on the amenity and the quality of the user experience of the PRoW network has not been adequately addressed in the applications. This aspect should be a separate theme within the ESs in order to address the impact on both the tourism industry and local communities. For example, PRoWs are considered in the tourism assessment using receptors suitable for a tourism business or attraction. This is not appropriate for PRoWs which individually may not be a tourist attraction, but as a network, are integral to the tourism offer for Suffolk and a highly valued local amenity. The lack of a holistic approach to PRoWs and amenity has resulted in omissions and contradictions in the ESs.

18.11. The Applicants have addressed some of the logistical aspects relating to the closure of the physical infrastructure of PRoWs with the provision of alternatives, temporary and permanent, through the Outline PRoW Plan but has not addressed the impact on the amenity value of these PRoWs.

Cable Corridor and Landfall Site

18.12. The fact that many PRoWs along the cable corridor and substations site will only be closed temporarily does not mean that they are preserved as a local amenity when the ability to derive any enjoyment from them is severely reduced as they are unavailable to users. The applications do not recognise or mitigate for this loss of amenity.

18.13. In the Tourism, Recreation and Socio-Economics - Chapter 30, the Applicants have failed to recognise that the Sandlings Walk is a tourism asset. It is a long-distance route that is promoted nationally (Cicerone publication and shown on OS Explorer Maps) and should according to Table 30.10 have a medium sensitivity. Appropriate mitigation should be applied via a suitable crossing of the cable route

18.14. The Applicants have failed to identify that the proposed route of the new National Trail, the England Coast Path, will be affected by the landfall site. This will be the first National Trail in Suffolk and is anticipated to bring economic benefits to the region.

Substations Site

18.15. The choice of location for the viewpoints with regards to the Landscape & Visual Impact (Chapter 29) at the substations site is not adequate with respect to the impact on walkers. The selection of viewpoints situated 1km apart at the extremities of the public footpath on the western edge of the substations site (Friston FP17) inevitably results in an underestimate of the actual impact of the development on a person walking that footpath.

18.16. There are no viewpoints taken from the proposed new public footpath that replaces the permanently stopped up footpath. This new route is exposed in parts to views of the development and thus the impact of the amenity and quality of the walking experience has not been recognised, or mitigated, by the Applicants.

Permanent Closure of Public Footpath at the Substations Site

18.17. We disagree with the statement in the Onshore Substation Design Principles Statement that the “overall site design will seek to deliver gains for public amenity, including enhanced access through PRoW proposals”.

18.18. The permanent stopping up proposals will remove a historic, tranquil and attractive walking route in a rural landscape and replace it with a circuitous route that is not wholly screened from the new industrial landscape, running adjacent to the open

road in parts and possibly in a ditch. During construction, there will be physical disruption, noise, a loss of tranquillity and a severe visual impact which will continue following construction. This is not a gain to the pleasantness and attractiveness of the walking routes around Friston.

18.19. The plan showing the proposed alternative public footpath is not adequate. The locations for the new alternative routes need to be accurately surveyed and mapped, together with a written description, including width, so that a definitive map and statement can be produced post-DCO.

Outline Public Rights of Way Strategy (OPRoW)

18.20. The principles for management in the OPRoW are broadly acceptable for taking forward to the detailed PRoW strategy. However, there is inadequate detail provided as to the phasing and duration of closures, particularly where several PRoWs are close together and the PRoWs at the substations site. The Councils are concerned that there could be closures and disruption of a network of PRoW all at the same time, leaving local walkers with very limited or no access at all.

Compliance with Local Policy

18.21. The importance of the PRoW network is recognised in local policy, the impacts of the development on the network has been set out above. As the proposals currently stand the applications are not considered compliant with local policy in respect of protecting and enhancing the PRoW provision. The impacts on the amenity and quality of the user experience has not been fully assessed or mitigated.

Further Work/Mitigation Required

18.22. The Councils continuing to engage with the Applicants regarding the impacts of the projects both during construction and operation on the PRoW network to seek further mitigation/compensatory measures, should the DCOs be consented.

19. Noise and Vibration

Lead Authority ESC

ESC Local Plan Policies

19.1. Policy SCLP10.3: Environmental Quality, states that proposals will be expected to protect the quality of the environment and to minimise and, where possible, reduce all forms of pollution and contamination including noise pollution.

19.2. Policy SCLP10.4: Landscape Character, provides that proposals for development should protect and enhance the tranquillity and dark skies across the District.

19.3. SCLP11.2: Residential Amenity, states that the Council will have regard to noise and disturbance with the expectation that developments will not cause an unacceptable loss of amenity for existing and futures occupiers in the vicinity.

Other Relevant Policy

19.4. AONB Management Plan 2018-2023.

Key Local Issues

19.5. The Councils are concerned about the noise and vibration impacts during the construction phase, relating to the works themselves, the operation of the CCSs and associated HGV movements more generally. There are specific locations of concern along the onshore Order Limits where residential properties are in close proximity to the proposed working areas. These include the landfall site; area south of Sizewell Gap Road; Aldringham crossing and at the substations site. The Councils raised significant concerns regarding the proposed Saturday working hours during pre-application engagement.

19.6. A key concern of the Councils and the local community relates to the impact of the operational noise from the substations in the operational phase which would continue effectively on a permanent basis. The background sound levels in this location are very low and it is considered that the introduction of these new substations will permanently alter the noise climate in the surrounding area in terms of both the sound level and character. The Councils therefore disagree with the Applicants' conclusions that noise from the substations will not have a significant impact on the surrounding noise sensitive receptors. In addition, there is also significant concern regarding the Applicants' BS4142 assessment, which does not

apply any acoustic feature corrections to the predicted operational noise levels for tonality and other characteristics, despite precedent and evidence that these features can reasonably be expected from these types of onshore substations.

19.7. The proposals include alterations to the existing National Grid overhead lines which in addition to the realignment works include a new pylon and sealing end compounds. If this work introduces any additional power line tonal noise to nearby receptors this must be fully assessed.

Adequacy of Applications/DCOs

Construction Noise and Vibrations

19.8. Significant levels of construction noise and vibration are likely to occur at some sensitive receptors during the construction period. There is an expectation that the principles and requirements of BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration be implemented in full to reduce the impact on sensitive receptors. This was broadly agreed during early consultations with the Applicants.

19.9. BS 5228-1:2009 + A1:2014 sets out two example methods which can be adopted for the assessment of construction noise. Example Method 1 "The ABC method" specifies construction noise limits for various times and days based on the existing ambient noise level at a noise-sensitive receptor. These thresholds are presented in Table 25.9 of Chapter 25. Category "A" thresholds were adopted for all receptors because ambient noise levels at measurement locations were below the threshold values for Category "A". This reflects the quiet character of the area. Ambient noise measurements (Tables A25.3.5 and A25.3.6) were of relatively short duration, which we consider unlikely to be representative of the typical noise climate at all locations.

19.10. Residential receivers have been categorised to be of medium sensitivity.

19.11. A SoundPLAN model was generated utilising the BS 5228-1:2009+A1:2014 prediction methodology to predict construction noise levels during the phased assessment periods defined in Table A25.4.1. Predictions were based on the number and type of on-site construction plant and activities, with corrections for; the "on-time" of the plant (as a percentage of each assessment period), distance from source(s) to receptor(s), acoustic screening by barriers and buildings, and intervening ground type. Predictions are presented as a "Maximum Predicted Receptor Noise Level dBA"

for each period, which are of varying length. The assumptions informing the combination of plant and activities within each assessment period are not explained, including where construction processes would overlap multiple assessment periods.

19.12. The predictions indicated by the "Maximum Predicted Receptor Noise Level dBA" indicate that there will be no impact on nearby receptors at the landfall location and no daytime impact on nearby receptors at the substations' location or along the onshore cable route. Therefore, the report has concluded that no additional noise mitigation measures will be necessary for these elements, although Appendix 25.4 does state that an overall 5 dB(A) reduction was applied to the predictions as a "conservative" measure based on assumed Best Practice construction mitigation.

19.13. The Councils consider that there is insufficient information in the report to determine if the noise predictions presented are representative. There remains some uncertainty regarding various aspects of the modelling methodology and the assumptions made in order to present a singular "Maximum Predicted Receptor Noise Level dBA" for each construction assessment period; particularly where individual construction activities would overlap different assessment periods. This may have resulted in an underestimation of impact and therefore also in the requirement for mitigation. However, we acknowledge that construction proposals cannot be fully developed until sub-contractors are appointed and that the prediction methodology includes necessary assumptions. It is therefore considered that the "Construction Phase Noise Management Plan" committed to in the outline CoCP should be based on an updated assessment of construction noise based on more detailed construction proposals.

19.14. BS 5228-1:2009 + A1:2014 and "the ABC method" seek to protect sensitive receptors whilst acknowledging the inherent noise associated with construction activities. However, it should be acknowledged that there are certain points along the cable route that are extremely close to the construction works (principally areas south of Sizewell Gap Road, Aldringham crossing and the substation site). Due to the proximity of works, duration of works and/or type of works (which include significant noise sources such as piling and may necessitate 24-hour operation of plant for dewatering) there are likely to be periods when construction noise levels could cause significant disturbance and potentially exceed "Category A" threshold values. It is therefore considered that enhanced mitigation may need to be employed to adequately protect residents. This will need to be addressed in the CoCP along with the "Standard Mitigation" stated in the outline document.

19.15. It is likely that, in addition to monitoring required to ensure that works are compliant with the relevant threshold limits, further (longer-term) baseline noise monitoring

will be required in particularly sensitive locations prior to construction commencing to inform the requirements for localised, site specific mitigation. Plans for monitoring will need to be included in the CoCP and agreed with the local planning authority.

19.16. During pre-application engagement the Councils identified concerns with Saturday afternoon working for construction activities, this appears to have been addressed in Appendix 25.2 Noise and Vibration Cumulative Impact Assessment:

"As a worst-case scenario, HDD has been assumed to be in operation at the landfall location for 24 hours a day and assessed accordingly; for all other construction activities at the landfall, onshore cable route and onshore substation *the assessment is based on construction between the hours of 07:00 to 19:00 Monday to Friday, and 07:00 to 13:00 on Saturday. Piling works may be required to provide a stable platform base for the HDD works at landfall, and for substructure works at the onshore substation and National Grid infrastructure. To present a conservative assessment, piling activity was included in the construction noise modelling and assumed to take place during early mobilisation works in Month 1 to Month 4 at the landfall, and at the onshore substation between Month 7 and Month 10. Piling work in the assessment is based on construction between the hours of 07:00 to 19:00 Monday to Friday, and 07:00 to 13:00 on Saturday."*

19.17. The Councils welcome the commitment to not work Saturday afternoons.

19.18. Construction works will be undertaken during daytime hours where practicable, except for essential activities including (but not necessarily limited to) those set out in Requirement 23(2) and Requirement 24(2) of the draft DCOs (APP-024). Prior to undertaking any such activities, the timing and duration of such works will need to be approved in advance by ESC through an agreed process to be included in the CoCP, considering the noise and vibration impact where appropriate. Any such works will then need to be carried out within the approved timeframe.

Operational Noise

19.19. Following an initial assessment by the Councils, significant concerns were raised in terms of the assessment and likely operational impact of noise from the projects. As a result, the Councils have appointed consultants to review the DCOs and pay particular attention to operational noise from the projects alone and in-combination with each other and the National Grid infrastructure.

19.20. The Councils have significant concerns over the reliability of the source data and methodology used to predict the operational noise levels from the two substations.

ESC's consultants have met with the Applicant's noise consultants to discuss these concerns and have requested additional information to validate the reported levels. Additional information offered by the Applicants in relation to the source data, modelling methodology and data analysis along with predicted levels from the National Grid substation site is yet to be received. The Councils concerns over the reliability of the individual and cumulative predicted operational noise levels therefore remain unresolved.

19.21. The reported operational noise levels do not include any acoustic feature corrections, as required by the assessment standard (BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*) where the source is expected to contain tonality, impulsivity, intermittency or other characteristic elements which are likely to affect the impact onto noise sensitive receptors. The Councils are not satisfied by the evidence provided by the Applicants to justify the claim that acoustic feature corrections are not required in this case, particularly in relation to tonality. The Applicants' position is contrary to precedent set in other similar DCOs where a tonality correction has been applied to noise form onshore substations as a matter of course.

19.22. Operational noise will be governed by the limits set in Requirements 26 and 27. This has been set in the draft DCOs as a level of 34 dB L_{Ar} at the nearest receptors. The Councils do not consider this to be an appropriate limit for operational noise which has been set on the basis that 5 dBA above the background sound level is considered as the Lowest Observed Adverse Effect Level (LOAEL). The Councils do not agree that operational noise at a rating level up to 5 dB above the background sound level can be said to have no adverse impact. There is precedent in other similar DCO applications for the LOAEL threshold for operational noise from onshore substations to be set at the background sound level established at noise sensitive receptors.

19.23. Furthermore, the Councils consider the Applicants assumed value for a typical background sound level of 29dB $L_{AF90,\ 5mins}$ to be an overestimate of typical background sound levels at the residential receptors. This is based on the Councils officers and the consultants previous experience of monitoring the sound climate in the area. The Applicants have supplied details of the measurement data and statistical analysis used to determine a figure of 29dB $L_{AF90,\ 5mins.}$ The consultants have reviewed the data supplied and, on this basis, has suggested an alternative figure of 24 dB $L_{AF90,\ 5mins}$ as figure for a representative background sound level to determine appropriate rating noise limits for operational noise. The analysis is provided in Appendix 4 of this report.

19.24. Given the National Grid infrastructure required, and likely future projects, the Councils are concerned regarding background noise creep in the study area. It is noted that the operational noise rating level of 34 dB L_{Ar} set by draft Requirement 26 provides a limit which is applicable for either one project alone or cumulatively for both EA1N and EA2 projects. This limit however represents an increase on the existing background sound level. If the proposed development is consented, the projects will change the sound climate in the surrounding area on a permanent basis.

19.25. The Councils are aware of existing and potential connection offers being made by National Grid which could result in further development in the locality (see Section 6). Future assessments would then be based on the 'new' sound climate including EA1N and EA2 and result in continued noise creep.

19.26. The Councils have undertaken site work and observed that National Grid substations are also a complex source of sound emissions. Given that the proposed development of onshore infrastructure for EA1N and EA2 inherently require the National Grid infrastructure, the Councils' view is that any target sound rating level must apply to any combination of the three site sources at the nearest noise sensitive receptors.

19.27. The assessments also fail to consider the potential impact of noise on any receptor other than dwellings, so the impact on amenity spaces such as gardens and footpaths which pass close to the site has not been addressed. The assessments have also not addressed the potential impact on non-residential receptors such as wildlife in the surrounding area. Concerns in relation to these matters have also been highlighted in the sections of this report on Ecology and PRoW.

19.28. The Councils do not consider that the Applicants have fully assessed some of the factors that determine the noise impact from a project as set out in Paragraph 5.11.3 of EN-1 and described as follows:

- The inherent operational noise from the proposed development, and its characteristics;
- The proximity of the proposed development to noise sensitive premises (including residential properties, schools, and hospitals) and noise sensitive areas (including certain parks and open spaces);
- The proximity of the proposed development to quiet places and other areas that are particularly values for their acoustic environment or landscape quality; and
- The proximity of the proposed development to designated sites where noise may have an adverse impact on protected species or other wildlife.

19.29. In not addressing these factors sufficiently, the Applicants in the Councils' view have not therefore satisfied the assessment requirements as set out in Paragraph 5.11.4 of EN-1. Further, the aims as set out in 5.11.9 are not considered to be satisfactorily achieved.

19.30. Finally, it does not appear that the Applicants have set out any options for noise mitigation for the operational phase to human or other noise sensitive receptors. The assessments consider that the rating level proposed (with no consideration of acoustic character of the source compared with the existing sound climate) would be suitably protective and therefore is the mitigation.

19.31. The Councils do not agree with this approach, and as a minimum consider the Applicants could review the onshore infrastructure proposed, the types of equipment to be installed, the sounds they may generate and determine how these sources could be further mitigated (for example by enclosure or attenuation) in order to try to achieve the noise aims within EN-1.

Compliance with Local Policy

19.32. The Councils have concerns regarding both the construction and operation noise associated with the project and cumulatively with both projects. It is not considered that the applications comply with local policy. The developments alone and in-combination would potentially have significant adverse impacts on residential properties, their amenity, and the surrounding environment.

19.33. As discussed in Paras 19.29, 19.30 and 19.32, the application fails to address and therefore satisfy the assessment requirements and noise aims of the Overarching National Policy Statement for Energy (EN-1).

Further Work Required

19.34. In terms of construction noise, the Councils request that the Outline CoCP is updated to include:

- Commitment that the "Construction Phase Noise Management Plan" described in the outline CoCP will be informed by an updated assessment of construction noise based on finalised construction proposals as and when they are available.
- Commitment to providing specific mitigation measures for the areas where the onshore Order Limits and hence construction works are in close proximity to residential properties. Locations include properties south of Sizewell Gap Road, Gypsy and Fitches Lane and immediately around the substations site in Friston.

- Commitment that proposals for construction noise monitoring will be included in the CoCP and would be agreed with the local planning authority.
- Commitment that prior to undertaking any essential night-time working, the timing and duration of such works will be approved by ESC through an agreed process to be included in the CoCP, including consideration of the noise and vibration impact where appropriate.

19.35. In terms of operational noise, the Councils request that the Applicants undertake the further work identified/supplies the following additional information as previously offered:

- Details of the layout and sizes of the difference noise sources modelled on both substations sites.
- A break-down of the relative level of noise generated by the different sources at each receptor location.
- Clarification on whether the reported A-weighted or Octave band source data reported for operational noise sources have been used in the noise model.
- Results of noise modelling of National Grid substation.
- 1/3 Octave measurement data from existing substations to substantiate the position that operational noise is not expected to contain tonal elements.
- Confirmation of whether the effect of air humidity on corona discharge noise from existing power transmission lines was considered during the noise survey data analysis process.
- Reconsideration of the identified background level for the site.
- Assessment of the effect of operational noises on the amenity and character of the areas that these sounds would be introduced into.
- Assessment of the impact of operational noise on ecological receptors.
- Further consideration should be given to noise mitigation options which could be utilised.
- Amendment to the wording of Requirements 26 and 27 to set the noise limit at or below background levels and to include an additional monitoring receptor to the north of the site.

20.Socio-Economic Impacts

Lead Authority Workforce SCC, Lead Authority Tourism ESC

National Policy Statements

20.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, socio-economics is addressed as a generic impact in section 5.12 of EN-1 (see para 1.3.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

ESC Local Plan Policies

20.2. Policy SCLP6.1: Tourism, recognises that tourism is a substantial and important part of the East Suffolk's overall economy, which brings benefit to quality of life and well-being of communities.

20.3. Policy WLP2.2: Power Park, recognises the huge potential for growth in the former Waveney area associated with the development of offshore wind farms.

Other Relevant Local Policy

20.4. The importance of clean energy as an economic opportunity for the region is prioritised in the following key economic policy documents:

- The New Anglia Local Industrial Strategy
- The Norfolk & Suffolk Economic Strategy
- The East Suffolk Economic Growth Plan 2018 – 23.

20.5. The importance of the tourism sector and the economic benefits that it brings to the local area are also highlighted in the above documents as well as the AONB Management Plan 2018-2023 and the Suffolk Coast Tourism Strategy 2013-2023.

20.6. Hardisty Jones Associates Sizewell C Economic Impact Assessment suggest that there could be potential impacts upon tourism and recreation from Sizewell C new nuclear power station during construction and cumulative impacts.

20.7. SCC Raising the Bar Strategy 2018-2020 aims to promote young people's progression to higher education and to improve youth employment rates.

20.8. Inclusive Growth is identified as one of three headline priorities for SCC in its Statement of Priorities for 2017 – 2021.

Key Local Issues

20.9. The Councils welcome the overall economic opportunity that the construction of EA1N and EA2 will open up for the area and remain committed to working in partnership with the Applicants to ensure that the potential benefits are fully realised.

20.10. The Councils have enjoyed a positive, collaborative relationship with SPR and through the two consented projects of EA1 and EA3, have been able to deliver benefits for the region and SPR through the shared objectives encapsulated in a MoU.

20.11. In our response to the Stage 4 consultation, the Councils highlighted a number of areas in which we hoped to see further action from the Applicants in order to enhance the local socio-economic benefits achievable.

Tourism

20.12. The projects alongside other major developments have the potential to create additional demand for accommodation in the peak tourist season with a potential consequence of either deterring tourists due to occupancy rates or driving accommodation prices to a premium.

20.13. The Suffolk Coast Destination Management Organisation (DMO) commissioned BVA BDRC in 2019 to evaluate the impact EDF Energy's Sizewell C new nuclear power station and EA1N and EA2 wind farms will have on the Suffolk Coast from a tourism perspective. The research involved a visitor survey of both actual and potential regional visitors and a tourism business survey. The survey highlighted that regular tourists who find it difficult to find accommodation will be dissuaded from returning in the future. In the absence of detail about where non home-based workers are coming from there is a concern that at certain times of the year this could adversely impact on the availability of tourist accommodation.

20.14. The majority of visitors are drawn to the area because of the beauty and tranquillity that it offers with the Heritage Coast and nationally designated landscape of the AONB. With a number of major energy projects being developed along the coast at the same time as EA1N and EA2 (in particular the proposed Sizewell C new nuclear power station), it is likely that this key target market will be significantly impacted. The DMO visitor survey (2019) highlighted that the visitor numbers are likely to drop by 17% - which equates to £20-30 million of lost economic activity in the area.

20.15. Emerging evidence from the development of Hinkley Point C highlights the importance of reducing the potential impact of major energy projects on visitor numbers through the proactive agreement of mitigation measures. As such, we are keen for plans to be agreed with the Applicants in this area as early as possible with an adequate mitigation strategy to offset the anticipated impacts that the projects could have on visitor numbers to the region.

Local Supply Chain

20.16. Opportunities exist for local businesses to become part of the onshore and offshore supply chain as demonstrated through the levels of local contract spend for EA1. The Councils expect to see the same positive commitment to maximise local content for EA1N and EA2 and indeed the EA3 development. Associated with this are the likely employment prospects that would be available through this avenue and through the provision of indirect services.

20.17. The potential scale of local economic growth hinges on the choice of both base and marshalling ports, which the Applicants have not confirmed. However, it is important that the Councils work with SPR to ensure the £30 million investment from EA1 in port infrastructure at Lowestoft and Great Yarmouth is maximised, specifically EA1's Operations and Maintenance base at Lowestoft.

Skills & Employment

20.18. The Councils are concerned that there is the potential for cumulative pressures on the local labour force, leading to workforce displacement and a distorted labour market that will adversely impact local businesses. Significant displacement caused by the cumulative pressures of many infrastructure projects, in particular EA1N and EA2 together with the proposed Sizewell C new nuclear power station, building in the same timeframe will lead to wage inflation and potentially reduce the availability of local workers, necessitating in the need for non-home-based workers traveling into the area.

20.19. There is a high-level ambition to develop a sustainable regional and national supply chain that will require an enhanced education and training offer, providing additional indirect benefits. However, our paramount concern has been that every effort should be undertaken to ensure that a significant proportion of these benefits is localised. Typically, with significant infrastructure projects, the potential positive benefits are regionally felt whilst the negative impacts of the development are felt far more locally.

Distribution of Benefits

20.20. There is currently little consideration given to the differential impact that the projects will have on people and localities across the area and we would like to work with the Applicants to understand the distributional economic and social impacts of the projects and to co-develop a strategy to ensure that the potential benefits of the development are properly shared.

20.21. The Councils are keen to ensure that the towns and villages close to the developments are able to benefit from new opportunities for training and employment. On a wider level, we are also keen to explore with the Applicants how the projects will help to support our inclusive growth agenda and tackle challenges such as low wages and social exclusion at a local level.

Adequacy of Applications/DCOs

Tourism

20.22. Volume 1, Chapter 30 of the ESs provides an adequate assessment of effects, with the exception of the possible impact on tourist accommodation, the wider visitor economy and cumulative effects.

20.23. The ESs identified there was sufficient accommodation available in the locality to accommodate the workers associated with both projects constructed simultaneously. However, the Councils were concerned about the capacity of the accommodation sector in the local areas to accommodate the cumulative number construction workers from the projects and Sizewell C. The Councils therefore requested an update to the CIA from the Applicants taking into consideration the Sizewell C DCO material. In response the Applicants provided the Councils with a draft clarification note. It was stated that in the worst-case scenario of all peak Non Home Based (NHB) workers for all the projects colliding with the peak tourist season, there would be a potential excess of demand. The Applicants however argued that this worst-case was unlikely to happen as based on the construction programmes the Sizewell C peak was considered to occur after the completion of the EA1N and EA2 projects. EDF has also proposed an Accommodation Strategy in order to mitigate the impacts on the accommodation sector including a worker campus and caravan park in addition to other measures. The Councils accept the conclusions of the clarification note in relation to the impacts of the projects on tourist accommodation.

20.24. The Applicants have not undertaken their own visitor perception survey to assess and measure the tourism related impacts of the proposed development. The reliance on

desk-based research and Trip Advisor reviews of wind turbine visual impacts is inadequate and not sufficiently robust. This cannot accurately assess the tourism related impacts of the disruption caused by the offshore and onshore construction work nor can it realistically assess visitor perceptions of the completed windfarms and onshore substations.

20.25. As stated previously, the DMO survey (2019) identified a potential net drop in visitors to the Suffolk Coast for days out or holidays of 17%. With fewer people prepared to consider visiting during the construction of the projects, fewer trips will happen and BVA BDRC's analysis indicates this will cost the tourism sector at least £24 million per annum. The findings of the DMO's survey have not been addressed within the applications.

20.26. The SLVIA identified significant effects from the offshore infrastructure of EA2 on the AONB. The AONB and Heritage Coast are designations which are currently based on the tranquillity and unspoilt nature of the area. It is this natural asset which tourists come to visit. The Councils are concerned that the harm caused to the AONB could have a consequential impact on the tourist industry.

20.27. In order to help overcome the potential decline in the visitor activity as a consequence of visitor perceptions during the construction periods of the projects and overlapping construction phases with Sizewell C, the Councils consider that there is a need to develop marketing activity to attract increased numbers of overnight visitors to the area. The Councils are currently discussing this with the Applicants. The impact on visitor perceptions would be exacerbated further if other nationally significant infrastructure projects were constructed in similar timeframes.

Skills, Education and Employment

20.28. We are satisfied that the ESs have provided adequate assessment of skills, education, employment and economic development, and that through a MoU between the Councils and SPR we will be able to continue to work in partnership to maximise the positive local benefits.

20.29. The MoU establishes a commitment between SPR both as a developer and as a significant regional employer to work with the Councils to maximise the education, skills, and economic benefits of the East Anglia Offshore Wind Projects. Through the MoU SPR have been able to enhance and enrich existing regional projects and priorities. The flexible nature of this process means that as our regional objectives change, as they have done with the challenges of Covid-19 recently, SPR are able to adapt and flex their support to ensure it is still relevant.

20.30. We also welcome SPR's involvement in the All Energy Industry Council and their commitment to deliver local content as demonstrated through their signing of the Industry Charter as part of the Offshore Wind Industry Council and the Offshore Wind Sector Deal.

Compliance with Local Policy

20.31. A number of potential socio-economic benefits have been highlighted above however the Councils remain concerned regarding the impacts of the projects on visitor perceptions. Local policy recognises the importance of tourism to the district economy and therefore further work is required to be undertaken by the Applicants in light of the findings of the DMO survey (2019). It is essential that the cumulative impacts of the projects are adequately mitigated and/or compensated.

Further Work/Mitigation Required

20.32. The Councils consider that there is a need to develop and undertake marketing activity to attract increased numbers of overnight visitors to the area. The Councils will continue to engage with the Applicants on this matter.

21.Traffic and Transport

Lead Authority SCC

National Policy Statements

21.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, traffic and transport is addressed as a generic impact in section 5.13 of EN-1 (see para 1.3.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

Legislation

21.2. The Road Traffic Regulation Act 1988 places a duty on Local Highway Authorities (in light if studies into crashes) to take such measures as appear to the authority to be appropriate to prevent such accidents, including the dissemination of information and advice relating to the use of roads, the giving of practical training to road users or any class or description of road users, the construction, improvement, maintenance or repair of roads for the maintenance of which they are responsible and other measures taken in the exercise of their powers for controlling, protecting or assisting the movement of traffic on roads.

ESC Local Plan Policies

21.3. Policy SCLP2.2: states that the Council will work with other parties in supporting and enabling delivery of key strategic infrastructure in particular:

- Ipswich Northern Route
- A12 improvements
- A14 improvements
- Sustainable transport measures in Ipswich
- Improved walking and cycle routes

21.4. With regard to Major Energy Infrastructure, Table 3.6 lists a number of relevant issues that need to be considered:

- Suitability of local roads to cope with the number and type of vehicle movements necessary for construction;
- The agreement of dedicated routes with local community participation;
- Need for park and ride facilities;
- Inadequate provision of laybys on the Suffolk road network; and
- Cumulative impact of associated growth in and outside Suffolk;

21.5. Policy SCLP 3.4 of the ESC Local Plan sets out that proposals for major infrastructure projects will be considered against a number of policy requirements, including:

- Appropriate packages of local community benefit to be provided by the developer to offset and compensate the burden and disturbance experienced by the local community for hosting major infrastructure projects;
- Appropriate road and highway measures (including diversion routes) for construction, operational and commercial traffic to reduce the pressure on the local communities;
- The development and associated infrastructure proposals are to deliver positive outcomes for the local community and surrounding environment;
- Cumulative impacts of projects are taken into account and do not cause significant adverse impacts; and
- Appropriate monitoring measures during construction, operating and decommissioning phases to ensure mitigation measures remain relevant and effective.

21.6. Policy SCLP7.1 of the ESC Local Plan sets out that development proposals should be designed from the outset to incorporate measures that will encourage using non-car modes. The policy goes on to state that development will be supported where:

- It is proportionate in scale to the existing transport network;
- It is located close to, and provides safe pedestrian and cycle access to services and facilities;
- It is well integrated into and enhances the existing cycle network including the safe design and layout of new cycle routes and provision of covered, secure cycle parking;
- It is well integrated into, protects and enhances the existing pedestrian routes and the PRoW network;
- It reduces conflict between users of the transport network including pedestrians, cyclists, users of mobility vehicles and drivers and does not reduce road safety;
- It will improve public transport in the rural areas of the District; and
- The cumulative impact of new development will not create severe impacts on the existing transport network.

21.7. Policy SCLP7.1 also sets out that development that would have significant transport implications should be supported by a Travel Plan and that for non-residential developments the need for a Transport Assessment will be assessed on a case by case basis.

21.8. Policy SCLP7.2 states that proposals involving vehicle parking will be supported where they take opportunities to make efficient use of land and they include:

- The provision of safe, secure, and convenient off-street parking of an appropriate size and quantity including addressing the need for parking or secure storage for cars, cycles, and motorcycles, and where relevant, coaches and lorries;
- Opportunities to reduce the recognised problem of anti-social parking or potential problems that may arise which impacts the quality of life or vitality of an area for residents and visitors;
- Appropriate provision for vehicle charging points and ancillary infrastructure associated with the increased use of low emission vehicles; and
- The incorporation of sustainable drainage systems (SuDS), permeable surfacing materials and means of protecting water quality in drainage schemes should be ensured.

Other Relevant Local Policy

SCC Local Transport Plan (LTP)

21.9. The energy coast is recognised in the LTP as one of the key areas for growth and development. Transport should play its part in supporting and facilitating sustainable economic growth by:

- Maintaining (and in the future improving) transport networks
- Tackling congestion
- Improving access to jobs and markets
- Encourage a shift to sustainable travel option

21.10. The LTP plan supports:

- The challenge of maintaining the highway in a good condition
- Seeking improvement to the A11, A12 and A14 connecting businesses and markets to each other

21.11. Key relevant transport issues in Suffolk are listed in the LTP as:

- A12 Four Villages Bypass
- A12 Reliability – flooding due to climate change
- Congestion on Ipswich Eastern Fringe including A12, A1214 and A14
- Air Quality in Ipswich and Woodbridge

Key Local Issues

Relevant Representation

21.12. Traffic and Transport - The Councils consider that the assessment of impacts and proposed mitigation are inadequate as identified in the following:

- the assessment of the impact of abnormal loads is insufficient, particularly for the future as AIL access for maintenance and decommissioning are not assessed in either the ES or Transport Assessment (TA) beyond local clearance at the B1069/A1094 junction;
- the proposals to reduce the southbound A12 speed limit to 40 mph at the Friday Street A12/A1094 junction together with new rumble strips and an adjustment to the existing speed camera would not be to avoid an increase in accidents and that alternative mitigation is required and as part of ongoing SoCG discussions a traffic signal scheme has been proposed, which would be acceptable to the highway authority subject to relevant detailed design.;
- no provision has been made to enter into a planning obligation with the Local Highway Authority to cover the cost of necessary highways works, for example changes to the A12 speed limit at Benhall;
- the cumulative impact of this project and other future energy projects has not been assessed in transport terms, this specifically impacts the Stratford St Andrew Air Quality management Area (AQMA); however, as part of SoCG discussions the Applicants have agreed to submit a technical note that includes the cumulative traffic assessment with Sizewell C. The Councils have not yet received this note but have had discussions with the applicant about its content;
- the operational, maintenance and decommissioning activities of EA1(N), EA2 have been scoped out of the ES and TA;
- Controls of traffic movements have not been included in the outline Construction Transport Management Plan (OCTMP) and Outline Travel Plan (OTP) to limit the transport impacts to those assessed in the ES and TA; however, as part of SoCG discussions the Applicants have indicated that they will enshrine relevant controls and monitoring within the OCTMP and OTP. The specific details of these controls need to be agreed;
- it has not been demonstrated that the delivery of mitigation for these projects does not compromise routes already in use by other schemes e.g. Sizewell C, and;
- protective provisions, similar to those included in the DCO for other statutory undertakers, are necessary to allow the Local Highway Authority to discharge its responsibilities to access, inspect and maintain the public highway within the order limits. Examples of such protective provisions are included in the DCOs for East Midlands Gateway Rail Freight Interchange and the Northampton Gateway Rail Freight Interchange
- Cumulative Impacts –The full cumulative impacts of the existing and potential future projects in the East Suffolk area have not been adequately assessed within the applications.; however, as part of SoCG discussions the Applicants have agreed to submit a technical note that includes the cumulative traffic assessment

with Sizewell C. The Councils have not yet received this note but have had discussions with the Applicants about its content.

Comparison with Consented Projects: East Anglian One Windfarm (EA1) and East Anglian Three Windfarm (EA3)

21.13. While the EA1 onshore route was longer than that proposed for these schemes, EA1 had multiple accesses spreading traffic across wide areas of the network. By contrast, these projects will focus all traffic on a much more limited number of roads such as the A12, A1094 and B1122.

21.14. For EA1 the substation was an extension to an existing site with an extant preferred heavy load route (HR82), albeit one compromised by issues on the strategic road network requiring deliveries from the Port of Ipswich to Bramford substation rather than from the M25. This change in routing required temporary strengthening of the A137 Wherstead Creek bridge and significant traffic disruption to do this. EA1N and EA2 both require a new substation in a location not served by an accepted heavy load route. The Councils have advised that there is an accepted heavy load route serving Sizewell A and B.

21.15. The movement of wide and long loads or those in excess of 44 tonnes, not just the few special order movements (>150 tonnes) is problematic on the existing constrained local road network, particularly on B class roads where the road widths are in places less than 5.5m wide; the width considered necessary for two HGVs to pass (Manual for Streets). Highway structures on A12, A14 to Yoxford, A1094, B1069 and B1122 have not been assessed for heavy loads exceeding 44 tonnes.

21.16. EA1 was delivered in isolation to other NSIPs. EA1N and EA2 are expected to be constructed at the same time and in the same location as Sizewell C. Other NSIPs further away will also have a transport impact that overlaps with EA1N and EA2 e.g. EA3 (A12 and A14), Norfolk Boreas and Norfolk Vanguard (both may use Lowestoft as a port).

Network Resilience

21.17. The Councils have raised concerns regarding the resilience of the highway network. The proposals rely on the A12 as the sole HGV route and most HGVs are likely to use the A14 to travel to/from the development. The main issues are:

- Closure of the A14 Orwell Bridge due to collisions or high winds resulting in construction traffic being diverted through Ipswich;

- Closure of Port of Felixstowe, implementation of Operation Stack and consequential impact on the highway network;
- Closure of the A14 or the A12 (north and south of the A14) for routine maintenance and or incidents and lack of suitable diversions for large vehicles;
- Capacity of junctions on the strategic road network, particularly if delivery of multiple NSIPs coincide;
- Restrictions on the ability to maintain the highway network during normal working hours due to the higher volume of construction movements;
- Lack of laybys or other suitable parking, rest or stop over facilities east of the A12. With the exception of the A12 north of Seven Hills the local highway network has few laybys suitable for use by HGVs. There is only a single layby (at Eastbridge) on the combined A1094, B1122, and B1069 routes.

Local Road Network

21.18. East of the A12, except for parts of the B1122 that serve as the access to Sizewell nuclear power stations, the roads are local in nature and not designed for high levels of HGV traffic. Details of advisory lorry routes are available at https://www.suffolk.gov.uk/assets/Roads-and-transport/lorry-management/Lorry-Route-Map-Amended-MAY-17.pdf. Due to the rural nature of the area slow moving agricultural vehicles are common on all routes. Recreational, walkers and cyclists use some of the lighter traffic roads especially near the coast and a number of cycle routes and the Suffolk Coast Path are within the limits of this project. https://www.sustrans.org.uk/national-cycle-network/

21.19. Specific issues on the proposed access routes are:

A12

- Narrow carriageway and bend at Farnham,
- Evolved nature of single carriageway sections with thin road construction and some substandard junction layouts,
- Poor safety record at A12/A1094 junction,
- Congestion at and south of Woodbridge.

A1094

- A tourist, recreational dominated route,
- Significant lengths of speed limits, 40mph between A12 and Snape, 30mph limits through Snape and Aldeburgh,
- Narrow and winding particularly at its western end,
- A number of junctions with sub-standard visibility between A12 and Snape
- Poor forward visibility west of Aldeburgh,

B1069

- Narrow pinch points through Leiston, including a level crossing,

- No formal pedestrian crossing facilities between community to the west of the road to services on the other side e.g. Primary School,
- Urban or semi-urban except for south of Knodishall.

B1122

- Despite improvements still a winding route with some junctions with poor visibility (e.g. Mill Lane, Middleton),
- Significant summer use by tourists and during Sizewell B outages,
- Variable speed limit along length,
- Passes through scatted communities (Theberton, Middleton Moor) and town of Leiston.

B1121

- Sharp bends in Sternfield,
- Narrow in places,
- Passes through communities of Sternfield and Friston where footways are rarely present. Lower classification in SCC Lorry Route Map than routes above

Cumulative Impact (Regional)

21.20. Other NSIPs likely to come forward at around the same time include completion of the permitted EA3 onshore works and construction of Sizewell C. The Sizewell C DCO was submitted May 2020 and is proposed to commence in 2022 with highway mitigation delivered in the first three years of the project (depending on which element of mitigation) and prior to the peak of construction in 2028. An indicative Implementation Plan has been submitted as part of the Sizewell C DCO. Due to the uncertainty of when, or indeed if any or all of these NSIPs are delivered, at what time they are delivered and in which order, the Councils' task of assessing the cumulative impact and ensuring that the necessary mitigation is delivered in a timely and co-ordinated manner is extremely difficult. Significant residential development is also planned for the area with 2,000 homes at Brightwell Lakes at Martlesham and growth across the district.

Cumulative Impacts (Project Specific)

21.21. The impact assessment presented in the ESs considers the proposed EA1N and EA2 projects under two construction scenarios:

- Scenario 1 - the proposed EA1N and EA2 projects are built simultaneously; and
- Scenario 2 - the proposed EA1N and EA2 project are built sequentially.

21.22. If the proposed EA1N and EA2 projects are constructed simultaneously (Scenario 1), depending upon how contracts are let, there could be one contractor for each

project, or one contractor for both projects. In addition, the National Grid infrastructure works would be completed separately by contractors appointed by National Grid.

21.23. There could be significant differences in terms of the duration of impacts; the nature of those impacts and the peak HGV/worker trips depending on whether simultaneous or sequential construction takes place. Building sequentially would generate a higher total number of trips due to the additional remediation necessary between the two projects and repeated mobilisation. Building simultaneously creates a smaller overall trip total, but a shorter duration and hence higher daily flows, and a greater peak hour impact. It is acknowledged that SPR have included data summarising the worst-case highway impacts in terms of highest maximum daily HGVs (EA1N and EA2 constructed at the same time and create the maximum total daily movements), assuming relevant controls are in place, by assessing the peak of each project element occurring at the same time. A sequential construction program may result in overlap with Sizewell C peak construction traffic in 2028.

21.24. Simultaneous development will create fewer overall construction movements over a shorter time but higher peak movements. This will reduce overall structural damage to the highway network but increase delays and journey times. Sequential development will generally result in fewer peak movements reducing congestion on peak days but increase the overall impact in terms of numbers of movements and length of disruption.

21.25. The traffic impacts of the port activities associated with the offshore construction and maintenance have not been assessed in the ES, any port related development being considered either within permitted development or as a separate planning application. The Councils appreciate the reason for this is to retain flexibility for deciding which port will be used but have concerns that the ESs do not assess the projects in their entirety. Requirement 36 (Port Travel Plan) should also include the cumulative transport impacts of onshore port related traffic together with the works specified within these DCOs. The Councils request that Requirement 36 include for a Port Traffic Management Plan for the Construction Phase.

Onshore Construction – Materials and Employee Numbers – Impact on Highway Network

21.26. The construction and use of five new accesses and three crossing points on quiet rural roads will result in an increase in driver delay and an increase in the potential for road collisions as a result of the number of turning movements in and out of the accesses, including the potential for sharp braking as unfamiliar drivers are less likely

to expect these conditions. Clear unambiguous layouts and signing must be submitted and approved to discharge Requirement 16.

21.27. The Applicants have provided considerable data on the construction workers and quantities of materials required, although the sources of such material have not been defined. A worst-case scenario has been assessed with 100% of HGV traffic traveling either north or 100% south of the A12/A1094 junction (26.6.1.3). The assessment indicates across the entire 36-month period (which represents the most contracted build period) for both projects combined:

- a peak of 270 daily HGV movements for simultaneous delivery or 210 if delivered sequentially,
- approximately 72,000 HGV movements in total peaking at 3850 HGV movements per month,
- approximately 521 peak workforce vehicle movements per month,
- a total of approximately 120,000 workforce vehicle movements.

	Scenario 1: together		Scenario 2: Single project	
Link	Vehicles	HGVs	Vehicles	HGVs
A12 north of B1122	442	270	349	210
A12 between B1122 and B1094	357	270	285	210
A12 south of A1094	452	270	357	210
B1122 from A12 to Lover's Lane	355	153	276	115
A1094 from the A12 to the B1069	425	256	339	205
B1069 from the A1094 to Knodishall	663	265	524	213
Lover's Lane	341	153	271	115

Table 21.1 Summary of daily vehicle movements on selected links (this is over a 12-hour window of 7am to 7pm.

21.28. The proposals will:

- result in a significant increase in HGV movements on the A12, potentially both to the north and south of Saxmundham.
- result in construction traffic from the south traveling through the four villages (Marlesford, Little Glemham, Stratford St Andrew and Farnham), with negative impacts on air quality, noise, severance, road safety and congestion, especially the pinch point at Farnham bend where large loads manoeuvre very close to buildings.
- increase HGV movements resulting in increased delay and reduced residual capacity on the A12, A1094, B1069, B1122.
- add to delays where predicted future growth scenarios indicate congestion will be significant, particularly in peak periods, most noticeably the A12 at Woodbridge and to the east of Ipswich.
- increase HGV movements along the A12, A1094, B1122 and B1069 reducing the attractiveness of the routes for users of sustainable transport, particularly cycling, as well as increasing severance in communities along the route.
- reduce the attractiveness of core strategic routes, such as the A12, due to delays and longer journey times causing local traffic to switch to minor, less suitable roads.
- increase wear and deterioration of roads and structures due to the additional traffic

Capacity: Junction Modelling

21.29. The junctions for which transport model outputs have been provided are listed below. It is worth noting that the submissions do not include any of the traffic surveys, data used to calibrate the junction models or drawings highlighting that the junction geometries used within the modelling are acceptable. This brings inherent risk to each model and means that the results presented need to be treated with a reasonable amount of caution, above the general risk associated with any transport model.

21.30. Reviewing the junction modelling the following points are noted:

- The A12 / A1094 junction is shown to be approaching capacity in the four 'with development' scenarios modelled; however, this does not refer to the traffic signal option that is being discussed which has been evidenced to function within capacity.
- The A12 / Ufford Road junction, whilst the junction is shown to be well within capacity, there is a noticeable increase in delay, and whilst in isolation not considered to be a significant impact, the modelling supports the theory that the development will increase delays at sidearms and accesses along the A12,

increasing driver delay and associated frustration and potentially the likelihood of road collisions.

21.31. The A12 roundabout junctions from Woodbridge (A1152) to Foxhall Road, are shown to be at or approaching capacity. Most notably, the development results in:

- The B1079 west approach to the A12 / B1079 roundabout reaching capacity in the AM peak hour and a 40 to 60 second increase in delay on this approach.
- The Foxhall Road approach to the A12 / Foxhall Road roundabout junction going from being at capacity in the AM peak hour to significantly over capacity, increasing delay by approximately 150 seconds.
- The traffic flow diagrams at Appendix 26.16 and 26.25 indicates a potential increase in vehicle movements at the B1119 Leiston town centre signal junction of between 151 and 197 vehicles. The junction is known to experience congestion and the development is likely to significantly increase delay and queuing, negatively impacting on the operation of the highway network in Leiston.

A12 Marlesford Bridge (Work No.37)

21.32. Strengthening of the bridge on the A12 at Marlesford is included as an offsite highway improvement to facilitate movements by Abnormal Indivisible Loads (AIL). The Applicants have not discussed this matter with the Councils, and we are unaware of how this requirement has been identified. If such work is found to be necessary, it should be undertaken in advance of any significant construction movements for this project or other large scale projects in the area to avoid disruption to a major route required for these. The Highway Authority notes that this may not be the only structure that requires inspection and potentially strengthening on the local highway network

Local Pedestrian Improvements

21.33. The embedded mitigation proposes improvements to footways in Theberton and Snape.

Theberton:

- Extension of footway on B1122 near manor cottage
- Uncontrolled pedestrian crossing from near Manor Cottages to Ivy Cottages
- Short section of footway on west side of Church Road.

Snape:

- Uncontrolled pedestrian crossing and footway outside the church

- Extension of footway outside the petrol station
- Uncontrolled crossing and footway opposite the petrol station.

21.34. The principle of these improvements is accepted by the Councils. Technical approval by the LHA will be required.

21.35. Construction of any works on the highway network used to access Sizewell C, EA1N or EA2 is unlikely to be permitted after any of these projects commence to avoid causing delays or disruption to traffic by temporary traffic management. Hence, construction prior to commencement of any of these projects is necessary.

21.36. It is noted at Sections 26.5.1.1, 26.5.1.2 and 26.5.1 of Chapter 26 of the ESs that footways are often present on at least one side of the road in many settlements (e.g. Farnham). While generally true the assessment does not state that these footways are often narrow, below the 1.5m width considered necessary in Manual for Streets for two pedestrians to walk side by side or to pass each other. In many cases the footway is immediately adjacent to the carriageway. Being linear settlements, the services that are present are often on the opposite side to many residents. This requires crossing of the road although formal crossing points are sparse.

21.37. PRoWs often start and finish at roads. Where they cross the road, this is not always immediately opposite each other and hence some use of the road network by walkers is necessary to rejoin the PRoW.

Road Safety

21.38. The assessment identified that Links 5 and 7 located on the B1121 were the only locations within the study area where the baseline collision rates on the defined links exceeded the national average. The A1094 is just below the national average.

21.39. The junctions below were examined as collision cluster sites.

- A12/B1119 Saxmundham. Assessed in chapter 26.6.1.10
- A1094/B1069 Friston. Not assessed further
- A12/A1094 Farnham. Assessed in chapter 26.6.1.10
- A1094/B1069/C247 Sternfield Road, Snape Not assessed further
- A12/B1122 Yoxford Not assessed further

A12/A1094 Junction Friday Street, Farnham

21.40. As set out at paragraph 152 of Chapter 26 of the ES:

"A total of 17 collisions have been recorded at this junction during the study period, resulting in 16 slight injuries and one serious injury. Eleven of the collisions involved vehicles turning across the path of traffic on the A12; nine of these involved vehicles turning right into the A1094 from the A12, including the serious collision, with the remaining two collisions occurring as vehicles turned right out of the A1094. Six of the collisions were rear end shunt type collisions; three within the central reserve, and three on the A1094 approach to the A12."

21.41. Clearly the junction has a history of collisions, most notably relating to right turning vehicle movements across the A12 and it is reasonable to assume that the proposed development will further exacerbate these issues given the increase of right turn movements from A12 south to the A1094 for one project, with a peak daily increase of approximately 105 HGVs right turning at this location. As set out at Table 26.24, paragraph 286 and paragraph 294 of the ES, the proposed increased use risks a greater frequency and severity of collisions to the extent that it requires mitigation.

21.42. The mitigation proposed and included within the ES includes the following:

- A reduction in the posted speed limit in advance of the junction from 50mph to 40mph;
- Provision of enhanced warning signage to better highlight the junction to approaching drivers; and
- Provision of 'rumble strips' and associated slow markings, to provide an audible and visual warning of the hazard to approaching drivers.

21.43. The junction already has an existing high standard of signing including a speed enforcement camera, a reduced speed limit of 50mph and the visibility exceeds national guidance. The Councils are concerned about the effectiveness of the current speed limit as numbers are still regularly caught exceeding 50mph.

21.44. Localised junction modelling has been undertaken of the A12/A1094 junction which indicates between a 100% and a 150% increase in delay for right turning traffic at the junction in the AM peak hour. The poor road safety performance is likely to be a result of difficulty for vehicles to find gaps to undertake turning movements, and this is indicative of a junction where there is the potential for issues with capacity e.g. the delay at the junction means that drivers are undertaking risky turning manoeuvres. Further to this, the significant increase in HGVs will result in longer queues in the right turn lane as HGVs need greater gaps to undertake manoeuvres.

21.45. It is the Councils' opinion that more significant mitigation works are required for the junction than those submitted in the draft DCOs. The increase in traffic will mean that there will be fewer gaps for vehicles to undertake turning manoeuvres, along with a significant increase in HGVs undertaking the manoeuvres. On top of these impacts is Scenario 1, this includes a cumulative impact assessment with both EA1N and EA2 coming forward at the same time. Appendices 26.25 provide indicative traffic flow diagrams for the cumulative impact of the two developments, these are for the combined average day of the peak, and show, if all materials were from the south a peak impact of 452 daily movements (182 cars and 270 HGVs) at the junction.

21.46. The Councils consider the impacts of these projects on this junction in terms of road safety are the single most important transport issue arising from these projects. We are yet to be convinced that the embedded mitigation will reduce this risk to an acceptable measure and the proposals are therefore considered to be unacceptable in safety terms (NPPF p109). Discussions have taken place with the Applicants and their revised proposal of temporary traffic signals at this junction is, subject to agreement of detailed design and road safety audits, acceptable. These improvements would be secured via a Section 278 (of the Transport Act 1980) Agreement.

21.47. EDF Energy have previously consulted on their proposals for Sizewell C, which includes a two-village bypass of the villages of Farnham and Stratford St Andrew. The proposals include a roundabout at the A12/A1094 junction to be delivered in the early years of their programme and the Councils consider that this would resolve any concerns around the junction's historic safety record. However, there is currently no guarantee or timeline for the potential delivery of SZC. The Councils cannot rely on the two-village bypass being constructed in an appropriate timeframe to support SPR's proposals. Communication between all parties will need to be ongoing to minimise the potential for disruption.

A12/B1119 Junction Saxmundham

21.48. Nine collisions occurred with a pattern associated with right turns out of the side roads. The number of turning movements is not expected to increase as a result of these projects but the assessment does indicate some increase of traffic on the A12 and many of these will be HGVs (20% increase). Therefore, there will be an increased risk that the frequency (total numbers of vehicles) and severity of the collisions (HGVs) may increase. It is noted that a minor road safety scheme was recently completed by the Highway Authority at this junction and it too early to assess the

benefits of this scheme. Currently, the Councils consider that level of risk is not of the magnitude to require significant highway improvements for these projects.

A1094/B1121 Junction Friston

21.49. Due to the land rising west of this junction and the bend forward visibility for westbound A1094 traffic turning onto the B1121 is limited. The angle of the junction also makes it necessary for vans and HGVs travelling eastbound to enter the junction at low speed potentially crossing the centre line to negotiate the tight left hand turn.

A1094/B1121 junction Friston

21.50. The embedded mitigation consists of vegetation clearance and temporary over-run areas to allow Abnormal Indivisible Loads movement through this junction, specifically right hand out and left hand in turns to the B1069. No mitigation is proposed for the additional construction traffic going to and from AC4.

21.51. The areas shown on drawing 180476_PLN_DCO_1820.10_A reference plots 152 153 and 154 are indexed as Land Subject to Temporary Occupation and Use and confirmed by inclusion in schedule 9 Land of which temporary position may be taken and exclusion from Schedule 7. This would mean that no permanent improvements can be made at this junction to allow passage of large vehicles after completion of the works

Damage Through Exceptional Use

21.52. Based on the Applicants data, it is estimated that an additional 72,000 HGV movements will be associated with these projects. This will have a detrimental impact on the local roads which have evolved rather been designed for such traffic.

21.53. Condition surveys will be undertaken by the contractor both prior to the commencement of construction and subsequently at a point close to the completion of construction to identify existing highway defects and any changes following completion of the proposed project. The methodology and scope of surveys will be agreed between the contractor and SCC prior to commencement of construction.

21.54. Any damage (the scope of which will be agreed with SCC and the contractor) to the highway caused by construction traffic will be repaired by the contractor or a financial contribution made to SCC to cover the cost of remedial work.

21.55. The Highway Authority may also accrue additional costs if the volume of construction traffic requires routine and planned maintenance works to be undertaken overnight to avoid disruption. The Highway Authority would look to recover these additional costs.

21.56. In all cases the Highway Authority seeks to recover its reasonable costs through a planning obligation similar to that secured for Sizewell B Dry Fuel Store and the Galloper Wind Farm.

Adequacy of Applications/DCOs

Environmental Assessment of Transport Effects

21.57. Chapter 26 of the ESs contains the environmental assessment of traffic and transport. Although it is unusual to use the ES as a surrogate for a formal Transport Assessment the Highway Authority accepts it contains the relevant data also appendixes containing the transport modelling data.

21.58. The assessment methodology used within the DCO submissions relies heavily on 'Guidelines for the Environmental assessment of Road Traffic' (GEART) assessment method produced by the Institute of Environmental Assessment (IEMA). At previous consultation stages the Councils raised the use of this method as problematic given that it can often fail to fully assess the specific transport related impacts of development. The GEART guidance is one method of analysing the impacts in terms of risks to receptors and it is considered by the Councils to be a coarse high-level tool with some limitations and some of its conclusions should be treated with caution.

21.59. GEART itself recognizes its limitations and paragraphs 1.11 and 1.12 have been provided below:

"The purpose of these Guidelines is to provide a systematic, consistent and comprehensive coverage of the appraisal of traffic impacts for a wide range of development projects. It is believed that these Guidelines will prove to bring a significant benefit to the design of the project by indicating, at an early stage, potential problems and possible solutions. These Guidelines are not intended to be exhaustive nor a reference for the very detailed or specific problems that occur in assessing the environmental impact of traffic. The Guidelines are intended to complement professional judgment and the experience of trained assessors. The environmental impact of traffic will vary project by project and case by case. The experience and expertise of the assessor will remain of prime importance in conducting an environmental assessment. Moreover, the process and practice of

environmental assessment is evolving rapidly, as is legislation, and guidance on the environmental impact of traffic. There is therefore a continual requirement to monitor and update procedures. The structure of the Guidelines is intended to mirror the activities necessary to undertake an Environmental Assessment".

"The assessment of impacts from individual projects cannot be expected to take account of the regional or global environmental effects that arise from the accumulation of many individual projects. Whilst a project-specific environmental assessment should aim to identify a cumulative effect it is felt that these can only be considered at a policy or programme level undertaken by central or local government".

21.60. Paragraph 3.15 of GEART identifies for screening of links two "broad rules-of-thumb" for the screening process, these being:

- include highway links where traffic flows will increase by more than 30% or where the number of HGVs will increase by 30%
- include any other specifically sensitive areas where traffic flows have increased by more than 10%.

21.61. This method of screening has been undertaken by the Applicants and, whilst not considered to be unreasonable, lacks nuance.

21.62. With regards to the assessment of severance paragraph 4.21 includes the following text *"THE MEA sets out a range of indicators for determining the significance of the relief from severance. Changes in traffic flows of 30%, 60% and 90% are regarded as producing "slight", "moderate" and substantial changes in severance respectively. These figures have been derived from studies of major changes in traffic flow and therefore should be used cautiously in any environmental assessment. The assessment of severance should pay full regards to specific local conditions e.g. whether crossing facilities are provided or note, traffic signal settings etc.".*

21.63. Highways England document LA112 'Population and Human Health' provides further information on the assessment of severance and identifies for Rights of Ways daily traffic flows of less than 4,000 as low levels of severance, between 4,000 and 8,000 as medium, between 8,000 and 16,000 as high and over 16,000 as very high.

21.64. The Applicants have based their assessment on changes of traffic flow as set out in GEART. The Councils remain concerned that it is a coarse assessment method and that the evidence base for the method is based on roads with major traffic flows and may not be representative of the locations being assessed, where changes in traffic flows may be far more noticeable to residents living on these roads. There is evidence

that community severance can occur with relatively small changes in traffic and that perception of severance can be affected by environment meaning that 'generic' figures may not be appropriate.

21.65. With regards to Driver Delay, GEART recommends using relevant transport modelling packages to assess increases in driver delay. However, there is limited information on what might be considered a 'significant' level of change in driver delay.

21.66. The assessment of driver delay by the Applicants are picked up through the junction modelling assessment using standard modelling software and based on the scale of impact of the development is considered to be acceptable. Further assessment of driver delay is provided based on swept path analysis and this is also considered to be an acceptable method for assessing these movements.

21.67. With regards to Pedestrian Delay GEART identifies that given the factors involved assessors use their own judgment to determine whether pedestrian delay is significant.

21.68. The Applicants have not specifically assessed pedestrian delay, albeit given the relative scale of impact of the development and lifetime of these impacts this impact is considered to be picked up reasonably by the assessment of other effects.

21.69. With regards to Pedestrian Amenity GEART mentions a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its *HGV* component) is doubled or halved.

21.70. The Applicants' assessment is based on a change in traffic flows of over 100%. Clearly this can require a significant change in traffic flow and the Council remains concerned about the coarseness of the method. Increased traffic flows can lead to changes in perception, suppressed walking trips, perceptions in danger and in some cases a 50% change in traffic flow might be more impactful than a 200% change.

21.71. With regards to Fear and Intimidation, GEART identifies thresholds to be used as a first approximation with a need for judgment to be used when determining the degree of fear and intimidation. Changes are determined by the average traffic flow over an 18-hour day, the total HGV flow and average speeds.

21.72. The assessment of fear and intimidation has been included within the assessment of pedestrian and cycle amenity. This is not based on the GEART methodology as above.

21.73. With regards to Road Safety GEART identifies a review of local accident data should be undertaken and professional judgement used to assess the implications.

21.74. The Applicants have undertaken a review of accident patterns both on a link basis and to identify any clusters to identify any areas requiring further study, and this method is considered acceptable.

21.75. With regards to hazardous loads GEART identifies assessing the likely potential for an increase in an accident based on national accident records.

21.76. The assessment includes an AIL study to assess the potential routes to/from the site.

21.77. GEART provides limited information on determining the sensitivity of links, but that consideration should be given towards affected parties, sensitive groups, access to relevant facilities etc.

21.78. The Applicants' assessment of link sensitivity is based on the concentration of receptors and the proximity of highway environment. The general method of determining link sensitivity is acceptable, albeit that any high-level assessment will not capture every specific location perfectly. The Councils appreciate that the Applicants reconsidered the sensitivity of a number of links following comments from the Councils.

21.79. It is recognised that the Applicants' methodology is consistent with many other ESs of traffic impacts. However, the methodology has its limitations which means that significant impacts may occur that are not identified, albeit the temporary nature of traffic associated with the development also needs to be considered as well.

21.80. The Councils are also of the opinion that the assessment does not fully consider what the cumulative impact of the number of different impacts e.g. severance, amenity, road safety etc) on the community. No consideration is given to whether a number of minor adverse impacts collectively represent a moderate or major transport impact on the community.

Offshore Construction and Operational Transport Issues

21.81. Chapter 26.1 states that 'no decision has yet been made regarding a preferred base port for the offshore construction and operation of the proposed project'. Such facilities would be provided or brought into operation by means of one or more planning applications or as port operations with permitted development rights. The

ES therefore only considers the impacts of constructing and operating the onshore infrastructure, not the entire projects.

21.82. The Applicants have stated that foundation components would be manufactured onshore and delivered to site as close to fully assembled as practical (paragraph 39 of Chapter 6.1.6). This also applies to the turbines and scour prevention materials, cable protection, cables and ancillary structures. Further clarity is needed in relation to this claim and whether the consequential impacts on transport have been fully assessed.

21.83. The ports likely to be used for offshore construction, Great Yarmouth and Lowestoft are both linked to the Strategic Road Network and are, at least for passenger traffic, part of the rail network. However, without information on the nature and scale of traffic movements associated with the offshore construction, the Councils cannot evaluate the cumulative impact of the whole project. Assessing these through one or more planning applications will create a fragmentary method of assessment and may prevent the appropriate mitigation for the cumulative impact being delivered at the appropriate time.

Road Safety

21.84. The inadequacy of the embedded mitigation for the A12/A1094 Friday Street junction has been discussed previously, along with the current position of discussions with the Applicants.

Speed Management Proposals

21.85. The embedded mitigation proposes specific changes to speed limits on a temporary or permanent basis. It is noted that temporary can mean up to the 7-year duration of the project, far in excess of the 18-month period for temporary speed restriction orders (Road Traffic Regulation Act 1984 s88).

21.86. The Road Traffic Regulation Act 1984 is not legislation included within the DCOs nor are any schedules detailing such orders. The Councils presume that the Applicants intend that the LHA uses its powers to create temporary and permanent traffic regulation orders and that SPR will enter an obligation to enable this to be done and the LHA recover its reasonable costs. This is under discussion with the Applicants.

21.87. The Applicants have proposed a range of modifications to speed limits on the network any changes that are made to the speed camera at Farnham will have to be

undertaken by Suffolk Constabulary. Any resultant costs will need to be met by the Applicants through a planning obligation or other such arrangement.

Road Closures

21.88. The draft DCOs makes provision for streets to be stopped up (DCO Schedule 5) yet Table 26.4 states that no roads are to be fully closed to install the proposed cables under the public highway.

21.89. It is unclear if stopping up of streets is required solely for access construction. The Councils consider that for practical and safety reasons closure (or partial closure) of Sizewell Gap would not be acceptable at any stage as it forms the sole access to Sizewell B. Closures of the A12 and A1094 would only be considered if restricted to times where traffic flows are low to avoid significant disruption to road users.

HGV Access Strategy

21.90. Table 26.4 and the Operational Access Management Plan (OAMP) states that:

- All HGV traffic routed via A1094 or B1122.
- No HGV construction traffic to
  - Use B1119
  - travel via Leiston and Knodishall (B1069)
  - travel via B1121 via Friston and Sternfield
  - permitted to use B1353 to Thorpeness

21.91. It is apparent that the term "HGV" does not apply to AILs as these will be required to travel via the B1121 through Friston to the new permanent substations access and therefore some construction traffic would use this route.

21.92. The A12, B1122 and C228 Lovers Lane/Sizewell Gap form part of the DFT advisory AIL HR100, the other roads impacted by this project do not. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/360533/High_and_Heavy_Load_Grids_Map_for_Abnormal_Loads.pdf.

21.93. However, it is unclear if the works on Church Road, Friston and the permanent access AC6 will be accessed via internal haul roads or if some construction traffic will have to use the B1121 through Friston. It is also noted that the temporary speed limit at this location will not remain for the permanent access

21.94. Access to Works Plan shows five access points:

- AC1 and AC2, both with temporary exits south off Sizewell Gap and accessed via A12, B1122 and Lovers Lane
- AC3 temporary exits west and east off B1122 Aldeburgh Road, Aldringham
- AC4 temporary exit east off B1069 Snape Road, Knodishall
- AC5 permanent access off B1121 Friston

21.95. The Highway Authority would like to be assured that access from the B1122 (AC3) will be minimised as stated in Table 26.22, figure 26.2 and paragraph 211 of the ES which indicate that only a small length of section 3 will be served by the access off the B1122 Aldeburgh Road .

21.96. Further details will be required to satisfy the Highway Authority that the operation of access AC4 is safe and practical, specifically the movements into the western access being reversed to cross the B1069 to gain access to the works east of this road. Also, the Access Locations and Associated Onshore Infrastructure indicates an access on both sides of the B1069 which is contradicted by the Access Work Plan

21.97. The use of differing references to the access points within the DCOs and supporting documents is confusing and appears to result in discrepancies between the documents with respect to access of work areas between the B1353 and B1069. The Works Access Plan suggests a more significant use of the less suitable access off the B1122 Aldeburgh Road rather than the B1069 Snape Road. If this is the case it undermines the assumptions made for traffic flows in the EIA and Transport Assessment.

Summary of Access Points

Location	2.4 Access Work Plan	6.2.26.2 Access Locations and Associated Onshore Infrastructure
Sizewell Gap (east)	AC1 – access south	1 – access south
Sizewell Gap (west)	AC2 – access south	2 – access north
B1353		3 & 4 – crossing north and south
B1122 Aldeburgh Road, Aldringham	AC3 – access east and west	5 & 6 – access east and west
Sloe Lane, Knodishall		7 & 8 – crossing north and south
B1069 Snape Road, Knodishall	AC4 – access west – eastbound traffic has to return across B1069	9 & 10 – access east and west
Grove Road Friston		11 & 12
B1121 Friston	AC5 – access north	13

AIL Impacts

21.98. Paragraph 26.4.3.1.5 implies that there would be two delivery routes for most AILs required as part of the construction programme:

- Option 1: Lowestoft. This is Highways England's preferred route (HR100) although this is dated and incorrect in some minor details. Due to restrictions, unloading would need to occur on the southern side of the lake. However, there is currently a risk that long-term access cannot be secured.
- Option 2: Felixstowe via the A14, A12, B1122, B1069, A1094 and B1121.

21.99. It is noted that high and heavy AILs (Special-order movements) have been recently landed at Ipswich due to issues with structures on the A12 between Ipswich and the M25. Further work is still required on both routes including detailed structural assessment. Although the AIL study (Appendix 26.3) has identified that abnormal loads could come from either Felixstowe or Lowestoft, Network Rail have advised that a rail bridge over the A1094 should be avoided for special order movements. The response from Network Rail in Appendix 26.3 indicates they were only considering the specific special-order load they were consulted on. They imply that no more than 100 tonne loads can be accommodated by the A1094 rail bridge, but this is not explicit as they also raise concerns regarding the condition of the bridge. Therefore, it is unclear if this bridge can carry loads between 44 tonnes and 150 tonnes. If AILs do use the A1094 the Highway Authorities concerns about access off the A1094 to the B1121 remain.

21.100. The limits on the A1094 rail bridge will result in all special-order movements and potentially other AILs travelling via the B1122 from Yoxford and passing through Leiston along the B1069 to the junction with the A1094 where localised widening is required. From this point the vehicle would then travel along the A1094 and B1121 through Friston to access the onshore substations site over the new access road. The Police response in Appendix 26.3 raises concerns regarding parking and that the route through Leiston should avoid this.

21.101. The Councils note that 26.4.3.1.5 the Applicants consider that it is unlikely that any future special-order movements will be required after completion. The Councils consider that this is unwise and does not consider movements required during decommissioning or if other projects come forward requiring extension of the sub-station. Temporary widening of the A1094/B1069 junction only for the construction period is short sighted particularly if the substation is extended by subsequent projects.

21.102. The Councils have significant concerns regarding the route from Felixstowe as it passes through Stratford St Andrew, Farnham, Yoxford, Leiston, Knodishall and Friston with height issues, such as those caused by a footbridge on Park Hill, Leiston , a narrow carriageway on Haylings Road, Leiston that creates a pinch point for two-way vehicle movement, especially for large vehicles and A12 Farnham where the proximity of buildings to the carriageway and narrow footway create a significant pinch point which has historically been difficult for AILS to navigate. Appendix 26.4 includes a swept path assessment of the AILs at the Farnham bend and at the A1094/B1069 junction. The swept path assessment indicates that AILs can theoretically negotiate the Farnham bend, but with 0.2m (200mm) to spare.

21.103. The presence of AILs on the road network is likely to lead to substantial delays for short time periods, however the Councils are concerned that the number of AILs has been underestimated, as set out below. The presence of AILs will have negative impacts including increasing driver frustration and driver delay on top of those increases associated with the more generic development traffic.

21.104. The Applicants have not assessed all AIL movements, only concentrating on special order movements. Special Order movements are broadly those that exceed any of the following:

- Have a weight of more than 150,000kg;
- Width exceeding 6.1m
- Length exceeding 30m

21.105. Whilst Abnormal loads are broadly those that exceed any of the following:

- A weight of more than 44,000kg;
- An axle load of more than 10,000kg for a single non-driving axle 11,500kg for a single driving axle
- A width of more than 2.9 metres
- A rigid length of more than 18.65 metres

21.106. The applicant is preparing a clarification note to outline the breakdown of non-special order AILs.

21.107. The Outline Access Management Plan (2.2.8) states the movement of abnormal loads would be outside of the restrictions (routes and times) contained within this OCTMP and should be subject to separate agreement with the relevant highway authorities and police through the Electronic Service Delivery for Abnormal Loads (ESDAL) system. The Councils would need more information on these proposals specifically

the timing as we understand that Suffolk Constabulary are only prepared to move AILs in daylight hours.

Outline Construction Traffic Management Plan (OCTMP)

21.108. The OCTMP only considers onshore construction, not port related construction or operational traffic. The Councils consider that future planning applications should be aligned with the OCTMP so that the full cumulative transport impacts can be monitored, and ongoing impacts assessed.

21.109. The contractors for EA1N or EA2 and the associated National Grid works have not been confirmed and may differ (8.9 OCTMP para 16 and OTP para 15). In a worst-case scenario this will result in four contractors being required to co-ordinate the Construction Traffic Management Plan(s) with each contractor required to appoint its own CTMP Co-ordinator. Although the Applicants would establish the role of the Transport Co-ordinator to take responsibility for the overall implementation of the CTMP it will be difficult to manage such a disparate arrangement.

21.110. The OCTMP (para26) states that to secure the required performance standards it adopts a series of 'input' measures, supported by an action plan (rather than finite HGV numbers). A monitoring regime would focus on the delivery of key action plan items as a 'health check' that the contractors are achieving the required standards. HGV traffic flow forecasts (extrapolated from the ES) are presented as a secondary monitoring indicator. The Councils consider that maximum daily and maximum peak HGV movements need to be embedded within the DCO, preferably by requirement stipulating the daily maximum number of movements of 210 (and average movements across the life of the project). The applicant has committed to including controls in their OCTMP and discussions are ongoing.

21.111. It is strongly advised that a trigger point below the maximum number of movements is agreed so that action can be initiated before HGV movements exceed those assessed in the ES.

21.112. The booking system for HGVs requires an appropriate monitoring and reporting methodology to be effective as a tool to demonstrate compliance with the CTMP. The Councils consider that a GPS based system that can locate and track individual vehicles is a better solution enabling proactive management of HGVs, for example in the case of interruption of the highway network and provide factual data in cases where restrictions are breached.

21.113. Within the OCTMP the following actions are considered to constitute a breach of the CTMP, whereby corrective measures would be required:

- Exceedance of assessed daily HGV numbers (either for individual projects or cumulative affect with EA2);
- Construction HGV traffic operating outside of agreed hours;
- Construction HGVs not adhering to the agreed routes; or
- Construction HGV traffic being driven inappropriately, e.g. speeding.

21.114. If the breach is found to be material, a three-stage process is proposed by the Applicants, that includes reviewing the data, liaison with the Highway Authority, potential identification of additional mitigation measures, potential removal of the individual committing the breach.

21.115. The Councils consider that monitoring and reporting outputs need to be more robust to ensure compliance with the impacts assessed and hence the EIA. These should include the following:

- Progress of the project against specific gateways;
- Freight movement to/from the site;
- Details of non-compliance with routing or speed limits;
- Near misses or safety related incidents;
- Freight compliance with appropriate exhaust emissions (Euro VI);
- Transport of AILs to/from the site;
- LGV movements to/from the site;
- Employee movement to/from the site, including modal split to ensure compliance with car share targets and in combination monitoring should EA2 project be being delivered commensurately; and
- Information on complaints received on transport related issues.

21.116. The Councils recommend that this is undertaken on a quarterly basis and any non-compliance reported through a Transport Review Group comprised of relevant stakeholders. Quarterly reports should be made available on a publicly accessible website.

21.117. The Councils consider the relevant thresholds are necessary to ensure that the impacts considered in the EIA are not exceeded and the embedded mitigation remains appropriate:

- Maximum HGV movements per day (210 single project, 270 together)
- Maximum HGV movements per hour between 0700 and 0900 and 1600 to 1800
- Haulage fleet to be 100% compliant with emissions requirements (Euro VI)

- Car share measured on a monthly basis to not be decreased below 1.5 workers per car

21.118. Prior to commencement of construction works, it is anticipated the construction contractor would record the condition of roads, tracks, land, fences, etc, by means of schedules and photographic or video surveys. The details of infrastructure (such as water pipes) collated would be reviewed in addition to a review of unrecorded services such as land drains and irrigation systems. The Applicants will be expected to provide a financial contribution for mitigating their extraneous impact on the quality and structure of the highway network.

21.119. The limiting of construction traffic to between 0700-1900 Mon-Fri and 0700-01300 Sat would in principle be acceptable, but it is unclear if this includes movements on all of the highway network including the A14. Controls may be required to prevent construction traffic laying over in unsuitable locations outside of these hours.

Outline Travel Plan (OTP)

21.120. To ensure that the final TP can be effectively enforced, it is important to define what will constitute a breach. The following actions are considered to constitute a breach of the TP, whereby corrective measures would be required:

- Construction workers overspill parking on the public highway;
- Exceedance of assessed daily employee vehicle numbers;
- Construction employee traffic operating within the onshore development area outside of agreed hours; and
- Construction traffic being driven inappropriately, e.g. speeding.

21.121. The Councils consider that this should be part of the regular report and should include as a minimum:

- Details of non-compliance with routing or speed limits
- Near misses or safety related incidents
- Employee movement to/from the site, including modal split to ensure compliance with car share targets and in combination monitoring should EA2 project be being delivered commensurately; and
- Information on complaints received on transport related issues including parking.

21.122. The monthly monitoring report should be submitted to the Highway Authority and a contribution for time and costs associated with reviewing and monitoring by the Highway Authority be paid.

Obligations

21.123. The Councils consider that the following contributions are necessary to mitigate the impacts of this project. These should be secured through a S106 agreement.

- A contribution towards the additional costs resulting from routine cyclic and emergency highway maintenance costs being restricted to out of hours working times on the applicant's freight route.
- An obligation, secured through the OCTMP, to undertake visual and structural surveys of all routes intended to carry construction HGVs prior to, during and after the construction period and to undertake or pay for the highway authority to undertake any such work that is deemed necessary to return the carriageway to its original condition.
- A contribution for review of submitted materials for monitoring the CTMP and for monitoring the TP for the life of the project.
- The sum of 7.5% of the total off-site highway works on or before the commencement of construction, to be applied to cover the full audit, legal costs, S278 agreements, dedication of land into highway, land compensation events and supervision fees for the transport schemes to be implemented by the Applicants under the DCOs.
- A contribution towards changes to the speed limit at the A12/A1094 Friday Street junction and changes in the speed enforcement equipment. The cost of temporary speed limits will be recovered by other means.
- Reimbursement of the Highway Authority for all costs associated with assessments of highway structures and the moving, removing, installed and reinstalling street furniture, streetlights, traffic signals, traffic islands and all other highway infrastructure including structures necessary for safe movement of AIL's and any associated traffic management and temporary traffic orders.
- Funding for any monitoring and necessary mitigation required for the A12 Stratford St Andrew AQMA

Compliance with Local Policy

21.124. The Councils consider that the proposals are inadequate in a number of ways including:

a) the lack of planning obligations or similar measures to allow the Highway Authority to undertake measures necessary to mitigate the impacts of the development , to deliver the highway works and monitor the management plans provision for a planning obligation to cover the cost of necessary highways works;

b) the cumulative impacts of the projects in terms of offsite highway works, operation, decommissioning and port related activities and with respect to Sizewell C have not been adequately assessed.
c) the proposals to reduce the southbound A12 speed limit to 40 mph at the Friday Street A12/A1094 junction together with new rumble strips and an adjustment to the existing speed camera would not be adequate to avoid an increase in accidents and that a new roundabout is required, and
d) the transport impacts of future development of the substation, for example access by HGVs or AILs have not been considered
e) That the use of GEART without adjustment for local or cumulative factors may not give a true analysis of impact and does not allow for perception of impacts by local residents and road users.

21.125. For the reasons set out above the proposals are not compliant with local policy.

22.Minerals and Waste

Lead Authority SCC

National Policy Statements

22.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, minerals and waste is addressed as a generic impact in section 5.10 of EN-1 (see para 1.3.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

ESC Local Plan Policies

22.2. Policy SCLP9.2: Sustainable Construction, requires all new non-residential developments of equal or greater than 1,000sqm gross floorspace to achieve the British Research Establishment Environmental Assessment Method 'Very Good' standard or equivalent unless it can be demonstrated that it is not viable or feasible to do so. This includes the consideration of waste management.

Suffolk Minerals & Waste Local Plan Policies

22.3. Suffolk Minerals & Waste Local Plan (SMWLP) Policy MP10: Minerals Consultation & Safeguarding Areas seeks to protect mineral resources from sterilisation and allocated sites from other forms of competing development.

22.4. SMWLP Policy GP4: General Environmental Criteria seeks to protect geodiversity. This includes Sites of Special Scientific Interest and Regional Important Geological Sites.

22.5. SMWLP Policy WP18: Safeguarding of Waste Management Facilities, seeks to protect existing and proposed waste management sites from other forms of competing development.

Key Local Issues

22.6. The onshore part of the development is within a Minerals Safeguarding Area the purpose of which is avoid sterilisation of minerals resources.

22.7. There are no geological conservation sites within the area which need to be safeguarded.

22.8. There are no existing or proposed waste management facilities are safeguarded from the proposed development.

22.9. Based on the experience of the EA1 windfarm, a significant amount of aggregate is used to make temporary access roads during construction which requires removal and recycling.

Adequacy of Applications/DCOs

22.10. Chapter 18 of the ESs - Ground Conditions and Contamination, includes reference to minerals safeguarding and geological conservation.

22.11. In respect of minerals safeguarding reference is made to the presence of sand and gravel resources being of regional importance and the reuse of minerals within the development. The ESs conclude that there would be a negative impact of minor adverse significance. This is based on the fact that the mitigation embedded in the applications would be sufficient to reduce the impacts from a more significant level. The level of significance however can only be known when an intrusive resource assessment of the sand and gravel within the site has been carried out.

22.12. It is acknowledged however that existing mapping and historical patterns of extraction within the County indicate that significant viable sand and gravel resources are not likely to be present. Parts of the cable route are also particularly constrained in terms of ever being viable minerals resources due to factors such as being within the AONB for example. Therefore, the development is compliant with SMWLP Policy MP10.

22.13. The Thorpeness County GeoSite mentioned in the ESs would not be directly affected as the cabling will pass underneath it at depth, therefore the proposal is compliant with Policy SMWLP GP4 e).

22.14. In respect of existing and proposed waste management none are affected by the proposed development therefore SMWLP Policy WP18 is complied with.

22.15. Recent evidence suggests that local contractors are capable of taking away Type 1 aggregate used for temporary construction roads for recycling. Although not specifically mentioned in the ESs this is not contrary to any SMWLP policy and in accordance with East Suffolk Development Plan policy SCLP9.2. The Construction Management Plan will also include further provisions for waste management and likewise would fit with Development Plan Policy.

Compliance with Local Policy

22.16. As outlined within the above text, the development is considered compliant with local policy.

23.Water Quality and Resources

Lead Authority SCC

National Policy Statements

23.1. Whilst renewable energy proposals are addressed in overall terms in EN-3, water quality and resources are addressed as a generic impact in section 5.15 of EN-1 (see para 1.3.2 of EN-5). The local policies discussed below are generally consistent with that generic guidance.

ESC Local Plan Policies

23.2. Policy SCLP9.7: Holistic Water Management, states that all new developments will incorporate water efficiency and re-use measures, including but not limited to:

- greywater recycling;
- rainwater harvesting; or
- water use minimisation technologies.

23.3. Policy SCLP10.3: Environmental Quality, states that development proposals will be considered in relation to their impact on water quality and the achievement of Water Framework Directive objectives.

Key Local Issues

23.4. Impact on the water quality has not been identified by the Councils as a likely significant effect of the development, although additional consents are relevant to this issue. As an example, SCC is responsible for issuing Land Drainage consents under the Land Drainage Act 1991 for works affecting ordinary water courses where there is no Internal Drainage Board. In issuing consents SCC will need to ensure that any works permitted are Water Framework Directive (WFD) compliant.

Adequacy of Applications/DCOs

23.5. Requirement 22 provides for a CoCP. The Outline CoCP includes measures to treat surface water runoff prior to discharge. However, some of these options do not use SuDS methods and rely on the use of proprietary products, as was the case for EA1 construction. It is unclear if the Applicants' proposals allow for sufficient space within the red line boundary for the use of SuDS to be prioritised for the purpose of surface water treatment. This is also discussed in Section 11.

23.6. No measures have been proposed to re-use surface water runoff to reduce the developments water supply needs, neither during construction nor operation, contrary to local policy.

Compliance with Local Policy

23.7. It is likely that local policy compliance can be achieved post consent through the agreement and implementation of an appropriately detailed CoCP. The Councils would however like to see the Applicants identify whether it is possible to re-use surface water runoff to reduce the water supply needs.

Further Work Required

23.8. The Councils would like the Applicants to consider opportunities to re-use surface water run-off to reduce the potential water needs in addition to provide further information to give the Councils confidence that there is sufficient space within the Order Limits to prioritise a SuDS for managing surface water.

24.Summary

24.1. The Councils have reviewed the DCO applications and evaluated the impacts in the context of local planning policy and other relevant policy. The assessment of the impacts has been topic based for ease of reference. The Councils have highlighted a number of areas where the applications, as currently submitted, are not considered to be compliant with local policy. The Councils have also sought to identify where further work is required and what additional mitigation or compensation measures are considered necessary. This further work would facilitate greater policy compliance.

24.2. The Councils wish to highlight the overall in-combination impacts which would be experienced on the environment and community around Friston. Each project, alone and cumulatively would result in detrimental impacts on:

- landscape and visual amenity;
- heritage assets;
- noise;
- PRoWs; and
- Potentially flood risk.

24.3. The projects when taken together, would have a significant adverse impact on the receiving landscape, local residents and visitors. There is insufficient commitment within the submissions to secure minimisation of the scale and impacts of the substations and address the future expansions of the site. The mitigation proposals presented to date do not satisfactorily address the Councils concerns. There is also considered to be insufficient information in relation to the long-term management of the site.

24.4. It is essential that all opportunities to consolidate the infrastructure between the projects are explored, especially in light of the BEIS OTNR and potential regulatory flexibility this could provide. It is also vital that all opportunities are explored to minimise the size, scale and impact of the developments through the use of a gas insulated technology in the National Grid substation and design refinement work in relation to the project substations. The National Grid substation should be designed to reflect its intended purpose as a strategic connection location. At the very least, the CIAs in the ESs should be updated to take account of the know future connection offers.

24.5. In addition to design mitigation, it is considered that opportunities to minimise the disruption to local communities and the environment can be increased through greater coordination between the onshore construction works. The Applicants

should commit to the simultaneous construction of the projects, if this is not feasible and the projects are constructed sequentially, the DCOs should ensure that the first project provides ducting for the second project's cabling. To avoid unnecessary duplication of works with consequential harm to the environment and disruption to the local community

24.6. In addition to specific impacts around the substations site, a number of issues have also been highlighted within the report in other areas:

- AONB - impacts on designated landscape resulting from the offshore infrastructure;
- Air Quality - cumulative impacts and mitigation proposals;
- Ecology – receptors not all fully assessed or insufficient mitigation proposed;
- Flood Risk – surface water drainage
- Archaeology - insufficient pre-determination evaluation
- Landscape – impact visually and on character by virtue of loss of hedgerows/trees;
- PRoW – insufficient assessment of impacts on amenity and quality of user experience;
- Traffic and Transport – junction design and abnormal loads
- Socio-economic – impact on visitor perception following DMO survey (2019);

24.7. The Councils will continue to engage with the Applicants in relation to the matters outlined within this LIR in order to resolve and narrow, where possible, areas of disagreement. We will also continue to seek appropriate mitigation and compensation in relation to the impacts of the projects.

APPENDICES

Appendix 1 – Rapid Historic Landscape Assessment

RAPID HISTORIC LANDSCAPE ASSESSMENT

Historic Landscape Assessment Report for Proposed Substation Site (Zone 7) for East Anglia Two and East Anglia One North Offshore Windfarms

Friston and Knodishall, Suffolk

Final v.3 prepared by Alice De Leo
November 2019

Contents

1. Summary

This report has been prepared by Suffolk County Council Archaeological Service to present an assessment of the historic landscape of Friston and Knodishall in Suffolk. This area is the location of the substation development site (Zone 7) relating to the East Anglia Two and East Anglia One North Offshore Windfarms (EA1N/EA2), proposed by ScottishPower Renewables (see Section 2.3). This report adds detail to, and should be considered alongside, the various archaeological and landscape assessments previously presented by ScottishPower Renewables.

The development of the proposed substation, with a cumulative footprint of c.12ha, and associated works, will directly impact on the landscape features identified in this landscape assessment report. The degree of harm in places will be impossible to mitigate, which will result in permanent damage to the landscape character and sense of place of Friston and Knodishall. This depth of continuing cultural use demonstrated in this assessment adds to the value of this historic landscape and sense of place.

This landscape was, since at least the 11th century, and still is, very much a rural landscape with a mix of cultivated arable land and heathland (see Section 5 for details). Friston and Knodishall were characterised by this mixed farming economy of cultivation and sheep rearing in the medieval and post-medieval periods. The longevity of this landscape use is characteristic of east Suffolk in comparison to other areas of light soils, such as Breckland in west Suffolk where fields were being enclosed by the 16th century.

The proposed substation development site sits on the boarder of two landscape typologies, Ancient Estate Claylands and Estate Sandlands, which make this area more distinctive in terms of land use and settlement pattern. The substation, as a massive industrial building with associated industrial activity, is uncharacteristic these landscape typologies (see Section 3 for details). It will remove the rural character of the area, impacting on the character of the rural settlement pattern, which is a feature of east Suffolk. It will break up the landscape and interrupt the physical and visual connectivity, thereby divorcing the dispersed historic farmsteads from Friston village.

Extant historic landscape features, of local and regional importance, will be affected by the substation development. This will include:

- the permanent destruction of a track which is a landscape feature marking part of an Anglo-Saxon Hundred boundary and historic parish boundary (see Section 7.2). This is locally and regionally significant.
- permanent destruction of locally significant historic field boundaries (see Section 7.1.).
- damage to the setting of a regionally and potentially nationally significant moated site and associated land (see Section 7.3).
- impact on the character and spatial significance of the dispersed settlement pattern and break up the physical and visual connectivity with Friston Church, as well as across the landscape as a whole (see Section 7.2.3).

Further research suggested in this report is needed to appreciate the significance of these features in enhancing the national understanding of regional variation relating to Anglo-Saxon and medieval land divisions and rural settlement throughout the medieval to the post-medieval periods.

The baseline data on the historic landscape within this report should also be considered alongside the Landscape and Visual Impact Assessment prepared by ScottishPower Renewables,[1] which analyses the impact of the development on the settings of heritage assets. As such, this landscape assessment can be approached in line with Historic England guidance on assessing the impact of the development on the settings of heritage assets.[2]

Little industrial activity has affected the immediate landscape, excepting post-medieval extraction pits and associated kilns, blacksmithing, linen making, local brewing and mills. In terms of modern industrialisation, there is a railway line to the north of Knodishall Parish and a sewerage works just outside Knodishall in the modern residential area of Coldfair Green. In the immediate area of the proposed substation development site, there are powerlines which cross the landscape, but their height and light structure means that they offer little interruption to the rural experience when physically standing in the landscape, compared to the proposed solid structure of three substations with a cumulative footprint of c.12ha up to 13-18m high.

[1] Scottish Power Renewables, (2019) East Anglia Two Offshore Windfarm, Preliminary Environmental Information, Appendix 29: Landscape and Visual Impact Report.

[2] Historic England, (2017) The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (2nd edition), Historic England. [Accessed 19/11/19] https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/

2. Introduction

This assessment has been prepared by Suffolk County Council Archaeological Service to present a rapid desk based historic landscape assessment of the proposed substation site relating to the East Anglia Two and East Anglia One North Offshore Windfarms (EA2 and EA1N) proposed by Scottish Power Renewables (Fig. 1).

The onshore site location of the new substation, which includes National Grid, EA2 and EA1N substations and associated infrastructure, was identified by the Onshore Archaeology and Cultural Heritage Desk Based Assessment (DBA), as one of two sites which could cause permanent change to the setting of heritage assets in the area. As such, this landscape assessment will focus on the proposed substation development site. The purpose of this assessment is to inform Suffolk County Council's planning inspectorate.

2.1 Aims and objectives

This assessment examines and assess the historic character of the landscape surrounding the proposed substation development site.

The aim of this assessment is to:

- assess the historic landscape character of the proposed development area of the substation site.
- understand the time-depth and significance of place.
- understand the potential degree of impact and harm to this historic landscape caused by the development.
- provide baseline data for understanding the contribution of setting to the significance of built heritage assets in the area

This assessment will not discuss the archaeological remains in the area, as this is covered in the DBA, except where the DBA has overlooked or excluded data.

2.2. Methodology

To prepare this assessment the following documents have been reviewed:

- Preliminary Environmental Information Report (PEI) prepared by Royal HaskoningDHV for Scottish Power Renewables, 2019.
- Onshore Archaeology and Cultural Heritage Desk Based Assessment (DBA) prepared by Headland Archaeology, 2018.

These two documents present the archaeological heritage and assess the impact and harm to heritage assets and their settings. However, there is little assessment of the historic landscape, which should be considered a historical asset in its own right.

This rapid historic landscape assessment does not intend to replicate what is set out in the PEI and DBA reports, but rather will address this gap by conducting further research and cartographic analysis to reveal the landscape context and time-depth. See bibliography and sources in Section 10 of this report for full list. Geographic Information Systems (GIS) have been used to illustrate the narrative of the historic landscape to provide visual evidence for the planning inspectorate.

2.3. Proposed Substation Site Location

(Fig. 1)

Scottish Power Renewables have identified 7 zones for the location of the substations; the site selection process is presented in Chapter 4 of the PEI report. Two substations (each 190 x190m footprint and 18m high) are proposed which will be sited adjacent to one another within a single compound, along with the National Grid substation (325 x140m footprint up to 13m high);[3] this is an overall footprint of c.12ha. Fig. 1 illustrates the applicant's preferred location and arrangement.

This site is located in the parishes of Knodishall and Friston in East Suffolk, adjacent to Grove Wood and Laurel Covert, north of Friston village.

3. Topography and geology of the site and surrounding landscape

(Fig. 2)

The proposed substation development site is located in east Suffolk in the modern parishes of Knodishall and Friston. Pliocene Crag forms the geological bedrock of this area with superficial deposits of loam, clays or gravel sands.[4] The proposed site sits on the boarder of two landscape typologies. Ancient Estate Claylands and Estate Sandlands. Ancient Estate Claylands is an area of clay plateau dissected by rivers draining east and south. The deeper clays are found on the higher plateau c.20-30m above sea level and are typically characterised as seasonally wet, slowly permeable, deep clay and fine loam over chalky till (Ragdale association), with areas of more calcareous clay soils (Hanslope association). On the slope, the soils are deep loam to clay and less waterlogged (Melford association).[5] The Ancient Estate Claylands typology is characterised by the organic pattern of field enclosures, enclosed former greens and commons, parkland, villages with dispersed hamlets and farmsteads and ancient semi-natural woodland.[6]

Further down the slope, c.1-15m above sea level, the soils change to a more sandy, well-draining soil which can be very acidic especially under heath or woodland (Newport 4 association), which corresponds with the area described as Estate Sandlands. This landscape is typically characterised by large arable fields, plantation woodlands and remnant heathland.[7] These sandy soils stretch out eastwards towards the coast. The coast is defined by dune sand and marine shingle (Sandwich association), with pockets of marine alluvium (Wallasea 1 association) and peaty soils (Mendham association). Marine alluvium (Wallasea 1 association) occurs in the river valley and flood zones adjacent to the River Alde to the south of the development area and is characterised by salt marsh (Saline 1 association). As the river courses further inland, the soils become more peaty and in parts

[3] Scottish Power Renewables, (2018) East Anglia Two Offshore Windfarm, Preliminary Environmental Information, Volume 3, Appendix 4.1 Red/Amber/Green (RAG) Assessment for onshore substation site selection in the Sizewell Area, p.8-13

[4] Chatwin, C. P., (1961) 'British Regional Geology: East Anglia and Adjoining Areas', Fourth Edition, London, p.42

[5] Ordnance Survey, (1983) 'Soils of England and Wales': S*oil survey of England and Wales, sheet 4 Eastern England* 1:250,000 Harpenden 1983.

[6] Suffolk County Council, (2011), *Landscape Character Assessment, Ancient Estate Claylands*, Available at: http://www.suffolklandscape.org.uk (Accessed: 16/09/19)

[7] Suffolk County Council, (2011), *Landscape Character Assessment, Estate Sandlands*, Available at: http://www.suffolklandscape.org.uk (Accessed: 16/09/19)

acidic (Mendham association). The soils surrounding the Hundred River to the east of the development site are sandier (Newport 2 and Newport 4 associations).[8]

4. Historic Landscape Characterisation, 2008

(Fig. 3)

The character of this landscape can be initially understood from the historic landscape types identified and mapped by the Historic Landscape Characterisation (HLC) project in 2008. Below is a description of the broad historic landscape typologies on and surrounding the substation site, with reference to the HLC codes. The map is illustrated in Fig. 3.

The proposed substation site sits in a landscape which is predominantly agricultural and reflects the evolution of farming practices over the past few centuries. On and to the north of the substation site, the landscape retains elements of an earlier farming landscape of piecemeal enclosure, with irregular field boundaries which may have originated in the medieval period (1.1); however large areas of these historic field boundaries have been lost (3.1 and 3.5) due to rationalisation of fields to accommodate 20th century farming practices, particularly on the lighter soils. An area of former moor identified as Friston moor, now enclosed, is illustrated to the north of the site (2.2). The substation site is adjacent to a 19th century plantation, known as Laurel Covert (7.3) and ancient woodland to the south east, known as Grove Wood, and south west, known as Friston House Wood (7.1). Settlement (10.1) is dispersed and reflect farmsteads, manor houses or halls, and the village of Friston and Knodishall which were formed by settlement in-filling areas of common land. A larger area on the lighter sandy soils is described as former common arable or heathland which has been enclosed (2.1).

The HLC demonstrates that the landscape surrounding the substation site was a mix of arable land and common land/heathland which was slowly enclosed piecemeal with parts of the heathland 'broken up' for cultivation. The nature of the dispersed settlement is typical of this landscape; farmsteads were built adjacent to the parcels of heathland and common land as they were enclosed. While some field boundaries have been lost, remnants of this historic landscape survive in the irregular field pattern and settlement pattern. As a combination of pre-18th century irregular fields, post-18th century enclosure and 20th century agricultural land, this landscape illustrates the narrative of landscape use and change over 300-500 years if not more.

Although the HLC typologies give an indication of the recent historical land use, the interpretation is broad and time depth limited, therefore further analysis at a local level is needed. Section 5-7.3 will provide an analysis of the documentary and cartographic sources to demonstrate the historic landscape character in more detail, this in turn will provide a deeper understanding of the historic setting of extant historic listed buildings in the surrounding area of the proposed substation site.

[8] Ordnance Survey, (1983) 'Soils of England and Wales': S*oil survey of England and Wales, sheet 4 Eastern England* 1:250,000 Harpenden 1983.

5. The Formation of Friston and Knodishall

The proposed substation development is located in the modern boundaries of Knodishall Parish and on the edge of Friston Parish. However, the boundaries of these parishes were altered in 1958. The historic parish boundary originally passed directly through the centre of the substation site and is demarcated by an extant track with existing public rights of way (PROW) access. The relationship between the extant track and the position of the historical boundary cannot be considered as purely a coincidence. This landscape assessment provides evidence to suggest that this track and public access originates from the 10th century as the boundary between two Anglo-Saxon Hundreds, Plomesgate and Blything Hundreds; it continued in use as a parish boundary from the c.12th century into the 20th century. The use of the track and PROW access continues today.

5.1. Anglo-Saxon Hundred Boundaries and the Domesday Survey of 1086

(Fig. 4-5)

5.1.1. What are Hundred Boundaries?

Hundreds were administrative territories which performed civil functions, they represented both a geographical area and an area of legal jurisdiction; most Hundreds in East Anglia were formed from the 10th century and continued to be used into the mid-19th centuries.[9] Hundreds were recorded in the Domesday Survey of 1086 and reflect the structure of land tenure and local justice.[10] The legacy of the Hundred system has shaped the subsequent development of England.[11]

810 hundreds (also known in other areas of England as wapentakes) can be identified from the Domesday Survey.[12] University College London have drawn from the information provided by the Domesday Survey, supplemented by boundary data of estates, parishes and hundreds mapped at later dates, to provide a digital representation of Anglo-Saxon Hundred boundaries throughout England.[13] See Fig. 4 for digital map of Hundreds in east Suffolk.

Hundred boundaries can usually be recognised as topographical and landscape features, such as rivers and watersheds.[14] From the c.9th Century, estate boundaries were walked and described in detail in some Anglo-Saxon charters, the boundary clauses can provide evidence of the type of features used to recognise the boundaries in the landscape.[15] While few Anglo-Saxon charters survive for Suffolk, the Charter of Chelsworth granted by King Edgar in 962 AD[16] provides an example. When Hart and

[9] Godfrey, M., (2007) Minsters, Estates and Parish Boundaries: The Churches, Settlements and Archaeology of Early Medieval Norfolk, PhD Archaeology, ProQuest LLC 2013, p.67

[10] Higham, N. J. and Ryan, M. J., (2015), *The Anglo-Saxon World*, Yale University Press, p. 433

[11] Ibid., p. 322

[12] Brooks, S., (2017) *Domesday Shires and Hundreds of England: General Guide*, Landscapes of Governance Project, University College London (unpublished)

[13] GIS data provided by University College London, created for interdisciplinary project L*andscapes of Governance* (2017).

[14] Godfrey, M., (2007) *Minsters, Estates and Parish Boundaries*, p.70

[15] Blair, J., (2005) *The Church in Anglo-Saxon Society*, p. 448

[16] Hart, C. and Syme, A., (1987) The Earliest Suffolk Charter, Proceedings of the Suffolk Institute of Archaeology and History, Volume CCCVI, Part 3, p.174

Translation of the land bounds from Old English to Modern English: These are the landmarks of Chelsworth. From *Caford* along the mill stream until it reaches Manna's boundary, then from there along *wealc hyrste*, forth by a stream until it comes back to Manna's boundary and Asa's boundary, then from thence until it

Syme ground-truthed the bounds in 1987, they found that the 962 AD estate boundaries were traceable in the landscape.[17] The landmarks described in the Charter include a bridge, streams, river, field boundaries, named boundaries, 'dene' or valley and hedges. Large ditches were often boundary markers, for example at Chelsworth one of the named boundaries in the Charter can be seen today on the ground as a significant boundary ditch with old hedgerows on either side.[18] Equally, boundaries can be traceable in the landscape as existing field boundaries or footpaths, for example, at Chelsworth, the boundary follows part of an existing footpath which runs from the river along field boundaries between Chelsworth Common and Semer Wood to join the road.[19]

Based on the research undertaken by UCL and the case study at Chelsworth, the track which passes through the proposed EA1N and EA2 substation site, can be recognised as a landscape feature which demarcates part of the Anglo-Saxon Hundred boundary between Plomesgate and Blything. This significance of this is further discussed in Section 7.2.

5.1.2. Friston

Friston is an Old English place name which refers to the folk-name 'Frisa, Fresa', and can be interpreted as 'The estate, farmstead of the Frisians'.[20] Frisians travelled from the Netherlands and settled in England from the 7th century onwards.[21] This suggests that Friston has Anglo-Saxon or earlier medieval origins.

Friston sits within the Hundred of Plomesgate, which in turn is part of the Anglo-Saxon area of five-and-a-half Hundreds called Wicklaw, also known as the Liberty of St Ethedreda. The story proposes that St Etheldreda gave the land known as Wicklaw to found a convent at Ely in 673 AD, however, there is no firm evidence of this until 970 AD where the *soke* or jurisdiction of the abbey of Ely over Wicklaw was granted by King Edgar.[22]A charter granted by King Edward in 1042x1066 AD confirmed Ely Priory's rights over *Wichelau* five-and-a half-Hundred.[23]

Wicklaw included the individual Hundreds of Plomesgate, Willford, Colneis, Carlford, Loes and the half Hundred of Parham[24] (Fig. 4). The half hundred of Parham was absorbed into Plomesgate Hundred in

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reaches a dene, then so forth until it reaches the stream that flows into *culan fenne*, and then so forth along the stream until it comes to Oswyth's boundary and Eadwold's boundary. Then forth along the hedge that flows from the stream until it reaches the street, and so forth along the street until it comes into the *mearcella*. then forward along *mearcella* until it arrives at the place where the mill stream and the *mearcella* flow together, then forth along the mill stream until it comes back into *Caford*.

[17] Ibid., p.176-179

[18] Ibid., p. 177

[19] Ibid., p.179

[20] Briggs, K. and Kilpatrick, K., (2016), *A Dictionary of Suffolk Place-Names*, English Place-Name Society Popular Series Volume 6, p. 56

[21] Bremmer, R. H., (1981) *Frisians in Anglo-Saxon England: A Historical and Toponymical Investigation*, Fryske Nammen 3, Nr. 597, Fryske Akademy Ljouwert, p. 72

[22] Atkinson, T., Hampson, E., Long, E., Meekings, C., Miller,E., Wells, H. and Woodgate, G., 'The Liberty of Ely: Origins of the Liberty of Ely', in A History of the County of Cambridge and the Isle of Ely: Volume 4, City of Ely; Ely, N. and S. Witchford and Wisbech Hundreds, ed. R B Pugh (London, 2002), pp. 4-8. British History Online [Accessed 1/10/19] http://www.british-history.ac.uk/vch/cambs/vol4/pp4-8

[23] Charter S 1051, A.D. 1042 x 1066. King Edward to Ely Abbey *Latin,* https://esawyer.lib.cam.ac.uk/charter/1051.html [Accessed 01/10/19]

[24] Anderson, O. S., (1934) The English Hundred-Names, Lund Universitets Arsskrift. N. F. Avd. 1. Bd 30. Nr1, Lund, p. 83

the 12th century.[25] Plomesgate Hundred shared its boarders with the Hundreds of Blything, Bishops, Hoxne, Loes and Wilford.

Friston is not recorded in the Domesday Survey of 1086 which suggests that Friston was recognised as its own settlement after 1086. The parish church, Church of St Mary, has remains of 11th and 12th century work,[26] which suggests that there was a settlement there at that time. It is likely that this area was included in the Domesday Survey under another manor, very possibly Snape. Snape Priory was founded in 1099 with a gift of a manor. The manor remained with the priory until 1524 when smaller monasteries were supressed, then in 1532 the Crown gave the manor to Thomas, Duke of Norfolk. The manor devolved to the Manor of Aldeburgh, which was then sold to Sir Henry Johnson, who rebuilt Friston Hall in the 17th century and resided there.[27] "Snape Mannor" is illustrated on Kirby's 1735 map of Suffolk just below the settlement of Friston (Fig. 15). The hall is now occupied as a farmhouse.

5.1.3. Knodishall

Knodishall is an Old English place name which refers to the personal name Cnott, Cnottes and can be interpreted as Cnott's nook or corner.[28]

Knodishall sits within the Hundred of Blything. The two Hundred Rivers to the north and south form the boundaries of the Blything Hundred and the watershed marks the boundary to the west.[29] Blything Hundred boarders the Hundreds of Plomesgate, Lothing, Wangford and Bishops (Fig. 4).

The 2018 DBA states that three manors were recorded at Knodishall in the Domesday Survey of 1086.[30] However, this is inaccurate. Knodishall is mentioned three times in the Domesday Survey but refers to two holdings. First, Ranulf son of Walter holds 80 acres of land from Roger Bigod as a 'berwick'[31], outlying estate, of the manor of Saxmundham; there are 3 small holders, 1 villager and 2 ploughs, Robert Malet has the *soke*.[32] Next, 1 free man, Boti, holds 30 acres from Roger Bigod; there is 1 plough and Robert Malet holds the *soke*.[33] Knodishall is mentioned a third time in the context of Saxmundham, however this refers to the 80 acre 'berwick' held by Ranulf son of Walter.[34] This demonstrates that land at Knodishall was being reclaimed from heathland for cultivation, potentially for the specialised production of barley, in the 11th century and that settlement was dispersed.

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[25] Ibid., p. xviii

[26] Historic England, The National Heritage List for England, Church of St Mary, List Entry number 1287864, https://historicengland.org.uk/listing/the-list/list-entry/1287864 [Accessed 04/10/19]

[27] Copinger W. A., (1909) *The Manors of Suffolk Notes on their History and Devolution: The Hundreds of Lothingland and Mutford, Plomesgate and Risbridge*, Manchester, 1909 [Accessed 01/10/19] https://archive.org/stream/manorsofsuffolkn05copiuoft/manorsofsuffolkn05copiuoft_djvu.txt]

[28] Briggs, K. and Kilpatrick, K., (2016), *A Dictionary of Suffolk Place-Names*, p. 84

[29] Warner, P.M., (1982), *Blything Hundred: A Study in the Development of Settlement AD. 400-1400*, PhD Thesis, Department of English Local History, University of Leicester, p. 110

[30] Headland Archaeology, *East Anglia Two and East Anglia One North Offshore Windfarms, Onshore Archaeology and Cultural Heritage Desk Based Assessment* for Royal Haskoning on behalf of Scottish Power Renewables, Grey Literature Report, November 2018, p. 10

[31] 'berwick' literally translates as barley farm

[32] *Eds* Martin, G. H and Williams, A., *Domesday Book: A Complete Translation*, Alecto Historical Editions, 3rd edition, London, 2003, p.1222

[33] Ibid p. 1222

[34] Ibid p. 1225

5.2. Parishes of Friston and Knodishall

(Fig. 6-8)

Parishes can be described in a simple way as parochial administrative areas and tend to be focused on medieval churches. The formation of Parishes is very complex and there is not enough scope to discuss this here. The extents of Friston and Knodishall parishes were altered in 1958 to the boundaries known today, however, in this case it is possible to see the continuity between their previous shared boundary (based on the 19th century Tithe map) and the Anglo-Saxon boundary of Plomesgate and Blything Hundred (Fig. 6-7).

The shape of Friston and Knodishall parishes are unusual and this is due to the development of the settlements and how the landscape was used. In East Suffolk the settlement pattern tends to remain dispersed with settlement in-filling areas of common land, rather than nucleated around a church. There is a relationship between settlement pattern, parishes and the landscape. Different soil types were conducive to different types of land exploitation. Parish boundaries tend to cross or converge on moor or heath[35] as demonstrated by the northern pointed parts of the 19th/20th century parish boundary of Friston and Knodishall Parish; each parish needed a share of the landscape resources (Fig. 8). The shape of Friston parish is fragmented but incorporates the clay and loam soils to the north, the sandy light soils to the south, and the marshes on the banks of the River Alde. The same pattern can be seen with Knodishall Parish; the parish incorporates a share of the same type of landscape resources. This partly explains the unusual shape of the historical parish boundary between Friston and Knodishall.

5.3. Settlements of Friston and Knodishall

(Fig. 9)

In Suffolk, medieval settlement tended to focus in the valleys and in relation to landscape resources and transport networks, such as road or river crossings, where early churches were encountered.[36] Settlement on the upland moors tended to be limited to isolated farms.[37] In east Suffolk, settlement began to in-fill the edges of common land in the Late Saxon to medieval period;[38] field names, isolated moats and deserted medieval settlements are indicators of this.[39] This is the case for Friston and Knodishall which both feature common-edge settlement, in-filling of common land, isolated moats and dispersed isolated farmsteads. This is typical for East Anglia, and particularly parts of Suffolk. The differences in settlement are linked to variations of farming regimes which are associated with social and manorial structures, field systems and landscape characteristics.[40]

[35] Warner, P.M., (1982) *Blything Hundred*, p. 35
[36] Ibid., p.32
[37] Ibid., p.33
[38] Ibid., p.36
[39] Ibid., p.189
[40] Roberts, B. and Wrathmell, S., (2002) *Region and Place: A Study of English Rural Settlement*, English Heritage p.59

5.3.1. Friston

Settlement in Friston gives the impression of an ad hoc and organic development. The church of St Mary is semi-isolated with a small cluster of settlement in the vicinity. The church is Grade II* listed (1287864) and mainly dates from the 14th/15th century, however there is evidence of earlier 11th and 12th century work. There is a row of cottages dating to the 17th century (1287971).

The main area of settlement developed slightly to the south from the church and is formed in the classic triangular shape of an in-filled green, adjacent to a large area of heathland, known as Black Heath in the 19th century and now known as Knodishall Whin.

Individual farmsteads are dispersed around the rest of the parish. Hodskinson's Map of Suffolk dated 1783 illustrates this dispersed settlement on the edge of Friston Moor (Fig. 16). Fig. 9 illustrates the listed buildings, and the settlement illustrated on 19th Century Tithe Maps. Fig. 9 also shows 20th-21st century settlement expansion on the modern Ordnance Survey base mapping.

5.3.2. Knodishall

The settlement pattern in Knodishall is similar. The church is isolated from the main settlement, and is adjacent to Knodishall Hall, associated buildings and the Rectory. The main area of settlement, with its own chapel, developed on Knoddishall Common and Coldfair Green, which has continued to expand. Isolated dispersed farmsteads are also a characteristic of Knodishall parish. See Fig. 9.

The remains of a moat is visible in the landscape adjacent to Little Moor Farm which may indicate the presence of a manorial residence or parsonage. This is discussed in Section 7.3.

Remains of a church are recorded on the 1st edition Ordnance Survey map, near Knodishall Green. Names of houses nearby indicate the area of the lost settlement of Buxlow. Warner suggests that "well-preserved earthworks of green-side sites can be seen beside Knodishall Green near to the ruins of Buxlow church."[41]

There is also be evidence of a possible deserted medieval settlement to the south of Grove Wood which was identified in recent Geophysical Survey.[42]

The settlement pattern of isolated farmsteads encroachment on common land has been preserved in the landscape today. Friston village has not expanded much since the 19th century. However, in Knodishall, the settlement on Coldfair Green has significantly expanded to the south; in addition to residential housing there is an area of sewerage works.

[41] Ibid., p. 213

[42] Headland Archaeology, *East Anglia One North/Two Offshore Windfarm Proposed Onshore Cable Corridor and Substation Sites: Geophysical Survey Interim Summary Report for Scottish Power Renewables Ltd*, Unpublished Grey Literature Report, November 2018

5.4. The Farming Landscape

East Suffolk has a long history of being a rural landscape with a mixed farming practice which has shaped the landscape we see today. In places, field boundaries are irregular, reflecting the piecemeal enclosure of an open-field system (communal strip cultivation) and encroachment of common and waste land which took place from the 14th-18th centuries.[43] In the 14th century, an irregular common field system tended to occupy the poorest and lightest soils in the Sandlings in east Suffolk, as well as the Breckland area in west Suffolk and the chalk clays in the south west.[44] These poorer soils were not regularly cultivated, but rather cropped for several years before being left fallow and returning to scrub.[45] The practice of sheep grazing (also known as sheep folding) on heathland or moorland was vitally important to supporting this farming system. Heathland and common land was also a valuable resource, not only for grazing, but also for fuel such as flag and ling, especially in the medieval period; documentary evidence held for Friston indicates that the parish was poor and healthand exploitation continued into the 19th century.[46]Friston and Knodishall were characterised by this mixed farming economy of cultivation and sheep folding in the medieval and post-medieval periods. This continued into the 16th century where soils were poorest and sheep foldcourses were less formally organised, than for example Breckland in west Suffolk where fields were already being enclosed.[47] Enclosure in east Suffolk was piecemeal and was undertaken over a long period of time, as such east Suffolk is unique for the county in preserving the historical irregular field boundaries and areas of heathland, due to the weaker tenurial structure.[48]

5.4.1. Tithe Maps – 1840s

(Fig. 10-13)

The Tithe maps of Friston (1847) and Knodishall (1846) (Fig. 10 and Fig. 11) illustrate a predominantly arable landscape in the 19th century, with pockets of common land, semi-ancient woodland and plantations. Settlement was dispersed with isolated farmsteads dotted throughout both parishes and evidence of green-edge/common-edge settlement on Knodishall Common, Coldfair Green, Friston Moor and at Friston village. It is evident that settlement here grew out of encroaching on and in-filling areas of common land. As common land was 'broken up' for cultivation and gradually enclosed, farmsteads were built nearby to reinforce their claim.

In the 19th century, the poorer soils were intensively cultivated due to a revolution in agricultural practices. This led to the reclamation of common land, such as greens, moorland and heathland for arable cultivation. Field names in the Tithe apportionments for Friston and Knodishall confirm this, such as "Old Whin", "Whitmore", "Tyes Whiffe", "Kiln Walk". This land was gradually enclosed, farmed for several years, and in some cases was left to revert back to scrub. When analysing the field names in the Tithe apportionments it is possible to reconstruct areas of former common land which by the 1840s had been taken into cultivation (Fig. 12 and Fig. 13). As the land was relatively unsettled, large areas of common land could be reclaimed, which accounts for the larger straight grid-style fields in some areas. Field names also indicate other local industry in the area. Sand and clay extraction was

[43] Bailey, M., The form, function and evolution of irregular field systems in Suffolk, c.1300 to c.1550, Agricultural History Review, vol. 57, Issue I, p. 16
[44] Ibid., p. 19
[45] Ibid., p.21
[46] See SRO FC124/A/3 Accounts and Vouchers (c1640-1865)
[47] Ibid., p.23
[48] Ibid., p.21

undertaken across both parishes on areas of common land which is visible on the Tithe map and later Ordnance Survey maps, and associated kilns can also be identified from the field names "Kiln field "Kiln walk".

The field names also help us to understand the type of farming practices which were being used and indicate that a mixed farming economy of arable cultivation ("Close", "pightle", "field") and sheep farming ("sheep walk", "sheep fold", "osiers"[49]) was prevalent in this area throughout the medieval period and continued into the 19th century. The field names indicate that agricultural industry was focused on cultivation of barley, oats and wheat, and sheep rearing for wool. Hops and hemp were also being grown in Friston indicating evidence of brewing and linen making.

Evidence of medieval open-field farming[50] can also be seen in the shape of certain fields which appear like strips, and also the field names such as "feld", "fielding". (See Fig. 12 and key "'fielding' former open-fields, now enclosed"). To the north of the proposed substation development site is Friston Moor Farm. This area was consolidated from open fields of several tenements and moor-side encroachment as seen on Kirby's 1781 plan of the farm annotated by Warner (Fig. 17). These open-fields were slowly enclosed which accounts for their irregular boundaries. While internal divisions of these boundaries have now been lost in places, some of the external enclosures can still be seen in the landscape today (Fig. 18).

5.4.2. Land Utilisation Survey 1930s

The Land Utilisation Survey map for Suffolk, completed in 1937, shows the landscape during the inter-war years. For this assessment, this map was digitised in GIS for the areas of Friston and Knodishall to demonstrate the change in land use since the 19th century. This map shows the reversion of cultivated arable land back to permanent pasture and heathland; in places woodland is planted (Fig. 14). This demonstrates the cyclical nature of the mixed farming economy where heathland was 'broken up' and reclaimed responding to wider socio-economic issues, which continued in Suffolk into the 20th century.

6. The Landscape Today

Aerial photos (Fig. 19) and photographs from a site visit (appendix 1) show that the landscape today continues to be a cultivated arable landscape with pockets of heathland and pasture. Friston Moor has disappeared, taken over for cultivation. However, this landscape is not dissimilar to the 19th century and earlier landscape with some historic trackways and field boundaries preserved; although in places modern agriculture has removed some historic field boundaries. There is continuity in terms of the dispersed settlement pattern compared to the 19th century tithe maps, with only very little built development, excepting residential expansion at Coldfair Green (see Fig. 9). The landscape has evolved and developed as a result of human activity and while the dispersed farmsteads are no long set in their exact contemporary landscapes, their current setting is not too dissimilar from their historic setting of farmland, woodland and heathland.

[49] Osiers = willow trees used to make hurdles for sheep folding.
[50] Also known as strip cultivation, where land was farmed communally in strips.

7. Surviving Historic Landscape Features

7.1. Historic Field Boundaries

Figure 18 shows the survival of historic 19th century field boundaries. This is discussed in Section 5.4.1.

7.2. Track and footpath as a historic boundary – Previously unidentified Non-Designated Heritage Asset

An extant track passes directly through the proposed EA1N/EA2 substation development site at Friston and Knodishall (Fig. 20). The track is a regularly used footpath. The track is respected by the cultivation in the neighbouring fields and the hedgerows some of which are newly planted. There is a large ditch beside the section of the track at Little Moor Farm with trees on the western side; the adjacent field here on this western side is not cultivated. On the eastern side of the track, and also along the rest of the track, the fields are or have been recently ploughed, which may explain the absence of ditches there; cultivation may have eroded any ditches or banks (see photos in appendix 1).

The discussions below highlight that this track should be considered as a non-designated Heritage Asset, previously unidentified by the Desk Based Assessment Report and the Landscape Visual Impact Assessment Report produced for the EA1N/EA2 scheme.

7.2.1. Relationship of the track with historic land divisions and boundaries

This track is historically significant because it can be interpreted as forming part of a territorial and administrative boundary between the Anglo-Saxon Hundreds of Plomesgate and Blything, which were formed from as early as the 10th century (Fig. 5) (see Section 5.1 for details). The significance of the track is heightened by the fact it continued in use as a Parish boundary through to the 20th century, until the boundary was altered in 1958 (see Section 5.2). Hodskinson's Map of Suffolk dated 1783 illustrates Friston and the historic Hundred boundary (Fig. 16).

However, the track is not an isolated feature in the landscape. The entire north-eastern boundary where Plomesgate Hundred boarders Blything Hundred, which also forms the later parish boundaries of Friston and Knodishall, are visible in the landscape. Aerial photography shows the line of the boundary with an associated footpath along tracks and field boundaries. The track and footpath in question which will be affected by the substation development starts at Friston village and continues northwards to Little Moor Farm. Beyond the farm, the line of the public footpath continues northwards along field boundaries, following the historic boundary, and joins the track called Workhouse Lane up to the railway track and The Gate House. It is this point where Plomesgate and Blything Hundred boundaries meets the boundary of Bishops Hundred. Beyond the railway track, the boundary between Blything and Bishops Hundreds continues along a lane now known as Hawthorne Road, and then north west along Honeypot Lane and private field boundaries where it reaches Boundary Farm.

Other parts of Plomesgate Hundred boundary are traceable in the landscape as field boundaries and country lanes, but do not have a consistent footpath and is lost in parts due to modern agriculture.

The Hundred River and the River Butley form the boundaries to the south and east where it meets the coast.

This demonstrates that the track and footpath which form the north-eastern section of the Plomesgate Hundred boundary, and the later parish boundary of Friston and Knodishall, is locally significant as a preserved landscape feature. This significance is magnified by its relationship with St Mary's Church in Friston village, discussed below. Although this track and boundary is a locally significant feature, it forms part of a historic territorial and administrative division of land used nationwide from the 10th to the 19th century. The survival rate of Hundred boundaries preserved as landscape features is unknown and further research is needed to ascertain the rarity of such features and the preservation of Hundred boundaries elsewhere in England.

The Anglo-Saxon archaeology and potential of the substation development site, and that of the entire development area, was overlooked in the Desk Based Assessment conducted by Headland Archaeology for EA1N/EA2. Understanding this potential will contribute to the significance and understanding of the extant track and footpath as representing Anglo-Saxon land division and boundary. East Suffolk is a nationally and internationally important landscape in the heart of the Anglo-Saxon kingdom of East Anglia. Nearby nationally significant known and excavated archaeological sites dating to the Anglo-Saxon period include: the cemetery and ship burial at Snape[51] (2km from the substation development site and c.1km from the cable route); the cemetery at Barbour's Point on the River Alde[52] (4km from the substation development site and 2.8km from the cable route); the internationally significant royal estate centre at Rendlesham[53] and the cemetery and ship burial of Sutton Hoo both situated on the River Deben (approximately 11km and 16km respectively from the substation development site). The combination of these sites places Friston within a significant wider Anglo-Saxon landscape.

7.2.2. Relationship of the track with St Mary's Church, Friston

The location of the track and its proximity to St Mary's Church in Friston suggests that there is a relationship between the two.

Firstly, to set St Mary's Church at Friston in its regional context. East Anglia has a dense distribution of small local churches compared to other parts of England, such as the Midlands.[54] Many of these small local churches in East Anglia were founded in the 11th century around the time of the Domesday Survey of 1086, particularly in Suffolk. They tended to be attached to small holdings belonging to local people, as opposed to the result of an organised national movement of church building.[55] Such churches were founded in a landscape of dispersed settlements and small villages[56] like that of Friston. This fostered a strong sense of parochial community throughout the medieval period, which was

[51] Filmer-Sankey, W. and Pestell, T., (2001) Snape Anglo-Saxon Cemetery: Excavations and Surveys 1824-1992, Volume 95, East Anglian Archaeology, Suffolk County Council
[52] Meredith, J., (2012) River Alde Saxon Heritage Project, Barbers Point (Excavations 2010) FRS 001, Archaeological Excavation Report, No. 2012/036, Suffolk County Council
[53] Caruth, J., Minter, F., Plouviez, J. and Scull, C., (2014), Rendlesham Park and Sand Walk RLM 054 and 055, Post Excavation Report, No. 2014/130, Suffolk County Council
[54] Blair, (2005) *The Church in Anglo-Saxon Society* p.426
[55] Ibid., p. 392
[56] Ibid., p. 421

expressed in various ways, but particularly through the communal observance of Christian ritual and liturgical activity.

Rogation processions were a communal ritual activity which commemorated the Pentecost at Easter; this was a major event by the 5th century which involved the whole community walking around the fields to bless the spring crops.[57] The consensus among historians is that the annual Rogation Day processions involved walking the parish boundaries to define its identity within the community.[58] This custom continued from the 5th century until the 16th century; by the 14th century it became a semi-ecclesiastical civic ritual.[59] While there is little documentary evidence of walking specifically around the parish boundary during the late Anglo-Saxon period, it is suggested that local people likely used the existing secular landmarks similar to those identified in the Anglo-Saxon boundary charters (see also in 5.1.1) as their reference.[60] This argument is strengthened by evidence that during the 16th century, parish clergy in England were reminded to inspect the parish boundaries during Rogation Days.[61] This custom eventually dwindled, for example in East Suffolk during the late 16th-early 17th centuries out of 260 parishes 35 no longer continued the custom.[62] However, there is evidence for the tradition of attending Pentecost, also known as Whitsun, into the 19th century, for example at Framlingham.[63]

In Friston, St Mary's Church is grade II* listed (1287864) and has 11th and 12th century fabric although the main body is 14th and 15th century in date. The extant track and footpath is directly opposite the church and leads northwards to and across the fields, following the line of the historic parish and Hundred boundaries, as discussed above (Fig. 5). This cannot be coincidental and it is likely that this track formed part of the Rogation processional route. This suggestion is reinforced by local knowledge today of the track being known as 'Old Pilgrim's Way'.[64] As such, there is a strong argument to suggest that this landscape feature is a boundary which has a long-seated tradition of being walked by the community since the 11th century.

This relationship with the church could explain why this track and whole north-eastern part of the Hundred and parish boundaries are preserved in the landscape today with continued public rights of way.

[57] Hutton, R., (1996), *The Stations of the Sun: A History of the Ritual Year in Britain*, Oxford University Press, p. 277

[58] Duffy, E., (2005) *The Stripping of the Altars: Traditional Religion in England 1400-1580*, 2nd ed., Yale University Press, p. 136

[59] Hall, M., (2018) Approaching Medieval Sacrality, *in* Gerrard, C. and Gutierrez, A. (eds) *Later Medieval Archaeology in Britain*, Oxford University Press, p. 620

[60] Blair, (2005) *The Church in Anglo-Saxon Society* p. 487-488

[61] Hutton, (1996), *The Stations of the Sun* p. 282

[62] Ibid., p. 282

[63] SRO FC1001/I/2/2, Voucher in respect of John Dixon for attending at the Whitsun and Michaelmas fairs, 1832

[64] See Letter dated 05/02/19 To Ms Abraham and Ms Minter from Mary Shipman, Sub-station Action: *"Also of note is information from our retired Vicar and current Parish Councillor, Reverend Christine Brooks, who still lives in Friston, that the track crossing the proposed substation site (Footpath 6) is an old "Pilgrims Way". This track is shown on OS Maps as late as 1990 as "other road, track or drive"."*

7.2.3. Relationship of the track with the settlement and wider landscape

The settlement of Friston, as discussed in Section 5.3.1, is characterised by the village near the church, the settlement infilling the green, and the dispersed farmsteads. While at first this arrangement looks like pockets of isolated inhabitants, it is in fact a landscape which historically was and still is well connected by a network of footpaths, tracks and lanes (Fig. 20). The track connected the inhabitants of the village and dispersed farmsteads with each other and their local resources in the wider landscape. Little Moor Farm and a moated site are directly next to this track which is discussed below. This connectivity was important to effectively exploit the agricultural potential and the resources in the landscape produced by the different soil types which supported the inhabitants and local agrarian economy. This is reflected in the dispersed settlement pattern. This is discussed in detail in Section 5.4.

7.2.4. The Track and Boundary as a potential Heritage Asset

There are three categories set by Historic England which define linear earthworks as Heritage Assets: 'Prehistoric Field Boundaries', 'Linear Frontier' or 'Pre-industrial Roads, Trackways or Canals'. The boundary and track at Friston can be considered as a Heritage Asset under the 'Pre-industrial Roads, Trackways or Canals' guidance[65], as a trackway which has developed over time by people walking it. This Historic England guidance suggests that such trackways continued in use and can survive as farm tracks, bridle paths, footpaths, field boundaries or modern roads[66] and are associated with contemporary monuments in the landscape including settlements and farmsteads.[67]

Based on the research presented in this assessment, this track and footpath at Friston which starts at Friston Village and extends northwards to The Gate House, can be considered as a Heritage Asset as defined by Historic England's guidance.

7.2.5 The Track and Boundary as a potential Scheduled Ancient Monument

Designating historic features as Scheduled Ancient Monuments is selective and designed to protect a site. Such sites must be of national importance and contribute to the understanding of the national story.[68] Anglo-Saxon Hundreds are considered under Historic England's scheduling guidance for historic features relating to 'Law and Government'. Hundred boundaries are not considered as schedulable monuments in themselves, as their form and location can change over time. However, in some cases the Hundred meeting or "moot" places can be identified by their associated earthwork mounds or stones, which are protected as Scheduled Ancient Monuments across England. For Example, Secklow Hundred Mound in Milton Keynes (1007940).[69]

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[65] Historic England, (2018), *Pre-industrial Roads, Trackways and Canals: Introductions to Heritage Assets*. Historic England. Swindon

[66] Ibid., p.4

[67] Ibid., p.11

[68] Historic England, (2018), *Law and Government: Scheduling Selection Guide*, Historic England, Swindon, p. 13

[69] Historic England, The National Heritage List for England, List Entry Number 1007940, https://historicengland.org.uk/listing/the-list/list-entry/1007940 [Accessed 19/11/19]

7.2.6. Conclusion – Track and Boundary

Based on the evidence presented in this assessment, part of the Anglo-Saxon Hundred boundary and historic parish boundary is preserved in the landscape along the line of the track, footpath and field boundaries. This landscape feature passes directly through the proposed substation development site. The significance of these landscape features as historic boundaries is strengthened by the relationship with the church, the surrounding settlement and the landscape resources. As such this feature should be considered as part of the wider contemporary landscape which connected the village, church and dispersed farmsteads with each other, as well as with the local resources, connecting the village situated on light sandy soils, with the moor situated on the clay and loamy soils.

The track can be considered as a heritage asset of local importance to Friston and east Suffolk, as well as of regional importance contributing to the understanding the tenurial and settled rural landscapes of Suffolk and East Anglia. There may be buried archaeological or palaeoenvironmental potential associated to this feature and field boundaries which should be considered. Further research is needed to understand whether the track's relationship with the church make the survival of this landscape feature more significant than other surviving features of Hundred and historic parish boundaries; this is beyond the scope of this report.

Further research is required to understand this feature in its national context. While the feature is unlikely to be of national importance requiring Scheduling, the case study of Friston does contribute to the regional and therefore national understanding of the social and tenurial structure of settled rural landscapes.

7.3. Moated Site at Little Moor Farm – Previously identified Heritage Asset

The earthworks of a rectangular moat are preserved on the edge of the former Friston Moor and adjacent to Little Moor Farm. It was possibly the site of the former Buxlow parsonage. This heritage asset is recorded on the Suffolk Historic Environment Record (SHER) as KND 011.

The DBA report produced by Headland Archaeology for the EA1N/EA2 scheme, mentions this site briefly in the text in relation to KND 009, possible site of a former church; however KND 011 is excluded from their map on Figure 3, along with two other sites; the site of possible 18th century buildings now demolished (KND 015) and an enclosure with a scatter of medieval pottery (KND 014). These are also not listed in their table of HER and NRHE records as they fell outside of the ADBA Study Area.

As the proposed development area has since been revised it is necessary to now consider these sites to understand their significance and the impact of the development.

7.3.1. The Moat as a Surviving Landscape Feature

The SHER records the moat as the site of the former Buxlow parsonage recorded in a Glebe Terrier of 1725. As demonstrated on Fig. 20, the moat with an associated piece of land is incorporated into the historic parish of Knodishall which indicates an unusual example of land ownership. This requires further investigation which is beyond the scope of this report. Adjacent to the moat is Little Moor Farm, a 17th century timber framed house (1215743). The moat is visible on historic maps and aerial photos:

1783 Hodskinson's Map of Suffolk (Fig. 16): The moat is not visible on this map, however buildings are illustrated in the same area on the Knodishall side of the parish boundary adjacent to Friston Moor which likely illustrates Little Moor Farm.

1846 Tithe Map and Apportionment of Knodishall (Fig. 11): The outline of the moat is illustrated and the apportionment described the land within the moat as tenement, cottage and garden. The farmstead of Little Moor Farm is also illustrated.

1880s Ordnance Survey Map (Fig. 21): 3 sides of the moat are visible with trees planted around the moat. The moat island appears to be divided into two landholdings, there are 4 buildings and the entrance track is to the north. The dotted boundary mark of Knodishall parish boundary includes the moat and surrounds a strip of land to the south of the moat.

1937 Land Use Map (Fig. 13): this map illustrates areas of settlement in the locations of the moat and of Little Moor Farm. Detail of the sites are not shown.

2000 to 2019 Google Earth Aerial Photography (Fig. 22): Three arms of the moat are visible, and the island is under tree cover, trees were partly cleared in 2019. No buildings are visible on the island of the moat. Little Moor Farm is visible and does not appear to encroach on the moat.

7.3.2. Relationship of the Moat with Surrounding Churches

The moat is connected to the surrounding landscape via a network of public footpaths (Fig. 20). To the north a footpath along the edge of the historic parish boundary leads to the former church of Buxlow. To the west the footpath follows along field boundaries across the former moor. To the east a footpath meets Grove Road and School Road which lead to Knodishall. To the south the track leads to Friston church and village. The survival of the track and relationship to St Mary's Church (discussed in Section 7.2) is enhanced by the presence of and connectivity with the moated site of a former parsonage. Further research is required to understand the purpose of the moat, to verify its use as a parsonage and whether the resident clergy served all or just one of the local parish churches.

7.3.3. The Moat as a Heritage Asset

The moated site is recognised and recorded on the SHER as a historic monument. It can also be considered as a Heritage Asset under Historic England's guidance for "Medieval Settlements".[70] It is locally and regionally significant as a feature representative of dispersed rural settlement recognisable in East Anglia and Suffolk, particularly in areas of light soil such as east Suffolk. It adds to the regional identity which distinguishes East Anglia from other parts of England.

[70] Historic England, (2018), *Medieval Settlements: Introductions to Heritage Assets*. Historic England. Swindon

7.3.4. The Moat as a nationally significant Heritage Asset and potential Scheduled Ancient Monument

Moats are considered under Historic England's Scheduling Selection criteria for "Settlement Sites to 1500". As there are c.6000 moated sites known in England the scheduling criteria is more selective for these types of features. The densest concentration of moats is in central and eastern parts of England, particularly on the heavier soils of Essex and Suffolk. Moats are typical features of dispersed settlement and were dug around farmsteads; in East Anglia some moats lie within areas of common land such as rough grazing. The moat at Friston is an archetypal example for this. [71] The presence and distribution of moats are important to the understanding of the wealth and status in the countryside.

When searching the Historic England database, it shows that 1274 moats in England are scheduled, 95 of which are in Suffolk. On the SHER there are 1091 records with the monument type "moat", of which 122 are Scheduled or are associated with Scheduled Ancient Monuments.[72]

Table 1 sets out a preliminary desk assessment, based on the research in this report, on how the moated site at Friston/Knodishall meets the scheduling considerations and whether further research is needed to inform this. If the site is considered ineligible for scheduling the following guidance should be considered:

"Other sites may be identified as being of national importance, but not scheduled. Government policy affords them protection through the planning system, and local authorities play a key part in managing them through their archaeological services and Historic Environment Records (HERs)."[73]

Table 1: Scheduling considerations for moated site at Friston/Knodishall

Specific scheduling considerations	**Moated site at Friston/Knodishall**
Period	The moated site is representative of medieval dispersed rural settlement. The site was also occupied during the post-medieval period
Documentation *Additional guidance for moated sites: contemporary documentation – although this should not be expected, as many sites were occupied by freeholders who generally did not make records*	The SHER record states that the moated site is likely the parsonage associated with the church at Buxlow, as mentioned in 1725 Glebe Terrier. 1725 is the earliest documentation date for Knodishall Parish held by the SRO. The SRO hold records for Buxlow dated 17th Century. These need to be reviewed.
Group Value *Additional guidance for moated sites: location in the contemporary landscape*	The moated site, as the potential site of a parsonage, is connected with other contemporary sites, including churches, by a network of footpaths and tracks.

[71] Historic England, (2018), Settlement Sites to 1500: Scheduling Selection Guide, Historic England, Swindon, p.15

[72] Search of Suffolk Historic Environment Record performed 20/11/19

[73] Historic England, (2018), Settlement Sites to 1500: Scheduling Selection Guide, Historic England, Swindon, p.20

	A historic trackway connects the moated site with St Mary's Church in Friston to the south (see Section 7.2 for significance of track as a historic boundary), and footpaths along field boundaries connect the moat to the site of the church at Buxlow, now demolished. The site sits within the wider landscape of medieval and post-medieval dispersed settlement typical to that of East Anglia, including cottages on the edge of commons/moor/heath, village settlement and infilling of greens typical to that of the lighter soils of east Suffolk. Adjacent to the moated site is Little Moor Farm which is a listed 17th century timber framed house (1215743) The moat is associated with a long strip of land. The historic parish boundary of Knodishall diverts to incorporate the moated site and associated land (Fig. 11 and Fig. 20). The churches, moat, track, adjacent listed 17th century house, and surrounding settlement show group value.
Survival and condition *Additional guidance for moated sites: good quality earthworks*	The earthworks of the moat are visible on aerial photos (2000-2019), although at times the site was covered with trees, in 2019 the trees have been partially cleared. A site visit is required to survey the earthworks and ascertain the level of survival and condition.
Diversity	n/a
Archaeological Potential *Additional guidance for moated sites:* *demonstratable or likely survival of medieval archaeological deposits* *presence of listed buildings within moat*	No buildings survive within the moated site. Medieval pottery has been found 150m to the north of the moat during a fieldwalking survey undertaken in 2000-2001. There is no record of any archaeological investigations on the moated site. While archaeological deposits may be likely, there will also be post-medieval archaeological deposits relating to the cottages present on the site during the 18th-19th centuries (see above). It is likely that organic and palaeoenvironmental remains survive.

8. The Regional Research Framework for the East of England[74]

Finally, to consider the Regional Research Framework for the East of England, developed by the Association of Local Government Archaeological Officers (ALGAO) and supported by Historic England.

The case study of Friston and its significance can be better understood by addressing and contributing to the following regional research priorities:

8.1. Anglo-Saxon:

The extent and nature of Middle and Late Anglo-Saxon landscape reorganisation, village nucleation, field systems and land reclamation all need further exploitation.

Reference should be made to the way that Anglo-Saxon settlements and organisations of the landscape influenced the medieval landscape.

The increased interest in environmental determinism and the importance of agricultural production need to be capitalised upon and explored more fully.

The interchange between rural food supplies and urban industrial and craft products was essential for both town and village or hamlet. The east of England, historically rural with few large towns, is well-placed to study this problem.

8.2. Medieval:

The origins and development of the different rural settlement types need further research. Are there regional or landscape variations in settlement location, density or type? How far can settlement forms and the size and shapes of fields be related to agricultural regimes?

Palaeoenvironmental sampling and the dating of extant historic landscape features, such as field boundaries is recommended.

Settlement change, evolution and abandonment requires further study, particularly with reference to the evolution of greens and green-side settlements. Are there regional variations?

Research into the origins and development of greens, tyes and commons is needed.

Origins and development of dispersed settlement pattern needs further exploration. What are its implications for social organisation and landscape development across the medieval period.

Moated sites – can more be done to clarify their dating and to elucidate the variety of forms and sizes?

Agricultural production and regional variation requires further research and the form of farms and farmsteads need exploring.

8.3. Post-medieval:

The economic and social influences of towns, including the effects on agricultural production in its hinterland require further study.

Research should focus on the East Anglian farmstead 1750-1914, which are a crucial but understudied component of the East Anglian landscape.

[74] The Regional Research Framework 2019 is currently under review. A summary of the topics and priorities can be found here: http://eaareports.org.uk/algao-east/regional-research-framework-review/

The Agricultural Revolution in East Anglia and its impact on the landscape requires further study.

The impact of social change on the landscape during this period requires further study.

9. Impact of Development – Substation Development Site (Zone 7).

The development of the proposed substation, with a cumulative footprint of c.12ha, and associated works, will directly impact on the landscape features identified in this landscape assessment report. The degree of harm in places will be impossible to mitigate, which will result in permanent damage to the landscape character and sense of place of Friston and Knodishall. The substation, as a massive industrial building with associated industrial activity, is uncharacteristic of the Ancient Estate Claylands and Estate Sandlands (see Section 3). It will remove the rural character of the area, impacting on the character of the rural settlement pattern, which is a feature of east Suffolk, breaking up the landscape and interrupting the connectivity, thereby divorcing the dispersed historic farmsteads from Friston's historic settlement.

Extant historic landscape features, of local and regional importance, will be permanently destroyed as a result of the substation development. This will include the permanent destruction of part of the track as part of the historic Hundred and parish boundary, as well as of historic field boundaries. As such the landscape context of the regionally and potentially nationally significant moated site and associated land will be affected. Further research suggested in this report will help to understand the significance of these features in enhancing the national understanding of regional variation relating to Anglo-Saxon and medieval land divisions and rural settlement through to the post-medieval period.

The baseline data on the historic landscape within this report should be considered alongside the Landscape and Visual Impact Assessment prepared by ScottishPower Renewables,[75] which analyses the impact of the development on the settings of heritage assets. As such, this landscape assessment can be approached in line with Historic England guidance on assessing the impact of the development on the settings of heritage assets.

[75] Scottish Power Renewables, (2019) East Anglia Two Offshore Windfarm, Preliminary Environmental Information, Appendix 29: Landscape and Visual Impact Report.

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11. Figures

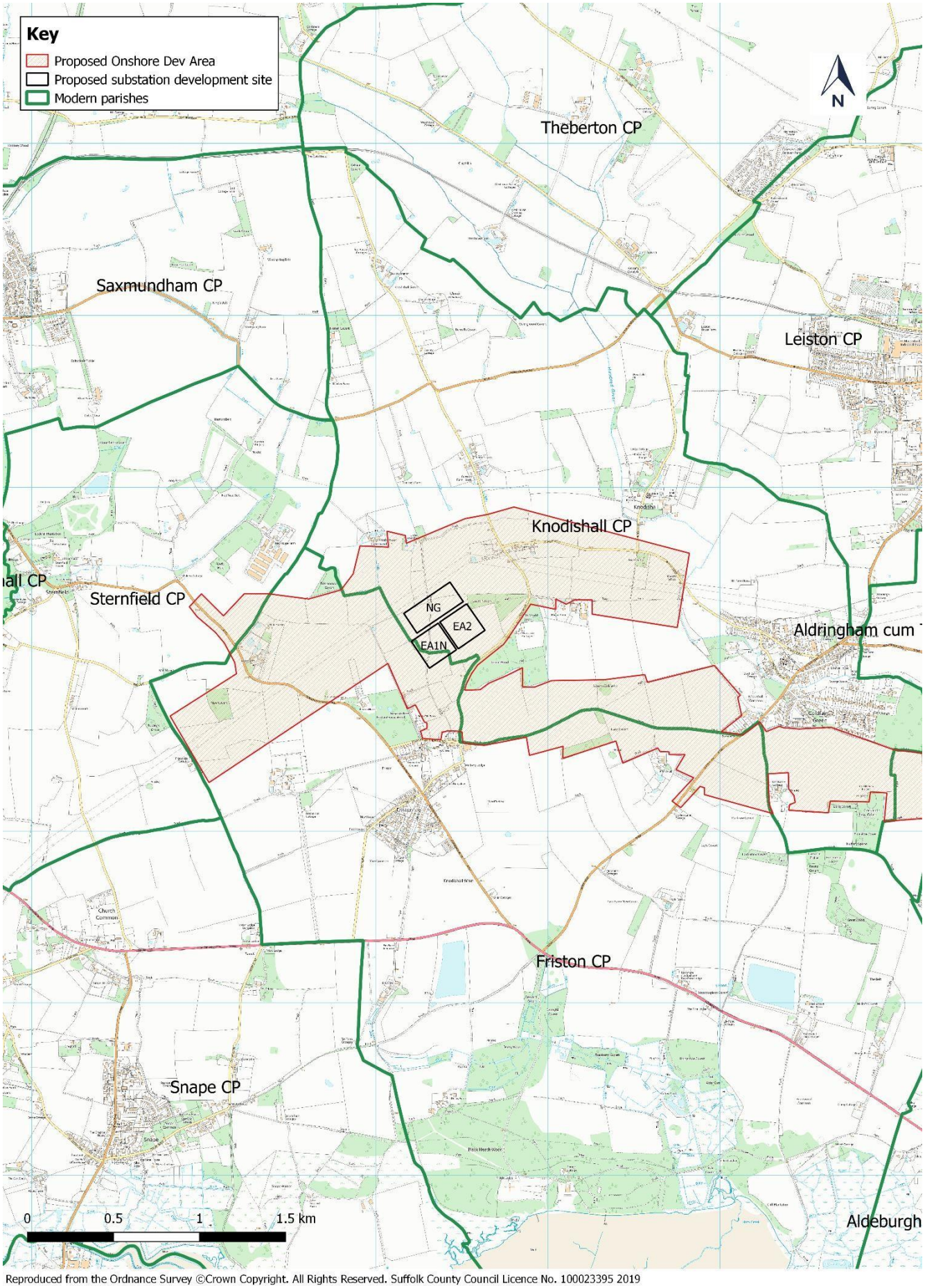


Fig. 1. Proposed substation development site and modern parish boundaries

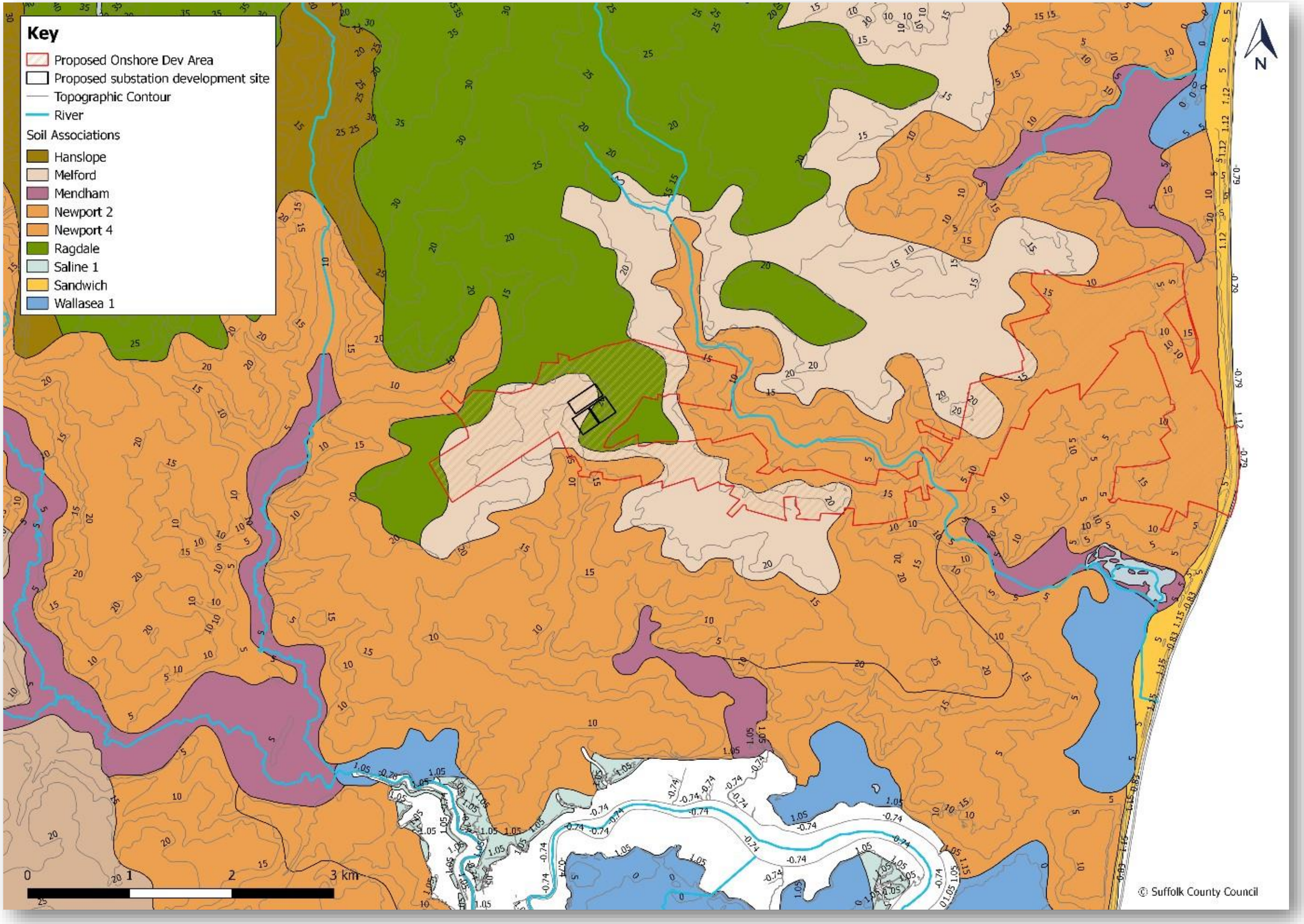


Fig. 2. Topography and geology of proposed development area.

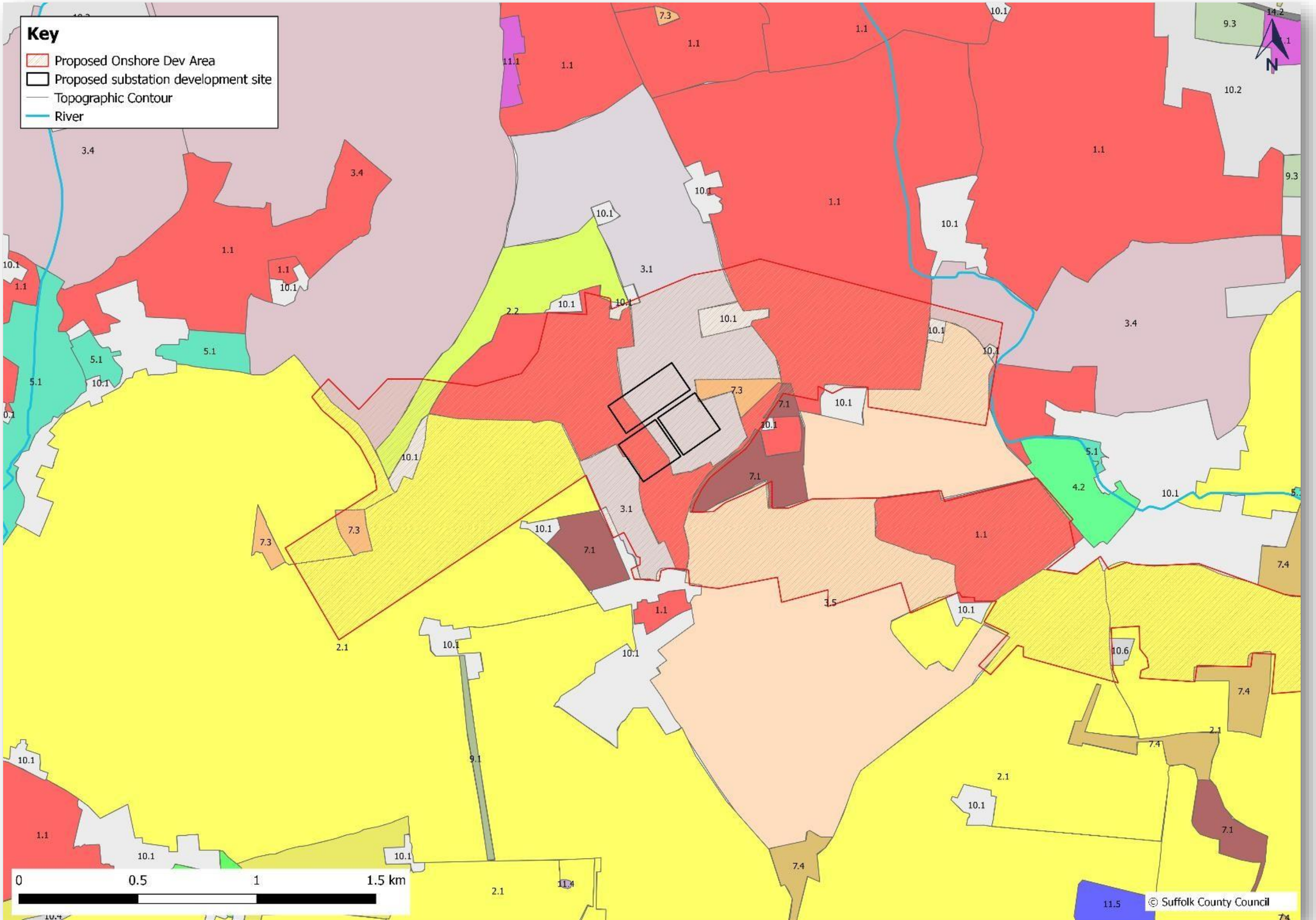


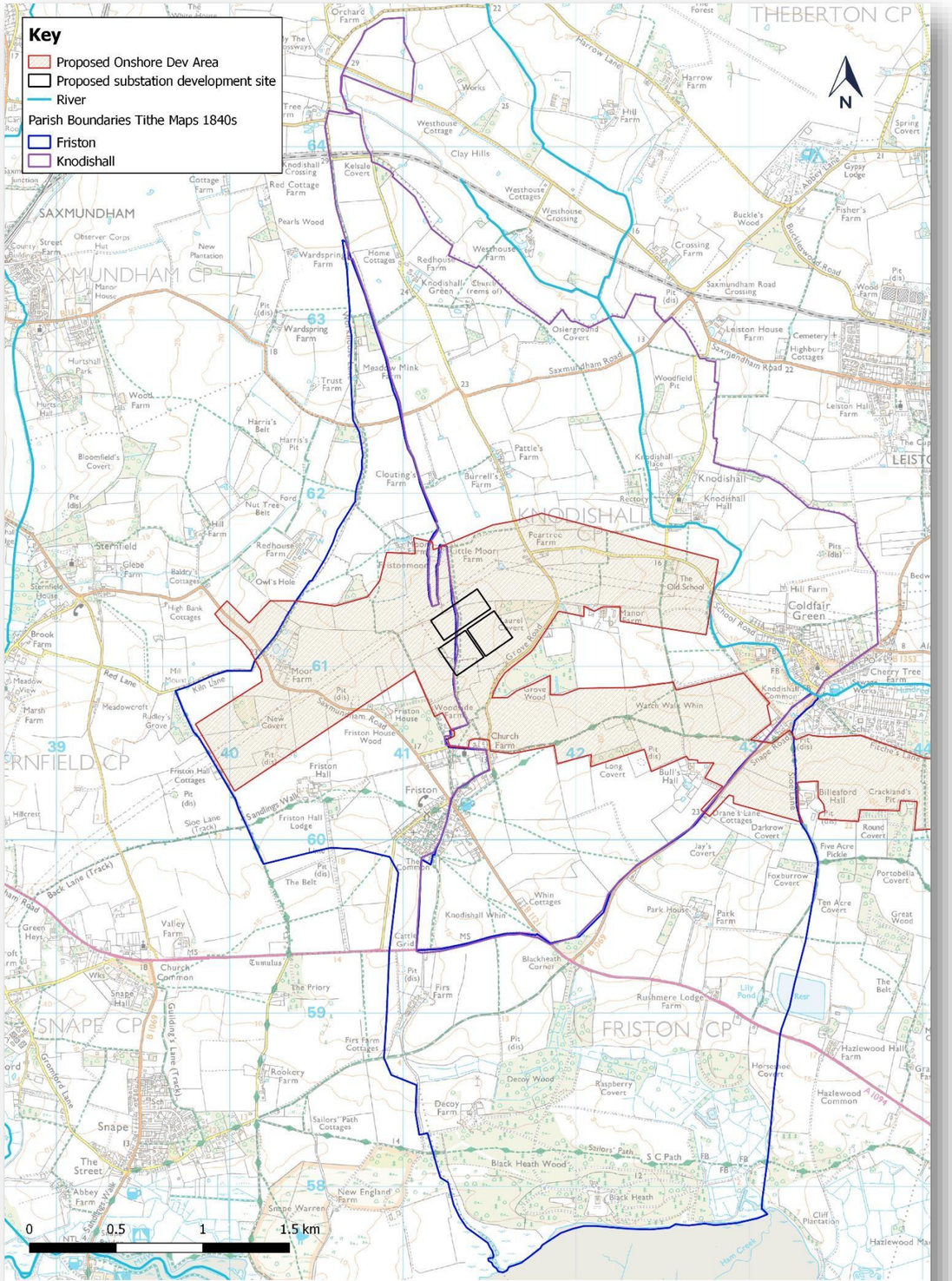
Fig. 3. Historic Landscape Characterisation (2008) of proposed substation development area

Fig. 4: Hundred boundaries recorded in 1086 Domesday Survey.

Digital mapping is based on hundreds recorded in the Domesday Book and is based on early modern cartographic evidence of hundreds. Provided by University College London Institute of Archaeology. Digital mapping formed part of *Landscapes of Governance* project 2012 funded by Leverhulme Trust.

Fig. 5: Plomesgate and Blything Hundred boundary passing through proposed substation development site

Digital mapping is based on hundreds recorded in the Domesday Book and is based on early modern cartographic evidence of hundreds. Provided by University College London Institute of Archaeology. Digital mapping formed part of *Landscapes of Governance* project 2012 funded by Leverhulme Trust.



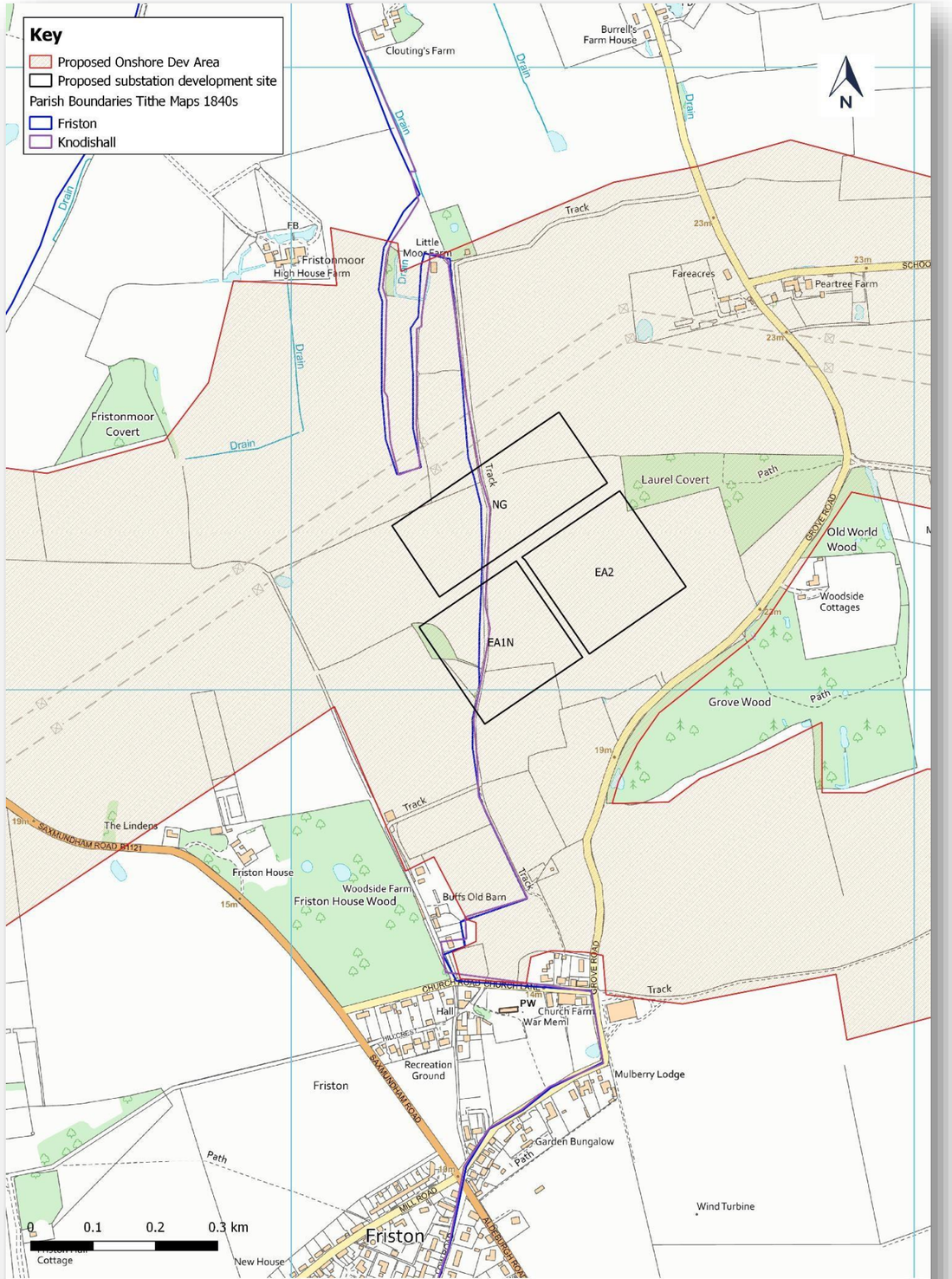


Fig. 6 and 7: Parish boundaries of Friston (1847) and Knodishall (1846) redrawn from Tithe Maps.

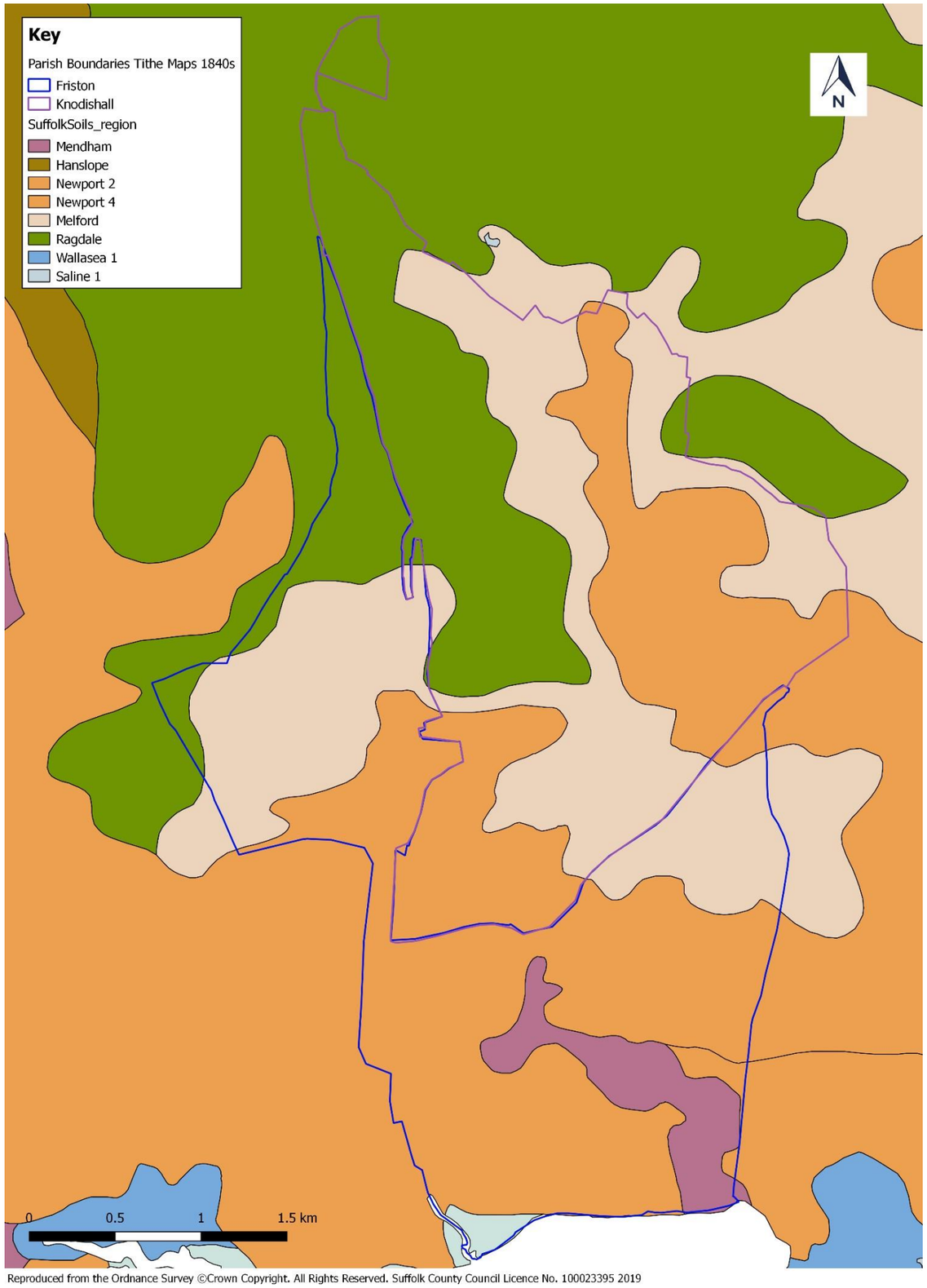


Fig. 8: Parish boundaries of Friston (1847) and Knodishall (1846) redrawn from Tithe Maps and overlain over soil map

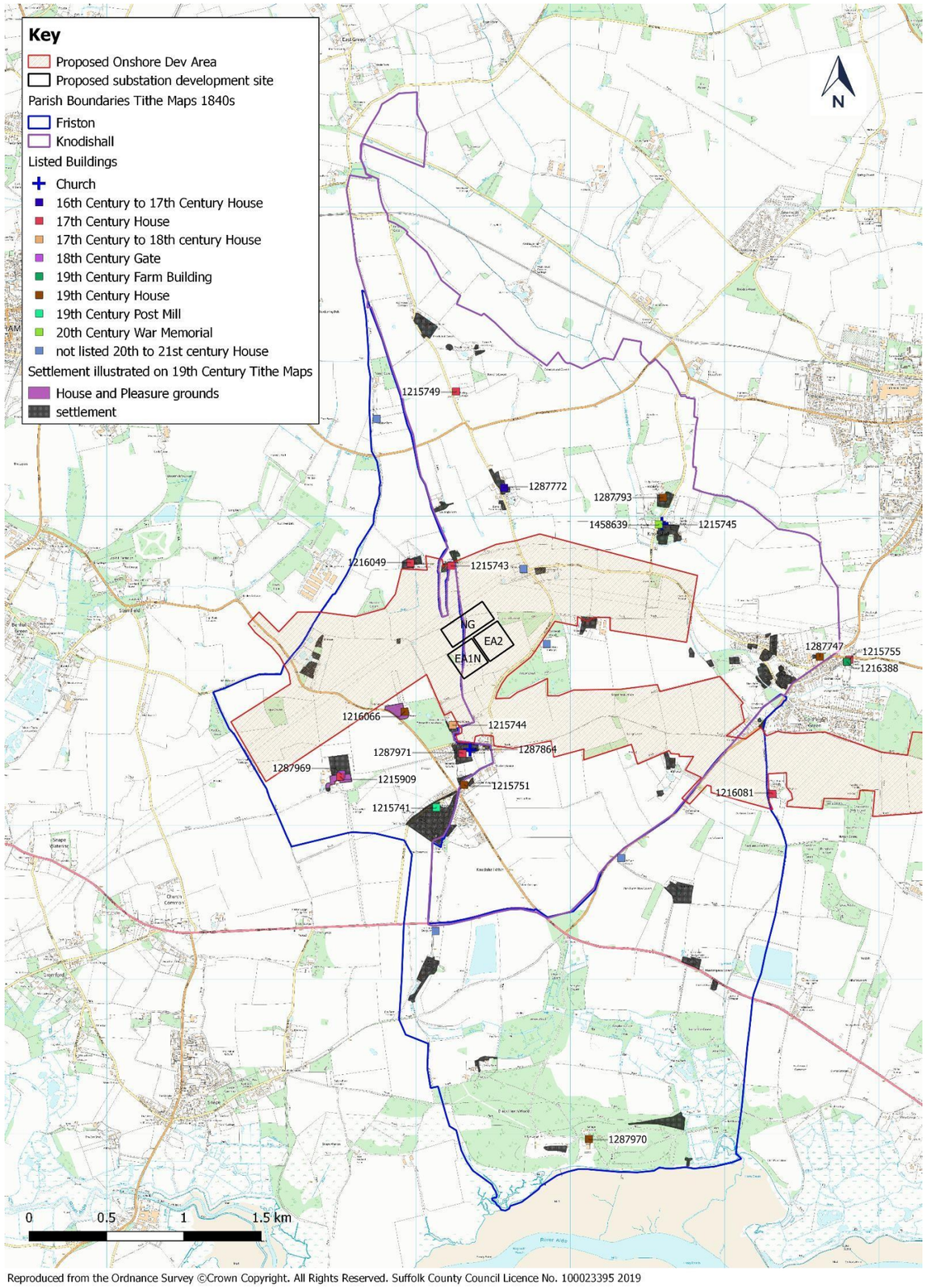
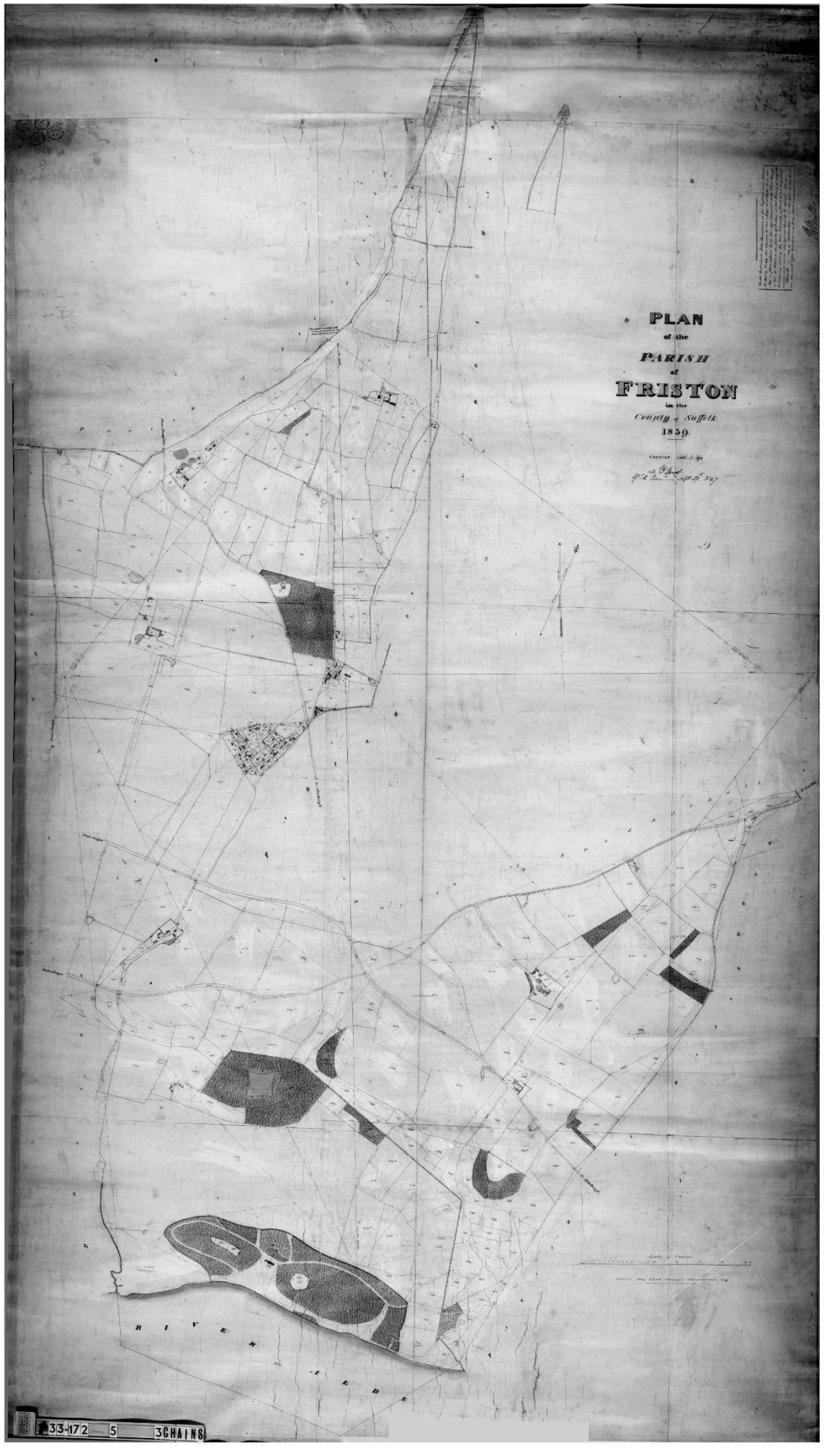


Fig. 9: Listed buildings in Friston and Knodishall with areas of settlement illustrated on 19th Century Tithe Maps.



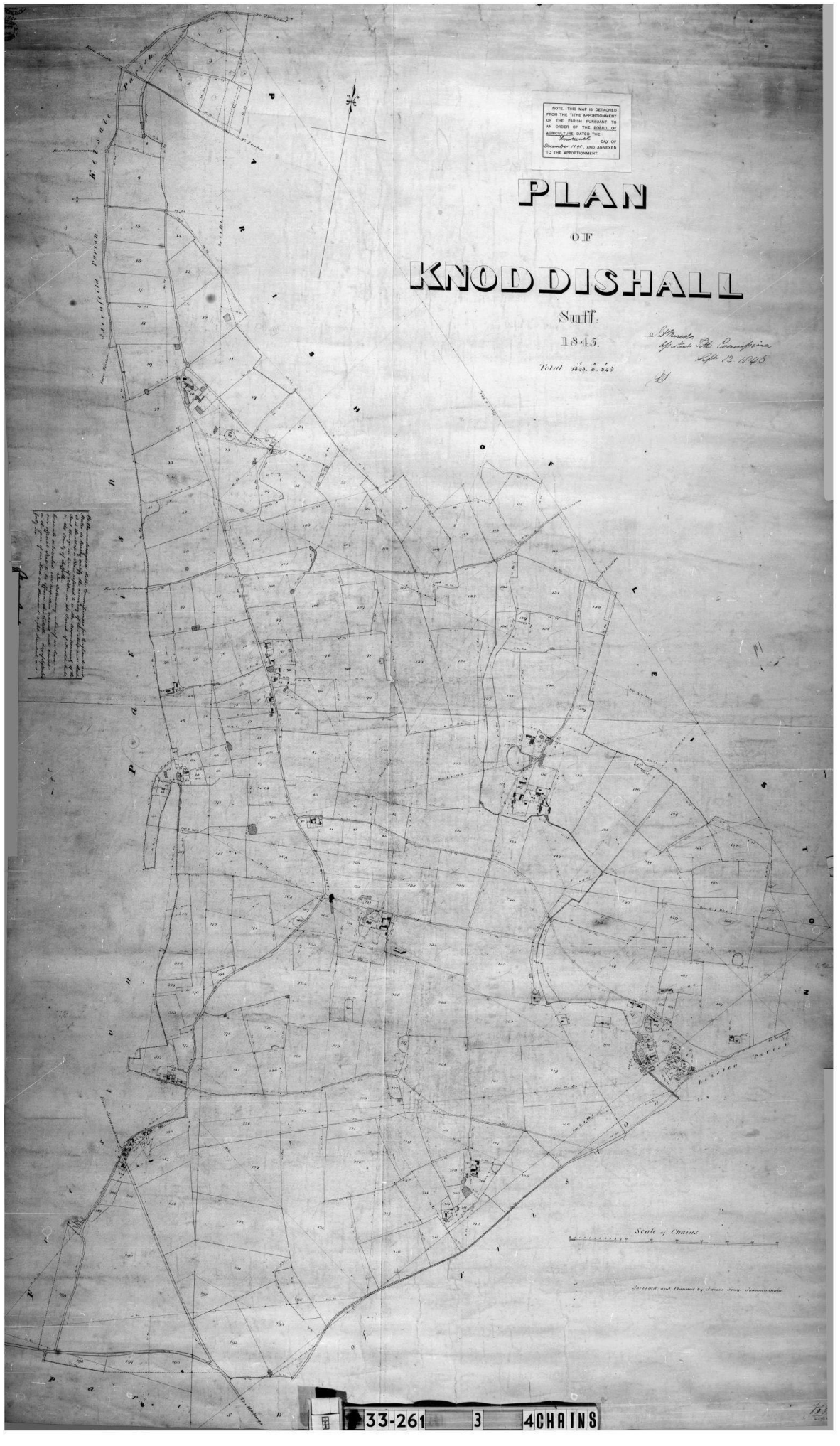


Fig. 10 and 11: Tithe Maps of Friston (1847) and Knodishall (1846)

Pre-1840s

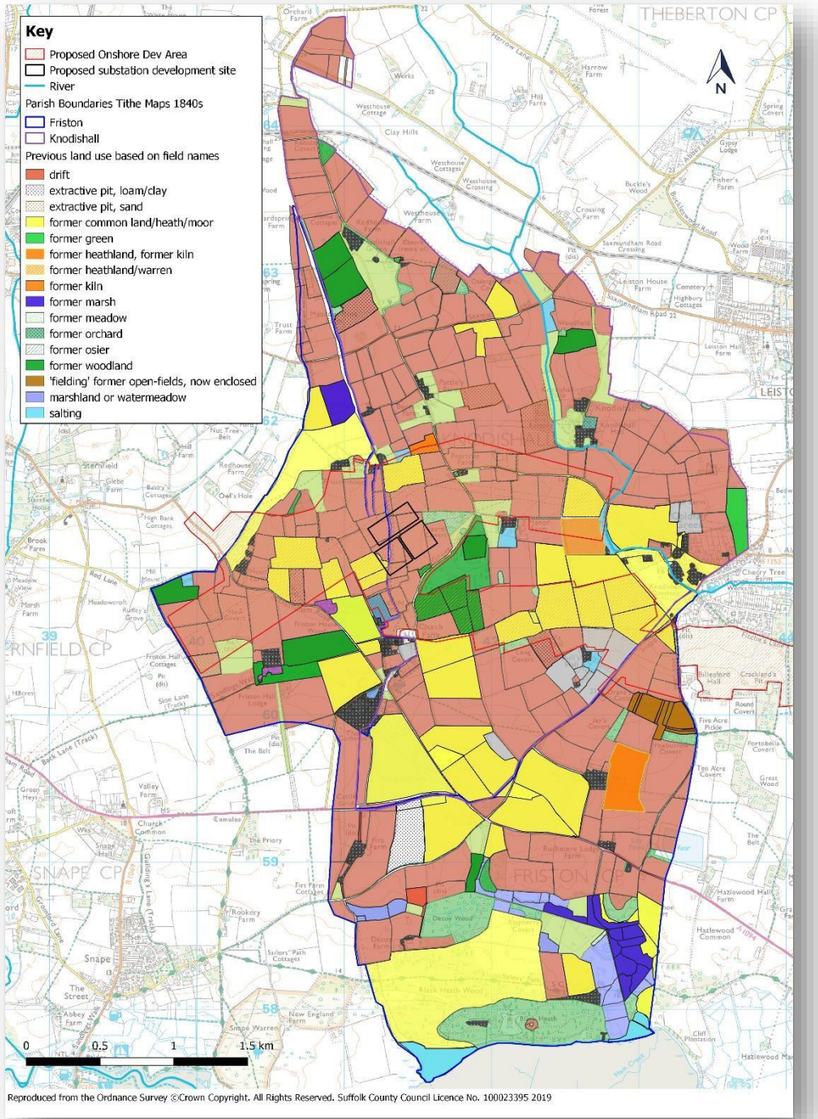


Fig. 12: Pre-1840s: Land use before 1846 overlain onto Fig 13. Based on the Tithe Map and apportionments of Friston (1847) and Knodishall (1846).

1846-1847

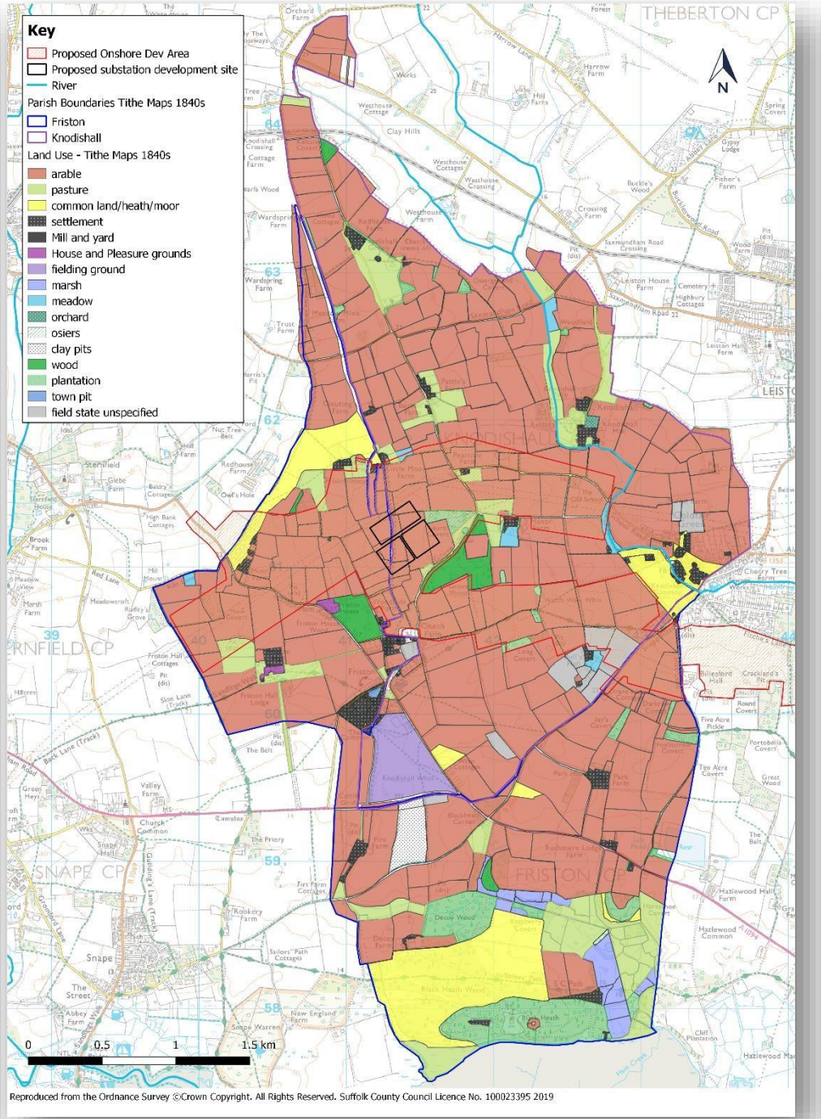


Fig. 13: 1846-1847: Digitally re-drawn Tithe Map of Friston (1847) and Knodishall (1846), showing field boundaries, land use and settlement based on land apportionment.

1937

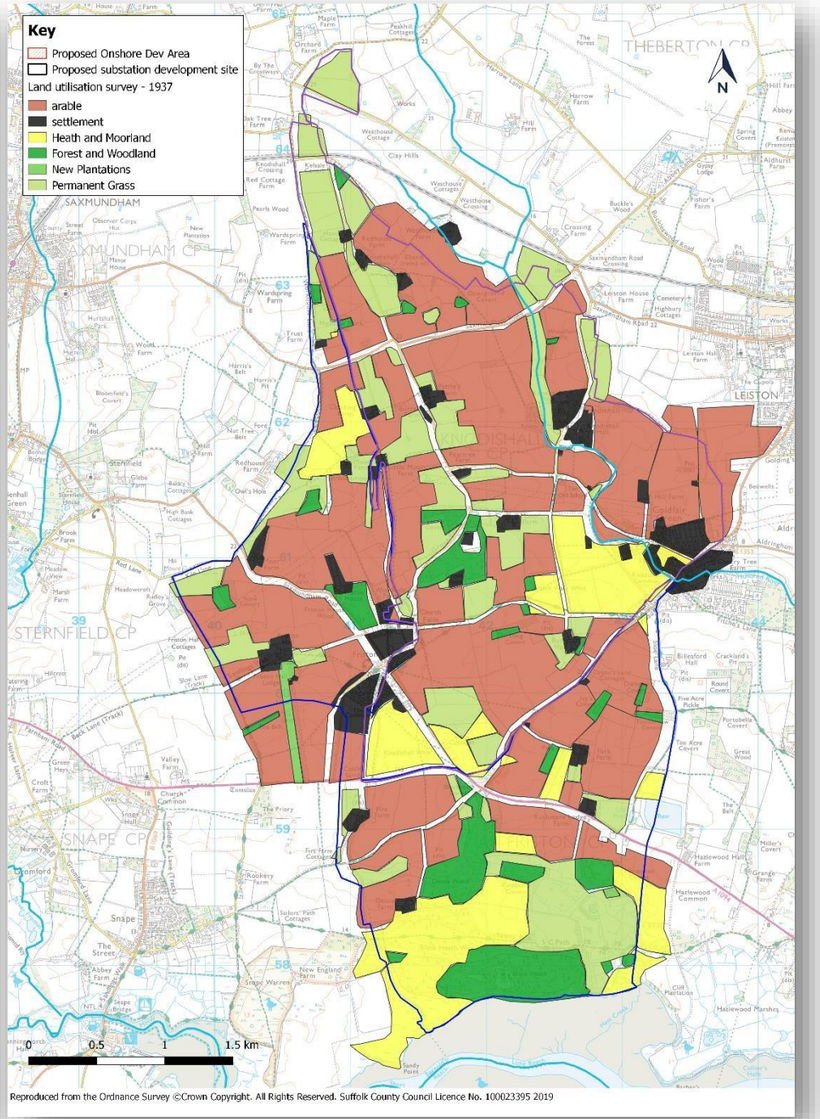


Fig. 14: 1937: Digitally re-drawn from Land Utilisation Survey 1937 map, showing field boundaries, land use and settlement.

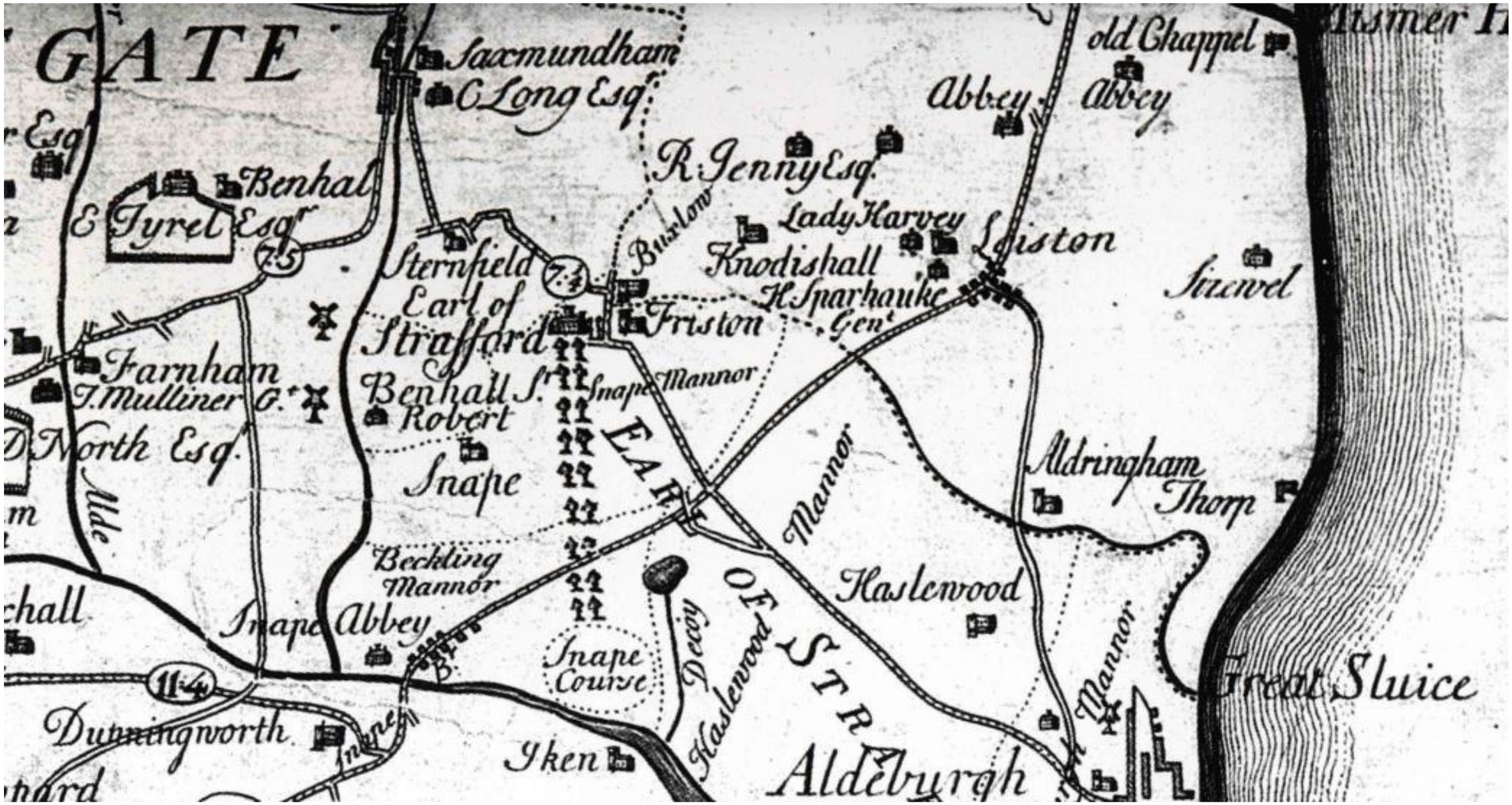


Fig. 15: Kirby's Map of Suffolk 1735 – Close up of Friston, Buxlow and Kndoishall

Fig. 16: Hodskinson's Map of Suffolk 1783 – Close up of Friston, Buxlow and Knodishall

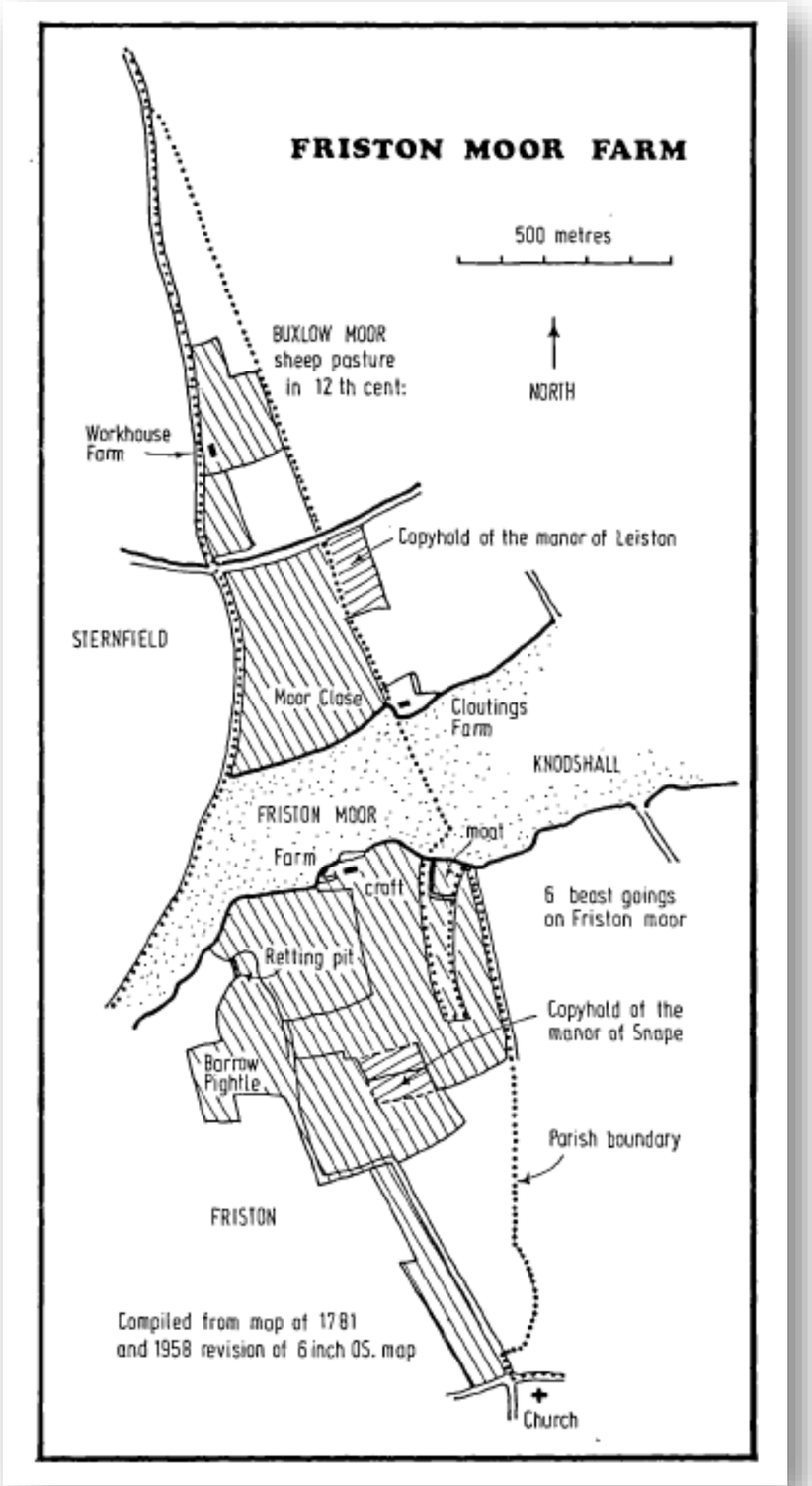


Fig. 17: Illustration of Friston Moor Farm showing field boundaries and remnant open-fields based on Kirby's 1781 map. (Warner, P.M., (1982) *Blything Hundred: A Study in the Development of Settlement AD. 400-1400*, PhD Thesis, Department of English Local History, University of Leicester, Fig. 59

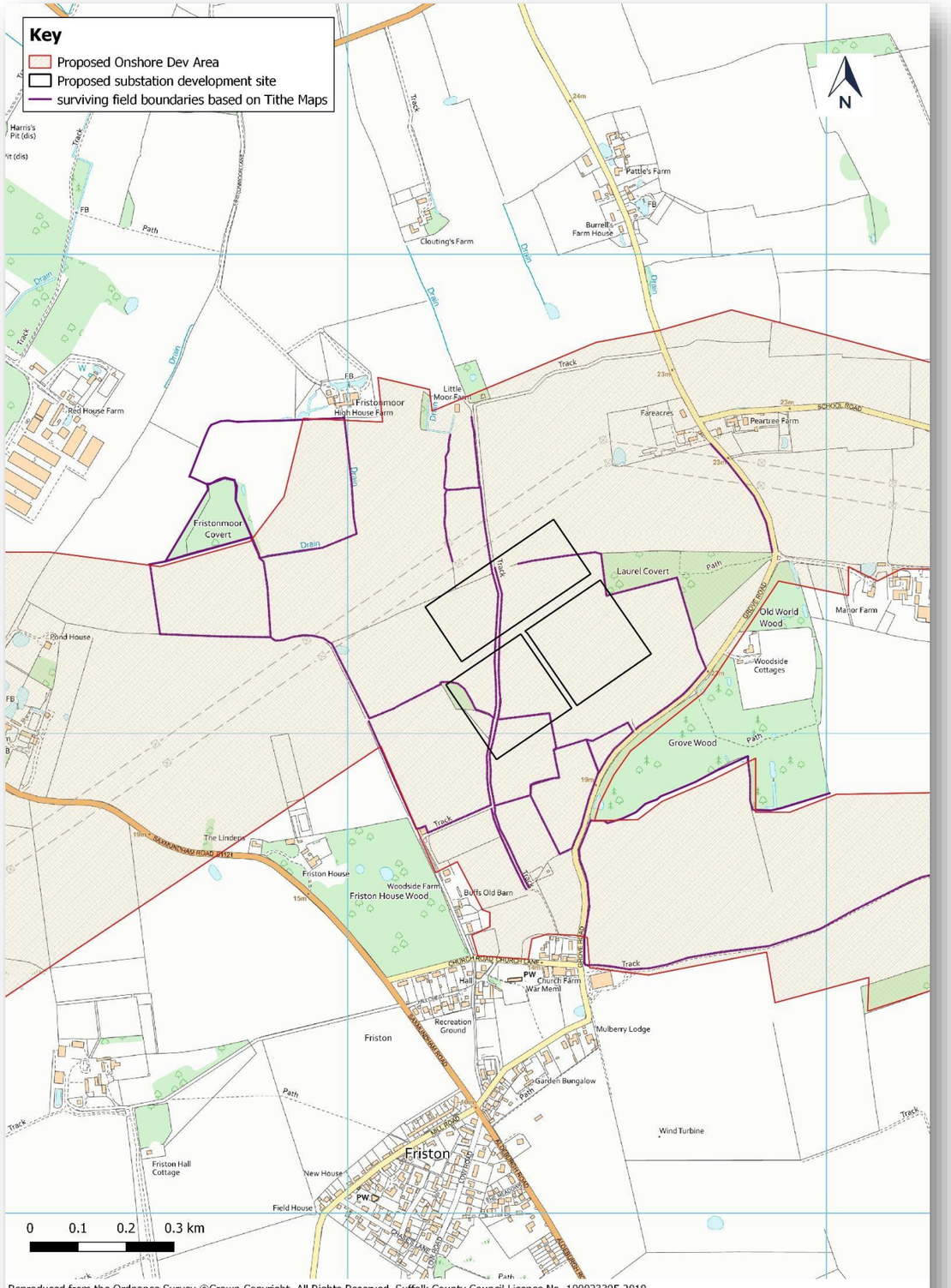


Fig. 18: Surviving field boundaries within area of proposed development ,based on 1840s Tithe maps compared to modern Ordnance Survey map (field boundaries outside of this area have not been looked at).

Fig. 19: Google Earth Aerial Photograph of Friston and landscape of proposed substation development site.

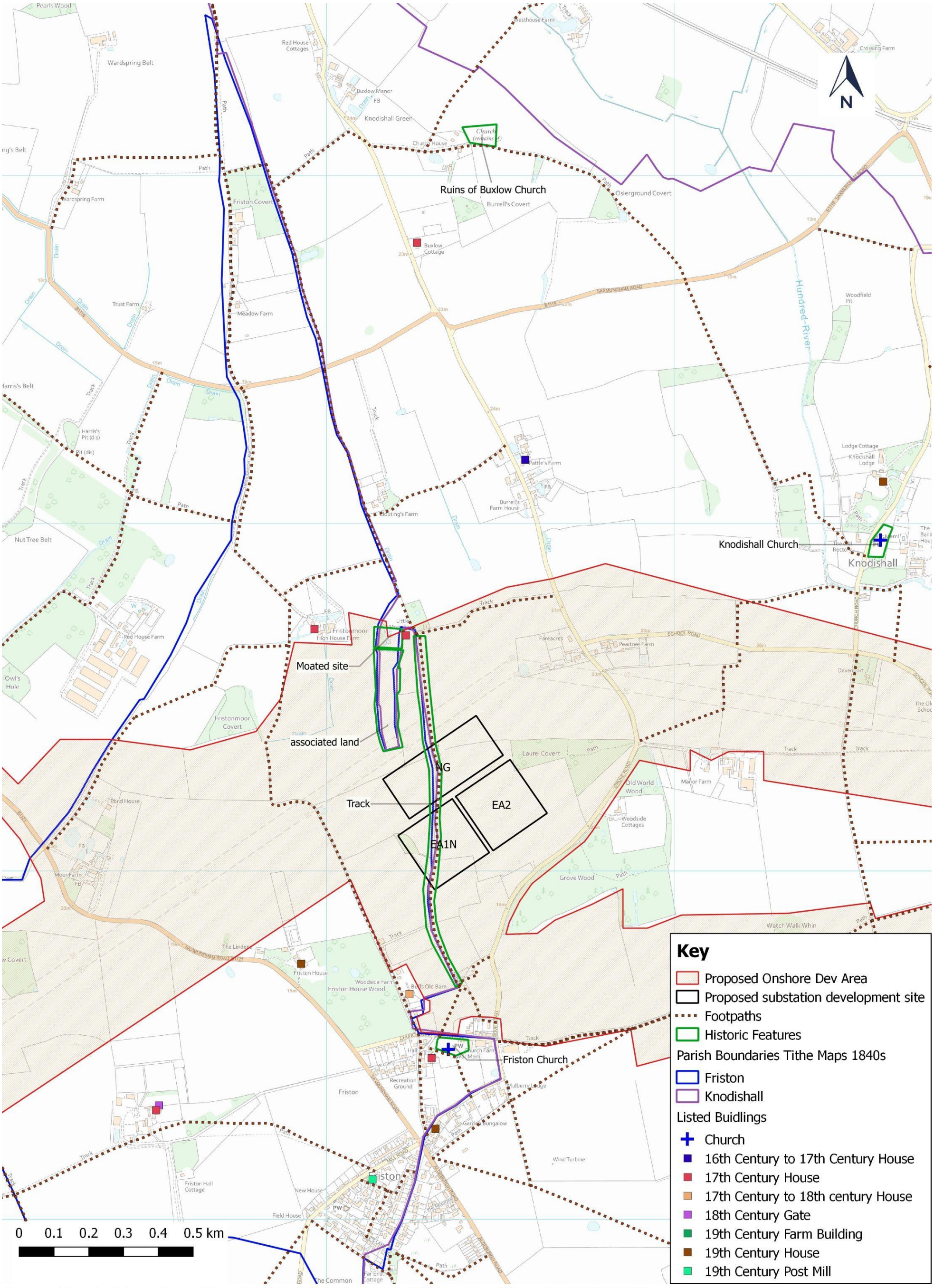


Fig. 20: Annotated map showing connectivity between historic features via footpaths, tracks and lanes.

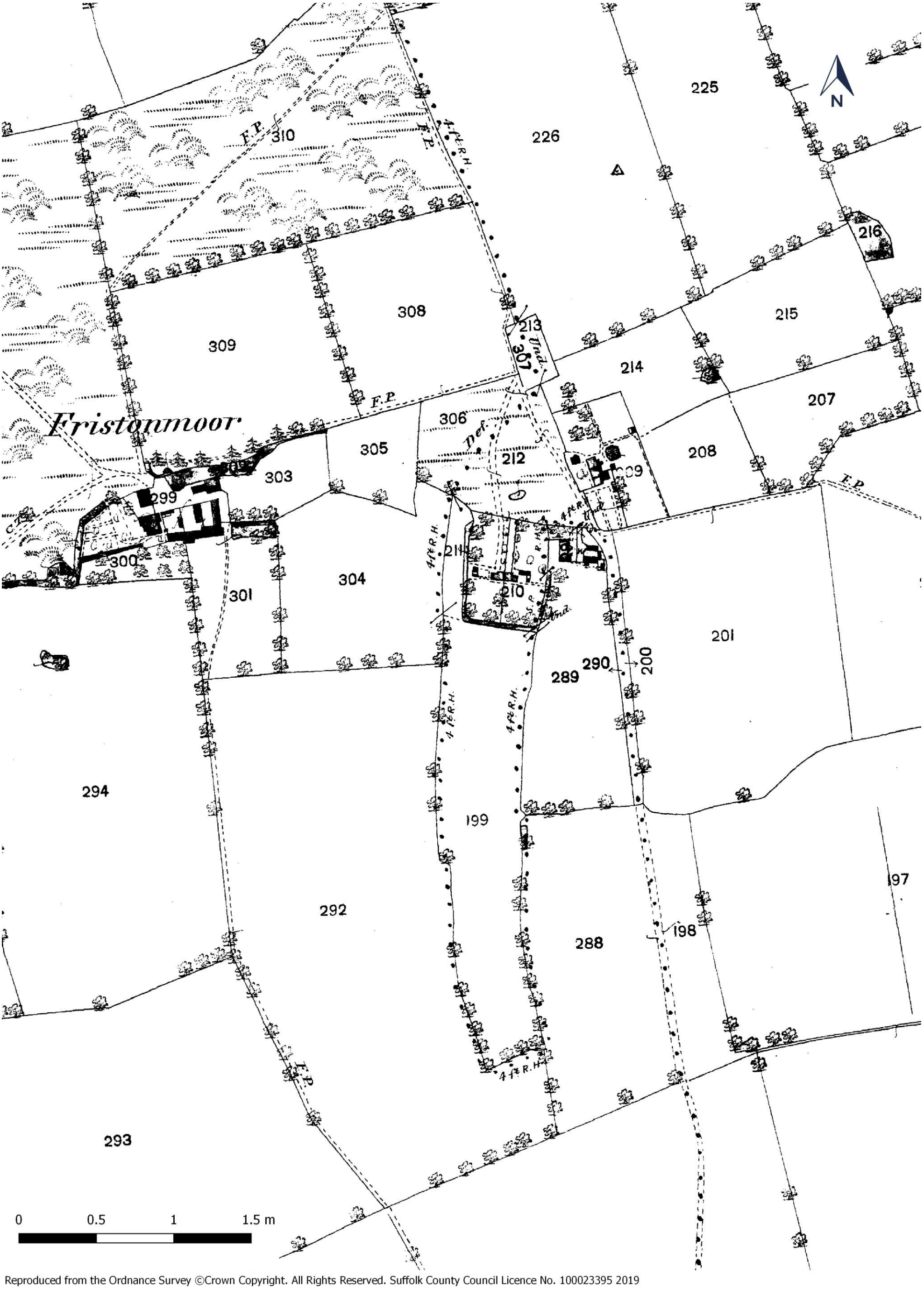


Fig. 21: 1880s Ordnance Survey Map – close up of moated site and associated land

Fig. 22: Aerial Photo of moated site (2019)

12. Appendix 1 – Photographs of Site Visit to Friston 24th September 2019

Photo 1: Looking north walking along track

Photo 2: Look north walking along track

Photo 3 : Looking north walking along track

Photo 4: Looking north walking along track

Photo 5 : Looking north. On track at proposed substation development site. Photo shows that cultivation has respected the line of the track.

Photo 6: Looking south back along track.

Photo 7: Looking south towards proposed substation site. Ditch and hedge lining track

Photo 8

Looking north. Ditch and hedge lining track

Photo 9

Looking south towards proposed substation site. Friston Church of St Mary visible across fields.

Photo 10.

On Grove Road looking West over Substation site. Friston Moor Farm visible across field.

Appendix 2: Archaeology

Comments on DCO Wording

1. The DCO defines the Outline WSI as 'the document certified as the outline written scheme of investigation (onshore) by the Secretary of State for the purposes of this Order…', although there is no reference to what the WSI for – a reference to archaeology should be added.

2. Requirement 19 does not fully make accommodation for archaeology to be designed in advance or of alongside other pre-commencement works (such as access or ecological mitigation), although the need for this is set out and acknowledged in the OPCAEP. The requirement as proposed also does not explicitly require that pre-commencement works are undertaken in accordance with the principles set out in the outline WSI. We would suggest amendment to:

   1) Onshore preparation works, including archaeological surveys, archaeological investigations or site preparation works in respect of such surveys or investigations, may not be carried out until a pre-commencement archaeology execution plan (which accords with the outline pre-commencement archaeology execution plan and the outline written scheme of investigation (onshore)) for those works has been submitted to and approved by the relevant planning authority.

   2) Intrusive pre-commencement archaeological surveys, archaeological investigations and associated site preparation works must be carried out in accordance with the approved plan.

3. Requirement20 does not reflect the likely stages of archaeological work. Amendment is suggested to remedy this, as follows:

   1. No *stage of the onshore works may commence until 1. for that stage a written scheme of archaeological investigation (which accords with the outline written scheme of investigation (onshore) and is informed by the pre-commencement archaeological surveys has, after consultation with Historic England and Suffolk County Council, been submitted to and approved by the relevant planning authority.*

   2. in the event that site investigation is required the scheme must include details of the following-

   a) An assessment of significance and research questions
   b) The programme and methodology of site investigation and recording
   c) The programme for post-investigation assessment

d) Provision to be made for the analysis of the site investigation and recording

e) Provision to be made for publication and dissemination of the analysis and records of the site investigation

f) Provision to be made for the archive deposition of the analysis and records of the site investigation and

g) Nomination of a competent person or persons/organisation to undertake the works set out within the written scheme of investigation.

3. Any archaeological works or watching brief must be carried out in accordance with the approved written scheme of investigation for that stage.

4. In the event that site investigation is required, the site investigation and post-investigation assessment must be completed for that stage in accordance with the programme set out in the written scheme of archaeological investigation and provision made for analysis, publication and dissemination of results and archive deposition secured for that stage.

4. Points 13 on pages 67, 70, 82 and Point 16 on page 76 of the draft DCO regarding the right to remove artefacts are intended to allow archaeological work to go ahead, but the wording potentially undermines the precautionary approach as worded regarding preservation in situ where remains are significant, as it reduces the considerations down to cost.

Comments on the Outline Written Scheme of Investigation

5. Given that the DCO relies on the outline WSI to shape the mitigation, there is a need for amendment to this document to make provision robust. We suggest the following in relation to numbered paragraphs in the submitted 'Outline Written Scheme of Investigation: Onshore' for each scheme:
   - Paragraph 3: Should refer to site preparation AND construction works
   - Paragraph 12: Add preservation in situ to options
   - Paragraph 22 - SCCAS documents were updated in 2019.
   - The WSI should include a section setting out the nature of all impacts on archaeological remains, including preconstruction works and where an effect is deemed minor as it affects remains of local interest that have been graded 'low' importance.
   - The WSI should include a section on the 11 preliminary Areas of Archaeological Activity.
   - The outline WSI should include a section setting out basic principles of timing (e.g. for the sequencing of works), with links to the OPCAEP (following the approved East Anglia 1 WSI).

- The outline WSI should set out a map of the entire process of archaeological mitigation, from evaluation, through pre-construction and construction phase assessment, to post excavation and archiving. WSIs that sit under it will be area specific and nested, with research questions. T preparation works and rather than a final WSI, there will be nested WSIs.
- Paragraph 58: Add an acknowledgement that the eleven areas are preliminary at this stage.
- Paragraphs 60-2 and Appendix 1: requirements for evaluation apply to the whole scheme until evaluation has been undertaken. A systematic c. 4% survey will be a requirement across the development area
- Section 6 and paragraph 93 need amending to reflect the reduced scope of the work that has been done.
- Paragraph 85: Add that all required archaeological works will be discussed and agreed with ESC/SCC, in consultation with SCCAS/HE as required.
- Paragraph 87 - Significance should also be established.
- Paragraph 89 - <u>This paragraph undermines the whole WSI.</u> It reads: 'Health and Safety considerations will be of paramount importance in conducting all archaeological fieldwork. Safe working practices will override archaeological considerations at all times'. This is not in the spirit of the Outline CoCP, which is about safe delivery with consideration for control measures. Health and Safety is of paramount importance, but the paragraph needs revising to say that the aims of the archaeological project, as dictated by sector specific guidance, will be met through projects that are informed by health and safety at all times. This may involve developing approaches and working practices such as stepping and shoring and may involve solutions to be developed to safely investigate archaeological remains to fulfil the WSI, proportionate to the significance of those remains.
- Section 9.2 paragraphs 96 and 103– the WSI needs to a commit to a robust level of trenching across the whole scheme, not targeted on positive geophysical results with some sampling of apparent blank areas. A full and systematic survey will be required across the scheme to ground-truth the data and cover any shortfalls in the geophysical technique. The outline WSI should include some basic principles (e.g. relating to the method of excavation of trenches with a toothless bucket, the approach to cleaning and notes on sample sections, reporting). This should follow the content of the approved WSI for East Anglia 1.
- Section 9.6 – More information should be provided on geoarchaeological assessment to say that initial works will be monitored, that a targeted programme will be devised, that appropriate provision will be made for scientific dating and that a report will be produced.
- Section 10.5: Preservation in situ section should include a note on options including reduction in cable width where appropriate/HDD, as well as provision for appropriate

matting, including signage. Links to appropriate construction management documents should be developed.

- Paragraph 108 – Archaeological monitoring will also lead to a programme of post-excavation assessment etc.
- Paragraph 110 - This should say that if for any reason an SPE needs to be undertaken in conjunction with mobilisation for construction, construction will hold off until archaeological work is completed. As per the approved WSI for East Anglia 1, basic notes on methodology and excavation principles should be included. The WSI should set out parameters for excavations on sandy soil – sites should not be left open too long on the one hand and large areas should not be stripped, whilst at the same time work should not be too piecemeal.
- Paragraph 111 – As for the approved WSI for East Anglia 1, basic notes on methodology and excavation principles should be included: SMS should be topsoil and subsoil stripped to the depth of archaeological remains; the sampling strategy should be sufficient to understand the site and also may require excavation to full standards; plant movement should be restricted over stripped areas; toothless buckets will be used; approaches to stripping the haul road and cable corridor should be considered. The WSI should set out parameters for excavations on sandy soil – sites should not be left open too long. Equally, large areas should not be stripped whilst at the same time work should not be too piecemeal.
- Paragraph 114 – refinement to WSI should be discussed with SCCAS.
- Paragraph 116 – monitoring – where features are encountered, works will be undertaken under the direction of the archaeologists. Areas where it is known that monitoring will be required should be highlighted- e.g. where works are done to existing water courses, where the route cuts through hedge lines and boundaries – the approved WSI for EA1 included a section on drawing of sections of boundaries to look for redefinition through time and retrieve any finds.
- The protocol section would benefit from addition of unexpected human remains in the CoCP (page 37).
- Paragraph 139 – SCCAS will provide a brief for the overall mitigation (following all the investigative works) which systematically sets out requirements across the scheme.
- The OWSI should include high level finds and environmental policies. It should make provisions for the expectation that there will be washing and processing of environmental remains as sites progress, to inform the ongoing strategy.
- There should be a section which sets out general principles or options for overall post-excavation analysis, synthesis and publication (following the model of the approved WSI for East Anglia 1).
- There should be a statement on Archiving principles which can be developed in subsequent WSIs.
- The WSI should include provision for outreach, community impact, legacy and benefit and public promotion in the various stages of work (following the model of the EA1

WSI, with links to the OPCAEP). Options include display, signs and boards, open days, talks, community participation.

- The WSI should demonstrate commitment to the OASIS project and provision of appropriate summaries for PSIAH.
- Outline WSIs should set out specialists – relevant and local ones – and parameters for selecting their expertise.
- A section on collaboration with researchers would be useful (see EA1 WSI).
- Site security, where appropriate (in CoCP) archaeological sites should be adequately fenced.

Comments on the Outline Pre-Construction Archaeology Execution Plan:

- This document should not refer to final outline WSI as there are going to be a number of WSI documents (OPCAEP point 6 page 2).
- Section 10, add PRoW, Ecology.
- OPCAEP should include pre-commencement planting, drainage etc.

Appendix 3 – Annotated Visualisations of Trees and Vegetation

EA1N/2 Landscape and Visual Impact Assessment Viewpoint 1

Titled *Visual representation of 15th year of operational phase*.

Local Authority response comment:

1. The image shows significant stem diameter typical of a tree that is 40 – 50 years old.
2. Significant lateral limb growth, again typical of a tree that is 40 – 50 years old.
3. Suggestion of secondary natural regeneration not usually found in recently planted woodland of only 15 years age.

EA1N/2 Landscape and Visual Impact Assessment Viewpoint 2

Titled *Visual representation of 15th year of operational phase*.

Local Authority response comment:

1. Existing twin stemmed hedgerow Oak that features in the baseline photo for Viewpoint 2. This tree shows characteristics of an Oak that is 90 – 120 years old.
2. The submitted photomontage shows trees purported to be 15 years post-planting, and yet the imagery shows trees with all the characteristics of trees that are of a similar age to the baseline tree i.e. *circa* 100 years old. These photomontage trees also show a limb structure that suggests that the trees on which they are based have been subject to high pollard lopping which is something that would never be characteristic of a 15 year old trees as these are also claimed to be. They also show substantial trunk diameter that is characteristic of trees that are c. 100 years old.

The following images show new planting on the **Heveningham Estate** that lies to the south west of Halesworth in Suffolk.

It may be reliably assumed that the prevailing weather pattern for this site is directly comparable to the Friston area, being only 15km apart.

Soil type on the Estate where these trees are growing is described by the Cranfield Soil and Agrifood Institute as being Soilscape 9, a lime rich loamy and clayey soil with impeded drainage and high fertility. The adjacent soil type to the west and on which some of the trees are growing, is Soilscape 18, a slowly permeable seasonally wet, slightly acid but base-rich loamy and clayey soil, of moderate fertility. This is the same soil type that is found on the Friston Sub-station site, and therefore the growing conditions may be regarded as directly comparable.

The trees in these images are between 13 and 15 years post planting, according to Estate forestry records. They have been planted to high forestry best practice standards, and have been well maintained to ensure successful establishment and with very few failures. It may be reliably accepted that they are a good example of the sort of tree height than can be obtained in 13-15 years by following best forestry practice. Where tree tubes are shown, they are 1.2m. tall. On that basis, the trees in the following photos show heights of around 3 – 4m., 13-15 years after planting. This is in marked contrast to the images for 15 years post planting as shown in the submitted LVIA.

These images also show no secondary understorey woody vegetation as indicated in the LVIA images.

13 Years post-planting, tree tubes 1.2m. tall, trees 3 -4m.

13 Years post-planting, tree tubes 1.2m. tall, trees 3 -4m.

15 Years post-planting, trees 4 -5m. height.

Appendix 4 – Analysis of Background Noise Survey Date

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TECHNICAL MEMORANDUM

Project	12381 Scottish Power Renewables - EA1N and EA2 review		
Date	20 October 2020	**Memo No**	M004
Memo to	Naomi Goold and Mark Kemp, East Suffolk Council	**Copies to**	-
From	Joe Bear MIOA	**Checked by**	Adrian James FIOA
Filename	12381 M004		

ANALYSIS OF BACKGROUND NOISE SURVEY DATA

1 BACKGROUND

In the Environmental Statement Royal Haskoning DHV have determined the representative background sound level for the receptors surrounding the EA1N and EA2 onshore substation sites to be 29 dB L_{AF90}. This is not consistent with our experience of the noise climate in this area from visits to the site and previous noise monitoring for other projects locally when we have found background noise levels to typically be below 25 dB L_{AF90}.

On 2 October 2020 Royal Haskoning DHV supplied the raw noise survey data and analysis methodology that they used to establish 29 dB L_{AF90} at the representative background sound level. We have reviewed this information and this document sets out our comments.

Royal Haskoning measured background sound levels at 9 survey locations for periods of between 6 and 9 days between 26 June and 12 July 2018 in 5-minute periods. We understand that access constraints prevented measurements at SSR4, SSR6 and SSR8.

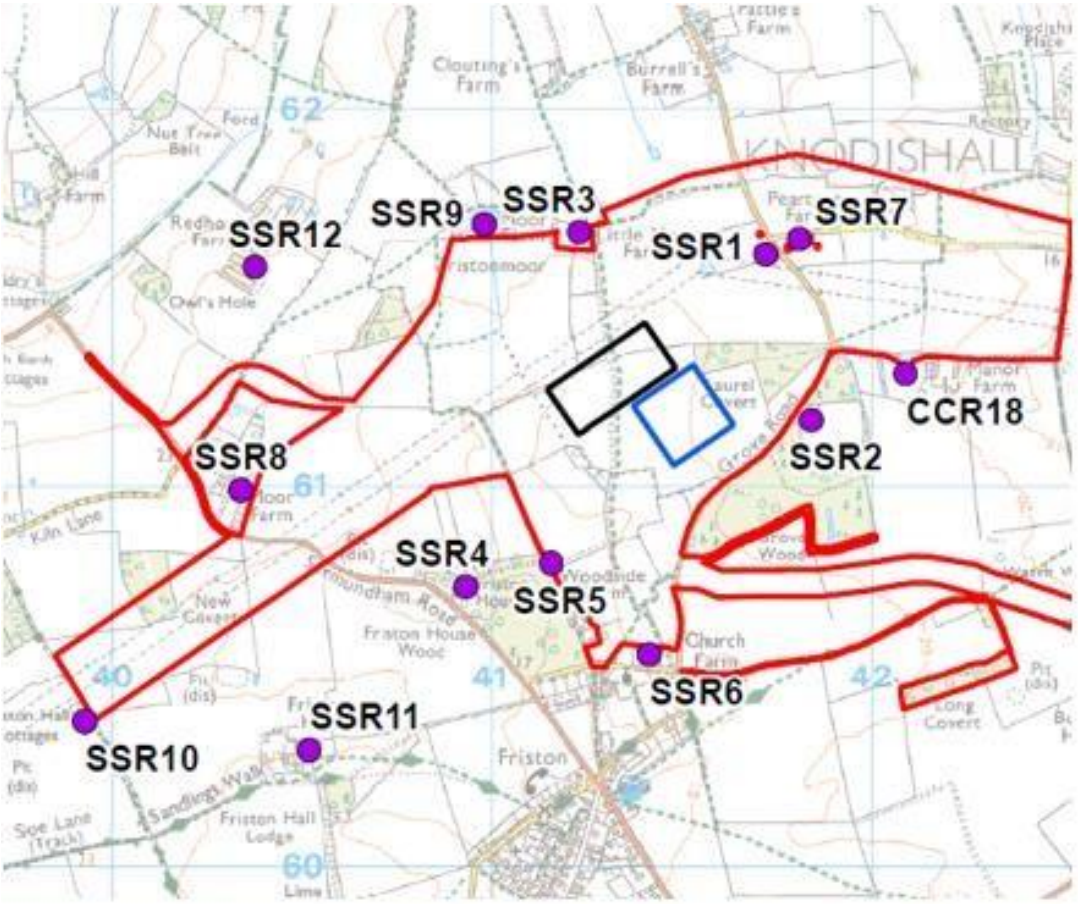


Figure 1 - Assessment locations

2 SURVEY DATA

2.1 Weather conditions

The proposed operational noise sources would run continuously and the assessment is therefore based on the night-time measurements, when the background noise levels are normally at their lowest. The RH DHV weather station data suggests that the night-time periods were largely unaffected by adverse weather conditions with only 15 minutes of measurement data excluded from the analysis in total.

2.2 Limits of measurement

The measured night-time noise levels varied between 17 and 46 dB $L_{Af90,\ 5mins}$. 17 dB L_{Af90} is an extremely low background noise level and although not uncommon at night in this type of rural environment it is below the reliable measurement range for conventional environmental noise measurement equipment.

BS4142 states that:

> *"Care is necessary in circumstances where background sound levels are low to ensure that self-generated and electrical noise within the measurement system does not unduly influence the reported values, which may be the case if the measured background sound levels are less than 10 dB above the noise floor of the measurement system."*

Royal Haskoning do not state the limits of measurement of the sound level meters used in their surveys, but the data files for the Rion NL-52 meters report “under range” results for levels below around 26 dB $L_{Af90,5mins}$. This means that the measured level is affected by self-noise from the meter, pre-amp and microphone chain and that the reported level is likely to be an over-estimate of the true noise level. The data files for the B&K 2250 meters do not include an under range field, but we would expect similar limits of measurement to apply. It is therefore likely that the real background sound levels at very quiet times are lower than indicated by the meters.

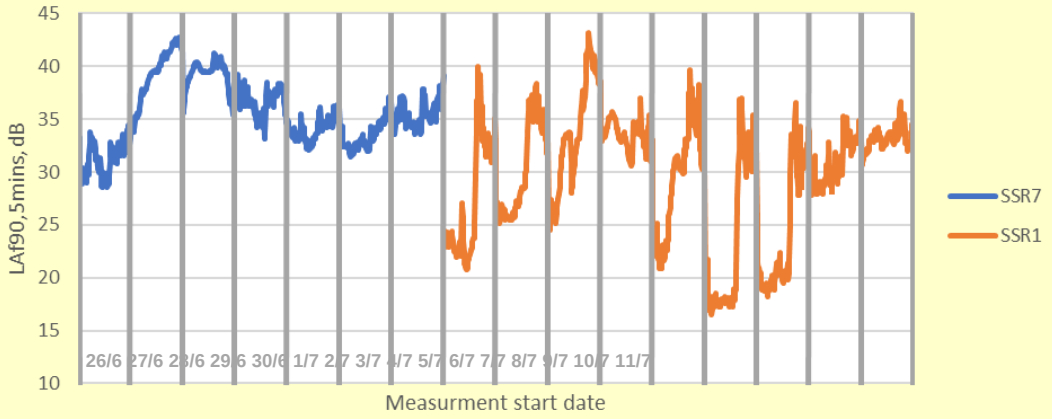
2.3 Sources of noise

Analysis of the logged survey data shows a significant variation in background sound levels between survey locations and in different periods at the same location. For example, the reported locations for measurement locations SSR1 and SSR7 are shown in Figure 2.

Figure 2 - Aerial photograph showing survey locations SSR1 and SSR7

The co-ordinates for these positions are less than 100m apart, but the logged results in Figure 3 show distinct differences in the noise climate between the two measurements.

Figure 3 – Measured night-time levels at SSR1 & SSR7



The night-time levels measured at position SSR7, between 26 June and 3 July 2018, were consistently between around 30 and 40dB $L_{AF90,5mins}$ with only slow variations in level. This is typical for a background noise climate dominated by a specific, slowly varying source.

By contrast, the night-time levels measured at position SSR1 between 3 and 12 July 2018 saw much larger variations in background sound levels, at times dropping as low as 17dB $L_{AF90,5mins}$. This variation is more typical for night-time background noise levels in rural environments where background sound is dominated by transient and distant sources. The exceptions to this are the levels measured at SSR1 on the nights of 6 – 7 July, 10 – 11 July and 11 – 12 July where the levels were more similar to those measured at SSR7.

Given the proximity of the two measurement locations, the data suggests that the noise climate at both locations was affected by a continuous noise source which did not drop below 29 dB $L_{AF90,5mins}$, on 28 June to 2 July and on 10-11 July but not from 3 July to 9 July. There is no discussion in the RH DHV reports of the dominant sources of background noise at these locations. However, from the information available to us, the most likely source of this noise is corona discharge on the existing overhead transmission lines. This effect is related to the electrical conductivity of the air, and therefore varies with humidity and precipitation. We have asked RH DHV to confirm whether air humidity was considered as a factor that might affect background noise levels in the area. However, given that only 15 minutes of data were excluded from the analysis of night-time levels it would appear that this has not been considered.

There was little or no corona discharge noise audible when we visited the site and without information on how regularly the overhead power lines generate noise it is not possible to determine whether it is appropriate to include this source within the “typical” background noise climate at the receptors. It is clear from the supplied data that noise levels would be substantially lower if noise from this source were excluded. This is shown clearly at SSR9 where a modal background level of 18 dB $L_{Af90,5mins}$ was measured.

It is vitally important to understand the extent to which this noise source effects the noise climate around the proposed substation sites as this has significant effect of the choice of representative background sound levels for the assessment and the context of the new source in this this existing noise climate.

3 RH DHV STATISTICAL ANALYSIS METHODOLOGY

Aside from the question of whether noise from overhead transmission lines should be included within measurements of the "typical" background noise climate there are also significant questions over the suitability of the methodology used by RH DHV to pick a single figure for representative background sound levels at each assessment location.

3.1 Methodology used in ES

RH DHV produced modal distribution plots of the measured background sound levels at each assessment position. These results are reported in Appendix 25.3 of the ES documentation along with the "Average L_{A90}", which we understand refers to the arithmetic mean. These figures are reproduced in Table 1 along with the "representative" figure, as determined by RH DHV.

Position	Night-time background noise level, dB $L_{Af90,5mins}$			AJA Comments
	Mode	Mean	"Representative"	
SSR1	33	29.5	33	No reason given for choice of mode over mean.
SSR2	27	31.5	31.5	Mean chosen because "bi-modal" peaks are identified (incorrectly) at 28.5 and 36.5 dBA. However, there is a clear uni-modal peak at 27 dBA.
SSR3	24	26.1	30	No reason given for reporting "representative" level that is completely different to the measured levels.
SSR4	-	-	29	No reason given for selecting 29 dB A as a "representative" figure.
SSR5	29	27.9	29	Mode chosen because of uni-modal distribution.
SSR6	-	-	29	No reason given for selecting 29 dB A as "representative" figure.
SSR7	35	35.6	35	No reason given for choice of mode over mean.
SSR8	-	-	29	No reason given for selecting 29 dB A as "representative" figure.
SSR9	18	24.2	29	Noise levels measured considered by RH DHV to be unrepresentative it does not include "background noise emanating from overhead lines". No reason given for using the higher of the two suggested surrogate results (SSR12) and ignoring the much lower noise levels measured at SSR3.
SSR10	37	31.3	31	No reason given for choice of mean over mode.
SSR11	33	29.8	30	No reason given for choice of mean over mode.
SSR12	29	25.9	29	No reason given for choice of mode over mean.

Table 1 - Modal, mean and representative background noise levels reported by RH DHV

As identified in the comments in Table 1, the process used to determine the "representative" figure at each assessment position is not adequately explained, is inconsistent and generally favours the highest of the modal or mean values, or an entirely different higher value in each case. We do not consider the approach adopted to be either appropriate or in accordance with any methodology set out in the assessment standard.

The noise limits in the draft requirement were set at 5 dB over the "representative" level at SSR5 (see Paragraph 121 of Chapter 25 of the ES). We understand that this figure was selected because it was the lower of the noise levels at the two defined monitoring positions.

3.2 Clarification note

We questioned RH DHV on the validity of the methodology used in the ES to determine representative background noise levels. RH DHV issued a "Clarification note" in October 2020 which sets out a different assessment methodology and contradicts the ES. This states that:

> *"To determine an average background noise level representative of the onshore substation location, the statistical means for all noise sensitive receptor locations were averaged - calculated as 29.1dB. Separately, the statistical modal values for all noise sensitive receptor locations were averaged, which was calculated as 29.3dB[1]. The averaged means and the averaged modes were then compared against each other to understand the range between the statistical parameters (calculated to be 0.2dB). When rounded to the nearest whole integer, a background noise level of 29dB is considered representative."*

Averaging statistical modes and means across multiple positions across a very large assessment area is an extremely unusual choice of analysis technique and unsupported by BS4142 or any other standard or guidance.

The noise levels measured at different receptors have been shown to be affected by localised noise from transmission lines. For example, the modal background noise level measured by RH DHV close to the transmission lines (SSR10) is 19 dBA higher than the same descriptor measured at a position away from the transmission lines (SSR9). An average of these two figures produces a number which not representative of either measured noise level and which is therefore irrelevant. We consider the methodology used by RH DHV to completely inappropriate and contrary to any standardised assessment methodologies or guidance on environmental noise assessment.

The clarification document goes on to justify the choice of 29 dB as the background sound level by considering the modal and mean results measured at the two monitoring positions (SSR2 and SSR5). These results are discussed in detail in Section 4, along with results at the proposed third monitoring position (SSR3).

4 RH DHV STATISTICAL ANALYSIS

4.1 BS4142 and the Association of Noise Consultants guidance

It is important to note that BS4142 does not set a single prescriptive methodology to determine a representative figure for background noise from a data series. It provides an example where the frequency distribution of measured background noise levels is plotted and the modal value is chosen as the representative background level. However, the standard also states that

> *"…A representative level should account for the range of background sound levels and should not automatically be assumed to be either the minimum or the modal value"*

The choice of representative background noise level is therefore based on interpretation and context. In March 2020 the Association of Noise Consultants published *"BS 4142:2014+A1:2019 Technical Note"* which provides guidance on a number of worked examples of the implementation of the Standard in real life scenarios. In relation to the assessment of background sound levels, the guide states:

> *"In practice, a range of approaches to the derivation of background sound levels should be considered as part of a complex assessment and the relevance and applicability of the derived values discussed. The time history, mean and mode values over the period(s) of interest would ordinarily be considered but no one method is always applicable. The assessor should use their professional judgement to evaluate a representative value in each situation."*

Our detailed analysis of the available data for the three monitoring positions (including SSR3 as requested by East Suffolk Council) is contained in the following sections of this report.

4.2 SSR2

Logged night-time background noise levels measured at position SSR2 are presented in Figure 4 and RH DHV's modal distribution plot is shown in Figure 5.

Figure 4 - Background noise levels at SSR2

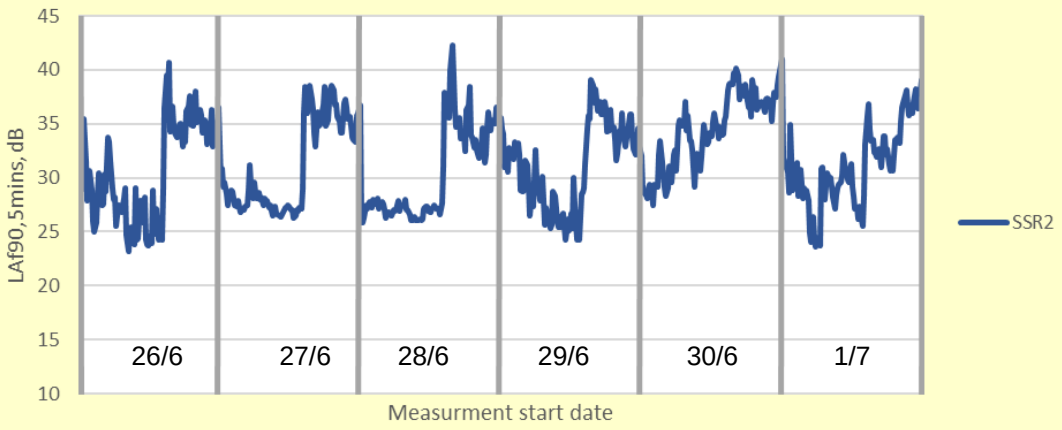
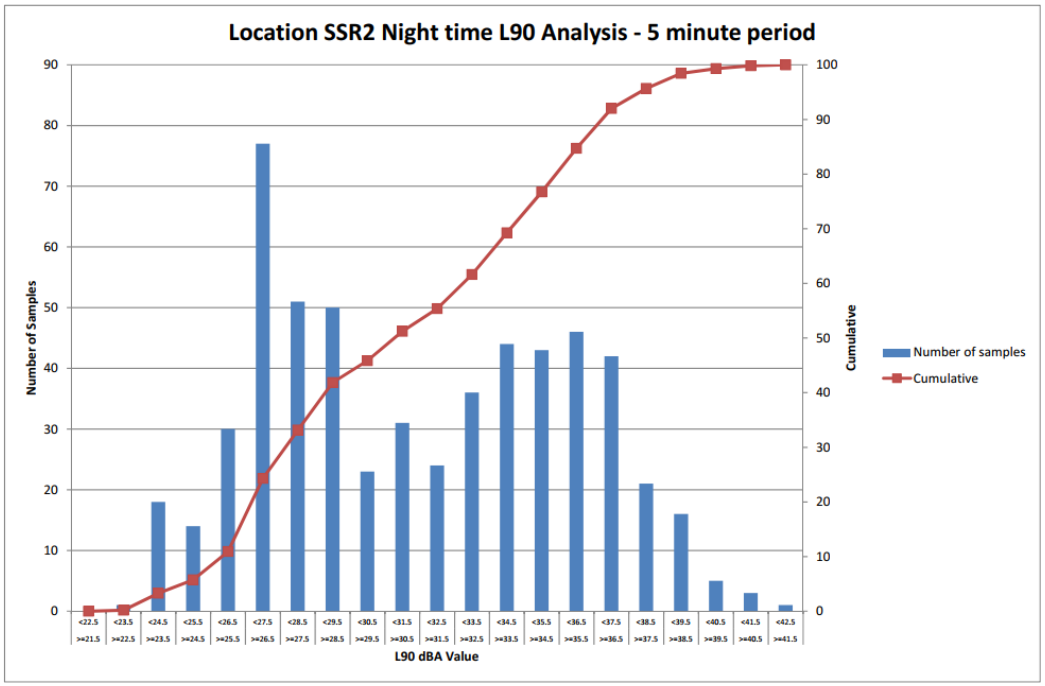


Figure 5 - RH DHV modal distribution plot for SSR2



The original RH DHV analysis resulted in a modal background noise level of 27 dB $L_{Af90,5mins}$ and a mean level of 31.5 dB $L_{Af90,5mins.}$ In their clarification note RH DHV state that :

> *"The spread of data observed using the graphical outputs of step 10 identified the mean value as the most representative noise value at noise receptor SSR2 due to its bi-modal spread."*

This analysis is not accepted, the modal distribution shows a clear mode at 27 dB $L_{Af90,5mins.}$ This compares well with the logged noise levels which show a consistent "shelf" at around this level. We therefore consider the 27 dB L_{Af90} to be the representative background sound level based on the measurement data supplied by RH DHV. However, this measurement period corresponds with the measurements at SSR7 when background sound levels were raised by corona discharge from transmission lines. We would therefore expect background sound levels to be substantially lower at this location in the absence of corona discharge noise.

4.3 SSR3

Logged night-time background noise levels measured at position SSR3 are presented in Figure 6 and RH DHV's modal distribution is shown in Figure 7.

Figure 6 –Background noise levels at SSR3

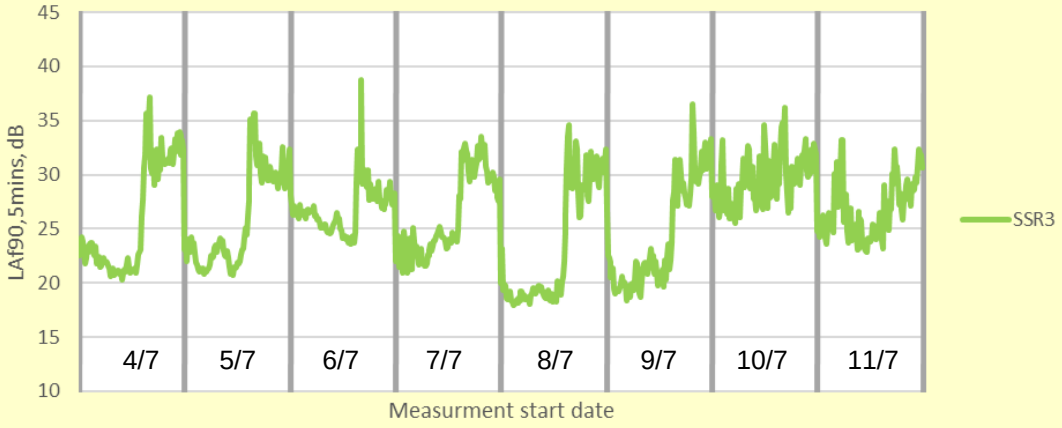
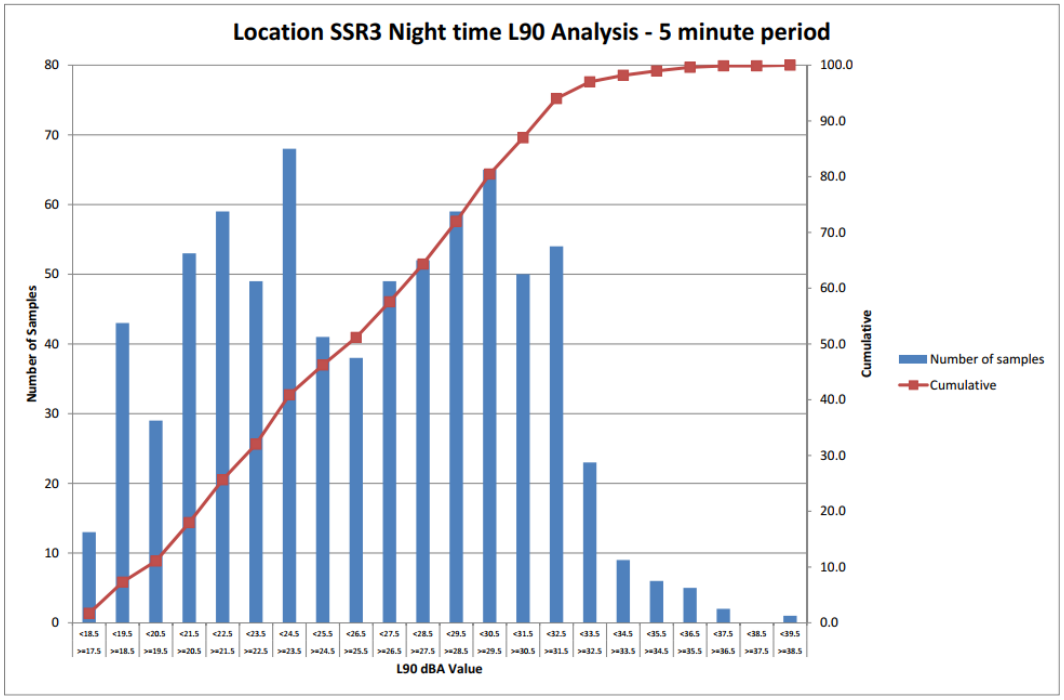


Figure 7 - RH DHV modal distribution plot for SSR3



The original RH DHV analysis resulted in a modal background noise level of 24 dB $L_{Af90,5mins}$ and a mean level of 26.1 dB $L_{Af90,5mins}$, but concluded without justification that the representative noise level at this position was 30 dB $L_{Af90,5mins}$.

The modal distribution plot shows two peaks, the mode being at 24 dBA but with a with a secondary peak at 30 dBA. This secondary peak is presumably the undocumented reason for the choice of 30 dBA as representative background sound level in the original assessment.

The above analysis is not accepted and we consider the true modal value of 24 dB L_{Af90} to be representative of the background sound level measured at this position. Again, this corresponds with a clear “shelf” in the logged data, although at times the noise levels dropped to substantially below this. These periods of lower levels correspond with measurements at SSR1 when noise from transmission lines did not appear to be to be present. It is therefore likely that the representative figure for background sound levels would be lower still in the absence of noise from transmission lines.

4.4 SSR5

Logged night-time background sound levels measured at position SSR5 are presented in Figure 8 and RH DHV's modal distribution plot is shown in Figure 8.

Figure 8 - Background noise levels at SSR5

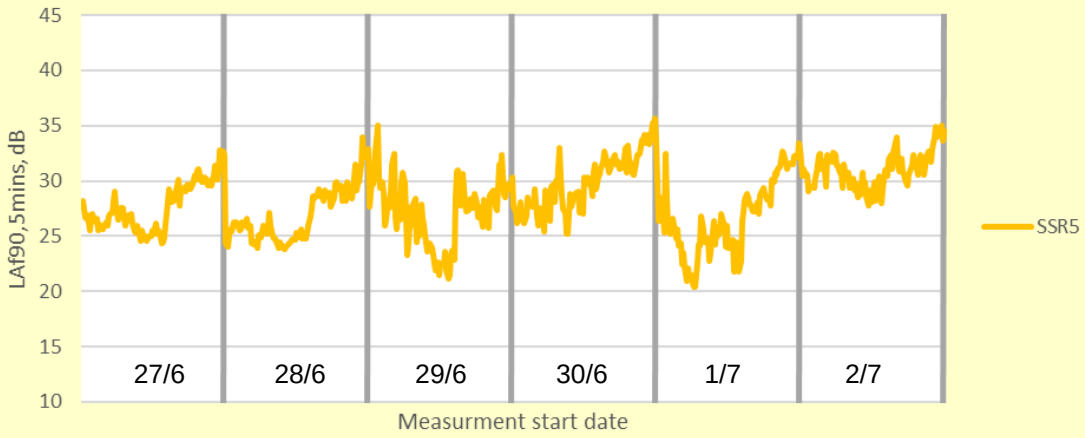
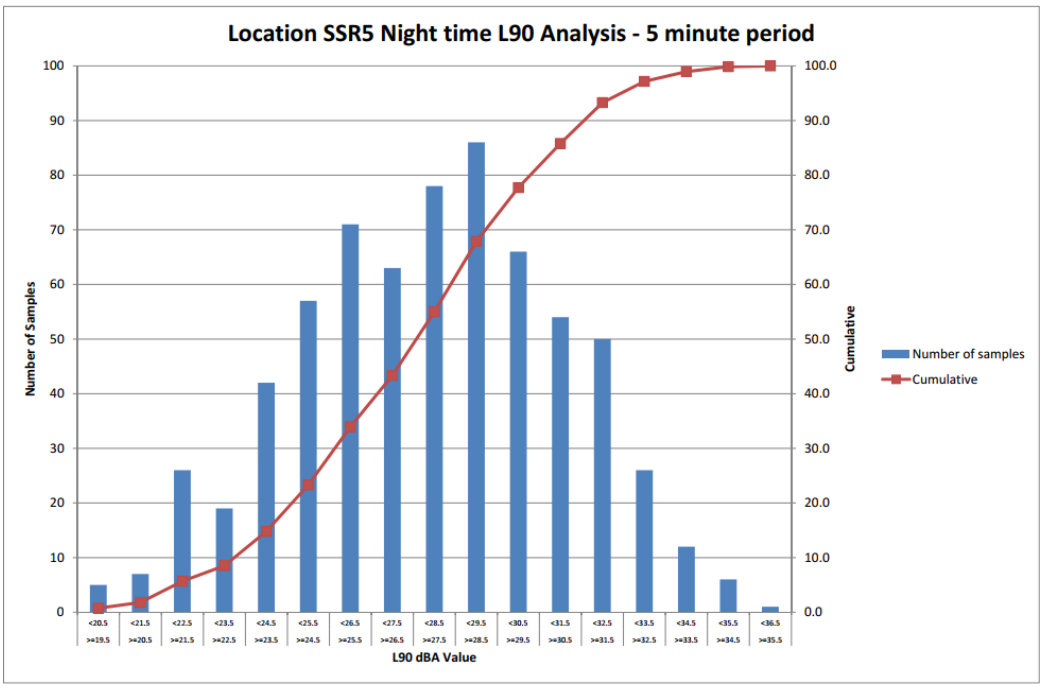


Figure 9 - RH DHV modal distribution plot for SSR3



The original analysis resulted in a modal background noise level of 29 dB $L_{Af90,5mins}$ and a mean level of 27.9 dB $L_{Af90,5mins.}$ In their clarification note RH DHV state that :

> *"Similarly, the modal value was identified as the most representative noise value at noise receptor SSR5 due to its distinct unimodal peak."*

We agreed that the model distribution of the available data shows 29 dB $L_{Af90,5mins}$ to be the typical background noise level measured by RH DHV at this position. However, this measurement period corresponds with the measurements at SSR7 when background sound levels were raised by corona discharge from transmission lines. It is therefore likely that background sound levels would be substantially lower at this location in the absence of noise from transmission lines.

5 REVISED NOISE LIMIT

As discussed, a review of the supplied raw background noise data shows that noise from existing transmission lines is likely to have had a significant effect on the background noise climate at the receptors. There is not sufficient information to determine whether this occurs sufficiently regularly to be considered a permanent part of the noise climate in the area. If noise from overhead transmission lines were excluded from the assessment the "typical" background sound levels could be substantially lower, as shown at SSR9 where a modal level of 18 dB $L_{Af90,5mins}$ was measured.

However, in the absence of any information on the noise from overheard transmission lines and based solely on the data supplied by RH DHV we consider that the "typical" noise levels at the three monitoring positions including corona discharge noise should be as follows:

- SSR2 – 27 dB $L_{Af90,5mins}$
- SSR3 – 24 dB $L_{Af90,5mins}$
- SSR5 – 29 dB $L_{Af90,5mins}$

According to the methodology set out in the ES, the noise limit in Requirement 26 should be determined by the lowest of these values, the level at SSR3. This would results in a 5 dB reduction in the noise limit set within Requirement 26 (excluding separate discussions of the appropriate LOAEL value).

Report Status

Revision	Date	Prepared by	Checked by
-	20 October 2020	Joe Bear MIOA	Adrian James FIOA

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