



East Anglia ONE North Offshore Windfarm

Appendix 20.1

Water Resources and Flood Risk Consultation Responses

Environmental Statement Volume 3

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Glossary of Acronyms

CoCP	Code of Construction Practice
CCS	Construction Consolidation Site
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
ETG	Expert Topic Group
FRA	Flood Risk Assessment
GEP	Good Ecological Potential
GES	Good Ecological Status
HDD	Horizontal Directional Drilling
NPPF	National Planning Policy Framework
NPS	National Policy Statement
PEIR	Preliminary Environmental Information Report
SBIS	Suffolk Biodiversity Information Service
SCDC	Suffolk Coastal District Council
SFRA	Strategic Flood Risk Assessment
SPZ	Source Protection Zone
SuDS	Sustainable Drainage System
SWDP	Surface Water Drainage Plan
WFD	Water Framework Directive

Glossary of Terminology

Applicant	East Anglia ONE North Limited.
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid

	overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid.
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia ONE North project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Onshore cable corridor	The corridor within which the onshore cable route will be located
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia ONE North project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre-planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.
Onshore substation	The East Anglia ONE North substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia ONE North project.

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20.1 Water Resources and Flood Risk Consultation Responses

20.1 Introduction

1. This appendix to **Chapter 20 Water Resources and Flood Risk** covers those statutory consultation responses that have been received as a response to the Scoping Report (2017), the Preliminary Environmental Information Report (PEIR) (2018) and Expert Topic Group (ETG) Meetings.
2. Responses from stakeholders and regard given by the Applicant have been captured in **Table A20.1.1**.
3. As Section 42 consultation for the proposed East Anglia ONE North project was conducted in parallel with the proposed East Anglia TWO project, where appropriate, stakeholder comments which were specific to East Anglia TWO, but may be of relevance East Anglia ONE North, have also been included in the consultation responses for East Anglia ONE North.

Table A20.1.1 Consultation Responses in relation to *Chapter 20 Water Resources and Flood Risk*

Consultee	Date/ Document	Comment	Response / where addressed in the ES
<p>The following comments were received prior to consultation on the PEIR and were in response to the Scoping Report or direct consultation with stakeholders. These comments were taken into account in the production of the PEIR.</p>			
Suffolk County Council and Suffolk Coastal District Council (SCDC)	08/12/2017 Scoping Response	The construction / installation of cables in ducts underground requires the stripping back and stockpiling of overlying topsoil over a 50m wide strip along the length of the undergrounding before the 2 trenches are dug for the ducts. There is potential for surface water runoff to be created in significant rain events and become concentrated flow (depending on gradient directions) along the windrow topsoil stock piles. There is likely to be suspended solids in the runoff which needs to be managed so as not to 'pollute' watercourses. In areas of springs or high-water table, the duct trenches could fill with water and the ground needs to be dewatered. Suitable settlement processes will be required for the pumped water to remove suspended solids.	<p>The potential impacts of the proposed East Anglia ONE North project construction techniques and installation of cabling ducts is discussed in section 20.5.5 of this chapter, along with proposed mitigation measures.</p> <p>Each watercourse likely to be impacted is identified in the description of the existing environment in section 20.5.1 of this chapter.</p> <p>A Code of Construction Practice (CoCP) will be produced post-consent to discharge a requirement of the draft DCO. A and Surface Water and Drainage Management Plan will be developed and implemented in the pre-construction period as part of the CoCP. The CoCP will also set out the measures required to manage foul drainage during construction.</p>
SCDC	08/12/2017	The Scoping Report identifies that the substation areas have the potential to increase flood risk caused by the replacement of	Impacts on surface and groundwater resources are set out

Consultee	Date/ Document	Comment	Response / where addressed in the ES
	Scoping Response	permeable greenfield agricultural land with impermeable surfaces forming the substation. Mitigation by surface water infiltration methods are identified and where these are not feasible then run off rates are to be attenuated to the existing greenfield rate. This is an acceptable standard approach. However, it will be important to identify to a degree of accuracy, the required land area / space required for either of these approaches at a very early stage so that the correct substation compound dimensions are established and become part of the formal development approval process.	in sections 20.5.5 and 20.7 of this chapter. Section 20.6.2 of this chapter acknowledges and assesses the potential for the building of permanent above ground infrastructure for the onshore substation and National Grid infrastructure to increase flood risk during operation due to the replacement of existing greenfield agricultural land. Embedded and additional mitigation measures to prevent an increase in flood risk are described in Table 20.3 and section 20.6.2 of this chapter, respectively.
Anglian Water	08/12/2017 Scoping Response	Reference is made to principal risks of flooding from the above project being fluvial and surface water flooding as part of the construction phase. Consideration should be given to all potential sources of flooding including sewer flooding as part of the PEI and related Flood Risk Assessment.	Appendix 20.3 is a Flood Risk Assessment (FRA) to inform the ES and considers all sources of flooding including sewers and groundwater. This is also discussed in sections 20.5.5 and 20.7 of this chapter.
Anglian Water	08/12/2017 Scoping Response	At this stage, it is unclear whether there is a requirement for wastewater services for the site. It is suggested that the PEI should include reference to the foul sewerage network and sewage treatment.	Topic specific embedded mitigation is included in section 20.3 of this chapter which includes consideration of foul drainage

Consultee	Date/ Document	Comment	Response / where addressed in the ES
			collected during construction and operation.
Environment Agency	08/12/2017 Scoping Response	The PEI needs to include consideration of abstractions points. There are number of licensed and deregulated groundwater abstractors in the study area. The data set should also include sites on the Environment Agency's groundwater levels monitoring network (there are three in the study area); works should be planned with knowledge of the sensitivity of these sites and the area around them.	Groundwater and abstractions are discussed in section 20.5.2 of this chapter. The sensitivity of the groundwater resources is also considered in section 20.5.4 of this chapter. Embedded and specific mitigating measures are proposed to reduce impacts on groundwater sources.
Environment Agency	08/12/2017 Scoping Response	The potential for an impact on shallow groundwater flow needs to be considered. We would also re-emphasize that the interaction of the on-shore cable with small abstractions does not appear to have been considered. There is no definitive statement of how groundwater abstractions in or near the cable route, or surface water abstractions downstream of where there may be river crossings will be considered.	Impacts on groundwater and groundwater abstractions are considered in Appendix 20.4 .
Environment Agency	08/12/2017 Scoping Response	We note that there are two main rivers within the study area, the Thorpeness Hundred River and Friston Watercourse. Depending on the types of crossing required, impacts on fisheries should be considered as appropriate.	Impacts on fisheries are addressed in section 20.6.1.2 of this chapter in terms of increased sediment supply. Further discussion on the impacts of the proposed East Anglia ONE North project on aquatic ecology is also provided in Chapter 22 Onshore Ecology .

Consultee	Date/ Document	Comment	Response / where addressed in the ES
Public Health England	05/12/2017 Scoping Response	<p>When considering a baseline (of existing water quality) and in the assessment and future monitoring of impacts, these:</p> <p>Should include assessment of potential impacts on human health and not focus solely on ecological impacts;</p> <p>Should identify and consider all routes by which emissions may lead to population exposure (e.g. surface watercourses; recreational waters; sewers; geological routes etc.);</p> <p>Should assess the potential off-site effects of emissions to groundwater (e.g. on aquifers used for drinking water) and surface water (used for drinking water abstraction) in terms of the potential for population exposure; and</p> <p>Should include consideration of potential impacts on recreational users (e.g. from fishing, canoeing etc.) alongside assessment of potential exposure via drinking water.</p>	<p>Potential impacts are discussed for construction, operation and decommissioning in section 20.5 of this chapter.</p> <p>Potential mitigation measures are also included in section 20.6 of this chapter.</p> <p>Potential impacts on human health receptors are considered separately in Chapter 27 Human Health.</p>
The Planning Inspectorate	20/12/2017 Scoping Response	<p>The Scoping Report chapter has set out the approach to WFD assessment and that the FRA will be undertaken in accordance with the National Planning Policy Framework (NPPF), however the chapter does not set out how impacts on water resources outside the remit of flood risk or WFD will be assessed. The PEI should include the methodology where necessary to assess impacts to these watercourses.</p>	<p>The assessment methodology is provided in section 20.4 of this chapter. Methodology for the WFD assessment and FRA is additional provided in Appendix 20.3 and Appendix 20.4 respectively.</p>
The Water Management Alliance	September 2016- December 2017 Phase 1 Consultation	<p>Any impacts on drainage need to be discussed with the East Suffolk Internal Drainage Board. There should be early discussions as there may be charges and opportunities to improve design and reduce costs to the developer and create more sustainable water.</p>	<p>Potential impacts during construction including direct disturbance of surface water bodies and increased sediment supply are discussed in sections 20.6.1 and 20.6.1.2 of this chapter respectively. Mitigation measures</p>

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Consultee	Date/ Document	Comment	Response / where addressed in the ES
			are also proposed and discussed to minimise potential impacts.
Friston Parish Council	January – May 2018 Phase 2 Consultation	Concerns over flood risk to Friston associated with installation of onshore substation in the western half of Zone 7.	Appendix 20.3 provides a detailed description of the baseline flood risk, and the implications of the proposed East Anglia ONE North project. This also includes mitigation measures where appropriate.
ETG: Suffolk County Council, Suffolk Coastal and Waveney District Council, Anglian Water and the Environment Agency	January – May 2018 Phase 2 Consultation	The Method Statement was provided to stakeholders in advance of the meeting and was discussed and reviewed at the ETG. Following this, the baseline presented in the Method Statement was agreed with the following recommendations: Inclusion of additional datasets: <ul style="list-style-type: none"> Protected species data (from Suffolk Biodiversity Information Service (SBIS)) Water body summary sheets (and mitigation measures) Product 4 and Product 8 flood zone risk mapping Suffolk CC flooding incident mapping Sewer flooding register Waveney and Suffolk Coastal Strategic Flood Risk Assessment: updated flood risk mapping (plus climate change) Domestic abstraction (non-licensed) and private water supply (request to Environment Agent (EA) and SCDC) Ordinary water courses 	Appendix 20.3 considers the additional datasets including the Product 4 and Product 8 data in detail and assesses the likelihood of the proposed East Anglia ONE North project being affected by current or future flooding from any source and whether it will increase flood risk elsewhere.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		No comments were received from the East Suffolk Internal Drainage Board.	
Expert Topic Group (ETG) (as before)	January – May 2018 Phase 2 Consultation	Expansion to include all abstractions (licenced or unlicensed). Stage two Sizewell C (SZC) consultation should inform the basis for the development of a worst case scenario to deal with these cumulative impacts of the construction and operation of SZC.	Potential impacts on licensed and unlicensed abstractions are considered in section 20.6 of this chapter. The assessment of cumulative impacts is presented in section 20.7 of this chapter and Appendix 20.2 .
ETG (as before)	January – May 2018 Phase 2 Consultation	More vulnerable land uses should also be High sensitivity Less Vulnerable land uses should be Medium sensitivity Water Compatible land uses (which include a built element) should be Low sensitivity. Water Compatible land uses that do not include any built element should be Negligible sensitivity Removal of "pollution likely to be acceptable" Sensitivity: <ul style="list-style-type: none"> • Public water supply abstractions as Medium sensitivity • All Principal Aquifer should be considered High sensitivity • Secondary A aquifers included as High Sensitivity • All abstractions within the study area included as High sensitivity Value:	During the description and defining of the existing environment in section 20.5 of this chapter, the sensitivity and value has been refined in Table 20.12 to take account of the recommendations made by the ETG during the Phase 2 consultation process. Scoping of those factors listed has been taken into consideration.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		<ul style="list-style-type: none"> All abstractions within the study area included as High value <p>Scale:</p> <ul style="list-style-type: none"> 'very minor and intermittent' impact in the 'Negligible' magnitude section means intermittent and short term No waterbody can be designated as Low / Negligible sensitivity <p>Scoping In of:</p> <ul style="list-style-type: none"> Potential impacts on downstream abstractions associated with any potential crossings of watercourses Foul and mains connections of construction compounds Storage areas within floodplain / surface water pathways Welfare at compounds (if applicable) 	
The following comments were made in response to the PEIR and were taken into account in the production of this ES.			
Environment Agency	26/03/2019 Section 42 Consultation Response	Table 20.1 of the PEI states that the ETG commented that public water supply abstractions should be considered Medium sensitivity. And that all abstractions within the study area be included as High sensitivity. For clarity, in respect of PWS abstractions the ETG recommended that it is acceptable to include public water supply abstractions as Medium sensitivity if their SPZ1 or 2 is outside the study area but all Principal Aquifer should be considered to be of High sensitivity	This has been clarified in Table 20.7 of this chapter by aligning the sensitivity of receptors with the responses received to Section 42 consultation.
Environment Agency	26/03/2019	The embedded mitigation included in PEI Table 20.4 states that foul drainage from welfare facilities and sub-stations will be to	Noted. Mains and septic tanks are both still considered as embedded mitigation for foul drainage. This is

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Consultee	Date/ Document	Comment	Response / where addressed in the ES
	Section 42 Consultation Response	mains or septic tank. Mains should be the first preference, and septic tanks may not be acceptable in certain locations.	clarified in Table 20.3 of this chapter.
Environment Agency	26/03/2019 Section 42 Consultation Response	We note that this PEI Table (20.4) does not include any embedded mitigation in respect of fluvial flood risk. The study area does include Flood Zone 2 & 3, with a crossing of the Hundred River. We would expect to see embedded mitigation listed; this might include for example storing materials and equipment outside of flood risk areas, and signing up to flood warnings as part of a flood warning and evacuation plan.	Clarified in Table 20.3 and section 20.5.1.1 of this chapter. As suggested, embedded mitigation measures include material storage outside of Flood Zones 2 and 3 as far as reasonably practicable.
Environment Agency	26/03/2019 Section 42 Consultation Response	While we generally welcome the revised rationale in respect of surface waters and water quality in PEI Table 20.8 (definitions of sensitivity); we note that the definitions agreed by the ETG (as included in table 20.1) in respect of flood risk vulnerability and groundwater resources do not appear to have been incorporated. This should therefore be corrected.	This has been clarified in Table 20.7 of this chapter by aligning the sensitivity of receptors with the responses received to Section 42 consultation.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Section 20.5.2 Existing Environment – Groundwater. In respect of paragraph 69, we would state that the Principal aquifer chalk is at significant depth in the study area, below the low permeability unproductive London Clay. The Crag is the Principal aquifer bedrock underlying the study area; the Crag is overlain by Secondary aquifer glacial deposits. Regarding Groundwater, PEI Table 20.13 should also explicitly include Secondary aquifer supporting abstractions.	Addressed in section 20.5.2 and Table 20.12 of this chapter by including the Secondary aquifer supporting abstractions in the existing environment of this assessment.
Environment Agency	26/03/2019	In respect of anticipated trends and PEI section 20.5.5.2 Groundwater, it is not valid to suggest that groundwater pressures will decrease in the future given the potential for climate change impacts and growth.	This has been clarified by adding further clarification in section 20.5.5 of this chapter in relation to future groundwater trends.

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	Section 42 Consultation Response		
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Section 20.6 Potential Impacts should also include an assessment of and mitigation against direct disturbance of the aquifer flow to surface water features and groundwater abstractions. This is included later in Table 20.20 but requires a more detailed consideration.	This has been clarified by providing a more detailed consideration of disturbance to aquifer flow in section 20.6.2.1 of this chapter.
Environment Agency	26/03/2019 Section 42 Consultation Response	We are broadly satisfied at this time with the general approach and methodology for looking at impacts on surface water quality, including mobilization of sediments. For the majority of ecological receptors, the report states that mitigation measures will be identified once detailed design is completed and the exact nature of impacts is known. The examples of the types of mitigation measures are accepted ways of working; however further judgement on likely residual impact is reserved for specific mitigation proposals. We would however highlight at this time that the temporary crossing of the Hundred River is suggested to be either a bridge or culvert. In most cases our preference is for a clear span bridge due to the potential impacts on the hydrology and ecology of a watercourse arising from the use of a culvert.	Noted regarding acceptance of the methodology. Potential impacts to the Hundred River have been further clarified in section 20.6.1.1 of this chapter. Noted regarding the preference for a bridge crossing. A bridge or a culvert have both been retained as potential crossing techniques.
Environment Agency	26/03/2019 Section 42 Consultation Response	With regard to the trenching technique detailed in PEI Section 20.6.1.1, we would highlight that there is no mention of potential timings. We would expect to see, for example, some mention of the potential to impact on any elver run expected around May – July, and potentially fish spawning.	This has been clarified in section 20.6.1.1 of this chapter. Any temporary watercourse crossings would be designed to ensure that fish passage was unimpeded.

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Consultee	Date/ Document	Comment	Response / where addressed in the ES
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Table 20.17 considers Impacts Resulting from the Accidental Release of Fuels, Oils, Lubricants, Foul Waters and Construction Materials. Whilst adverse impacts on groundwater quantity in the context of the entire WFD groundwater body are likely to be minor, impacts on a single potable water supply abstraction may have consequences much greater than “minor adverse”; this therefore requires further consideration. Additionally, an assessment of the impacts of changes to aquifer flow at a local scale needs to be assessed in detail somewhere within the Water Resources section.	This has been clarified in section 20.6.1.3 of this chapter by giving further consideration to water supply abstractions. A Code of Construction Practice (CoCP) will be produced post-consent to discharge a requirement of the draft DCO. This CoCP will include measures to control the accidental release of contaminants.
Environment Agency	26/03/2019 Section 42 Consultation Response	We acknowledge the “moderate adverse” significance prior to mitigation attributed to the Hundred River in PEI Table 20.17, due to the potential for a direct discharge.	Noted, no further response required.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.1 Having reviewed the FRA we are satisfied that for issues within our remit it provides a suitable basis to make an assessment of the flood risks arising from the proposed development. In particular the FRA confirms that: - Both the National Grid Substation and East Anglia TWO onshore substation are in Flood zone 1 - The majority of the onshore cable route is located within Flood Zone 1 - The FRA identifies that within the study area there are two main rivers namely the Thorpeness Hundred River and Friston Watercourse. A flood risk activity permit may be required at	Noted, no further response required.

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		these locations. Environmental permits for flood risk activities are required for work in, under, over or within 8 metres of a fluvial main river.	
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.1 We note the references to surface water flood risk. Suffolk County Council as Lead Local Flood Authority will need to be satisfied with the assessment of surface water flood risk and any mitigation measures proposed to ensure that there is no increase in flood risk as a result of the development. This will include managing surface water run-off during the construction phase and from the constructed sub-station sites. We would however highlight that any attenuation ponds or similar features to manage surface water should also be designed to incorporate ecological enhancements wherever possible, providing net gains for biodiversity.	This is clarified in Table 20.3 of this chapter which details the embedded mitigation proposed to manage surface water run-off during the construction phase of the proposed East Anglia ONE North project. The Outline Landscape and Ecological Management Strategy (OLEMS) submitted with this DCO application (document reference 8.7) illustrates the ecological mitigation and benefits of the proposed East Anglia ONE North project, including those in relation to the management of surface water. Species are listed as per the OLEMS which incorporates a desire to plant wet woodland for biodiversity.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.2 We welcome that the assessment of WFD covers both deterioration and “to ensure status objectives (i.e. GES or GEP) will not be prevented”. It identifies the scope to deliver measures that could improve the status of the water bodies, particularly at the Hundred River crossing. This is supported but will require	See Chapter 6 Project Description for further detail on the potential crossing methods of the Hundred River. Horizontal Directional Drilling (HDD) is only required at landfall to avoid

Consultee	Date/ Document	Comment	Response / where addressed in the ES
		specific detailing to fully assess the potential. It should also include assessment of and mitigation for HDD if this is to be used at all during the works.	intertidal habitats and will not be considered for crossing the Hundred River.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.2 As mentioned above, attenuation ponds have been suggested to manage surface runoff and these could provide areas for ecological benefit. Such beneficial features could include varying depths, gently shelved banks, an irregular outline and an area permanently retaining water; providing this does not compromise the ability of these features to function effectively as part of the drainage system.	This is clarified in Table 20.3 of this chapter which details the embedded mitigation proposed to manage surface water run-off during the construction phase of the proposed East Anglia ONE North project. The Outline Landscape and Ecological Management Strategy (OLEMS) submitted with this DCO application (document reference 8.7) illustrates the ecological mitigation and benefits of the proposed East Anglia ONE North project, including those in relation to the management of surface water. Species are listed as per the OLEMS which incorporates a desire to plant wet woodland for biodiversity.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.2 In respect of Table A20.1, we would highlight that groundwater quality is at risk from diffuse pollution from agriculture generally, and not necessarily solely from livestock.	Addressed in Appendix 20.4, Table A20.1 . The note on agriculture as a source of diffuse pollution has been added as requested by Section 42 comments.

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Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.3 A further assessment of impact upon river geomorphology is required for the river crossing and trench options. This may need further detail for the consideration of construction scenario 2 where the river would be impacted over an extended duration.	Appendix 20.5 provides details of baseline conditions only. Impacts on the geomorphology of surface watercourses are assessed in sections 20.6.1.1 and 20.6.1.2 of this chapter. The CIA presented in Appendix 20.2 and summarised in section 20.7.1 of this chapter provides the impact assessment expected in construction scenario 2.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.4 There is potential for an increased magnitude of effects from reoccurring disturbance in the event that construction scenario 2 is required. The local ecology will be further impeded from recovery in this case, particularly in the watercourse, and the extent of such cumulative impact needs addressing.	The CIA presented in Appendix 20.2 and summarised in section 20.7.1 of this chapter provides the impact assessment expected in construction scenario 2. This takes into consideration the impact of a reoccurring disturbance.
Environment Agency	26/03/2019 Section 42 Consultation Response	PEI Appendix 20.4 With regards to cumulative impact with Sizewell C; understandably the designs for both projects have previously been at a strategic level so CIA has been more speculative. However due to the close proximity of both projects, and the evolution of designs as time progresses, it is reasonable to suggest cumulative impacts are likely and the scale of which should be identified in more detail.	This has been clarified in section 20.7.2 of this chapter. A further screening of projects has additionally scoped the Sizewell B Power Station Complex into the CIA. The CIA with the Sizewell C New Nuclear Power Station uses the most recent consultation material available.

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Environment Agency	26/03/2019 Section 42 Consultation Response	The temporary crossing of the Hundred River is suggested to be either a bridge or culvert. We would highlight that culverting can significantly impact the hydrology and ecology of a watercourse and in most cases a bridge would be the preferred method.	Potential impacts to the Hundred River have been further clarified in section 20.6.1.1 of this chapter. Noted regarding the preference for a bridge crossing. A bridge or a culvert have both been retained as potential crossing techniques.
Environment Agency	26/03/2019 Section 42 Consultation Response	As highlighted above under Chapter 20 and section 20.6.1.1 of the PEI, the timing (and duration) of the works, along with the design will be key considerations. The construction should not prevent fish/eel passage and should be timed to prevent disruption during the fish spawning season.	This has been clarified in section 20.6.1.1 of this chapter. Any temporary watercourse crossings would be designed to ensure that fish passage was unimpeded.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The landfall transition bays have the potential to create significant disruption to natural groundwater pathways and also generate potentially significant surface water runoff volumes during construction. Two transition bays will be installed per project. The excavation during construction to install two transition bays is considerable (1,554m ²), if the bays were constructed simultaneously this would double (3,108m ²) and these areas would be in addition to the excavation required for the HDD construction compound and for the CCSs. SPR should carry out an assessment of those impacts and propose appropriate mitigation measures to ensure no worsening of risk to the nearby coastal cliffs over the full life of the landfall transition bays until their removal. The embedded mitigation measures may not be sufficient.	The potential impact of the landfall transmission bays has been clarified in section 20.6.1.4 of this chapter. Erosion impacts are addressed in Chapter 7 Marine Geology, Oceanography and Physical Processes which is supported by assessments of erosion rates.
Suffolk County Council/SCDC	27/03/2019	During operation, the transition bays for the projects have the potential to alter the surface water drainage characteristics of overlying strata caused by saturation which is unable to	The potential impact of the landfall transmission bays has been clarified in section 20.6.1.4 of this

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Consultee	Date/ Document	Comment	Response / where addressed in the ES
	Section 42 Consultation Response	percolate beyond the concrete structures. Dependent on the ground levels, this could result in an increase of overland flows. Given the proximity to the cliffs, the distance to which may be reducing throughout the lifetime of the projects, the potential impacts on the cliffs must be considered.	chapter. Erosion impacts are addressed in Chapter 7 Marine Geology, Oceanography and Physical Processes which is supported by assessments of erosion rates.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The formation of the cable route from the landfall to the substation site involves the removal of the top soil. Once topsoil has been stripped from the cable corridor there is an inherent risk of increased sediment laden surface water run-off. No details have been stated regarding how this will be managed. We expect this to be included in the Construction Method Statement (CMS).	Clarified in Table 20.3 of this chapter which provides detail on the measures which will be taken to prevent top soil run-off into surface water. A Soil Management Plan (SMP), including construction method statements for soil handling, would be produced by a competent contractor and agreed with the relevant regulator, in advance of the works. This would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available to discharge a requirement of the draft DCO. The contractor would be required to comply with the SMP (presented in the OCoCP submitted with this DCO

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			application). This is detailed further in Chapter 21 Land Use .
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The working width illustrations show a drainage ditch between one of the trenches and the access road. This will presumably drain the access road using a cross-fall. The Councils note the ditch looks to be located quite close to the open trench. It is also unclear how the area the other side of the central bund will drain. The Councils expect a lot of this detail will be provided as part of the Surface Water Drainage Plan (SWDP). The bunding will restrict any existing overland flows. Whilst there are only two major overland flow paths within the site extents, smaller, localised flow paths may be impacted which could directly feed some of the ponds located within the construction area. Care must be taken to ensure these re-directed overland flows do not increase flood risk.	The production, and content of, of the Surface Water Drainage Plan (SWDP) is clarified in Table 20.3 of this chapter. The SWDP will be developed and implemented in the pre-construction period as part of the CoCP.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	Edge drains are shown either side of the cable working width however it is not stated anywhere what these edge drains consist of or what they are designed to do.	Temporary cut-off drains would be installed parallel to the trench-line, before the start of construction, to intercept soil and groundwater before it reaches the cable trench – see Chapter 6 Project Description . Final design will be agreed post-consent as part of the process of discharging a requirement of the draft DCO.
Suffolk County Council/SCDC	27/03/2019	The risk of groundwater flooding during construction has been assessed in the Flood Risk Assessments. It is acknowledged there is a risk of groundwater flooding, most likely in the	This is considered as part of the FRA presented in Appendix 20.3 .

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Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The construction method of the temporary haul roads and access roads is yet to be established, other than it will consist of a suitable imported material. It is considered likely, similar to the temporary works areas that these surfaces will not be permeable surfaces and should therefore be accounted for as an impermeable area in the design of the SWDP. This is imperative given these roads will be required for access throughout the construction of the projects and could act as an exceedance route for flood flows to leave the sites defined boundaries.	Further detail regarding the construction of the temporary haul road and access road is provided in Chapter 6 Project Description and this has been considered when completing the FRA presented in Appendix 20.3 . The production, and content of, of the SWDP is clarified in Table 20.3 of this chapter. The SWDP will be developed and implemented in the pre-construction period as part of the CoCP.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The Construction Consolidation Sites (CCS) will require their own SuDS (Sustainable Drainage System) based surface water drainage strategy which we expect to be provided in the SWDP. At almost 41,000m ² each, these are significant construction	Chapter 6 Project Description details the location and size of each CCS. CCS (which will be a maximum of 16,500m ² in size) will not require their own SuDS ponds.

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		areas which will need to be managed carefully to ensure there is no increase in offsite flood risk or pollution.	
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	There is a CCS proposed adjacent to Grimseys Lane, Leiston. Leiston has a history of surface water flooding with multiple properties at risk from future flooding. The location of a CCS upstream of Leiston that could contribute to overland flows is discouraged. We recommend the CCS is sited in a location that cannot contribute to an increase of flood risk in Leiston. If this is unavoidable, the sites SuDS must be designed accordingly. Any SuDS utilising infiltration must have a factor of safety of 10. Maintenance and monitoring requirements must be more frequent than standard for other SuDS components on site. The sizing of surface water storage structures must take account of this risk.	Chapter 6 Project Description details the location and size of CCS. CCS (which will be a maximum of 16500m ² in size) will not require their own SuDS ponds. This has been considered when completing the FRA presented in Appendix 20.3 .
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	There is very little acknowledgement of Ordinary Watercourses throughout the PEIR documentation. The number of Ordinary Watercourse crossings along the cable route has not been established. The Main River crossing is assessed in more detail, as would be expected, however some details regarding Ordinary Watercourses and the localised risk presented by inadequate mitigation must be assessed. Acknowledgement is made that the Environment Agency will be consulted “to help determine the detailed method statement governing each crossing”. It should be noted that any works, temporary or permanent, to an Ordinary Watercourse, not within an Internal Drainage Board area, will require Land Drainage Consent from the Lead Local Flood Authority (Suffolk County Council). If the draft DCOs intend to dis-apply the Land Drainage Act 1991 there must be Protective Provisions.	There are no ordinary watercourse crossings present along the onshore cable route. This has been clarified in section 20.6.1.1 of this chapter.

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Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	A programme of Ordinary Watercourses monitoring throughout the construction phases must be specified in the CMS for each project. This is critical for Ordinary Watercourses adjacent to working areas, receiving surface water from site and those at risk of receiving sediment. This is to ensure there is no increase in flood risk or pollution.	There are no ordinary watercourse crossings present along the onshore cable route. This has been clarified in section 20.6.1.1 of this chapter.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	It is acknowledged that the timing of watercourse works is important with periods of low flow “chosen wherever practicable”. This is critical when working across the Main River but is also important for Ordinary Watercourses and must be a consideration when developing working methods. Given the duration of works, we appreciate that watercourse crossings may be undertaken during periods of wet weather. Methods of working must be in place to prevent any increase in flood risk or pollution.	There are no ordinary watercourse crossings present along the onshore cable route. This has been clarified in section 20.6.1.1 of this chapter.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	During operation, the cable routes are not expected to present any surface water or ground water flood risk. The cables will present a minor impermeable surface to the percolation of water however this is not significant. The impermeable areas created by the jointing bays are smaller than the transition bays and will be located at intervals which should reduce any potential adverse impact.	This is discussed in sections 20.5.5 and 20.6 of this chapter. No significant impacts to surface water or ground water flood risk are anticipated during the operational phase of the proposed East Anglia ONE North project.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The PEIR fails to assess impacts to watercourses which are not designated as Water Framework Directive (WFD) Water Bodies. The Councils are also concerned that the Main River through Friston has not been adequately assessed within the consultation documents. The ‘Friston Watercourse’ that is assessed through the PEIRs, is not the Main River that runs directly through Friston. It is in fact, the WFD section of the	The assessment presented in this chapter has considered all parts of the Friston Watercourse catchment, from its source north of Friston to the downstream limit with the Long Reach (Alde Estuary). Figure 20.1 has been

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		same river which is approximately 2.5km downstream of Friston. This is not clearly stated anywhere. We are concerned that local residents reading this information may not be aware of this and could therefore be misled by the information presented. The magnitude (both prior to and following mitigation), significance and residual impacts have therefore not been assessed for the Main River through Friston as a Receptor in its own right due to the residential setting, thus high sensitivity. This is a significant shortcoming of the PEIRs.	updated to clarify the Main River extent.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The PEIR incorrectly identifies the onshore substations as being within the Hundred River catchment. They are in fact located in the Friston Watercourse catchment, as shown in Figure 20.1. The same paragraph quotes the Friston Watercourse catchment as approximately 6km ² . As stated earlier within this section, the Main River through Friston has not been considered as a receptor within the consultation documents.	The onshore substation and National Grid infrastructure are identified as being located within the catchment of the Friston Watercourse, detailed within section 20.5.1.1 of this chapter. The assessment considers the whole Friston Watercourse catchment as a receptor.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The catchment contributing to the Main River through Friston has been estimated as 1.5km ² , this is based on the approach set out in Appendix D. Within the appendix the cumulative construction areas in the estimated catchment of the Main River through Friston have been estimated and considered against the estimated catchment to identify a maximum area of disturbed ground of 21%. This figure is far greater than the 3.8% identified within the PEIRs. This demonstrates that the Main River in Friston is at a much higher risk from silt laden run-off than is presented in the PEIR. Without adequate assessment and mitigation, this could result in an increase in surface water	The assessment considers the whole Friston Watercourse catchment as a receptor. Figure 20.1 has been updated to clarify the Main River extent.

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		flood risk in Friston. There are also pollution impacts that require consideration.	
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	Measures to manage surface water run off will need to be in place prior to any construction works, including grading. If grading is completed prior to the installation of surface water drainage infrastructure there's an increased risk of sediment laden runoff entering the downstream watercourse.	Clarified in Table 20.3 of this chapter which provides detail on the measures which will be taken to prevent sediment run-off into surface water. Grading is not considered as a required embedded mitigation measure.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The National Grid substation and CCS is located directly on multiple surface water flow paths. There has been no assessment regarding how the use of either of these sites during the construction phases will impact surface water flow paths. There is a significant potential for surface water flow paths to be obstructed or diverted, resulting in a potential increase in off site flood risk. There is also a potential on site flood risk that needs to be assessed. Furthermore, the placement of stockpiles along the route of these flow paths will increase the probability of sediment being transferred downstream via the surface water flow path. This also has the potential to increase surface water flood risk in Friston.	Changes to surface water flow paths in relation to the presence of the National Grid infrastructure and the CCSs are addressed in sections 20.6.1.4.1 and 20.6.2.1.1 of this chapter. This is also addressed within Appendix 20.3, section 20.4.3.6 .
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	There is a significant opportunity to reduce surface water flood risk in Friston as part of this project. At this stage, there are no details to suggest that the project intends to provide this betterment. The Councils strongly recommend that SPR consider this option and begin discussions with Suffolk County Council as Lead Local Flood Authority, the Environment Agency and local stakeholders to discuss potential options for betterment in terms of surface water flood risk.	Clarified in Table 20.3 of this chapter which provides detail on the measures which will be taken to prevent flood risk to Friston. In December 2018, Defra consulted on plans to introduce the principle of Net gain to the Planning System in England. A

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			<p>Defra's recent response to consultation¹ affirms their intention to bring forward legislation to mandate Net Gain within the Environment Bill but confirms their position that Nationally Significant Infrastructure Projects (NSIPs) and marine developments will remain out of scope of the mandatory requirement in the Environment Bill.</p> <p>SPR will continue to work constructively with Defra and key stakeholders such as Natural England to support the preparation of guidance on the application of Net Gain and in their work to establish potential approaches to achieving biodiversity net gains for NSIPs and marine developments.</p>
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	There is no adequate assessment of the proposed substations (EA1N, EA2 or National Grid) interaction with the existing surface water flow paths north of Friston. The Flood Risk Assessment (FRA) briefly assesses surface water flood risk (paragraphs 113-116). SPR incorrectly state the substations are located outside the extent of the 1:1000 year surface water flooding event. The only surface water flood map provided by	Changes to surface water flow paths in relation to the presence of the National Grid infrastructure and the onshore substations are addressed in sections 20.6.1.4.1 and 20.6.2.1.1 of this chapter. This is also addressed within

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819823/net-gain-consult-sum-resp.pdf

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		SPR is to a scale of 1:25,000. Upon further investigation, it is evident that the National Grid substation is located directly on a 1:30, 1:100 & 1:1000 surface water flow path. A map has been drawn to illustrate this and attached in Appendix D. The proposed 3m bunding directly north and west of the National Grid substation also intercepts surface water flow paths. There has been no assessment on the redirection of flows and the potential impacts this could have on flood risk in Friston.	Appendix 20.3, section 20.4.3.6. Appendix D submitted with this response has been interrogated.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	It is unclear whether the proposed surface water drainage strategy will utilise the Qbar or Long Term Storage method of discharge. This aspect is vital in understanding any potential betterment afforded to Friston in terms of surface water flood risk. It will also have an impact on the amount of space required for SuDS.	This is clarified in Appendix 20.3 and has been taken into consideration through the design process of the SuDS.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	It is also unclear what storm event the surface water system is being designed to. Paragraph 154 of the PEI FRA refers to 1:100 whilst paragraph 413 of Chapters 6 refers to 1:200. A climate change allowance of 20% has been used for the substation sites based on an operational life of 25 years. Unless there is a clear commitment to all impermeable areas being removed by 2069 then SuDS must be designed with a climate change allowance of 40%, as per national guidance.	Current design life of the onshore substations is assumed to be at least 25 years at which point decommissioning will reinstate to previous condition where possible. The current design is 1:200 year event. This is clarified in Appendix 20.3 and Table 20.3 .
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	It is unclear how the proposed development intends to comply with NPS EN-1, paragraph 5.7.20, which states "Site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without	Current design life of the onshore substations is assumed to be at least 25 years at which point decommissioning will reinstate to previous condition where possible.

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		adverse impacts". It is apparent that any exceedance events would have an adverse impact on Friston.	The current design is 1:200 year event. This is clarified in Appendix 20.3 and Table 20.3 .
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The Councils acknowledge the intention to combine SuDS with ecological and landscape mitigation and encourage this approach.	Noted, no further specific response required.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	As previously highlighted the long term impacts fail to consider the impacts to the Main River through Friston only focusing on the WFD impacts on the Main River 2.5km away. The estimated operational area utilised in the estimated catchment of the Main River through Friston is 10%, the calculation used to find this figure is set out in Appendix D. This is far in excess of the 1.6% stated by SPR, this demonstrates that the information contained in the PEIRs fail to assess the increased surface water flood risk to Friston.	The assessment considers the whole Friston Watercourse catchment as a receptor. Figure 20.1 has been updated to clarify the Main River extent.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The maintenance arrangement for any SuDS installed will be a key aspect in ensuring that they do not increase flood risk in Friston. No indication is given as to who would be responsible for these SuDS in perpetuity.	This will be maintained as part of the onshore substation and National Grid infrastructure operation. Clarified in Table 20.3 of this chapter.
Suffolk County Council/SCDC	27/03/2019 Section 42 Consultation Response	The Councils are concerned about the gaps in the information provided within the consultation documents and wish to see SPR explore the opportunity to provide betterment for the community of Friston by reducing the surface water flood risk.	Clarified in Table 20.3 of this chapter which provides detail on the measures which will be taken to prevent flood risk to Friston.

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			SPR will continue to work constructively with Defra and key stakeholders such as Natural England to support the preparation of guidance on the application of Net Gain and in their work to establish potential approaches to achieving biodiversity net gains for NSIPs and marine developments.