Environment Agency Written Representation on Sizewell C Development Consent Order

Our Reference: AE/2021/126206/01

2 June 2021

Executive Summary

The Environment Agency's Role
The Environment Agency works to create better places for people and wildlife.

We were established to bring together responsibilities for protecting and improving the environment and to contribute to sustainable development. We take an integrated approach in which we consider all elements of the environment when we plan and carry out our work. This allows us to advise on the best environmental options and solutions, taking into account the different impacts on water, land, air, resources and energy.

We help prevent hundreds of millions of pounds worth of damage from flooding.
Our work helps to support a greener economy through protecting and improving the natural environment for beneficial uses, working with businesses to reduce waste and save money, and helping to ensure that the UK economy is ready to cope with climate change. We will facilitate, as appropriate, the development of low carbon sources of energy ensuring people and the environment are properly protected.

We have three main roles:

We are an **environmental regulator** – we take a risk-based approach and target our effort to maintain and improve environmental standards and to minimise unnecessary burdens on businesses. We issue a range of permits and consents.

We are an **environmental operator** – we are a national organisation that operates locally. We work with people and communities across England to protect and improve the environment in an integrated way. We provide a vital incident response capability.

We are an **environmental adviser** – we compile and assess the best available evidence and use this to report on the state of the environment. We use our own monitoring information and that of others to inform this activity. We provide technical information and advice to national and local governments to support their roles in policy and decision-making.

The Environment Agency's position on Sizewell C
We will support the Examining Authority by advising them if the application is in line with these objectives so that they can be satisfied that their recommendation in relation to the application for the DCO can be made taking full account of environmental impacts.

Pre-application consultation
We have provided NNBGenCo (SzC) Ltd and their consultants with advice throughout the Pre-Application stage of the DCO to help enable them to develop their proposals for Sizewell C in ways that will protect people and the environment.

We have made comprehensive comments in response to each of NNBGenCo (SzC) Ltd's pre-application consultations. Throughout that process, and in the subsequent lead up to their DCO application, we have had extensive discussions to address issues and provide advice raised in response to their proposals. We have also been engaging with NNBGenCo (SzC) Ltd to seek common ground and will continue to progress do so throughout the examination process.

NNBGenCo (SzC) Ltd has responded positively in some areas. We have agreed some measures, including alterations to design or construction, use of best practice and adequate environmental monitoring and response, which have been included in their application to help secure protection of the environment, local habitats and protected species. However, there remain ongoing issues, as well as new issues from the January 2021 changes submission, that could cause unacceptable environmental harm. There is still a substantial amount of further information to be submitted.

Issues of concern
There are still a number of important issues that do require further attention at this time, as we have been unable to resolve these with NNBGenCo (SzC) Ltd in the pre-application period.

Flood Risk – We have yet to agree that the supporting flood risk modelling is sufficient to consider the extent and consequences of flooding at the Main Development Site (MDS) or Sizewell Link Road (SLR). The current Flood Risk Assessments (FRA) for both sites identify areas of increased flooding without identifying appropriate mitigation and compensation measures.

Coastal Processes – The sustainability of the Hard and Soft Coastal Defence Features (HCDF and SCDF) has not been demonstrated, and insufficient evidence has been provided to allow the impact on geomorphology and coastal processes to be understood.

Water Supply - The water supply options described do not provide evidence to demonstrate that a suitable and ecologically sustainable source of water can be provided to the Sizewell C Project.

Terrestrial Ecology – The proposed design of the SSSI crossing is unsuitable for migration of numerous invertebrates, and will cause fragmentation of sensitive habitats. Current assessments of the Sizewell Link Road watercourse crossings do not sufficiently identify likely impacts or provide appropriate mitigation and/or compensation measures.

Marine Ecology – We have outstanding concerns over methods being used to assess impacts to marine ecology and cannot yet agree to the appropriateness of proposed mitigation measures.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 - We have concerns that the assessments have not identified all the potential impacts under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations) or adequately assessed the potential for deterioration in the status of WFD water bodies affected by the development. If a deterioration in water body status cannot be ruled out an exemption will be required in accordance with Regulation 19 of the WFD Regulations and NNBGenCo (SzC) Ltd has not made a case to support this.

Alignment between submission of Environmental Permits and DCO – At this time we must highlight that we are currently unable to advise the Examining Authority of our likely proposed decision on the environmental permits required for operation, or construction.

Structure of the Environment Agency response

In the body of the detailed comments we identify those issues we would like the Examining Authority to take into account when considering this DCO application. We have outlined the issue, what the impact is, and suggested a solution to resolve it. In many cases we need more information to advise the Examining Authority and we request it be provided to be considered in the examination.

We have updated matters as set out in our Relevant Representation and will update the Examining Authority on progress with the resolution of these issues at appropriate points as the examination progresses. Where we have suggested the need for possible requirements, this is suggested to facilitate discussion with NNBGenCo (SzC) Ltd and other parties.

We note that other bodies are involved in the project, such as the Marine Management Organisation and Natural England, with interests in common to ourselves. We have had discussions with these bodies throughout the pre-examination period already and will continue to discuss further and collaborate with these organisations where appropriate.

The Environment Agency intends to make oral representations at any relevant hearings. We are concerned that there is a substantial amount of information still to be submitted and as a result of this we may not be able to review this new, and amended, information to timescales that will enable us to properly advise the Examining Authority within the deadlines set out in the Examination Timetable. Much will depend upon the extent to which NNBGenCo (SzC) Ltd can provide information of an appropriate quality to resolve outstanding issues, during the examination period.

Yours sincerely

Mr. Simon Barlow
Nuclear New Build Project Manager
East Anglia Area

Development Consent Order, Deemed Marine Licence, and Section 106 Town and Country Planning Act 1990 Agreement

1.0 NNBGenCo (SzC) Ltd have submitted a further revised Development Consent Order (DCO), Deemed Marine Licence (DML) and Section 106 Town and Country Planning Act 1990 agreement into the examination. We consider that a number of minor amendments are required to conditions and requirements to ensure the Environment Agency is consulted in the discharge of additional information being submitted to the discharging authority. We will work with NNBGenCo (SzC) Ltd to make these changes in future revisions to the DCO/DML.

1.1 We have highlighted throughout our Written Representation where we consider further information is required to give assurances that proposed conditions or requirements can be met. In addition there are instances where mitigation or compensation measures may need to be secured via additional legal agreements.

Flood Risk

2.0 Much of the Sizewell C Main Development Site and Associated Development Sites are in Flood Zone 3 (high probability of flooding), and there are also numerous proposed watercourse crossings. It is therefore essential for the DCO application to be supported by an adequate Flood Risk Assessment FRA) that demonstrates that there will be no increased risk of flooding on site or elsewhere, or where any increase in flood risk cannot be avoided or wholly mitigated, that it can be mitigated to an acceptable level, taking into account the benefits of the project and compensatory measures.

2.1 The Environment Agency has continued to engage with NNBGenCo (SzC) Ltd since the submission of the DCO application. Significant progress has been made across the Main Development Site, the Two Village Bypass and the Sizewell Link Road. We consider that the Two Village Bypass Flood Risk Assessment and modelling are satisfactory to support the DCO application. However, the Main Development Site (MDS) and Sizewell Link Road FRAs and modelling are still insufficient and must be improved by NNBGenCo (SzC) in order to resolve our outstanding concerns.

Main Development Site Flood Modelling

2.2 The main area of concern is over the Main Development Site fluvial hydrology, particularly in the use of a limited number of historic flood events and the way in which these flood events have been used to derive the rainfall runoff model parameters. Whilst it is possible that the overall conclusion of the FRA is unaffected by these shortcomings and there is a good amount of freeboard between the fluvial modelled water levels and main development site platform, we consider it is reasonable to expect to see a hydrological assessment that uses the best possible evidence. Where shortcomings have been identified these need to be properly checked and tested using more recent hydrological methods and datasets to ensure that the conclusions of the FRA are not affected.

Main Development Site Flood Risk Assessment

2.3 The FRA Addendum includes revised, more detailed, assessments on the impacts of the MDS on the risk of flooding to others, and the modelling includes the new proposed mitigation measures of the revised wider SSSI crossing and the flood risk storage area which is proposed to hold 100,000m³ of flood water.

2.4 The FRA Addendum shows that in the design fluvial 1% (1 in 100) annual probability flood event with 35% climate change the development would result in:

- an increase in flood depths of 0.01m to one residential property that is already at risk of flooding to 0.19m deep, and
- an increase of 0.01m flood depth to one commercial property that is already at risk of flooding to 0.20m deep in this flood event.

We consider that these small increases, with no change to the flood hazard, could potentially be classed as insignificant and within the realms of modelling error.

2.5 In the design tidal 0.5% (1 in 200) annual probability flood event in 2090, the development would result in one residential and two commercial properties experiencing an increase in flood depth of 0.02m, although they are already at risk of flooding to approximately 0.5m in this event. The very small increase in flood depths and no change in flood hazard or numbers of properties flooded could potentially be considered insignificant and not requiring any further mitigation, beyond the enlarged SSSI crossing and flood storage area now proposed. National Policy Statement for Energy (EN-1) Paragraph 5.7.17 allows an increase in flood risk elsewhere if it cannot be avoided or wholly mitigated, and if it can be mitigated to an acceptable level.

2.6 The modelling shows that there is an increase to third party land at tank traps by up to 0.24m depth in the design tidal 0.5% (1 in 200) annual probability flood event in 2090. The affected area appears to be approximately 130,000m². The land is already at risk of flooding by over a metre in this flood event. NNBGenCo (SzC) Ltd intends to mitigate this increased flood risk by securing landowner consent. This has presently not been achieved.

Flood Risk to the Main Development Site post construction

2.7 The modelling shows that the main development site is not at risk of tidal or fluvial flooding, from either overtopping of the main defences or the defences to the north and south of the site, or from breach of the defences, up to the year 2090 when the operation of the development site will cease. Therefore the buildings and staff will remain safe in a flood event over the operational lifetime of the development.

2.8 There is some risk to the site in the credible maximum climate change scenarios in 2140, from overtopping of the northern and southern defences, which could result in flood depths of 0.64m depth on the platform in the 0.1% (1 in 1000) annual probability flood event. There is also some risk to the site in a credible maximum breach of the main defence in a 0.5% (1:200) annual probability flood in 2140, which would result in flood depths of 0.3-0.4m on the main platform.

2.9 However 2140 is after the operation of the development site so by then decommissioning of the majority of the buildings on the site would be completed and so there would be very limited activities on the platform, probably only periodic inspections of the spent fuel storage facilities on the site. NNB GenCo (SzC) Ltd have understandably stated that 'with appropriate forecasting and warning systems in place, any activity on site would be avoided during such extreme events'. We recommend that the Examining Authority and East Suffolk Council Emergency Planner should satisfy themselves that the Emergency Plan is satisfactory in this regard.

Flood Risk to the Main Development Site during construction

2.10 The MDS Addendum states that a new temporary sheet piled defence will be constructed to a height of 7.3mAOD, prior to removal of the existing defence, so there will no longer be an actual flood risk to the construction workers during construction of the MDS. Table 4.1 in the wave overtopping modelling addendum shows that there would be no overtopping of the temporary defence in reasonably foreseeable 1:200 year event in 2030, and 0.36 l/s/m of overtopping in the 1:1000 year event in 2030, which is a great improvement from what was originally proposed, and ensures the safety of the construction site from wave overtopping or coastal inundation. The temporary defence will be breached to allow access to the permanent Beach Landing Facility (BLF), however this would only happen after the reinforced core of the permanent defence has been constructed up to a minimum level of 9.1m AOD, therefore maintaining the flood protection to the site.

2.11 Sections 3.1.2-3.1.3 in the Flood Risk Emergency Plan (FREP) states that there will be a risk to the construction workers while constructing the temporary defence, and realigning the Sizewell Drain, which are proposed to be managed by the actions in the FREP. The Examining Authority and Emergency Planner

will need to determine whether the Flood Response Emergency Plan is adequate to ensure the safety of the site and workers during construction.

Two Village Bypass Flood Risk Assessment

2.12 The FRA has assessed fluvial flood risk and has shown that some localised areas of increased flood depths as a result of the proposals. The increases in flood depths upstream of the bridge are up to 0.32m increase on the right bank floodplain, which falls to 0.22m increase and which extends for up to 80m upstream and covers an area of 0.65ha, while on the left hand bank the increase in flood depth on the floodplain is up to 0.14m for 25m upstream of bridge and covers an area of 0.15ha. NNBGenCo (SzC) Ltd has provided confirmation of written consent from the landowner that they accept the increased flood depth, hazard and velocity on their land. We recommend that this is also submitted to the Examining Authority for completeness because it is for the Examining Authority to determine whether this approach is sufficient in the absence of compensatory storage.

Sizewell Link Road Flood Modelling

2.13 There are discrepancies between the crossing designs shown in the modelling report and what is represented in the hydraulic model, particularly at crossings SW1 and SW2. It is unclear whether this is perhaps due to the crossing designs not yet being finalised, but if this is the case then a robust explanation is required to support the conclusions of the fluvial modelling.

Sizewell Link Road Flood Risk Assessment

2.14 NNBGenCo (SzC) Ltd has provided the Environment Agency with an FRA Addendum for the Sizewell Link Road that has not yet been provided to the Examining Authority. The Addendum presents a significant improvement in the quality of the FRA compared to the original documentation, and with agreement from NNBGenCo (SzC) Ltd we therefore consider it appropriate to offer our position on this latest information. We understand that NNBGenCo (SzC) Ltd intends to submit the FRA Addendum to the Examining Authority at Deadline 2.

2.15 The Sizewell Link Road FRA Addendum includes detailed survey and modelling of all seven of the proposed watercourse crossings. The modelling crossings SW1 to SW6 show that no properties are at an increased risk of flooding as a result of the works. However there are two other small areas of land and roads which would experience deeper flood depths as a result of the works, both of which are within the site boundary and which are as follows:

- Upstream of SW3 there is an increase of 0.22m flood depth for a distance of 40m along Hawthorn Road as shown on Figure SZC_Bk5_5.6Ad_C_FigC3.8, the road is already at risk of flooding to approximately 0.4m in this event as shown on Figure SZC_Bk5_5.6Ad_C_FigA3.8.

- Upstream of SW6 there is an increase in flood depth of up to 0.4m over an area of land approximately 40m by 40m, or 1600m², as shown on Figure SZC_Bk5_5.6Ad_C_FigC6.1. This area of land is not currently at risk of flooding in this event as shown in SZC_Bk5_5.6Ad_C_FigA6.1.

2.16 SW7 has now been surveyed and modelled, both for the baseline and with-scheme scenarios. The baseline modelling showed that the water will pond on the floodplain adjacent to the B1122, and will weir over in high flows. The proposal is to extend the existing culvert under the B1122 to incorporate the SLR, and to include a spillway on the left hand bank to allow water to flow onto the floodplain, and so maintain the capacity of the culvert. A new box culvert will be installed under the SLR to maintain the floodplain flows in this location.

2.17 The modelling shows that there will be an increase in flood depths upstream of the SLR and box culvert with an increased flood depth of 0.1m, however this is within the site boundary. No properties are impacted as the nearest are 300m away and the flood levels are not increased in this location. The SLR itself is 0.72m above the worst case extreme 0.1 (1 in 1000) AEP with 65% climate change flood depths so will remain dry in all flood events. The adjacent floodplain storage overspill area floods in all modelled events including the 20% (1 in 5 year) annual probability event, with 0.27m increase in depth of water compared to the existing situation in this event. The proposed flood depths are shown on Figure SZC_Bk5_5.6Ad_C_FigB7.1, and the existing flood depths are shown on SZC_Bk5_5.6Ad_C_FigA7.1. The plan showing the difference in depths (FigC7.1) is incorrect as it does not show the increase shown on the 'with scheme' plan B7.1. In the design 1% with 35% climate change event there is an increase of 0.05m depth on the floodplain compared to existing. The water will weir over the B1122 in the 1 in 20 year event, as is currently the case, however it will happen approximately 1.5 hours sooner in the with scheme scenario than happens currently, although the maximum flood depth on the B1122 road is only 0.01m higher. NNBGenCo (SzC) Ltd has not presently proposed any mitigation or compensation for this increased flood risk.

Water Supply

3.0 At its peak, the construction of Sizewell C will require over 4 megalitres of water per day. East Anglia is an area of serious water stress, and it is therefore crucial that NNBGenCo (SzC) Ltd demonstrates that this quantity of water can be sustainably provided without causing a deterioration to any water body status under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Essex and Suffolk Water (ESW) have been named in the DCO application as supplying the bulk of the required water supply to the site in the form of mains water from the Blyth Resource Zone. The availability of this water and the approach proposed is yet to be confirmed by NNBGenCo (SzC) Ltd and ESW.

3.1 It is our view that currently the supply options described still do not provide the detail that is necessary to provide the Examining Authority with the assurance that a sustainable source of water, that through use will not cause ecological harm, can be provided to the Sizewell C Project.

3.2 The Environment Agency is unable to comment at all on the likelihood of a successful water supply option being made available until ESW confirm that they have a viable means of supplying the water required to NNBGenCo (SzC) Ltd for the Sizewell C project. ESW will need to carry out an options appraisal to assess how the Sizewell C demand for water will be met, without causing deterioration to WFD status. We expect NNBGenCo (SzC) to reduce the water demand wherever possible and establish sources of non-potable water for construction and operation to help reduce the reliance on potable water sources.

3.3 The Environment Agency understands that a revised Water Supply Strategy is being prepared for submission to the Examination. We require to be consulted on any detailed options that confirm, or propose, how the water demand for this project is able to be met and any non-potable sources of water that can be used to meet supply whilst remaining ecologically sustainable.

3.4 We are concerned that this key issue is still not resolved at this stage of the examination.

Groundwater Modelling

4.0 Modelling has been undertaken to inform the understanding of the groundwater and surface water conditions at the site. During the pre-application stage of the Development Consent Order application, the Environment Agency has undertaken a series of reviews of the model and provided advice to NNBGenCo (SZC) Ltd with the aim of ensuring that the model is a sound evidence base to inform the Environmental Impact Assessment. The Environment Agency is satisfied that the model is a sound evidence base to inform the Environmental Impact Assessment.

Conventional Waste Management Strategy

5.0 Targets/KPI for waste and resource management have not been included. The Environment Agency needs to see clearly defined targets as set out in UK legislation. There are generic statements on how recycling and re-use will be achieved but not target figures. Without these defined targets it is hard to see how NNBGenCo (SzC) Ltd or their contractors will be able to measure their performance and improve upon it. Compared to the highly detailed information provided on storage, external waste management facilities, and bin sizes, it is very disappointing that the above information has not been included

5.1 The Environment Agency understands that NNBGenCo (SzC) Ltd propose to introduce targets/KPI for waste and resource management and submit an annex to the Conventional Waste Management Strategy into the examination at Deadline 5. The Environment Agency wish to be consulted on these proposals, including proposed securing mechanism (e.g DCO requirement).

Geomorphology and Coastal Processes

6.0 The accepted changes made to the DCO application have significantly affected the Environment Agency's position on the impacts that Sizewell C would have on geomorphology and coastal processes. As stated in our Relevant Representation, we previously considered the conclusions of the DCO application to be based on robust data, and to consider an appropriate range of plausible future scenarios with regards to the impacts of climate change. This is no longer the case.

6.1 We have reviewed report TR545 Modelling of the Temporary and Permanent Beach Landing Facilities (BLF) at Sizewell C and are generally satisfied that the study is rigorous. However, we will be unable to comment on their impact in combination with the HCDF and SCDF, and potential Habitat Regulation Assessment (HRA) impacts as a consequence, until we have received the outstanding studies relating to the sea defences.

6.2 We will need to review the necessary modelling and evidence required to support the claims made for the HCDF and SCDF, and so establish the viability and sustainability of the management approach proposed. This information should include an evidenced explanation of why NNBGenCo (SzC) Ltd has changed their approach from a scheme which would have accepted exposure of the HCDF over time by design to one that will require the ongoing replenishment of the SCDF as a part of the planned coastal protection infrastructure. The significance of this change lies in the fact that although previously the SCDF was designed as mitigation for the environmental impacts which would result from exposure of the HCDF, it now seems to be an integral element of the functioning of the sea defences. We are therefore now seeking greater certainty over the long term viability of the SCDF throughout the full lifetime of the development.

6.3 We are currently undertaking a review of report TR531 Storm Response Modelling – Preliminary evidence toward setting volumetric thresholds for SCDF recharge. We consider that TR531 and TR544 ought to be considered in parallel, and we will therefore not be able to provide detailed feedback until the accompanying report TR544 has been received. However, it is already clear that significant areas of clarification are required to give us confidence that the approach being taken is appropriate and fit for purpose. We were due to receive report TR544 Preliminary design and maintenance requirements for the Sizewell C Soft Coastal Defence Feature for our review on 30 April, but this has not yet been provided by NNBGenCo (SzC) Ltd. At the Preliminary Meetings we raised our concern that there may be insufficient time to allow us to review

technical documents on this issue ahead of the relevant Issue Specific Hearings, and that concern is compounded by this delay.

Terrestrial Ecology

Main Development Site

SSSI Crossing

7.0 The change to the design of the SSSI crossing is an improvement from the previous culvert design because it will better facilitate the passage of mammals including otters and water voles. However, the proposed design will be impassable by certain invertebrates due to the height of the crossing and the large shaded area under the crossing.

7.1 The proposed design of the SSSI crossing would prevent the upstream and downstream migration of numerous invertebrates either side of this significant structure approximately halfway along the river, and its associated SSSI designated habitat. This will lead to fragmentation of sensitive habitats and the isolation of species populations, some of which are not resilient to this kind of impact and will be significantly less resilient to future impacts. Choosing this approach to site access may well lead to a detrimental population decline in this area for several important species. We understand that NNBGenCo (SzC) are carrying out a design review to consider if the design of the structure could be optimised to further reduce impacts. At Deadline 4 we anticipate confirmation of a design 15m wide, with an increased soffit height, which would be an improvement upon the current design.

Compensation Areas

7.2 The newly constructed habitat area created at Aldhurst Farm is currently not functionally linked to the Sizewell Marshes SSSI for water vole and otter. NNBGenCo (SzC) Ltd has now proposed a new mammal culvert in close proximity to the existing culvert under Lover's Lane, with features to encourage use by mammals including otters and water voles, such as otter fencing. However, it has not been demonstrated that Aldhurst Farm adequately compensates for the loss of the SSSI destroyed due to the associated causeway crossing, nor that it provides appropriate connection to wet woodland habitat for invertebrate species.

Summary of Impacts on Protected Species and Habitats

7.3 **Invertebrates:** The Sizewell Marshes SSSI is designated for its invertebrate fauna and the Leiston Beck water body is classified at good ecological potential for invertebrates under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The large area of deep shade under the SSSI crossing and the low soffit height of the proposed crossing would be impassable by weak dispersers that cannot fly over the top of the structure.

Strong dispersers which may be able to travel over the top of the crossing will be attracted to roads, windscreens and artificial lights which emit polarised light pollution, this will then act as sinks for these taxa. The Aquatic Invertebrate and Fish Mitigation Strategy proposes road surfacing mitigation measures which we consider to be necessary. Assumption is used in the DCO application to suggest that some species would swim against the flow through a dark, unvegetated watercourse 40m in length. Swimming tends to be a predator avoidance strategy used only by some taxa, many aquatic insects colonise mainly downstream by drifting in flow. Other taxa do not swim at all, especially when there are fish present so this is an unlikely dispersal strategy. Weak dispersers such as mayflies must perform an upstream compensation flight to compensate for the drift of larvae and eggs, so if they are prevented from doing this it will lead to population decline.

7.4 Wet woodland compensation needs to be of an appropriate size to replace the loss of this habitat from the development, and it needs to be functionally linked to fen and ditch habitats if it is to be successful at compensating for the loss of this habitat for the associated invertebrate species which use it. The additional wet woodland habitat is welcome, but it will not be functionally linked to the area of impact.

7.5 **Fish:** The changes to the SSSI crossing will likely improve fish passage along the Leiston Beck but a deeply shaded area under the crossing will remain; a threshold of light intensity will determine what species are likely to pass under the crossing. This could lead to large scale fish mortality when fish are prevented from moving along a watercourse during events when water quality is reduced to a critical level, such as algal blooms, or pollution events. NNBGenCo (SzC) Ltd has indicated that there will be further optimisation made to the design of the SSSI crossing, which will be necessary to resolve these impacts.

Sizewell Link Road

7.6 **Watercourses:** Watercourses are important linear features of the landscape and important migratory routes for wildlife, including protected species such as the otter, they should be maintained as continuous corridors to maximise their benefits to biodiversity. We require an assessment of the impact to watercourses including the total loss of watercourses as a result of the development. No mitigation or compensation has been proposed for the impact to these features. We require as a minimum no net loss of watercourses through development and safe mammal passage to be provided.

7.7 **Otters:** Otters are likely to forage along the watercourses impacted by this development at certain times of the year, particularly juveniles and females with cubs who use smaller watercourses as dispersal routes. Detailed mitigation is required for the watercourse crossings.

Biodiversity net gain:

7.8 Opportunities exist to provide clearer net gain and greater enhancements for the biodiversity affected by this development, this includes effective mitigation and compensation for the loss of all habitats such as watercourses, and the design of features like attenuation basins to maximise the benefit to amphibians, invertebrates and reptiles.

Two Village Bypass

Mammal passage:

7.9 We require full design details and confirmation that the proposed mammal ledges and passes included as mitigation in the design to cross the River Alde and its floodplain, and other watercourses are sufficient to allow mammal migration during all periods of elevated flow. Monitoring the effectiveness of mammal mitigation is required.

Marine Ecology

8.0 The Environment Agency are an advisor and a consultee in the marine environment due to our wide role and remit. We have statutory responsibilities for the management of migratory fish to 6 nautical miles and also have a duty under the Environment Act 1995 to promote the conservation of wildlife and habitats dependent on the aquatic environment.

8.1 We are the competent authority for The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (including transitional and coastal waters out to 1 nautical mile). We are also the competent authority for preparation of Eel Management Plans under The Eels (England and Wales) Regulations 2009.

8.2 On this basis, our Marine Ecology advice focuses on impacts to migratory fish, eels and compliance under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

Good Design / Cooling Water System

8.3 NNBGenCo (SzC) Ltd is proposing to use a direct cooling water system to remove “waste heat” and provide turbine condenser cooling for the proposed power station. There are a number of environmental issues associated with direct cooling water. These include fish and invertebrate impingement and entrainment.

8.4 In considering the environmental impacts it is important that best practice in planning, design, mitigation and compensation are followed. This is supported by National Policy Statement for Energy (EN-1), Nuclear Power Generation (EN-6) and evidence documents such as the Environment Agency report on cooling water options for new nuclear build (EA, 2010; re SC070015/SR3).

8.5 This guidance considers fish deterrent devices to be a mitigation method that could be implemented as best practice and so demonstrate good design. No fish deterrent devices are proposed in this application, and we currently consider that insufficient explanation has been provided to justify the proposed design of the cooling water system.

8.6 The Environment Agency considers that NNBGenCo (SzC) Ltd has insufficiently evaluated the use of fish deterrent devices (such as Acoustic Fish Deterrents) and have not provided suitably detailed evidence as to why the logistical and safety considerations preclude their deployment at Sizewell C.

Fish and other marine biota impingement estimates

8.7 At present, the Environment Agency has concerns over some methods being used to assess impacts to marine ecology in the DCO application. We cannot currently agree the estimated numbers of fish and other biota predicted to be impinged at SZC, or the degree of mitigation offered by the proposed SZC intake design, or agree the significance of those losses.

8.8 These concerns relate to the data and methodologies used to consider the impact to marine ecology. In particular, these issues relate to the Comprehensive Impingement Monitoring Programme (CIMP) data, the Low Velocity Side Entry (LVSE) intakes, Equivalent Adult Value (EAV) calculations and scale of assessments.

8.9 Separate to the DCO application the Environment Agency is undertaking a comprehensive audit of NNBGenCo (SzC) Ltd's fish impingement assessment to support the determination of the Water Discharge Activity permit. This Environmental Permit considers the discharge of impinged and entrained fish to sea, and its potential polluting effect.

8.10 A number of documents used to consider effects on fish, have been submitted for both the DCO application and WDA Permit application. In undertaking our audit for the WDA permit we are assessing data presented and investigating the methods used. Currently we have a number of queries regarding CIMP data presented.

Bulk samples collected in the CIMP issue

8.11 The estimated numbers of fish impinged at Sizewell B (SZB) is one component used to help calculate the likely impingement at SZC. Presently, the true impingement rate at SZB is uncertain, as based on the CIMP data presented. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance for the DCO application under the Environmental Impact Assessment Regulations 2017 and The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 may prove to be unacceptable.

8.12 The CIMP undertaken at SZB had frequent overflowing of the bulk overnight sample. On these occasions an incomplete bulk sample was collected, providing a 'greater than' result, or the bulk sample was abandoned and no result obtained. This means that more fish may have been collected than recorded in the sampling. Results from overflowing bulk samples have been excluded from the data set, and impingement for surveys affected extrapolated from day-time hourly samples.

8.13 No significant differences were observed between hourly and bulk impingement rates throughout the year for the species tested when a valid bulk sample was collected based on the 22 valid CEFAS surveys only.

Survey Period	Contractor	Number surveys	Number Overflowing Bulk Samples	% Overflowing Bulk Samples
2009 – 2013	Pisces	128	27	21
2014 – 2017	CEFAS	77	55	71

Table 1. CIMP data as taken from BEEMS TR339.

8.14 It is unclear if this finding can be applied to occasions when the bulk sample overflowed. Valid bulk samples are therefore potentially biased toward periods when catches were low and does not provide a valid test for the period when catches were high and more likely to overflow the net. Therefore there is uncertainty in what the true overnight impingement rate was on occasions when the bulk sample overflowed. And therefore there is doubt as to whether extrapolation of daytime hourly impingement rates to cover the bulk overnight period is a valid approach.

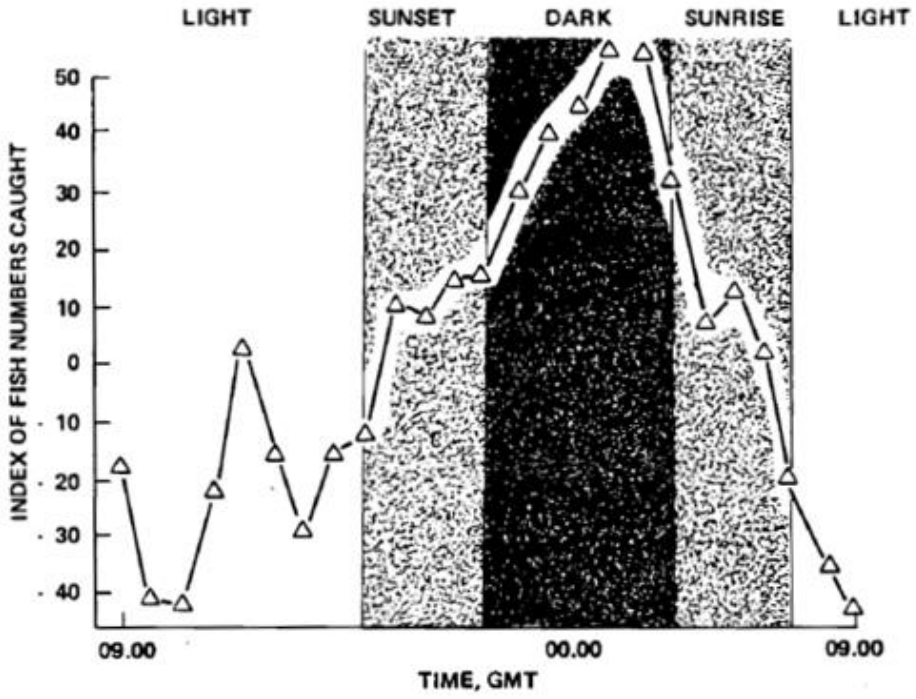

Fig 1. Diurnal Pattern of Fish Catch at Sizewell A Power Station. Averaged over 41 sampling days. Lightly stippled areas show range of times of dusk and dawn from mid-winter to mid-summer. Dark stippling shows hours of darkness common to all dates. (Turnpenny 1988)

8.15 The diurnal patterns of screen catch has been recorded locally in separate surveys. Fig 1 shows the averaged hourly index of catch measured on 41 dates at Sizewell A Power Station and indicates that peak catches occurred at night; the figure is taken from 'The Behavioural Basis of Fish Exclusion from Coastal Power Station Cooling Water Intakes', Turnpenny (1988).

8.16 Fish are less able to avoid intakes at night when they cannot see them. Some species are more mobile at night, so are at a greater risk of coming into close proximity with the intake. This is an observed behaviour for some species of concern at SZC, such as eels and smelt. It is uncertain what the true impingement rate was at SZB based on the data collected.

8.17 To allow for this uncertainty we consider that there should be an increase in the measured invalid (greater than) bulk sample impingement rate by a conservative factor, or, where bulk impingement is unknown (CEFAS invalid samples) to apply a factor to the measured hourly rate.

8.18 In addition, clarification has been sought from the applicant via our WDA permitting processes regarding Pisces bulk overflowing samples because of the marked difference in proportion of bulk samples overflowing reported for the two contractors, CEFAS 71% and Pisces 21%, suggesting the true proportion for Pisces surveys may be higher than that reported to date, on this basis a conservative factor may need to be applied to all Pisces bulk samples to address the uncertainty about which Pisces bulk samples did, or did not, overflow.

8.19 Following this further suggested work the figures used to assess the magnitude and impacts of SZC impingement may well differ from those currently provided by NNBGenCo (SzC) Ltd.

Low Velocity Side Entry intakes reduction calculation and issues related to intercept area of the proposed design

8.20 The LVSE intake is proposed as a mitigation measure to reduce the impingement of fish. The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.

8.21 The LVSE factor is a measure of the mitigation offered by Low Velocity Side Entry abstraction heads proposed for use at SZC, relative to the more conventional intake heads used at SZB. The factor is the ratio of the impingement area of the SZC to SZB abstraction heads. At present the applicant has used a method based on the geometry of the abstraction head current speed and direction. For SZB, the impingement area has been

derived using a hydrodynamic model (Telemac) and particle tracking. The method used for SZB considers currents induced in the tidal stream by the abstraction, and defines the area based on the envelope defined by all particles that are abstracted. The SZC method does not account for induced currents.

8.22 Both the modelling (Telemac) and geometric methods provide estimates of impingement area. It is possible that the two methods can give different estimates of impingement area when applied to the same intake. To address this uncertainty we consider that a consistent method should be used to estimate the impingement area for SZB and SZC.

8.23 We understand that NNBGenCo (SzC) Ltd can't use their Telemac model because the model isn't powerful enough to represent the complexities of the SZC abstraction head. They also can't use the HR Wallingford model used to design the SZC intakes as they can't use particle tracking with that model. In addition, they can't apply the SZC geometric method to SZB due to the complex geometry of the intake in relation to that method.

8.24 So, at present there is significant doubt over the validity of the LVSE factor derived in SPP099 ver. 4. It is unclear if NNBGenCo (SzC) Ltd can arrive at an improved estimate of the LVSE factor, NNBGenCo (SzC) Ltd have suggested we proceed on the basis of a conservative estimate of 1 as the EAV factor.

8.25 With an LVSE factor of 1 the impact of abstraction in terms of impacts to species of relevance under the EIA and WFD may prove to be unacceptable.

Equivalent Adult Value issue:

8.26 The Environment Agency considers that Equivalent Adult Values (EAVs) are an appropriate way to assess how impingement losses will affect fish populations but this is dependent on the parameters that are used within the calculation. We do not agree with some of the parameters used by NNBGenCo (SzC) Ltd. The consequence of this is that the predicted impacts at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may prove to be unacceptable.

8.27 EAVs are a means by which the losses of fish of all ages can be represented as an equivalent number of adults as it is recognised that not all fish entrapped would survive to maturity in the wild and therefore reproduce.

8.28 The method used by NNBGenCo (SzC) Ltd calculates, for a particular species, how many of the individuals impinged at SZB in one year would have gone on to become mature fish, counting an adult as a fish which has reached maturity and has spawned for the first time. In effect, the method calculates how many first-time spawners would be missing from the population in a given year as a result of impingement at SZB in that, and previous years. The number of fish that would have entered maturity is then divided by the total number impinged in a year to give the 'EAV factor' (which is the fraction of

impinged fish that would have otherwise reached maturity). The predicted entrapment for SZC is then multiplied by this EAV factor to express SZC impingement as a number of equivalent adults (the number of fish impinged at SZC in a year that would have otherwise entered maturity).

8.29 However, individuals of many species of fish survive to spawn again in years subsequent to the one in which they first matured (repeat spawners). They also produce more eggs in subsequent years as they increase in size and some species select more successful breeding locations in subsequent years. The method used by NNBGenCo (SzC) Ltd does not take 'repeat spawning' into account and is therefore likely to underestimate the impact SZC has on some fish species. The spawning population will include fish that have reached maturity and that reproduce for a number of years. The NNBGenCo (SzC) Ltd method does not account for the number of repeat spawners that would also have been present in the spawning population in a given year, had they not previously been impinged and so is underestimating the impact by counting some, but not all, of the fish that would otherwise have been present in the spawning population in a given year.

8.30 We are unable to accept the EAV calculations provided by NNBGenCo (SzC) Ltd for species which are known to be repeat spawners for this reason.

8.31 NNBGenCo (SzC) Ltd has used an EAV of 1 for some species where they do not have enough data to produce EAV calculations. Using an EAV of 1 may under or over-estimate the impact to a particular species and we recommend that the EAVs are recalculated to take into account repeat spawners. Once this recalculation has taken place, we also recommend that the underlying parameters used by NNBGenCo (SzC) Ltd in their EAV method are checked to ensure they are appropriate and suitably precautionary.

Scale of assessment and appropriateness of stock areas used:

8.32 The Environment Agency has raised concerns over the stock areas being applied to some species. NNBGenCo (SzC) Ltd outlined an approach to quantify the scale of predicted impingement losses for the marine fishes examined. NNBGenCo (SzC) Ltd.'s preferred method was to identify losses using International Council for Exploration of the Sea (ICES) spawning stock biomass (SSB) figures and/or international fisheries landings.

8.33 The stock units used for the assessment of impacts to fish species therefore use very large areas that include the Southern North Sea and large areas of European seas. We do not think that the use of such large stock areas offer a meaningful ecological assessment of the losses to fish populations within the waters around SZC. Smaller sub-populations of some species are known to exist and the impact to these populations has not been adequately assessed. NNBGenCo (SzC) Ltd produced a local effects assessment in SPP103 v3 which attempts to quantify impacts using local replenishment rates from a given area. This approach provides a focus for assessing impact on fish local to the SZC intakes, which is helpful in indicating the relative scales of impact at a more meaningful scale for key species. However, the model has to make a number of assumptions e.g. that fish behave as inert particles with no

behavioural responses. In addition, use of a different LVSE factor (para 8.20) would affect the results of this model.

Species	EIA	WFD	Repeat Spawner (iteroparous)	Agreement on stock comparator
River lamprey	Yes	No	No	Yes
Twaite shad	Yes	Yes	Yes	No
European eel	Yes	Yes	No	Yes
Five beard rockling	No	Yes	No data	No data
Herring	No	Yes	Yes	No
Bass	No	Yes	Yes	No
Thin lipped grey mullet	No	Yes	No data	No
European smelt	Yes	Yes	Yes	No
Plaice	No	Yes	Yes	No data
Sand goby	No	Yes	Yes	No
Dover sole	No	Yes	Yes	No
European sprat	No	Yes	Yes	No

Table 2. Species of relevance under the EIA and WFD assessments with outstanding impingement prediction concerns.

8.34 Changes to predicted impingement loss figures (as a result of our highlighted concerns) and changes to the stock areas being applied to some species has the potential to alter our conclusion of impacts for these species.

Example of impingement prediction concerns using smelt *(Osmerus eperlanus)*:

8.35 The Environment Agency has a statutory duty to maintain, improve and develop smelt fisheries and conserve their aquatic environment under the Environment Act 1995. Smelt are listed as a biodiversity action plan (BAP) species and are a key indicator species under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Smelt have been described as vulnerable, rare and very sensitive to anthropogenic environmental changes. Status of Rare Fish. A Literature Review of Freshwater Fish in the UK, Winfield et al (1994). Smelt populations have historically been impacted to a point causing the collapse and loss of discrete populations of the species from some water bodies on the east coast, from which their recovery has taken a long time. Some water bodies have not recovered from this historical collapse.

8.36 NNBGenCo (SzC) Ltd has used stock assessment units that include very large smelt populations from estuaries in Germany and Belgium and a UK stock that spans the east coast of England. The methods used to derive the European population figures are not acceptable.

8.37 A breeding population of smelt is present in the Ore & Alde estuary; WFD transitional and coastal (TraC) water body GB520503503800. References to

this population are made in; The status of smelt *Osmerus eperlanus* in England Maitland (2003), and in; A review of the status of smelt *Osmerus eperlanus* in England and Wales Colclough (2013). Both papers mention that it is probable the Ore & Alde population is common to a population belonging to the Deben, Orwell and Stour. The Environment Agency WFD TraC surveillance monitoring programme has recorded 278 smelt ranging in length from 49mm to 247mm in the Ore & Alde between 2003-2018 (no fish monitoring was undertaken in this water body between 2007-2012). The Environment Agency also captured 128 smelt in an electrofishing survey in the freshwater Alde at a site upstream of Langham Bridge in the spring of 2003. The smelt ranged from 160-210mm in length. It was presumed that this was a spawning migration.

8.38 In the Stour (GB520503613602) 11 smelt ranging in length from 28mm to 216mm have been recorded between 2007-2018 and in the Orwell (GB520503613601) 9 smelt ranging in length from 62mm to 222mm have been recorded between 2004-2018. In addition the Environment Agency recorded a single smelt in the Blyth (GB510503503700) in 2016, the Blyth estuary is not monitored under the WFD for fish and limited sampling was only undertaken in 2016. NNBGenCo (SzC) Ltd also undertook smelt monitoring in the Blyth waterbody in 2016 and concluded that a breeding population was not present in this waterbody (Ref. TR382).

Water body	**No of smelt caught**	**Size range mm**	**Years of sampling**	**CPUE** (TraC only)
Ore & Alde	278 (406 incl freshwater)	49-247	10	1.66
Stour	11	28-216	12	0.03
Orwell	9	62-222	15	0.03

Table 3. Smelt caught in the TraC WFD monitoring programme – Extract from Environment Agency National Fish Population Database

8.39 The Ore & Alde has the smallest amount of sampling effort and significantly more smelt have been recorded in this water body as shown in table 2. Genetic studies have demonstrated a level of homogeneity to a wider stock that spans the coast from the Thames to the Broads (possibly the Wash). This would indicate that the population in the Ore & Alde experience some immigration from this wider stock. The geographical extent and level of immigration effecting the Ore & Alde population is not known. Due to the uncertainty over the level of immigration it is not possible to confirm if this immigration would exceed the predicted losses through impingement into the SZC and SZB cooling water systems. This predicted loss could lead to the sustainability of the Ore & Alde population becoming compromised.

8.40 NNBGenCo (SzC) Ltd have described that no statistically significant reduction in impinged smelt has been shown at SZB through the CIMP programme from 2009 to 2017. However it does not follow that the level of loss can be increased by the amount expected from the SZC cooling water intake without

it causing a reduction to fish numbers, and with it an impact to the sustainability of the Ore & Alde population.

8.41 Smelt are repeat spawners and reproductive potential significantly increases with size; Synopsis of Biological Data on Smelt, Belyanina (1969) and so the EAV calculation applied by NNBGenCo (SzC) Ltd may not be appropriate and has not been applied to predicted impingement numbers.

8.42 The efficacy of the LVSE is not known at this time and no evidence has been provided that it would reduce the number of impinged smelt as described. In addition we consider that the Fish Return and Recovery (FRR) system would offer no mitigation for smelt.

8.43 With the current level of information provided by NNBGenCo (SzC) Ltd we are unable to conclude that the Ore & Alde smelt population will not be exploited to a level where it would be possible to cause the actual collapse of this population.

Fish Monitoring Plan - Deemed Marine Licence Condition 50

8.44 As previously discussed we consider there is a high degree of uncertainty on the potential impacts to fish from the proposed cooling water system. It is important that best practice in monitoring, mitigation and compensation are followed. The Environment Agency has concerns whether the requirements of Deemed Marine Licence Condition 50 – Monitoring Plan, can be met.

'*50. No water abstraction shall commence until a monitoring plan has, after consultation with NE and the EA, been submitted to and approved by the MMO. The plan will set out:*

(a) the monitoring arrangements for assessing the efficacy of the intake head and the fish recovery and return system during the commissioning of Unit 1 and Unit 2;

(b) the additional adaptive measures arising from (a) that may be required during operation of Unit 1 and Unit;

(c) the monitoring methodology, frequency of monitoring and format of monitoring reports.'

8.45 In particular, there is uncertainty as to what monitoring can be undertaken and whether any adaptive measures can be undertaken on site or through optimisation of the cooling water system. Should offsite mitigation or compensation be required then securing mechanisms (such as a S106 TCPA 1990 agreement) that fall outside of the powers of this condition in the DML may be required. The Environment Agency understand that NNBGenCo (SzC) Ltd are preparing further information to provide confidence as to what monitoring can be provided. In addition, The Environment Agency understand

that NNBGenCo (SzC) Ltd are preparing further proposals to identify appropriate secure securing mechanisms to provide mitigation/compensation for marine ecology impacts.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations)

9.0 The Environment Agency is concerned that a number of the proposals may lead to a deterioration under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations. If a deterioration in water body status cannot be ruled out an exemption will be required in accordance with Regulation 19 of the WFD Regulations and NNBGenCo (SzC) Ltd has not made a case to support this. Further information is required to assess the following issues:

Water Supply

9.1 As highlighted in our water supply comments, the supply options described do not provide sufficient detail to give assurance that a source of water can be provided to the Sizewell C Project.

9.2 Some options could place a large additional demand on the groundwater levels in this area and could lead to detrimental WFD impacts that needs to be assessed. We require submission of detailed options confirming how the water demand is going to be met and assessed within the WFD assessment.

Invertebrates in the Leiston Beck water body:

9.3 The Sizewell Marshes SSSI is designated for its invertebrate fauna and the Leiston Beck is currently classified at good ecological potential for invertebrates. The Leiston Beck is 4.3km in length and the proposed SSSI crossing is approximately 2km upstream of its confluence with the Minsmere River. The location of the proposed crossing across the Leiston Beck in compartment 1 includes protected, rare and threatened invertebrate species.

9.4 We are unable to conclude that a risk of deterioration to invertebrates in the Leiston Beck does not exist as a result of the proposed design. The height of clearance under the crossing is of principal importance and should be increased to a minimum of 6m to reduce the impact to invertebrates. A height of >6m should allow some migration of weak dispersers upstream (assuming a level of reflected polarised light exists under the crossing) although it will likely still have a significant impact and we would prefer to see it higher than this. On the Two Village Bypass bridge across the River Alde a soffit height of 7m has been secured. Watercourse crossings are known to be a barrier to the upstream migration of flying insects and every effort should be made to minimise the impact this will have.

9.5 Assumption is used in the DCO application to suggest that some species would swim against the flow through a dark, unvegetated watercourse 40m in length. Swimming tends to be a predator avoidance strategy used only by some taxa, many aquatic insects colonise mainly downstream by drifting in flow. Other taxa do not swim at all, especially when there are fish present this is an unlikely dispersal strategy. Some weak dispersers such as mayflies must perform an upstream compensation flight to compensate for the downstream drift of eggs and larvae. If this compensation flight is prevented then population decline will result.

Fish in the Ore/Alde water body

9.6 The Environment Agency is concerned that the impacts of entrapment during cooling water abstraction may cause a deterioration to the fish element in the transitional and coastal Ore & Alde water body and possibly also the Blyth water body. The species of greatest concern is the smelt *Osmerus eperlanus* - a key indicator species under the WFD (and also a biodiversity action plan (BAP) species). A reduction in other fish species which feature in the Ore & Alde water body would also contribute to a potential deterioration in this water body.

9.7 Fish in transitional waters are assessed under the WFD at an estuary size scale. To assess a potential impact to a WFD water body the scale of assessment may need to be done at a smaller scale than that used by NNBGenCo (SzC). The scale the Applicant has used at ICES fisheries stock level is not readily applicable to understanding impacts to some species at a water body level.

9.8 Further evidence is required that demonstrates that the migration of key fish species (including smelt) from wider stocks outside of the Ore/Alde waterbody would prevent the deterioration of those species within this waterbody. If this is not the case we are concerned that there would be population declines in this waterbody caused by the exploitation of those species, from Sizewell C in combination with Sizewell B for the period when both stations are operational. In the absence of this evidence we require the use of smaller stock comparators against which to assess the likely impact.

9.9 In addition, we are assessing whether key fish species (including smelt) migrations, past the Sizewell location may be impacted by the thermal plume. It is unclear if avoidance of some areas experiencing elevated temperatures as a result of the plume may reduce migration success. Increased energy expenditure as a result of avoiding the plume prior to a migration run may also negatively affect reproduction success in the adjoining water bodies. The effects of the thermal plume will be determined by the Water Discharge Activity permitting process.

Fish entrapment and Low Velocity Side Entry (LVSE) intake design

9.10 As described in our marine ecology comments, the Environment Agency has concerns over some methods being used to calculate the numbers of fish and biota being entrapped and discharged from the fish return and recovery system (FRR). The LVSE intake design and the reduction factor used to calculate fish impingement are being reviewed. On this basis we cannot agree the impacts described in the WFD assessment for Sizewell C.

CIMP bulk sample overflow issue

9.11 As described in more detail in our marine ecology comments, the CIMP undertaken at SZB had frequent overflowing of the bulk overnight sample. This could mean that predicted fish impingement numbers for SZC have been underestimated. On this basis we cannot agree the impacts described in the WFD assessment for Sizewell C.

Appropriateness of the stock areas being used for some fish species.

9.12 We disagree with the appropriateness of the stock areas being used to assess potential impacts to certain species at a WFD water body level. In addition to smelt we also have concerns over the stock areas being applied for other species which feature in the Ore & Alde. We are currently unable to accept that the stock areas proposed by NNBGenCo (SzC) Ltd are acceptable in terms of detecting a potential for deterioration under the WFD.

Cumulative effect assessment:

9.13 We are not able to reach a conclusion on the cumulative effect within the Sizewell C project or with other projects as some of the information described or expected to have been submitted has not been provided. Further detail is provided in Appendix A.

Habitats Regulations Assessment

10.0 Natural England is the Statutory Nature Conservation Body for DCO advice.

10.1 The Environment Agency is a competent authority for the purposes of the Habitats Regulations when determining applications for permits, consents and licences for which it is the regulatory authority.

10.2 A number of permits will be required for construction and operation. Three Environmental Permit applications for the operation of the power station have been submitted to the Environment Agency:

- a Water Discharge Activity permit - required for the proposed discharges of cooling water and liquid process effluents into the marine environment, during operation of the power station

- a Combustion Activity permit - required for the proposed operation of diesel generators, to be used to provide back-up electrical supply at the site, and
- a Radioactive Substances Regulations permit - required for the proposed disposal of operational radioactive waste emissions to air, and water, and by transfer

10.3 There are complex overlapping Habitats Regulations Assessment (HRA) needs that fall across these permit decisions and the DCO decision, especially where there are project-wide in combination impacts on the marine environment. Despite our repeated advice, and that in PINS Advice Note 11 (Annex D), NNBGenCo (SzC) Ltd has chosen to not submit their applications for these environmental permits well in advance of the DCO application. We are a competent authority and must undertake an HRA as part of our determination process. It is currently our projection that our permit decisions - and associated HRA conclusions - are unlikely to be available by the close of the Examination, due to the submission strategy adopted by NNBGenCo (SzC) Ltd. We consider that our permit determination HRA conclusion should have assisted with the within project in combination HRA for the DCO application and its absence could result in challenges to the HRA process – at a DCO decision level.

Eel Regulations Assessment

11.0 Eels are a critically endangered species and the decline in eel stocks is an international concern. In 2007, the European Union adopted a Council Regulation which charged the UK and other member states to take specific actions. The domestic legislation which implemented is the Eels (England and Wales) Regulations 2009, for which the Environment Agency is the competent authority. The Eel Regulations 2009 gave us new powers to protect eels from exploitation and entrainment and require improvements in passage to assist their migration over barriers and weirs.

11.1 The proposed operation of SZC nuclear power station will not be compliant with the Eel Regulations 2009 as NNBGenCo (SzC) Ltd cannot use a screen on the four cooling water intakes that will prevent the entrainment of glass eels. The Environment Agency has outstanding concerns over what the total entrapment losses of eel will be from the operation of SZC and what impact this could have on the Anglian River Basin District (RBD) eel stock. Our concerns are outlined below, but are predominately in relation to the uncertainty that exists of what entrainment losses will be to glass eels and the effectiveness of some of the mitigation that is proposed to reduce impacts to impinged eels.

11.2 The current Eels Regulations Assessment (May 2020) provides a commitment from NNBGenCo (SzC) to ongoing monitoring of the impact to eels if Sizewell C becomes operational and for the commitment to additional mitigation or compensation if deemed necessary. There are currently no provisions within the draft DCO/DML or by way of a section 106 TCPA 1990 agreement to secure such mitigation or compensation measures.

11.3 The Environment Agency understands that NNBGenCo (SzC) are preparing further information to consider what monitoring can be undertake. NNBGenCo (SzC) have indicated that they may not be able to undertake entrainment monitoring at SZC due to constraints with the station design and available space. If this is the case it will not be possible to quantify actual entrainment of glass eels in the absence of this monitoring.

11.4 Given the inability to monitor, together with the uncertainty of predicted entrainment losses, and concerns regarding the effectiveness of mitigation, the Environment Agency considers that further mitigation and compensation measures are required. NNBGenCo (SzC) are considering what measures can be undertaken, however these are likely to be off site. On this basis, securing mechanisms (such as a legal agreement) may be required.

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LVSE intake head design

11.5 It is stated that the low velocity side entry (LVSE) intake heads will reduce the number of fish impinged. An LVSE reduction factor has been calculated as a measure of the mitigation offered by the LVSE intake head at SZC relative to the conventional heads in operation at Sizewell B (SZB).

11.6 The Environment Agency considers that no evidence has been supplied that demonstrates the LVSE intakes will reduce impingement of eels and as such cannot agree with the LVSE reduction factor as applied in TR406 v7.

CIMP bulk sample overflow issue

11.7 As described in more detail in our marine ecology comments, the CIMP undertaken at SZB had frequent overflowing of the bulk overnight sample. Eel are a species known to be more mobile at night. This could mean that predicted impingement numbers of eel for SZC have been underestimated. On this basis we cannot agree the impacts described in the eel regulations assessment for Sizewell C.

Glass eel entrainment predictions

11.8 Glass eel specific surveys at the location of the SZC intakes were only conducted for 1 year, additional data indicates they missed the peak migration period for this location and they did not include all of the variables that could influence glass eel movements at this location, such as monitoring in dark conditions (at night) and monitoring at different stages of the lunar cycle. Data from nearby glass eel monitoring stations also demonstrate that glass eel migrations numbers are highly variable in this area and that double the number of glass eels were recorded in the previous year for this location.

Worst case predicted glass eel entrainment

11.9 BEEMS SPP104 v3 uses limited survey data and extrapolates this information to provide a worst case eel entrainment figure. Whilst this provides information

on what entrainment might be at SZC, the speculative calculations do not allow conclusions to be drawn about the impact of entrainment. Looking at all available evidence it is likely that sampling missed peak migration at the location of the SZC intakes. Due to the presence of eel in catchments draining into Greater Sizewell Bay, the capture of yellow eel in impingement monitoring, and the capture of the single individual in the limited glass eel surveys (8.75 hrs of sampling) it is likely that glass eel pass Sizewell and that they will therefore be entrained at SZC. The scale and impact of entrainment cannot be quantified with certainty. Whilst this provides a useful scenario to consider, this assessment is not considered a worst case and does not provide clarification on the potential number of glass eels present or their vulnerability to entrainment at the location of the SZC intakes.

Entrainment Mimic Unit (EMU) experiments

11.10 BEEMS TR395 Conducted experiments on glass eels but the BEEMS Entrainment Mimic Unit (EMU) was not available for these experiments therefore the pressure profile and mechanical damage predicted to be experienced by glass eels at SZC could not be simulated in combination with temperature elevation and chlorination. The Environment Agency was unable to conclude predicted survival rates from TR395 and so NNBGenCo (SzC) produced a revised version of TR273 (v4).

11.11 BEEMS TR273 v4 describes an expected survival rate of 82.8% for glass eels entrained at SZC. This does not appear to consider the 9% of the eels that pass through the band screens. 91% would have drum screen mortality levels replicated through the EMU whereas the 9% through the band screens would have 100% mortality. Mean survival of 82.8% of the 91% of glass eels passing through the drum screens would give an overall figure of 75.35% survival. If the L95 figure is used then 77.16% survival of the 91% of glass eels that pass through the drum screens = 70.22% survival -1.8% for pump damage = 68.42 % survival from passage through the drum and band screens.

PTC group	Mean survival %	L95 survival %
Combined survival of drum and band screen with pump damage adjustment	75.35	68.42

Table 4. Revised survival predictions for entrained glass eels at SZC with drum screen adjustment.

This does not include any precautionary adjustments for exposure to heat and chemical stress whilst being exposed to pressure and/or mechanical stress simultaneously as a this could not be replicated in the experiments, TRO fluctuations had a significant effect on survival, higher temperature profile and the resulting increased mortality this causes for eels migrating later in the season does not appear to be included, hydrazine exposure cumulatively with other stresses has not been included and no adjustment has been made for

eels that suffer mortality after the observed 24h period. This is not considered a precautionary assessment.

Safe passage for eels as required under Part 4 of the Regulations

11.12 No details of water level control structures and incorporated eel passes have been provided. Any structure and associated eel pass will need to be approved by the Environment Agency prior to the commencement of any work. Ongoing monitoring will be required to assess the effectiveness of any eel pass. Dewatering operations and the use of pumps needs to ensure that eels cannot be entrained, screening will be required to prevent the entrainment of eels if a risk exists.

Alignment between Environmental Permits and Development Consent Order Process

12.1 NNB GenCo (SzC) Ltd has submitted the operational water discharge activity (WDA), Radioactive Substances Regulation activity and combustion activity permit applications to the Environment Agency at the same time as submitting the application for the DCO to the Examining Authority. We had advised NNB GenCo (SzC) Ltd that Planning Inspectorate Advice Note 7[1], recommends that applications for permits for development with novel technology, or with expected complex Habitats Regulations Assessments (HRA) should be submitted 6 months before the DCO application to ensure any examination can be informed by permitting assessments.

12.2 The WDA permit application determination will consider the potential for pollution as a result of heated water, process chemicals and dead fish and biota. It's therefore relevant to both the WDA permit and DCO applications that an assessment of biota entrapment and mortality is presented in both applications. The permit application determination will also require an in-combination assessment for Habitats Regulations, which will consider proposed activities within the project, and in-combination with other plans and projects, and possible cumulative impacts on designated species – or features – as a result of potential pollutions. In addition, as the competent authority for WFD Regulations when considering the permit application we will consider if the proposals would result in a deterioration in transitional (estuarine) and river water bodies.

12.3 Due to the submission of the permit applications and the DCO application at the same time and because of the complexity of the direct cooling discharge assessment, associated HRA and WFD assessments, it is unlikely we will be able to publish our draft decisions on the environmental permits before the Sizewell C DCO examination closes. We therefore may not be able to advise

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/12/Advice-note-7.pdf

the Examining Authority of our likely position on the permits, or provide representations on any matters covered by that permit, at a time that would allow these decisions (and any recommendations that we may make from them) to be taken into account in the Examining Authority's recommendation to the Secretary of State for BEIS.

12.4 If during the permit determination the Environment Agency disagrees with assessment methods that have been used, we may decide that we would calculate our own predictions, and this may be especially the case for biota entrapment and mortality. Our comments relating to marine ecology and WFD above highlight the concerns with the methods currently presented within the DCO application. Our methods therefore may differ from those submitted by NNB GenCo (SzC) Ltd in the DCO application. During Appropriate Assessment and WFD assessment this may lead to differences in conclusions as to whether ecological and/or environmental impacts are likely, and what could be done to mitigate for these.

12.5 As the competent authority for WFD Regulations we may also require the incorporation of measures to reduce, or mitigate for potential environmental impacts, or potential loss of fish that could otherwise result in a deterioration in the fish element of transitional (estuarine) and river water bodies. We wish to highlight at this time that it may be unlikely that the scope of our powers would allow such protective measures to be written into a permit. Therefore we may rely on the DCO to secure such measures.

Appendix A: Update on issues raised in DCO Relevant Representation

To help you, where possible, we have laid out our comments in the following format:
Issue – indicating a particular area of concern;
Comment – which discusses that issue in greater detail and the potential impact;
Suggested solution – which presents a potential solution to the issue in the form of information, or evidence that - if provided - might ensure that no adverse impact will arise, or identifies a potential mitigation measure for you to consider.
Current Position – this column has been created for the Written Representation to update our position from the Relevant Representation.

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
Flood Risk – Main Development Site					
Sizewell C Main Development Site FRA	General comment	The Flood Risk Assessment (FRA) must show that site users will have safe dry access to and from the site in fluvial & tidal flood events, but access/egress, refuge and flood warning and evacuation are not discussed in detail. This is contrary to paragraph 5.7.5 of National Policy Statement EN-1. Appendix D of the EA & ONR Joint Advice Note (July 2017) states that Safe assess /egress must be provided in the 0.5% tidal flood and 1% fluvial flood with an allowance for climate change. A safe means of escape (or sufficient time available) must be provided up to the 0.1% fluvial and tidal event.	NNBGenCo (SzC) Ltd has stated an intention is to develop a Flood Risk Emergency Plan (FREP) post-DCO stage, which will be informed by emerging information regarding construction phasing and operations. However, this information is required in order to demonstrate that workers and users of the site will be safe during the construction and operation phases. It is unknown whether the site will use the Environment Agency's Flood Warning Service, how site users will know what to do in the event of a flood, when evacuation should occur, whether there is safe dry access, egress and refuge available, or what the flood hazard presented to site users would be.	Provide further information on the flood warning and evacuation procedures to demonstrate that the proposed development can be made safe for people both during construction and operation. This Flood Response Plan should be informed by the hazards posed to people using the site and the phasing of construction activities, as well as ongoing operational activities throughout the lifetime of development. Please refer to guidance on Flood Risk Emergency Plans for New Development Also refer to the standards set out in Appendix D of the EA & ONR Joint Advice Note (July 2017) to ensure people on site are safe in the event of a flood. We will object where these are not met.	We note that by 2140 the majority of the buildings will be decommissioned, and people would only be on site in the event of periodic inspections of the spent fuel facilities. We agree that the resulting receptor risk is therefore low, and that the risk to people will be able to be avoided by ensuring that the site is not inspected when there are flood warnings issued.
Sizewell C Main Development Site Fluvial Model Update Report & Appendix C, D & E.	MDS FRA 11.3.8, 12.7.19-12.7.22 and Fluvial Model Update	The Fluvial Flood Risk Assessment has established that the hazard rating category for 4 residential properties will be increased as a result of the proposed development. Modelling shows the development will increase flood risk elsewhere which is	The fluvial modelling results confirm that the change in the maximum water levels within the Minsmere catchment area is less than 15mm for all the considered scenarios, including 100-year and 1,000-year events with 65% and 80% climate change allowances. the number of residential properties at risk of fluvial flooding does not increase as a result of the scheme, the	Investigate whether the provision of compensatory flood storage could mitigate this increased fluvial flood risk. Threshold survey data could inform of specific nature of anticipated flood risk (e.g. internal flooding). Adequate mitigation and compensation should be provided to ensure the development does not increase flood risk to property.	Resolved.

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
	Report 8.1.9	contrary to paragraph 5.7.16 of National Policy Statement EN-1.	hazard rating which 4 of these residential properties could experience will be increased (in 1% with 35%climate change event). There is inconsistency within the FRA as to whether the flood hazard rating increases from 'Danger to Some' to 'Danger to Most' or from 'Danger to Most' to 'Danger to All'.		
Sizewell C Main Development Site Fluvial Model Update Report & Appendix C, D & E.	Tables 6.2 and 6.3, Plates 6.14-6.20, Table 6.5	The FRA has identified that, as a result of the proposals, an additional 5/6 non-residential properties will be at risk of fluvial flooding, which currently are not. Modelling shows the development will increase flood risk elsewhere which is contrary to paragraph 5.7.16 of National Policy Statement EN-1.	Reference to Tables 6.2 and 6.3 clearly show that the scheme could result in an additional 5 non-residential properties at risk in all return period events, from the 5year to the 1000 year event, with 6 additional non-residential properties at risk in the 1000year with the higher 65% and 80% climate change allowances. The location of the properties at risk is not made clear. The FRA appears to excuse this increased flood risk to non-residential property as being within the Very Low hazard category (as the increase in peak flood level is less than 0.1m). However, the inclusion of these properties within the flood outlines constitutes an increased flood risk to people and property.	Investigate whether the provision of mitigation measures, including compensatory flood storage could mitigate this increased fluvial flood risk. Threshold survey data could inform of specific nature of anticipated flood risk (e.g. internal flooding). Adequate mitigation should be provided to ensure the development does not increase flood risk to property.	Resolved.
Sizewell C Main Development Site FRA	11.3.13, 11.3.6, 11.3.8 & 11.3.9	FRA has demonstrated an increased change in off-site fluvial flood risk to both residential and non-residential properties as a result of the development. Yet, compensatory flood storage has not been provided. There is no clear and justified explanation for this. FRA states that EA confirmed that compensatory storage is not usually required where change in flood depth is less than 30mm, which is inaccurate.	Generally 30mm is a small change but the consequence of this change must still be assessed in the FRA to confirm this. The FRA has identified that the change in fluvial flood risk as a result of the scheme will result in the flood hazard rating increasing for 4 residential properties for the 1% with 35% climate change. This therefore confirms that the scheme is anticipated to increase the fluvial flood risk to 4 residential properties, with at least one of these becoming considered dangerous for most users. It is not acceptable to increase flood risk to people or properties. Paragraph 11.3.9 also states that the scheme will result in an increase in flood risk to 5/6 non-residential properties. Flood depths are assessed to be	The evidence submitted demonstrates that the off-site fluvial flood risk will be increased as a result of the scheme. Compensatory flood storage or other means of mitigation should be investigated to determine whether this would mitigate against this increased risk.	Resolved.

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
			between 5 and 8mm with low velocities. However, this is still a greater number of properties at risk as a direct result of the scheme.		
Sizewell C Main Development Site FRA	General and 7.1.12 & 7.2.9, Table 7.4 & 7.1.29 7.1.20	There is a lack of clarity over the proposed sequencing of the early construction phases, which has implications for assessing the flood risks posed from overtopping of the defences during the construction phases.	The existing defences will be removed prior to construction of a new haul road/defence. It is not made clear how long this phase will take, or the time of year etc. No detail regarding the proposed design or construction of the temporary haul road has been provided. Throughout this phase, the crest level is anticipated to be as low as 4.36mAOD. The overtopping assessment has indicated rate of 140.36l/s during this stage. This is not within safe threshold limits. The FRA has not fully assessed what this means for the safety of the site and its users during this early construction phase (depth, extent, duration, velocity, and hazard). NNBGENCO (SZC) Ltd have commented that they will address this post DCO, as a better understanding of sequencing and inundation modelling for construction phase is developed, alongside the FREP. Works to remove existing defences are also likely to require an environmental permit. On the basis of the FRA at the current time, it is therefore not clear how, or whether, this level of risk from overtopping can be managed.	Clarify the following issues within the FRA: What are the implications of this rate of overtopping. How might the temporary lowering of the defences impact on flood extents and receptors? What are the risks to the site itself and to the ongoing construction works across the site area? How could these risks be managed?	Agreed that a breach in the temporary sheet pile defence is unlikely, and that the management measures in the FREP of evacuation on receipt of flood warnings should hopefully mitigate any risk. The East Suffolk Council Emergency Planner and Examining Authority will need to determine whether the FREP is acceptable to ensure the safety of the development during construction and once operational.
Sizewell C Main Development Site FRA	8.1.11, Table 8.2 & 8.2.7, 8.3.10	The temporary SSSI crossing during construction will be at risk of fluvial flooding and also coastal flooding in the 0.1% event as the existing defences are inundated, and also during a breach flood event.	The risk of fluvial flooding for the area of the temporary SSSI crossing is unclear. 8.3.10 indicates that the levels of the proposed temporary crossing are unknown, but that these should be set above 2.0mAOD in order that the road would remain dry from fluvial flooding (1 in 100yr +25% level 1.86mAOD). However, there is no assessment of the potential implications of fluvial flood risk on the construction site itself, nor for the safety of the construction workers. Para 8.1.13 states a 0.1% still water level of 4.35mAOD, which is above the shingle crest. This is	Explain the fluvial and coastal flood risk posed to the temporary crossing and people using it, for both the risk of fluvial flooding or coastal inundation during the early construction phase, and also in the event of a breach occurring. Ensure there is a safe access/egress or a safe means of escape. Detail how this would be implemented and how people on site will know when to evacuate or stop work. A breach flood can occur without warning.	Agreed that the Flood Risk Activity Permit (FRAP) application will contain the details of the construction methods that will be used, and also the specific safety measures that will be taken in the event of high river flows. The East Suffolk Council Emergency Planner will need to agree to any measures that have been revised in the updated FREP and ensure that the measures will ensure the safety of the construction workers.

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
			below the level of the proposed haul road (7.3mAOD). However, there will be a period of risk during the early construction phase BEFORE completion of the haul road. For a period of time where this risk will be real and there will be no defences in place. What impacts would this event have at this time and how will this risk be managed?		
Sizewell C Main Development Site FRA	11.2.6	FRA identifies a change in flood risk associated with a breach at Tank Traps, and attempts a description of the impacts of this change, however references a Table (8.2), the data in which does not appear to be consistent with the description.	Any change in flood risk (either increased or reduction) must be clearly identified in the FRA with maps, plates or figures so it is clear to the reader what the impact of the development is. This must then be assessed in detail (depth, hazard, velocity) and the results interpreted for the receptors affected. What is the consequence of this change in flood risk? For example if an area is already at risk of flooding in a breach to significant depths additional flooding which does not increase the hazard to people could be acceptable. If there are new areas flooded that were not flooded before this would be a more significant consequence. The receptors in this area would then need to be identified to determine if this change is significant.	Provide full assessment of change in off-site flood risk in a breach. Clearly show change in depth, hazard and velocity and identify key areas where the impact is felt. Assess the consequence of this change to the receptors present. This also applies to offsite flood risk as result of the development for tidal overtopping and fluvial flood risk.	Unresolved. NNBGenCo (SzC) Ltd intends to mitigate this increased flood risk by securing landowner consent. This has presently not been achieved.
Sizewell C Main Development Site FRA	7.2.16, Tables 7.5, 7.6 and 7.7	There is detailed assessment of the depth, hazard, velocity and time until inundation on the platform in the event of a breach at: 1).Tank Traps (Table 7.5; during the construction phase, prior to raising of the platform area and construction of the new defences), 2). the main defence (Table 7.6 and 7.7 during the operational epoch and beyond).	7.2.7 and Table 7.5 show the depth, velocity and hazard of a breach at tank traps in 2030 and 2190. There is no information on how this risk (which at some points/locations indicates Danger for Most/All) shall be managed (including main platform 2030 in 0.5%/0.1% events, which would present a risk during the early construction phase, prior to raising of the platform area). Breach in main HCFD in 2140 (worst case credible maximum) results in flooding to MPlatform, 7.2.27 indicates 70mm-170mm of internal flooding for up to 3hours. The FRA (7.2.25-7.2.26) mentions forecasting, warning, suspension of operations and a flood emergency plan, although there is no detail	The FRA must be updated to show how the risk to people will be managed.	The location of the varying flood depths across the site have now been clarified. We note that by 2140 the majority of the buildings will be decommissioned, and people would only be on site in the event of periodic inspections of the spent fuel facilities. We agree that the resulting receptor risk is therefore low, and that the risk to people will be able to be avoided by ensuring that the site is not inspected when there are flood warnings issued.

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			to indicate that this could act as a means of keeping people safe.		
Sizewell C Main Development Site FRA	Fig 33, 9.2.13 and Fig 56 and 9.3.3	Water Management Zone 1 basin is shown to be at fluvial risk in the 1000yr (and to a lesser extent the 200yr) extent in the baseline scenario, however, in the with scheme mapping, the proposed basin acts as the boundary for the flood extent.	The proposals should be made clear. Will proposed raised embankments create the boundaries of the flood extents? If so, the updated flood extents must be demonstrated. Figure 56 indicates that this location would be inundated in the future 100year flood events, based upon upper end and credible maximum scenarios.	Provide plates and figures showing flood risk and the construction site location. Illustrate the flood risk for the areas of the construction site that are at risk (depth, hazard & velocity). Confirm mitigation measures if required.	Resolved.
Sizewell C Main Development Site FRA	General comment	The FRA must show that site users will have safe dry access to and from the site in fluvial & tidal flood events, but access/egress, refuge and flood warning and evacuation are not discussed in detail. This is contrary to paragraph 5.7.5 of National Policy Statement EN-1. Appendix D of the EA & ONR Joint Advice Note (July 2017) states that Safe assess /egress must be provided in the 0.5% tidal flood and 1% fluvial flood with an allowance for climate change. A safe means of escape (or sufficient time available) must be provided up to the 0.1% fluvial and tidal event.	NNBGenCo (SzC) Ltd has stated an intention is to develop a Flood Risk Emergency Plan (FREP) following the examination stage of the DCO, which will be informed by emerging information regarding construction phasing and operations. However, this information is required in order to demonstrate that workers and users of the site will be safe during the construction and operation phases. It is unknown whether the site will use the Environment Agency's Flood Warning Service, how site users will know what to do in the event of a flood, when evacuation should occur, whether there is safe dry access, egress and refuge available, or what the flood hazard presented to site users would be.	Provide further information on the flood warning and evacuation procedures to demonstrate that the proposed development can be made safe for people both during construction and operation. This Flood Response Plan should be informed by the hazards posed to people using the site and the phasing of construction activities, as well as ongoing operational activities throughout the lifetime of development. Please refer to guidance on Flood Risk Emergency Plans for New Development Also refer to the standards set out in Appendix D of the EA & ONR Joint Advice Note (July 2017) to ensure people on site are safe in the event of a flood. We will object where these are not met.	We note that by 2140 the majority of the buildings will be decommissioned, and people would only be on site in the event of periodic inspections of the spent fuel facilities. We agree that the resulting receptor risk is therefore low, and that the risk to people will be able to be avoided by ensuring that the site is not inspected when there are flood warnings issued.
Flood Risk – Two Village Bypass					
Two Village Bypass Flood Risk Assessment	4.3.3, 7.2.5, 7.2.6, 7.2.8, 7.2.9	FRA has assessed fluvial flood risk and demonstrated some localised areas of increased depths as a result of the proposals. Landowner	4.3.3 Report is updated to consider flood zone 3b and this is now mapped. The FRA has determined that flood depths (and extents) will be increased in places as a result of the proposals7.2.5 identifies	Discussions are ongoing with the landowner to mitigate for an increased flood risk on the flood plain. Written consent from the landowner must be included in the final FRA for the increased flood depth, hazard &	NNBGenCo (SzC) has provided confirmation of written consent from the landowner that they accept the increased flood depth, hazard and velocity on their land. We recommend that this is also

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
		agreements will need to be sought to confirm that the potential impacts on landowners are accepted.	increased peak water levels in design event of 30-32mm and concludes no floodplain compensation or further mitigation (beyond the 'embedded mitigation') is proposed. Paragraph 7.2.6 states that increases in depth are higher upstream of the proposed crossing. Paragraph 7.2.8 states depths increase with scheme by 220mm-320mm near the flood relief culvert on R.B. On L.B., depths increase by up to140mm. 7.2.9 clarifies R.B depths up to 350mm extend 80m u/s of bridge; and L.B depths up to 250mm extend up to 25m u/s.	velocity on their land in order for this to be acceptable without further mitigation as required by EN-6 3.6.16.	submitted to the Examining Authority for completeness because it is for the Examining Authority to determine whether this approach is sufficient in the absence of mitigation or compensation.
Flood Risk – Sizewell Link Road					
Sizewell Link Road Flood Risk Assessment	3.6.2	Existing and proposed road levels not provided for SW4. Although proposed not to change culvert, current and future flood risk is still unknown.	The SW4 crossing was not modelled as the existing culvert will remain in place. The existing baseline flood risk is unknown as the watercourse is not currently modelled. The FRA also states that road levels will remain close to existing but not the same. Any increase in road level could create a further barrier to flood water which must be assessed.	Confirm road levels. Modelling may be required to evidence baseline and post development flood risk. This must be determined in consultation with Suffolk County Council as the river is an ordinary watercourse and the existing baseline flood risk is unknown.	Resolved.
Sizewell Link Road Flood Risk Assessment & Model Report	3.6.3 of FRA & 2.1.9 of model report	No flood risk assessment of proposed crossing at SW7. FRA does not show the road will be safe for its lifetime without increasing flood risk elsewhere which is contrary to paragraph 5.7.3 & 5.7.16 of National Policy Statement EN1 and paragraph 160 of the National Planning Policy Framework.	Flood risk at SW7 has not been assessed due to lack of information collected. This is not adequate justification for not assessing flood risk and fails to comply with national planning policy. The flood map for surface water shows a clear flow path is present and the new SLR will create a barrier to this and therefore could increase flood risk elsewhere. It is also possible that the road itself could be at risk of flooding. It has not be proven in principle that the design could work and be sized correctly. It is understood that some hydrology calculations were undertaken for this catchment but this has not be used in the FRA or model report.	Provide further investigation and assessment of flood risk at SW7. Explain why hydrological calculations have not been used to inform design i.e. crossing size. This must be agreed in discussion with Suffolk County Council as this is a surface water flow path/ordinary watercourse.	SW7 has now been surveyed and modelled, both for the baseline and with-scheme scenarios. The baseline modelling showed that the water will pond on the floodplain adjacent to the B1122, and will weir over in high flows. The proposal is to extend the existing culvert under the B1122 to incorporate the SLR, and to include a spillway on the left hand bank to allow water to flow onto the floodplain, and so maintain the capacity of the culvert. A new box culvert will be installed under the SLR to maintain the floodplain flows in this location. The modelling shows that there will be an increase in flood depths upstream of the SLR and box culvert with an increased flood depth of 0.1m, however this is within the site boundary. No properties are impacted as the nearest are 300m away and the flood levels are not increased in this location. The SLR itself is 0.72m above the worst case

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
					extreme 0.1 (1 in 1000) AEP with 65% climate change so will remain dry in all flood events. The adjacent floodplain storage overspill area floods in all modelled events including the 20% (1 in 5 year) annual probability event, with 0.27m increase in depth of water compared to existing situation. In the design 1% with 35%cc event there is an increase of 0.05m depth on the floodplain compared to existing. The water will weir over the B1122 in the 1 in 20 year event, as is currently the case, however it will happen approximately 1.5 hours sooner in the with scheme scenario than happens currently, although the maximum flood depth on the B1122 road is only 0.01m higher. The highways authority should ensure that they are in agreement with this, and the landowner of the area of floodplain storage should also agree to the 0.27m deeper depths in the 5% event, and 0.05m deeper in the 1% with 35% cc design event. It also appears that Figure C7.1 is incorrect, as minimal flooding is shown on the floodplain in the baseline scenario for the 5% event in Figure A7.1 and there is extensive flooding of the floodplain in the with scheme scenario in Figure B7.1, but the plan showing the difference (Fig C7.1) does not show a large area of increased flood depth as would be expected from the large differences between the two maps.
Sizewell Link Road Flood Risk Assessment	3.6.6 & 3.6.7	The final design for the crossings are unclear	The FRA states portal culvert have been used at the crossings. This is misleading as this has not been possible in all locations and contradicts the modelling report and model build (e.g. SW1 is now a T shaped concrete culvert). Flood relief culverts have been used at some crossings (it is unclear which) and they are not shown on the plans provided or no plans have been provided at all.	Provide final designs for all crossings SW1 to SW7 with arrangement plans and cross sections for each.	Resolved.
Sizewell Link Road Flood Risk Assessment	5.2.5	FRA states & concludes that the SLR site is in Flood Zone 1 which has not been proven in the FRA. Several of the	There is a clear indication of flood risk near to crossings as this information has been provided with cross sections. However, a map showing the extents of Flood Zones 3a,	Update FRA and model report text to state correct flood zones. This should be evidenced by modelled flood extents and levels.	Resolved.

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
		watercourses that will be crossed by the SLR have been modelled, although Flood Zone mapping has not been provided.	3b and 2, based upon the hydraulic model outputs has not been provided. The baseline hydraulic model should be incorporated into the known flood risk areas, in order to provide an up to date map showing the extents of flood zones 3a, 3b and 2. The flood levels on the development site should be determined and compared to a topographic site survey to determine the location, flood depths and extent of flooding across the site.		
Sizewell Link Road Flood Risk Assessment	4.3.3, Table 4.1, 5.1.2	The level of road compared with maximum modelled flood extents demonstrates road surface is above flood level. However, the FRA should assess whether the footprint of the SLR is at risk of flooding. This could indicate the site would be at risk of flooding during the construction phase.	FRA states SLR design at Fordley Road will reduce risks of flooding as the road will be moved outside of the currently mapped Flood Zone 3 which is based on JFLOW modelling. The Flood Zone maps in this area are formed of national generalised modelling, which was used in 2004 to create fluvial floodplain maps on a national scale, known as JFLOW. This modelling is not a detailed local assessment, it is used to give an indication of areas at risk from flooding. JFLOW outputs are not suitable for detailed decision making. In these circumstances an FRA will need to undertake a modelling exercise in order to derive flood levels and extents (flood zones), both with and without allowances for climate change in order to inform the design of the site. The SLR will still cross the watercourse. The claim that flood risk has been reduced must be evidenced.	Update FRA and model report text and ensure all crossing assessments are based on detailed modelling flood extents not JFLOW extents/flood zones. Remove claim that new SLR route will reduce risk of flooding or qualify with detailed modelling.	Resolved.
Water Supply					
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.1.1	The text states that the principal supply for the Sizewell C Project will come from mains water, provided by Essex and Suffolk Water (ESW).	The mains supply of water to Sizewell C continues to remain unconfirmed. Under the Water Industry National Environment Programme (WINEP) Asset Management Plan (AMP) 7 investigations, water companies are required to determine if abstraction licences are impacting on the ability of water bodies to achieve their Water Framework Directive (WFD) status. Recent	Where use of the regional NEAC groundwater model is required, and where ESW are stated as the water provider, it is the responsibility of ESW to scope out the required runs necessary to help identify their water resource availability. Water may need to be pumped in from a different resource zone or be supplied from a different water company. As yet no viable	Ongoing, the E&SW WINEP investigations have not been concluded. We understand that a revised Water Supply Strategy is being prepared for submission to the Examination. We will expect to be consulted on any detailed options that confirm, or propose, how the water demand for this project is able to be met and any non-potable sources of water that can be used

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
			groundwater modelling for ESW sources in the Blyth Water Resource Zone (WRZ) show that any increase in water demand here is likely to deteriorate WFD status further and is therefore unacceptable to the Environment Agency.	options have been presented to the Environment Agency. Holistic solutions around water resources in East Suffolk may help towards reaching levels of sustainable abstraction, as there is already a significant pressure on resources from agricultural summer demand for spray irrigation.	to meet supply whilst remaining ecologically sustainable.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	Table 1.1	Summary of all potential water supply options have not been investigated further to check their viability. These are ideas raised predominantly by the Environment Agency for NNBGenCo (SzC) Ltd to investigate.	At this stage we would expect options to be fully assessed with quantities of water identified. The Environment Agency would need to be consulted to assess whether they meet abstraction licensing requirements.	All of the non-potable water options have to be assessed in more detail and quantities assigned. It is rightly assumed that due to the shortages of water in this area, there is likely to be groups of supply options. More detail is required.	This table has now been separated into three, Potable water supply, New Resource, Non-Potable. There is some improvement, options have been considered further, some values have been added to options taken forward but others still lack volumes and detail.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.5 & 1.5.2	The assumption that the potable water and the main water supply will be provided by ESW from within the Blyth WRZ.	This is incorrect. ESW's WINEP AMP 7 Investigation in to the sustainability of the Blyth groundwater sources is still in progress and early indications show that regardless of WFD planning cycle deadlines, we can currently only assume Recent Actual levels of abstraction are available or, once WINEP has concluded, whatever is proven to be the sustainable level of annual abstraction.	Groundwater modelling is required to confirm a sustainable supply of potable water for Sizewell, it is likely that the supply of water will have to found outside of the Blyth WRZ.	This has been discounted and the new proposal is to supply via a new pipeline from outside the Blyth Resource Zone. This assessment is ongoing and not concluded.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.7 and 1.4.8	Using discharged water from Minsmere sluice as a source of supply.	No numbers have been provided on the resources available, which would indicate SZC has not installed any flow monitoring. No works or pipe line from Minsmere sluice are mentioned or any consultation with the relevant authorities.	Flow monitoring is installed and this option is assessed in more detail.	This option has been discounted as the quantities required cannot be guaranteed on a regular basis needed for operation.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.18	Ship tankering	There are no quantities on the amount of water tankered and where this water comes from.	Quantities are assigned and it is confirmed where this water could come from. Costs and benefits should also be assessed.	This option has been discounted

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.21	The text states that 'The Environment Agency has stated that licence trading would be a viable water supply option"	This is incorrect. In theory abstraction licence trading is an option to explore, but the Environment Agency have not confirmed that this is a 'viable ' water supply option or have indicated quantities of water available from a water rights trade.	NNBGenCo (SzC) Ltd need to negotiate with licence holders to identify licences available to trade and to supply EA with a list of licences and detailed information around a potential trade. EA will need time to assess the application and to confirm the potential quantities of water available. If suitable NNBGenCo (SzC) Ltd need to apply for a pre-application abstraction licences in order to vary licences and to allow a trade to take place.	This has been amended to remove the statement about EA involvement in this process.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.26,	NNBGenCo (SzC) Ltd is working with the Environment Agency to understand how the use of compensation discharge may support water supply for the Sizewell C Project.	The Environment Agency strategy is for a presumption against any new groundwater compensation schemes. There can be deterioration of groundwater bodies too with long term use of groundwater compensation schemes.	More strategic solutions would be preferable, which tackle the underlying sustainable abstraction problem.	The option for compensation discharge has been discounted.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.28	The text states that "The Environment Agency have carried out an initial scoping exercise to understand how operating the compensation discharges may act as a benefit to support abstraction."	This is incorrect. ESW have tested their existing compensation schemes as part of their AMP 7 WINEP Investigations.	This statement should be removed from the document.	The option for compensation discharge has been discounted.
8.4 Planning Statement Appendix 8.4K site Water Supply Strategy	1.4.35	ESW transfer from Northern/Central WRZ)	This has been discussed, but no hydrological modelling has taken place to assess impacts and explore options around this. There are significant time delays on both the development of this option and building of any new pipeline. If the water is to be treated at Barsham Treatment Works, there may be time implications as this ESW treatment works is undergoing a re-building programme. This might have implications for the timescale of the Sizewell C development.	The viability of this is explored further. ESW need to provide the Environment Agency with evidence that increasing abstraction from this resource zone does not cause deterioration to WFD. ESW need to discuss further the implications of additional abstraction in this zone on the Waveney. The Waveney is supported by the Waveney Augmentation scheme operated by the Environment Agency Hydrology Team. It is suggested further discussions are held with EA Hydrology. In addition, ESW may also require further modelling work using the Regional NEAC	This option has been discounted.

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				model to further investigate the additional impact from use of the WAGS etc.	
Waste					
Book 6: Environmental Statement Chapter 8, Conventional Waste Management. Appendix 8A. Waste Management Strategy	Section 12	Whilst the applicant has been very thorough in describing how they will store, manage, reduce, recycle and re-use waste, there are no targets or KPIs in the DCO application at all. We expect to see targets and detailed description of how waste management is monitored and performance is measured against target.	By not having these targets, NNBGenCo (SzC) Ltd will have no idea how they are performing, where to improve, and where the waste is being generated. There should be clearly laid out recycling values and percentages of each waste stream generated, such as (but not limited to) paper and card, metals, plastic, all packaging waste, wood, in accordance with both UK and EU targets, and the aspirations of the circular economy.	Please include UK and European revised waste targets, as laid out in the European Circular Economy Package. Adopting these targets will show the site has a highly effective waste and resource strategy.	EA understand that NNBGenCo (SzC) propose to introduce targets/KPI for waste and resource management, however proposals, including securing mechanism (e.g DCO requirement) have yet to be submitted into examination. EA understand that NNBGenCo (SzC) will submit an annex to the Conventional Waste Management Strategy into the examination at Deadline 5 to set KPIs. We wish to be consulted on these proposals and any securing mechanism (e.g. DCO Requirement).
Terrestrial Ecology – Main Development Site					
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	Table 14.2 (EN-6 C.8.62 & EN-6 C.8.63) 14.14.47	The creation of Aldhurst Farm habitat area has not addressed the issue of habitat fragmentation, particularly as the culvert crossing at Lovers Lane is now not going to be improved to facilitate the passage of mammals.	The decision not to upgrade this crossing means the Aldhurst Farm site and the mammals relocated to it, will remain isolated from the remainder of the Sizewell Belts and SSSI habitat. This is not a coherent ecological network that is more resilient to change and may lead to isolated populations for translocated water voles and increased mortality from vehicle collision for otters.	Upgrade the culvert underneath Lovers Lane to facilitate mammal movement safely between the 2 habitats.	A mammal pass has now been proposed close to the existing culvert under Lover's Lane, which includes otter fencing.
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	14.8.27	The Sizewell Marshes SSSI is designated for its invertebrate fauna and the Leiston Beck is currently classified at good ecological potential for invertebrates under WFD. The location of the proposed culvert crossing across the Leiston Beck in compartment 1 includes protected, rare and threatened species.	Upstream dispersal of aquatic invertebrates will not be possible through an un-vegetated, dark culvert 70m in length. Most insects whose larvae develop in freshwater use polarization of light reflected from water for navigation (positive polarotaxis). These species will not go through a culvert of these dimensions for this reason, they will either turn back, or if they attempt to travel over the top of the culvert and road, may travel along the course of the road instead of the watercourse and attempt to oviposition upon the road surface, this is because they are	We require the crossing of the SSSI and the Leiston Beck to have the minimal amount of land take as possible and to facilitate the passage of the species identified in in this area, particularly protected species. From the design options put forward, the design most likely to achieve this is the three span bridge as this will significantly reduce the land take from the SSSI and will significantly reduce the risk of habitat fragmentation for all the species listed.	Unresolved. The proposed change to the SSSI crossing is an improvement from the culvert design but it will still leave a large area under the crossing in deep shade and impassable by weak dispersers which cannot fly over the top. strongly flying orders Coleoptera and Odonata which may be able to travel over the top of the crossing will be attracted to roads and windscreens which emit polarised light pollution, this will then act as sinks for these taxa. Assumption is used to suggest that some species would swim against the flow through a dark,

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			deceived by artificial surfaces particularly roads which omit polarized light pollution. Numerous publications evidence these issues (Blakely et al 2006, Kriska et al 2009, Malik et al 2010, Malnas et al 2011). We are unable to conclude that a potential for deterioration for invertebrates does not exist in this water body as a result of the proposed design. Upstream of the Lovers Lane crossing at the top of the Leiston Beck water body a water treatment works discharges untreated effluent to this water body during storm events, impacted sensitive invertebrate taxa are unlikely to recover in this area if upstream migration and dispersal is prevented due to the proposed culvert and embankment.		unvegetated watercourse 40+ m in length. Swimming tends to be a predator avoidance strategy used only by some taxa, many aquatic insects colonise mainly downstream by drifting in flow. That's why mayflies fly upstream as adults, to compensate for the fact that the larvae will move down again by drift! Other taxa don't swim at all. Especially when there are fish present this is an unlikely dispersal strategy. EA understand that NNBGenCo (SzC) are carrying out a design review to consider if the design of the structure could be optimised to further reduce impacts. At Deadline 4 we anticipate confirmation of a design 15m wide, with an increased soffit height, which would be welcome.
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	14.8.91	Habitat fragmentation caused by the SSSI crossing combined with loss of wet woodland habitat has not been fully considered. We cannot conclude a deterioration for invertebrates would not happen as a result of these impacts and this carries concerns for WFD and protected species.	The loss of habitat combined with the isolation from remaining habitat is not discussed.	Provide a combined assessment of impacts to invertebrates in the Leiston Beck	The company has proposed additional wet woodland habitat which is welcome, but this additional wet woodland will not be functionally linked to the area of impact. Environmental Stakeholders, including EA, should be consulted on the final location Habitat fragmentation caused by the SSSI crossing is still not resolved.
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	14.9.8-14.9.10	Loss of fish habitat, inadequate connectivity in the water body and compensation area for fish.	Fish are unlikely to enter the habitat creation area at Aldhurst Farm due to the oblique, dark culvert under Lovers Lane, this will act as a barrier to fish and fragments the two areas. Fish migration into this area will likely be further inhibited by excessive macrophytes causing a barrier to fish movement. SSSI crossing; culverts can inhibit fish movement as the abrupt change in light and extended length of dark, un-vegetated and featureless watercourse is known to prevent fish movement. This can lead to large scale fish mortality when fish are prevented from moving along a	SSSI crossing should not prevent the movement of fish, this could be achieved with a widespan bridge that prevented an abrupt change in light at the entrances and reduced the overall length of dark watercourse. Upgrade the culvert underneath Lovers Lane to facilitate fish movement.	The accepted change to the SSSI crossing will likely improve fish passage along the Leiston Beck but a deeply shaded area under the crossing will remain, a threshold of light intensity will determine what species are likely to pass under the crossing: Low light intensities increase avoidance behaviour of diurnal fish species: implications for use of road culverts by fish. Keep et al (2020).

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			watercourse during events when water quality is reduced to a critical level, such as algal blooms or pollution events.		
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	14.14.31-14.14.32	We cannot conclude that the proposed culvert and embankment across the Sizewell Marshes SSSI and the Leiston Beck water body would be of sufficient dimensions to facilitate the passage of otters. And therefore cannot conclude that this will not lead to the fragmentation of habitats between the Minsmere south levels and Sizewell marshes.	No evidence has been provided that demonstrates a culvert of the dimensions put forward would facilitate the passage of otters (protected species W&C act 1981). Some grey literature indicate that otters will be reluctant to use culverts over 50m in length (Otter Report, Jacobs 2007).	A widespan bridge crossing will ensure connectivity of these habitats for otters.	Resolved
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	14.14.51	The anecdotal evidence described here is not considered to provide adequate robust evidence that water voles will not be impacted by the proposed SSSI culvert crossing.	Impacts to water vole populations could be underestimated by this crossing. In the absence of more robust evidence relating to water vole use of culverts of this length, a more precautionary assessment is required.	A widespan bridge crossing will ensure connectivity of these habitats for water voles.	Resolved
SZC_Bk6_ES_V2_Ch14 Terrestrial Ecology and Ornithology	14.14.51	Without supporting evidence we cannot conclude that the water vole population in the Sizewell Marshes could be sustained without genetic interchange from a wider area.	Insufficient evidence provided to confirm this population could be sustained.	Provide evidence that demonstrates a population of this size could be sustained long term without genetic interchange from a larger area.	Resolved
Terrestrial Ecology – Two Village Bypass					
SZC_Bk6_ES_V5_Ch7_ Terrestrial_Ecology	7.4.9-7.4.11	Figure 7.4 in Appendix 7A shows the results of the NVC surveys of the River Alde and Floodplain grassland. Insufficient spatial coverage of the floodplain meadow and insufficient sampling effort has been used to conclude the species present or the potential impact to this habitat.	The spatial coverage of these surveys appears to be very limited with floodplain meadow only being surveyed upstream of the proposed crossing, this is insufficient to assess the species present in the floodplain meadow downstream that require periodic inundation, and that will be impacted by changes in flood water conveyance over the meadow, furthermore surveys were also limited to one survey in June 2019, the lack of coverage and sampling events (they are	Provide further sampling over a greater spatial area, including downstream of the crossing. Provide data for more than a single year.	Resolved

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			limited to 1 month in a single year) gives us very poor confidence in this data.		
SZC_Bk6_ES_V5_Ch7_Terrestrial_Ecology	7.5.4 7.6.88 7.6.168-7.6.169	The report states that an otter ledge would be installed on the bridge abutments, if required, to allow passage at times of high flows, and that otter fencing would be incorporated.	We will only be able to accept this once flood modelling demonstrates that the mammal passes and ledges facilitate the passage of these species during elevated flows. We will also require the details of the otter fencing and maintenance programme for that fencing. Fencing may be needed to prevent otters (and other wildlife) entering excavations during the construction period. Need to ensure that there is a safe means of egress for any animals that enter excavations, and that a safe passage for otters along the river corridor is maintained.	We require detailed information on the position and height of the proposed otter ledges (there should be one on each side of the river), the height (in relation to flood flows of the mammal culverts through the embankment across the Alde valley, and details of any fencing that is proposed. These details will also be required as part of any environmental permit application for works within 8m of the River Alde.	Engagement with NNBGenCo (SzC) indicates that the required otter ledges and fencing will be provided. The final designs are still to be confirmed.
SZC_Bk6_ES_V5_Ch7_Terrestrial_Ecology	7.5.4	The provision of up to four ponds is also proposed along the route, which would provide additional pond habitat in the area and contribute to bio-diversity net gain.	The total number of new ponds needs to be confirmed. Further detail is required about the design of these ponds (e.g. size and depth, how they will hold water etc.). Details are also required of the grass/wildflower mix to be planted around the infiltration basins. We would like the infiltration basins to incorporate a small area of permanent standing water to further improve biodiversity. Shape and profiling of the infiltration lagoons needs further consideration. These should have a naturalistic appearance, with an irregular planform and gently shelving margins. Consideration should be given to planting wetland vegetation in the base (in areas of permanent water) to further enhance biodiversity.	Provide further design details of this mitigation and incorporate the suggested measures included	Resolved
SZC_Bk6_ES_V5_Ch7_Terrestrial_Ecology	7.6.30	The flow regime of the River Alde, functional floodplain and surface drainage network during construction would, however, be altered by the embankment across the	The increased back flooding upstream of the proposed embankment will also result in reduced inundation of the downstream floodplain grazing meadow, which in-turn has the potential to alter the composition of this priority habitat. See comments also in 7.4.9.	Provide modelling/evidence that inundation downstream of the embankment cannot be improved with the inclusion of additional culverts in to the design.	Further flood risk information has been submitted, this is under review to confirm whether the continued inundation of the floodplain has been demonstrated.

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		floodplain during periods of higher flow, when the river is 'out of bank'. Even though flood relief culverts through the embankment would be present, temporary and localised back-flooding on the floodplain and potentially within the surface drainage network during high flow periods is anticipated.	Can the inclusion of additional flood relief culverts through the embankment help to reduce this impact on both sides of the embankment		
SZC_Bk6_ES_V5_Ch7_Terrestrial_Ecology	7.6.33	The scheme will involve the permanent loss of 2.91ha of floodplain grazing marsh, a NERC Section 41 Priority Habitat. There will also be a temporary loss of 3.91ha of this habitat.	We disagree with the assessment that this loss is not significant. There appears to be no mitigation for the loss of this area of habitat. It will result in a net loss of biodiversity rather than the net gain that we would expect.	Mitigation may be achieved by enhancing some of the remaining areas of this habitat if the provision of replacement habitat is not possible. For example, the reinstatement of the temporarily affected areas could involve re-seeding with an appropriate grassland and wild flower mix which is of greater conservation value than the existing sward.	Resolved
SZC_Bk6_ES_V5_Ch7_Terrestrial_Ecology	7.6.44	We disagree with the assessment that habitat loss of grazing marsh is not significant. Insufficient information has been provided on how much of the ditch network will be affected.	The report doesn't say how much of the ditch network will be affected and so more clarity/certainty is required on this issue so that we can be confident that any proposed mitigation is acceptable/proportionate.	The loss of these habitats needs to be accurately quantified and appropriate mitigation or compensation needs to be provided, this should include the potential loss of floodplain downstream of the crossing as a result of reduced periodic inundation.	Resolved
Terrestrial Ecology – Sizewell Link Road					
Review_SZC_Bk6_ES_V6_Ch7_Terrestrial_Ecology_and_Ornithology	7.3.34	Appendix 7A contains details of the detailed suite of ecological surveys.	Appendix 7A paragraph 1.4.9 states; no surveys were undertaken for invertebrates, reptiles or terrestrial mammals as the extended Phase 1 habitat and protected species survey identified habitats within the site boundary to be sub-optimal for these species.	Surveys need to be undertaken to determine the potential level of impact to these species, suitable habitat is present in the development footprint.	Updated baseline surveys were undertaken in 2020 but these focused on a very small proportion of the overall area impacted by the proposed SLR, and only 1 watercourse was in the survey area.
Review_SZC_Bk6_ES_V6_Ch7_Terre	7.4.14	Ten of these surface water features (Middleton Watercourse, Theberton	A single survey conducted 2019 is unlikely to give an accurate reflection of the value of these watercourses to the biodiversity of the	Additional surveys are required to assess these watercourses. Provide accurate details of the impact to watercourses as a	Updated baseline surveys were undertaken in 2020 but these focused on a very small proportion of the overall area impacted by

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strial_Ecology_and_Ornithology		Watercourse, an unnamed watercourse and seven ditches) were surveyed at the time of the Phase 1 habitat survey, and at the time of survey, were dry and most had recently been cleared of all aquatic and marginal vegetation.	area. 2019 was a very dry year which followed an exceptionally dry winter. Watercourses are important linear features of the landscape and important migratory routes for wildlife,	result of the development. Include the details of the total net loss of watercourse including that lost through culverting	the proposed SLR, and only 1 watercourse was in the survey area.
Review_SZC_Bk6_ES_V6_Ch7_Terrestrial_Ecology_and_Ornithology	7.4.42	Water vole considered absent from the site and has not been considered further within this assessment.	Due to the limited amount of surveys that took place and the significant length of time between the phase 1 surveys taking place and the commencement of the project we require further confirmation of the absence of this species prior to construction starting	Provide further assessment prior to the commencement of any construction work.	Updated baseline surveys were undertaken in 2020 but these focused on a very small proportion of the overall area impacted by the proposed SLR, and only 1 watercourse was in the survey area.
Review_SZC_Bk6_ES_V6_Ch7_Terrestrial_Ecology_and_Ornithology	Table 7.11 7.4.52 7.5.4	Watercourses including 2 main rivers have not been identified or taken forward as important ecological features. No mitigation or compensation has been proposed.	Watercourses are important linear features of the landscape and important migratory routes for wildlife, they should be maintained as continuous corridors to maximise their benefits to biodiversity. We also require as a minimum no net loss of watercourses through development.	Provide accurate details of the impact to watercourses as a result of the development. Include the details of the total net loss of watercourse including that lost through culverting. Provide comprehensive mitigation for this impact and appropriate compensation for the loss of any watercourses.	The Environmental Statement still does not acknowledge the presence of the watercourses or their importance for biodiversity. NNBGenCo (SzC) Ltd intends to rely upon mitigation to resolve this issue, which may potentially be sufficient to prevent adverse impacts, but this is not evidenced through the Environmental Statement.
Review_SZC_Bk6_ES_V6_Ch7_Terrestrial_Ecology_and_Ornithology	Table 7.11	Otter scoped out of table of Important Ecological Features to be taken forward for detailed assessment.	Otters are likely to forage along the watercourses impacted by this development at certain times of the year, particularly juveniles and females with cubs who use smaller watercourses as dispersal routes.	Scope in and provide detailed mitigation to avoid impacts to this species. This should include how passage will be maintained along watercourses impacted by the development.	Updated baseline surveys were undertaken in 2020 but these focused on a very small proportion of the overall area impacted by the proposed SLR, and only 1 watercourse was in the survey area.
Review_SZC_Bk6_ES_V6_Ch7_Terrestrial_Ecology_and_Ornithology	7.5.4	Infiltration basins are proposed, but insufficient design details have been included to demonstrate opportunities for biodiversity have been considered.	We would like the infiltration basins to incorporate a small area of permanent standing water to further improve biodiversity. Shape and profiling of the infiltration basins needs further consideration. These should have a naturalistic appearance, with an irregular planform and gently shelving	Provide further design details of this mitigation and incorporate the suggested measures included	Modelling has demonstrated that infiltration basins will not work and that discharge will now happen to watercourses via attenuation basins, It is not clear how the impact of this has been assessed or how the opportunities for biodiversity have been considered.

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			margins. Consideration should be given to planting wetland vegetation in the base (in areas of permanent water) to further enhance biodiversity.		
Marine Ecology					
Sizewell C Project Environmental Statement 6.3 Volume 2, Main Development Site Chapter 6. Revision 1.0. Alternatives and Design Evolution	Throughout this report and rest of ES.	Fish deterrent devices such as AFD are insufficiently assessed in the ES as mitigation methods that could be implemented as best practice in line with Agency guidance Ref 6.5. There is evidence that LVSE would not be effective without fish repulsion devices in tandem with an LVSE. And the design of LVSE is still unproven in the field.	The Applicant also acknowledges that LVSE may not work as stated in saying "the benefits of a LVSE design while seemingly reasonable are only hypothetical at present because there are no operational intake heads of this type" (6.5.19). Ref 6.5 Environment Agency, Cooling Water Options for the New Generation of Nuclear Power Stations in the UK, (2010)	Further robust consideration of repulsive technologies should be provided to ensure mitigation for fish impingement in line with environmental best practice and greater assurance is required on the efficacy of the LVSE as a mitigation solution in itself	Unresolved. Further robust consideration of repulsive technologies should be provided to ensure mitigation for fish impingement in line with environmental best practice. The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.
Sizewell C Project Environmental Statement 6.3 Volume 2, Main Development Site Chapter 6. Revision 1.0. Alternatives and Design Evolution	6.2.24	This paragraph states that: The Environment Agency (Ref. 6.5) states that direct cooling can be acceptable in coastal locations if three conditions are met: • extension of heat plume in the surface water leaves passage for fish migration; • cooling water intake is designed aiming at reduced fish entrainment; and • heat load does not interfere with other users of receiving surface water. And follows this is saying that All three of these criteria have been met by the Sizewell C Project. We disagree that	Ref 6.4 European Commission, Integrated Pollution Prevention and Control (IPPC), Reference Document on the application of Best Available Techniques to Industrial Cooling Systems, (2001). [It should be noted that the BREF statement used here are in relation to rivers and/or estuaries, and does not mention coastal locations as planned for SZC, as does the Agency's own interpretation of BAT.] Ref 6.5 Environment Agency, Cooling Water Options for the New Generation of Nuclear Power Stations in the UK, (2010).	Robust consideration of repulsive technologies should be included in the ES to ensure mitigation for fish impingement in line with best practice and to provide greater assurance on the efficacy of the LVSE as a mitigation solution in itself.	Unresolved. Further robust consideration of repulsive technologies should be provided to ensure mitigation for fish impingement in line with environmental best practice.

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		appropriate mitigation has been considered due to the lack of repulsive technologies, so these criteria have not been met.			
Sizewell C Project Environmental Statement 6.3 Volume 2, Main Development Site Chapter 6. Revision 1.0. Alternatives and Design Evolution	6.2.24 and generally	Concern that the intake itself could act as an attractant for some species due to the large-scale reef structure it may provide. Without fish repulsive technologies in place, the structure itself may increase fish coming into the intakes particularly when it becomes more visible as suspended sediment decreases in late spring and summer	The applicant has said the area is too turbid to enable the intakes heads to be easily seen by fish. Further assurance is required that the structure will not be visible at all times of the year	Consideration of repulsive technologies should be included in the ES to mitigate for fish impingement and provide greater assurance on the efficacy of the LVSE as a mitigation solution. Consideration needs to be given to understanding if this is going to be an attractant to fish.	Unresolved. Further robust consideration of repulsive technologies should be provided to ensure mitigation for fish impingement in line with environmental best practice. There is published work that states how artificial structures in water act as reefs for fish, however whether there is an impact on this in increasing cooling water entrapment of fish is not readily found in literature or within the DCO application. There is still uncertainty as to how the LVSE structure will impact on entrapment as a result, especially if repulsive technologies are not in place.
Volume 2, Main Development Site Book 6, chapter 22 Marine Ecology and Fisheries	Table 22.110 and Appendix 22I	We are concerned that the Scale of Assessment at ICES fisheries stock level is not readily applicable to understanding impacts to some species at an EIA, HRA or WFD level.	Potential impacts may be underestimated	Consider at a species levels whether the scale of assessment may need to be undertaken at a smaller scale.	Partly resolved. SPP103 (Rev 03) provides more evidence to justify the scales being used. Effort to provide a localised model in support of HRA assessment has also been provided in SPP103 (Rev 03) and is welcomed. The consequence of not having appropriate scale of assessment raises uncertainty over the overall impact of impingement on the fish stocks for these species. To put this in context: A reduction in scale of assessment increases the number of fish lost as a proportion of the spawning stock. It can provide one of the larger contributions

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					(potentially order of magnitude, as can calculations of EAV) to uncertainty in the result than perhaps other variables. More detailed comments on SPP103 (Rev 03) are provided in Appendix B.
6.3 Volume 2 Main Development Site Chapter 22 Marine Ecology and Fisheries Appendix 22i - Sizewell C impingement Predictions Based Upon Specific Cooling Water System Design.	Overarching Comment	The Environment Agency has received documentation from the applicant which changes the methods they have used to predict numbers of fish that will be impinged at SZC.	TR339 reports that the statistical method now being used to predict the average annual impingement of fish (with confidence limits) at SZB (bootstrapping) differs from that used in the DCO submission (zero inflated negative binomial or ZINB). Further to this, when scaling up from SZB to SZC a correction factor is used to account for the differing design of the intake heads (the LVSE factor). SPP099 uses a revised method to calculate an LVSE factor of 0.357 which differs from that used in the DCO submission (0.383). The result of both of these methodological changes is that the predicted numbers for annual impingement contained within the DCO are no longer current.	Appendix 22i and Chapter 22 of the Environmental Statement (Marine Ecology) and the shadow HRA need to be updated to include descriptions and results of the latest modelling and ensure that conclusions drawn are still consistent with the underlying data. There will also be implications when considering biota as polluting matter which may affect WFD assessments.	Partially Resolved. The applicant has provided a revised assessment that accounts for these changes. The Environment Agency, however considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.
6.3 Volume 2 Main Development Site Chapter 22 Marine Ecology and Fisheries Appendix 22i - Sizewell C impingement Predictions Based Upon Specific Cooling Water System Design.	Section 5.8 to 5.10	Potential impacts on fish populations have been assessed by expressing entrapment losses in terms of numbers of adult equivalents. The method used to calculate an equivalent adult value (EAV) for fish species calculates how many fish would have been expected to survive to the age of maturity. However, for many species spawning can take place for multiple years after the age of maturity. The applicant's method does not take into account the repeat spawning potential of fish and so	The Environment Agency has developed an extension to the applicant's method which takes repeat spawning into account, but the applicant did not accept the validity of this extension during pre-application discussions and submitted an unmodified EAV calculation.	The EAV methodology needs be updated to account for the ability of many fish species to spawn in multiple years, not just the single year during which they mature.	Not resolved. NNBGenCo (SzC) does not account for this in their assessment. The Environment Agency considers that Equivalent Adult Values (EAVs) are an appropriate way to assess how impingement losses will affect fish populations but this is dependent on the parameters that are used within the calculation. We do not agree with some of the parameters used by NNBGenCo (SzC) Ltd. The consequence of this is that the predicted impacts at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may prove to be unacceptable.

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		underestimates the potential impacts.			
Water Framework Directive					
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.3.10	Incorrect water bodies identified. Fen Meadow compensation areas stated as being in the Leiston Beck water body.	Sites 10 and 11 are located in the Fromus water body (GB105035045980). Site 28 is located in the Blyth water body (GB105035046030)	Assessment does not consider impacts to the correct water bodies.	Resolved
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	Table 2.8	Incorrect water body identified for fen meadow compensation areas. Incorrectly screened out.	Hydrological manipulation has the potential to affect WFD elements in the Fromus and Blyth water bodies and should be screened in for further assessment.	Identify correct water bodies and screen in for further assessment.	Resolved
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.4.21 & Table 2.12	Does not mention potential conflict with proposed measures to: Remove or soften hard bank, Preserve or restore habitats, In-channel morph diversity, Re-opening culverts, Alter culvert channel bed, Set-back embankments.	The channel realignment and proposed SSSI crossing in the Leiston Beck water body have the potential to prevent these mitigation measures being implemented.	Include these in the assessment	Resolved
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.156	No mention of the water supply needed for the construction or operation of SZC. Peak demand for the construction phase has been indicated at 3.5 megalitres a day.	This could place a large additional demand on the groundwater levels in this area and could lead to a detrimental impact that needs to be assessed.	Include the water demand for both the construction and operation of SZC.	Outstanding. We understand that a revised Water Supply Strategy is being prepared for submission to the Examination. We will expect to be consulted on any detailed options that confirm, or propose, how the water demand for this project is able to be met and any non-potable sources of water that can be used to meet supply whilst remaining ecologically sustainable.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.160	No mention of the water supply needed for the construction or operation of SZC. Peak demand for the construction phase has been indicated at 3.5 megalitres a day.	This could place a very large additional demand on the surface water levels in this area and could lead to a detrimental impact that needs to be assessed.	Include the water demand for both the construction and operation of SZC.	Outstanding. We understand that a revised Water Supply Strategy is being prepared for submission to the Examination. We will expect to be consulted on any detailed options that confirm, or propose, how the water demand for this project is able to be met and any non-potable sources of water that can be

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					used to meet supply whilst remaining ecologically sustainable.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.164	The ecological potential of the water body is predicted to remain as moderate throughout all phases of the proposed development. Invertebrates in the Leiston Beck are currently classified at good ecological potential.	Concern exists that impacts from the proposed development could cause a deterioration for invertebrates from good to moderate ecological potential.	Amend this and assess the potential impacts to invertebrates in the Leiston Beck.	Outstanding. The Environment Agency do not agree with the conclusions reached in the following paragraphs: 2.4.15 The area of deep shade will be impassable to polartactic invertebrates, this will result in habitat fragmentation. 2.4.16 Assumption is used to suggest that some species would swim against the flow through a dark, unvegetated watercourse 40+ m in length. Swimming tends to be a predator avoidance strategy used only by some taxa, many aquatic insects colonise mainly downstream by drifting in flow. That's why mayflies fly upstream as adults, to compensate for the fact that the larvae will move down again by drift! Other taxa don't swim at all. Especially when there are fish present this is an unlikely dispersal strategy. How long would hessian sacking last for? This isn't a long term effective mitigation for the species that could utilise it. 2.4.17 The water body is a migratory pathway for polartactic invertebrates. The primary issue is not the loss of 1.59% of the water body, the issue is it severs the water body and the migratory pathway in half, leading to habitat fragmentation. Leiston Beck WFD invertebrate classification is not mentioned. 2.4.18 Polarotaxis impacts species differently: Weakly flying orders will be unlikely to pass through the proposed crossing design, strongly flying orders Coleoptera and Odonata which may be able to travel over the top of the crossing will be attracted to roads and windscreens which

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					emit polarised light pollution, this will then act as sinks for these taxa. 2.4.19 This is a positive form of mitigation and will help to reduce impacts to strongly flying orders such as Coleoptera and Odonata, but will not reduce the impact of the crossing for weakly flying orders that will be unable to fly over the top of the crossing. 2.4.20 We are unable to conclude that a risk of deterioration to invertebrates in the Leiston Beck does not exist as a result of the proposed design. The height of clearance under the crossing is of principal importance and should be increased to reduce the impact to invertebrates. Watercourse crossings are known to be a barrier to the upstream migration of flying insects and every effort should be made to minimise the impact this will have. EA understand that NNBGenCo (SzC) Ltd are carrying out a design review to consider if the design of the structure could be optimised to further reduce impacts. . At Deadline 4 we anticipate confirmation of a design 15m wide, with an increased soffit height, which would be welcome.
tSZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.185	Does not include monitoring of invertebrates in the Leiston Beck	Invertebrate monitoring will need to be undertaken as loss of habitat and habitat fragmentation are likely to cause an impact to this element.	Include invertebrate monitoring	Aquatic invertebrate monitoring has been provided but the sampling effort and method was very limited, this will have underrepresented the species present. A revised TEMMP has been provided, which is currently under review to ensure an updated method will be used for future sampling.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.187	Temporary interruption to river continuity	No measurement of time given, not possible to understand the impact.	Include the period of time for this impact	Unresolved

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SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.256-2.5.278 & 2.5.324	Dredging activities and sediment release needs to be considered in-combination with any discharges to the marine environment that will contain sediment, such as tunnel boring waste water.	Worst case scenarios need to be considered for dredging and discharge activities in relation to seasonal stresses (temp, Do) and ecologically relevant times (migration periods).	Confirm and provide these combined assessments.	Unresolved
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.357-2.5.358	15µgl discharge concentration used for the month long model scenario looking at impacts to Minsmere Sluice. In 2.5.342 it is stated that the predicted discharge concentration will be 30µgl.	Why has the impact to Minsmere Sluice been modelled using half the predicted discharge concentration?	Explain why this assessment only uses half the predicted discharge concentration? Provide assessment that uses the 30µgl concentration.	Resolved, EA understand discharge will be at 15 µgl and will be considered in future Environmental Permit applications
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.385	Leiston Beck water body is 4.3km in length. It extends from the confluence with the Minsmere River to the Aldhurst Farm site.	Figure of 5.75km does not reflect actual length of watercourse. Minsmere Sluice is located in the Minsmere River water body.	Amend this statement in order to demonstrate the actual impact	Resolved
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.413	Details for the loss of these other habitats is not provided.	Unable to understand the impact.	Provide the details for each of the habitats being lost in the Leiston Beck water body.	Resolved
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.417	Complete loss of vegetation through the culvert combined with sheet piled sides will act as a barrier for the upstream dispersal of aquatic invertebrates.	It will not be possible for aquatic invertebrates to swim against the flow through a dark, un-vegetated and sheet piled culvert 68m in length.	This design will not facilitate the upstream dispersal of aquatic invertebrates.	Unresolved, although recognition of this impact has now been made and the design has been changed to offer some reduction in impact. See comments in 2.5.164. EA understand that NNBGenCo (SzC) Ltd are carrying out a design review to consider if the design of the structure could be optimised to further reduce impacts. . At Deadline 4 we anticipate confirmation of a design 15m wide, with an increased soffit height, which would be welcome.
SZC_Bk8_8.14_Water_Framework_Dir	2.5.424-2.5.426	Ecological connectivity for invertebrates will be significantly impacted by the proposed culvert crossing	Invertebrates: The Leiston Beck water body is currently classified at good ecological potential for invertebrates. The location of the proposed culvert crossing in compartment 1	Provide a detailed assessment of the potential impacts to invertebrates in the Leiston Beck as a result of the proposed culvert crossing across. A wide span bridge	Unresolved, see comments in 2.5.164 EA understand that NNBGenCo (SzC) Ltd are carrying out a design review to consider

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ective_Part_2_of_4		design, this could lead to a deterioration from good ecological potential for invertebrates to moderate ecological potential in the Leiston Beck water body. The Leiston Beck water body is approximately 4.3km in length and the location of the proposed crossing is approximately 2km from its confluence with the Minsmere River. A water treatment works upstream of the Lovers Lane crossing occasionally discharges untreated sewage effluent in to the upper reaches of the Leiston Beck water body during storm events. This has the potential to impact sensitive taxa in the upper part of the Leiston Beck, if upstream migration of invertebrates is prevented then any impacted stretches may not recover.	includes protected, rare and threatened species. Upstream dispersal of aquatic invertebrates will not be possible through an un-vegetated, dark culvert 70m in length. Most insects whose larvae develop in freshwater use polarization of light reflected from water for navigation (positive polarotaxis). These species will not go through a culvert of these dimensions for this reason, they will either turn back, or if they attempt to travel over the top of the culvert and road, may travel along the course of the road instead of the watercourse and attempt to oviposition upon the road surface, this is because they are deceived by artificial surfaces particularly roads which omit polarized light pollution. Numerous publications evidence these issues (Blakely et al 2006, Kriska et al 2009, Malik et al 2010, Manas et al 2011). We are unable to conclude that a potential for deterioration for invertebrates does not exist in this water body as a result of the proposed design.	would significantly reduce the impact to invertebrates and the resulting habitat fragmentation caused by an embankment and culvert design.	if the design of the structure could be optimised to further reduce impacts. . At Deadline 4 we anticipate confirmation of a design 15m wide, with an increased soffit height, which would be welcome.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.424-2.5.426	Fish will be reluctant to move through this culvert in certain conditions.	Culverts can inhibit fish movement, as the abrupt change in light and extended lengths of dark, un-vegetated and featureless watercourse is known to prevent fish movement during daylight. This can lead to large scale fish mortality when fish are prevented from moving along a watercourse during events when water quality is reduced to a critical level, such as algal blooms or pollution events. We acknowledge that a culvert will be unlikely to prevent the movement of some mobile fish species at night.	A design that maximises light penetration through the structure and reduces the abrupt change in light at the entrance and exit to any structure is much more likely to facilitate the movement of fish	Progress has been made on the design of the SSSI crossing and the current design will be more passable to some fish species. A threshold of light intensity will likely determine what species will pass under a watercourse crossing: **Low light intensities increase avoidance behaviour of diurnal fish species: implications for use of road culverts by fish. J Keep et al (2020)**
SZC_Bk8_8.14_Water_Framework_Dir	2.5.427	The fragmentation of the Leiston Beck caused by the proposed SSSI crossing could also impact the Minsmere Old	Impacts to biological features in the Minsmere Old River may occur as a result of the proposed SSSI crossing.	Provide a detailed assessment of the potential impacts to biological features in the Minsmere old River	Impacts to the Minsmere Old River as a consequence of the fragmentation of the Leiston Beck have not been considered.

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ective_Part_2_of_4		River, as this will be isolated from part of the Leiston Beck and the Sizewell Marshes SSSI			EA understand that NNBGenCo (SzC) are carrying out a design review to consider if the design of the structure could be optimised to further reduce impacts. At Deadline 4 we anticipate confirmation of a design 15m wide, with an increased soffit height, which would be welcome.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.592	The assessment states Smelt caught at Sizewell are considered to be part of a wider North Sea population. Numbers of individuals impinged have been compared with adult abundance estimates from monitoring surveys conducted in the River Elbe.	No evidence has been provided to support the position that smelt in the Ore/Alde water body are from a wider stock covering the North Sea. Smelt are an important species in the Ore/Alde water body and removing the species from the classification would result in an 11% deterioration in the fish classification. Given the predicted numbers of smelt to be impinged for the period when both SZB and SZC are operational, we are not able to conclude that a potential for deterioration to the Ore/Alde and possibly the Blyth water bodies does not exist.	Provide evidence that the immigration rate of smelt into the Ore and Alde (and possibly the Blyth) would exceed the exploitation rate at this location. If we cannot be confident that over time the smelt stock will not be reduced - we will be unable to conclude that a potential for deterioration is not present as a result of this project. This will need to be provided for any stock comparator being used.	Outstanding, insufficient evidence has been provided to confirm the appropriate stock comparator from, in the absence of any information on immigration rates from stocks outside of the Ore & Alde we must assume this is a discreet sub population. Resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of importance in the relevant water bodies if required.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.597	Modelling indicates that Sizewell C will abstract 0.383 per cumec of the fish abstracted by Sizewell B, because of the intake head design.	In BEEMS TR316 it was stated that LVSE intake designs are unproven and at present there is no experimental evidence that they would offer any additional impingement mitigation without the inclusion of a behavioural deterrent such as an Acoustic Fish Deterrent (AFD) system.	Further evidence is required to conclude that the LVSE intake design will reduce the number of abstracted fish as described.	The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	Table 2.58	Smelt mortality recorded as 9,139 after mitigation and 23,863 before mitigation.	FRR will not reduce mortality to this species so reduction is based on LVSE reduction.	Further evidence is required to conclude that the LVSE intake design will provide the reduction stated.	The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.
SZC_Bk8_8.14_Water_Framework_Dir	2.5.606	We have concerns that the method provided does not account for the fact that some	We have concerns that the method provided does not account for the fact that some	We are unable to conclude at this time that the EAV method provided by the applicant is the most appropriate.	Outstanding, resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of

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ective_Part_2_of_4		species will live to reproduce more than once and will have an EAV value of more than 1.	species will live to reproduce more than once and will have an EAV value of more than 1.		importance in the relevant water bodies if required.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.609	Given that the impingement numbers are extremely small and the number of species present would not be altered, no change in classification status is predicted.	We are unable to conclude that a potential for deterioration in the Ore/Alde and Blyth water bodies does not exist as a result of the proposed project.	Provide evidence that the fish species in the Ore/Alde and the Blyth would not be reduced to a point that would lead to a deterioration in these water bodies. If we cannot be confident that over time species such as the smelt will not be reduced to a point where we do not record them - we will be unable to conclude that a potential for deterioration is not present as a result of this project. This will need to be provided for any stock comparator being used for each of the relevant species.	Outstanding, resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of importance in the relevant water bodies if required.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.610 & table 2.60	1% of the SSB for a given species chosen as screening threshold to assess potential WFD deterioration against.	1% may be an appropriate screening threshold to use provided agreement has been reached that the relevant stock area for a given species is being used. In may not be appropriate to use large commercial fishery stock areas to measure the potential for deterioration of a sensitive species at a WFD water body level, particularly if sub-populations exist for that species.	The selection of a stock area that is relevant to measure impacts against for a given species is essential in order to assess the potential for deterioration at a water body level.	Outstanding, resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of importance in the relevant water bodies if required.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.614	BEEMS Technical Report TR406 (Ref. 2.25) considers that it is likely that 90% of bass would remain inshore of the Bank therefore the expected bass impingement would be reduced to 0.03% SSB.	Is this for the period when SZB and SZC are both operating? What would happen to bass stocks when SZB stops emitting a thermal plume inshore?	Risk that bass entrapment at the location of the SZC intakes may be underestimated for the period when SZC operates in isolation. Provide this assessment.	Outstanding, resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of importance in the relevant water bodies if required.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.615	BEEMS Technical Report TR406 (Ref. 2.25) considers it is highly unlikely that the landings represent more than 20% SSB and therefore the predicted impingement is reduced to approximately 0.1% SSB.	Is any evidence available to support this assumption? We would expect the precautionary principle to be applied in the absence of any evidence.	Provide evidence to support this position. If this is not available then apply the precautionary principle.	Outstanding, resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of importance in the relevant water bodies if required.

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SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.5.623	A precautionary survival rate of 0% was assumed for eggs of all species, except for Dover sole and seabass, which applied 20% and 50% survival rates, respectively based on experimental evidence.	Does the application of this survival rate for sole and bass take in to account the site specific trauma associated with a passage through the SZC cooling water system? Pressure change, temperature uplift and conditioning chemicals such as hydrazine, chlorine?	Trauma associated specifically with the SZC cooling water loop may not be fully considered.	Outstanding, resolution will be to secure requirements in the DCO to compensate for impacts to smelt and other species of importance in the relevant water bodies if required.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.6.643	Headwork design not accounted for and results should be should be considered as precautionary.	Without evidence demonstrating the effect of the proposed design it's not possible to determine if the LVSE without the inclusion of the AFD would make any reduction to impingement or even increase impingement from the SZB design.	We are currently unable to conclude that the LVSE intake design will reduce the number of abstracted fish as described.	The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.
SZC_Bk8_8.14_Water_Framework_Directive_Part_2_of_4	2.6.2	These tables demonstrate that the Stage 3 assessment did not indicate any parameters at risk of deterioration such that class status for any of the parameters would decrease. As a result, the proposed activities alone, as detailed in section 2.2, are considered compliant with the requirements of the WFD.	We have identified a potential for deterioration to invertebrates in the Leiston Beck as a result of habitat fragmentation caused by the SSSI culvert crossing. We have identified a potential for deterioration to fish in the transitional and coastal water bodies of the Ore & Alde and the Blyth as a result of fish entrapment from the cooling water system.	With the level of information currently provided we are unable to confirm that a potential to these element in these water bodies does not exist as a result of the proposed project	The potential for deterioration to invertebrates in the Leiston Beck due to the SSSI crossing has not been assessed.
SZC_Bk8_8.14_Water_Framework_Directive_Part_3_of_4	3.6.76	No mechanism for construction (or operation) of the overbridge to affect the hydromorphology and biology of the water body.	Although the proposed overbridge design will reduce the impact to invertebrates when compared to a culvert design, this does not mean that invertebrates in the River Alde will not be impacted by the crossing. The interference of reflected polarised light from the watercourse as a result of the crossing will reduce the upstream migration success of some species.	Provide an assessment of the potential impact to invertebrates as a result of habitat fragmentation caused by the proposed crossing.	Resolved, impact has been acknowledged and additional mitigation has been proposed (additional ditch networks will be created in the improved floodplain grazing meadow).
SZC_Bk8_8.14_Water_Framework_Directive_Part_3_of_4	3.6.77	The design of the culverts means that they would not present a barrier to the free movement of fish and other	Upstream dispersal of aquatic invertebrates is not possible through an un-vegetated, dark culvert 70m in length and is highly unlikely even at 45m in length. Most insects whose larvae develop in freshwater including the	Provide an assessment of the potential impact to invertebrates as a result of habitat fragmentation caused by the proposed culvert crossings.	Resolved, impact has been acknowledged and additional mitigation has been proposed (additional ditch networks will be created in the improved floodplain grazing meadow).

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		aquatic organisms in the two small watercourses.	species of beetles identified during the phase 1 surveys use polarization of light reflected from water for navigation (positive polarotaxis). These species are unlikely to go through a culvert of the proposed dimensions for this reason, they will either turn back, or if they attempt to travel over the top of the culvert and road, may travel along the course of the road instead of the watercourse and attempt to oviposition upon the road surface, this is because they are deceived by artificial surfaces particularly roads which omit polarized light pollution. Numerous publications evidence these issues (Blakely et al 2006, Kriska et al 2009, Malik et al 2010, Manas et al 2011).		
SZC_Bk8_8.14_Water_Framework_Directive_Part_3_of_4	3.7.66	The design of the culverts means that they would not present a barrier to the free movement of fish and other aquatic organisms in the two small watercourses.	Abundant evidence demonstrates that culverts inhibit the movement of invertebrates in both their aquatic and adult life stages. Although this unlikely to cause a deterioration to the water bodies affected by this development it will result in an impact to these species	Provide an assessment of the impact to invertebrates from the proposed crossings.	Resolved, impact has been acknowledged and additional mitigation has been proposed (additional ditch networks will be created in the improved floodplain grazing meadow).
SZC_Bk8_8.14_Water_Framework_Directive_Part_4_of_4	Table 4.7	C2: Cumulative impacts to the Leiston Beck water body: does not appear to consider the loss of ditch habitat, with the loss of fen meadow habitat, with the loss of wet woodland habitat, with the fragmentation of habitat caused by the SSSI crossing, combined with the temporary loss of habitat from the construction areas needed for each of these activities.	Cannot determine if the cumulative assessment has captured all of the impacts that are happening in the water body. Has this been assessed against each of the WFD elements?	Provide clarification/assessment of these cumulative impacts to biological elements in the Leiston Beck.	The potential for cumulative impacts to the Leiston Beck waterbody has not been assessed.
	4.3.9	The cumulative assessment for fish is incomplete. This section of the WFD Assessment needs to assess whether the activities in combination could impact on a water body. It is not sufficient	A deterioration was not predicted when the thermal discharge and impingement and entrainment activities were assessed individually. However in our view there are still uncertainties (e.g. assumed thermal occlusion thresholds) and gaps (e.g. the	Provide further assessment of activities in combination	Unresolved, consideration being undertaken in WDA permitting space and results may not be available to inform assessment.

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		to assess if the same individual fish could be impacted by separate activities. The estuary classification could also be impacted if the physically separated activities impact different fish and in combination result in fewer fish overall from a species entering the estuary. Based on the evidence presented we cannot conclude if the activities in combination present a risk of deterioration to the fish WFD quality element of estuaries or not.	impact of the thermal plume on the behaviour of marine migrant species such as dover sole & grey mullet is not considered) in the evidence presented to assess these activities individually. As we are unable to agree with the conclusions regarding the impact of these activities alone, we also cannot agree at this stage with the conclusion that a risk of deterioration is not predicted from the activities in combination.		
SZC_Bk8_8.14_Water_Framework_Directive_Part_4_of_4	Table 4.24	MLA/2017/00033 Gives a description of an operational maintenance requirement from SZB (desilting the forebays).	This is listed under Sizewell B decommissioning, when this is an operational activity.	SZB operational activities should be a separate section to SZB decommissioning, which is not forecast to commence for some years.	Unresolved, EA are awaiting clarity from NNBGenCo (SzC) Ltd.
SZC_Bk8_8.14_Water_Framework_Directive_Part_4_of_4	Table 4.24	Sizewell B, some operational activities have not been included.	What are the combined impacts for periods when SZC construction is underway combined with an outage at SZB.	Provide an assessment of all the SZB operations in-combination with SZC construction and operational activities.	Unresolved, EA are awaiting clarity from NNBGenCo (SzC) Ltd.
SZC_Bk8_8.14_Water_Framework_Directive_Part_4_of_4	Table 4.24	Decommissioning of the SZA station not included	Cannot assess any combined impacts from the decommissioning of SZA	Provide an in-combination assessment of all SZC, SZB and SZA impact pathways	Unresolved, EA are awaiting clarity from NNBGenCo (SzC) Ltd.
SZC_Bk8_8.14_Water_Framework_Directive_Part_4_of_5	4.5	Some of the combined assessments we require to reach our conclusions are missing.	We are not able to agree with this conclusion with the present level of information	Provide the missing information	Unresolved, EA are awaiting clarity from NNBGenCo (SzC) Ltd.
Habitats Regulations Assessment					

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Shadow HRA Report Volume 1	8.3.79	It in this section the use of 1% and 10% thresholds were covered. It states in this paragraph that "Similar thresholds were used and accepted during the assessment for Hinkley Point C", which is not correct.	We consider for some migratory species other measured of sustainability may be more appropriate	Rather than apply generic thresholds each feature needs to be considered on its own merit with quantitative assessment being used alongside a narrative for the feature which considers the conservation status of that feature in the light of the conservation objectives (and which may include quantitative and qualitative description).	NE are the Statutory Nature Conservation Body for DCO advice. The Environment Agency is a competent authority for the purposes of the Habitats Regulations when determining applications for permits, consents and licences for which it is the regulatory authority.
5.10 Shadow Habitats Regulations Assessment. Volume 1: Screening and Appropriate Assessment.		The Environment Agency's main remit in DCO is with regard to migratory (diadromous) fish species and to Water Framework Directive compliance. Eel are however, prey for bitterns. We therefore note that indirect effects may not all have been addressed for all appropriate bird species.	While effects on seabirds via their prey have been considered, there may be similar routes by which non-seabird species may be impacted. For example, breeding bittern (Minsmere-Walberswick SPA and Benacre to Easton Bavents SPA). At Minsmere at least, there is a specific objectives for 'supporting habitat: food availability' which requires the maintenance of the distribution, abundance and availability of key food and prey items. As eel are predicted to be entrapped at SZC and thermal/chemical plumes may intersect with the Minsmere sluice, there would seem to be pathways by which breeding bittern could be impacted.	Bittern should be considered in HRA	NE are the Statutory Nature Conservation Body for DCO advice. The Environment Agency is a competent authority for the purposes of the Habitats Regulations when determining applications for permits, consents and licences for which it is the regulatory authority.
5.10 Shadow Habitats Regulations Assessment. Volume 1: Screening and Appropriate Assessment.		The Environment Agency's main remit in DCO is with regard to migratory (diadromous) fish species and to Water Framework Directive compliance. However, through our review of entrapment predictions we note that marine invertebrates and gobies are vulnerable to entrapment. We therefore note that indirect effects may not all have been addressed for all appropriate bird species.	While effects on seabirds via their prey have been considered, there may be similar routes by which non-seabird species may be impacted, for example, breeding and non-breeding avocet (Alde-Ore Estuary SPA). These features have specific objectives for 'supporting habitat: food availability' which requires the maintenance of the distribution, abundance and availability of key food and prey items *(e.g. Gammarus, Corophium, flies, beetles, Nereis, Hydrobia, Cardium, gobies) at preferred sizes (e.g. fish or worms between 4-15 mm long)* Gobies are both predicted to be entrapped at Sizewell C and so there would seem to be a pathway by which these features could be impacted.	Breeding and non-breeding avocet should be considered in HRA	NE are the Statutory Nature Conservation Body for DCO advice. The Environment Agency is a competent authority for the purposes of the Habitats Regulations when determining applications for permits, consents and licences for which it is the regulatory authority.

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5.10 Shadow Habitats Regulations Assessment. Volume 1: Screening and Appropriate Assessment.	6.5.3 to 6.5.6 (and Table 4.5 in Section 4.3.1)	We are unsure how Natura 2000 sites have been selected with regard to potential losses of river lampreys.	Losses have been assessed against estimated spawning migration run sizes for the Humber SAC. However, there also appear to be mainland European Natura 2000 sites for which river lamprey are features, but potential losses to these SACs do not seem to be assessed in the same way. From Table 4.5, river lampreys are features of:' Schelde- en Durmeëstuarium van de Nederlandse grens tot Gent Site of Community Importance', 'Unterweser SCI', 'Weser bei Bremerhaven SCI', 'Nebenarme der Weser mit Strohauser Plate und Juliusplate SCI', 'Schleswig-Holsteinisches Elbästuar und angrenzende Flächen SCI', 'Unterelbe SCI', 'Mühlenberger Loch/Neßsand SCI', 'Hamburger Unterelbe SCI', 'Elbe zwischen Geesthacht und Hamburg SCI'	Include consideration of potential impacts upon all relevant designated sites for river lamprey.	NE are the Statutory Nature Conservation Body for DCO advice. The Environment Agency is a competent authority for the purposes of the Habitats Regulations when determining applications for permits, consents and licences for which it is the regulatory authority.
Eels Regulations Assessment					
SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Regulations_Assessment	3.2.16 5.3.25 5.3.29	A review of the proposed LVSE design and its ability to reduce the number of impinged fish is currently being undertaken by the Environment Agency. We are currently not able to conclude that the impact has been reduced as described by the applicant.	We are currently reviewing BEEMS SP099 V3. The LVSE design proposed for SZC and its fish protection compliance are currently being assessed.	We are currently unable to conclude that the LVSE intake design will reduce the number of abstracted fish as described.	It is stated that the low velocity side entry (LVSE) intake heads will reduce the number of fish impinged. An LVSE reduction factor has been calculated as a measure of the mitigation offered by the LVSE intake head at SZC relative to the conventional heads in operation at Sizewell B (SZB). The Environment Agency considers that no evidence has been supplied that demonstrates the LVSE intakes will reduce impingement of eels and as such cannot agree with the LVSE reduction factor as applied in TR406 v7.
SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Re	3.3.11	It's unclear what life stages this information relates to. It should be noted that eels move between depths at a rate of their choice which does not result in trauma. This does not mean that experiencing a	Eels experiencing this hydrostatic pressure change in a short period of time may result in trauma as the eel has no control over the speed of change. Yellow eels have not undergone any physiological change to their swim bladders and may also be more vulnerable to pressure change. The parasite,	Provide details of what life stages this assessment of potential barotrauma applies to, highlight any life stages where impact of hydrostatic pressure are not known. Provide Barotrauma damage threshold details (log ratio pressure LRP). Compare SZC pressure change to natural movement to	Unresolved, evidence is required of hydrostatic pressure impacts for the yellow eel life stage. A precautionary factor needs to be applied to the predicated survival of impinged eels to account for this uncertainty.

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
gulations_Assessment		change in depth and pressure in a short period of time as a result of passage through a cooling water loop will not result in trauma. Silver eels migrating back to the Sargasso have also experienced physiological change including changes to the swim bladder to accommodate this migration.	Anguillicoloides (Anguillicola) crassus may also alter tolerance to pressure change.	depth for this species for each life stage. Provide details of any known change in pressure tolerance as a result of infestation from Anguillicola.	
SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Regulations_Assessment	3.3.14 - 3.3.21	There are three key limitations to the surveying: 1) Monitoring at the location of the SZC intakes/outfall was limited to 8.75 hours of sampling conducted over 11 days in April and May 2015. 2) In 2015 data shows that the main glass eel run at Flatford Mill on the Stour estuary in Suffolk, took place in June with 7892 out of the 8554 glass eels recorded that year, running in that month, the next most productive month was July. This is the closest monitoring station the Environment Agency has to SZC, which is located to the south of the proposed intake location (glass eels would be expected to be observed at this location before they arrive at the SZC location). 3) In 2014 16310 glass eels were recorded passing through the Flatford glass eel monitoring station, this is nearly double the number recorded at the same location in 2015.	These limitations impact the conclusions of the survey as follows: 1) This is considered too small an amount of sampling effort to concluded potential impacts from. The survey design, as well as taking place too early in the year for this location, did not include all of the variables that could influence glass eel movements at this location, such as monitoring in dark conditions (at night) and monitoring at different stages of the lunar cycle. 2) This would indicate that the monitoring that was conducted by CEFAS to assess the potential numbers of glass eel present at the location of SZC intakes took place too early in the season (April and May). 3) This demonstrates inter-annual variation is an important consideration at this site and potential impacts cannot be concluded from a small amount of sampling conducted in a single year.	Update this section and include the limitations around the survey design and why it is not possible to draw conclusions on the potential entrainment of glass eels at the location of the SZC intakes. Amend the information to show that peak migration can take place later than suggested at this location and include details around inter-annual variability being an important consideration at this site. Suggest using 2015 as the reference year. Monitoring commenced on the Stour at the end of April, with the first glass eels being recorded in May (144), June recorded the highest number (7892), followed by July (345).	Unresolved. Looking at all available evidence it is likely that sampling missed peak migration at the location of the SZC intakes. Due to the presence of eel in catchments draining into Greater Sizewell Bay, the capture of yellow eel in impingement monitoring, and the capture of the single individual in the limited glass eel surveys (8.75 hrs of sampling) it is likely that glass eel pass Sizewell and that they will therefore be entrained at SZC. The scale and impact of entrainment cannot be quantified with certainty.

<table>
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<tr><td>SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Regulations_Assessment</td><td>3.4.2</td><td>The predicted survival for glass eels has not been provided.</td><td>Cannot assess predicted survival rates for glass eels as no figure has been provided.</td><td>Provide predicted survival rate for entrained glass eel at SZC.</td><td>Unresolved. BEEMS TR395 Conducted experiments on glass eels but the BEEMS Entrainment Mimic Unit (EMU) was not available for these experiments therefore the pressure profile and mechanical damage predicted to be experienced by glass eels at SZC could not be simulated in combination with temperature elevation and chlorination. The Environment Agency was unable to conclude predicted survival rates from TR395 and so NNBGenCo (SzC) produced a revised version of TR273 (v4).

BEEMS TR273 v4 describes an expected survival rate of 82.8% for glass eels entrained at SZC. This does not appear to consider the 9% of the eels that pass through the band screens. 91% would have drum screen mortality levels replicated through the EMU whereas the 9% through the band screens would have 100% mortality. Mean survival of 82.8% of the 91% of glass eels passing through the drum screens would give an overall figure of 75.35% survival. If the L95 figure is used then 77.16% survival of the 91% of glass eels that pass through the drum screens = 70.22% survival -1.8% for pump damage = 68.42 % survival from passage through the drum and band screens.
<table>
<tr><th>PTC group</th><th>Mean survival %</th><th>L95 survival %</th></tr>
<tr><td>Combined survival of drum and band screen with pump damage adjustment</td><td>75.35</td><td>68.42</td></tr>
</table>
This does not include any precautionary adjustments for exposure to heat and chemical stress whilst being exposed to pressure and/or mechanical stress</td></tr>
</table>

Document Title	Paragraph number	Issue	Comment	Suggested solution	Current Position
					simultaneously as a this could not be replicated in the experiments, TRO fluctuations had a significant effect on survival, higher temperature profile and the resulting increased mortality this causes for eels migrating later in the season does not appear to be included, hydrazine exposure cumulatively with other stresses has not been included and no adjustment has been made for eels that suffer mortality after the observed 24h period. This is not considered a precautionary assessment.
SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Regulations_Assessment	3.4.8-3.4.9	BEEMS TR395 did not include pressure change or condition chemicals such as hydrazine. Temperature should represent the expected temperatures at SZC during June-July when peak migration occurs. A more precautionary assessment is required in the absence of a comprehensive experiment. Pressure change for HPC assessed in BEEMS TR273. Is the intake depth and pressure change the same at HPC and SZC? Hydrazine and other condition chemicals appear to have also been excluded from this experiment. Does TR273 include the trauma associated with second pressure change and mechanical trauma from travel through the outfall pipe prior to discharge?	It is not possible to conclude what effect a passage through the SZC cooling water loop will have on glass eel survival. Experiments should include replication of passage through a 3km pipe, pressure change, trauma from passage through a pump, temperature uplift, exposure to the range of chemicals to be used at SZC, second passage through a 3km pipe and second pressure change prior to discharge at the outfall. It will not be possible to assess the cumulative impact of these traumas on glass eels if they are not all incorporated.	Use worst case survival predictions. Provide a clear description of the limitations of the glass eel EMU experiments and the eel surveys undertaken at Sizewell.	Unresolved. BEEMS TR395 Conducted experiments on glass eels but the BEEMS Entrainment Mimic Unit (EMU) was not available for these experiments therefore the pressure profile and mechanical damage predicted to be experienced by glass eels at SZC could not be simulated in combination with temperature elevation and chlorination. The Environment Agency was unable to conclude predicted survival rates from TR395 and so NNBGenCo (SzC) produced a revised version of TR273 (v4). BEEMS TR273 v4 describes an expected survival rate of 82.8% for glass eels entrained at SZC. This does not appear to consider the 9% of the eels that pass through the band screens. 91% would have drum screen mortality levels replicated through the EMU whereas the 9% through the band screens would have 100% mortality. Mean survival of 82.8% of the 91% of glass eels passing through the drum screens would give an overall figure of 75.35% survival. If the L95 figure is used then 77.16% survival of the 91% of glass eels that pass through the drum screens = 70.22% survival -1.8% for pump damage = 68.42 % survival from passage through the drum and band screens.

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This does not include any precautionary adjustments for exposure to heat and chemical stress whilst being exposed to pressure and/or mechanical stress simultaneously as a this could not be replicated in the experiments, TRO fluctuations had a significant effect on survival, higher temperature profile and the resulting increased mortality this causes for eels migrating later in the season does not appear to be included, hydrazine exposure cumulatively with other stresses has not been included and no adjustment has been made for eels that suffer mortality after the observed 24h period. This is not considered a precautionary assessment.
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<tr><td>SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Regulations_Assessment</td><td>5.2.49-5.2.51</td><td>What discharge concentration is being used for this assessment as both 15µgl and 30µgl concentrations have been proposed? Is this assessment for the commissioning phase or the operational phase? Bioaccumulation is described as medium by Slonim and Gisclard (1976)</td><td>Unsure of the discharge concentration being referred to in this assessment. Hydrazine impacts during either the commissioning or operational phase may not be provided. Hydrazine bio-accumulates to a higher degree than stated.</td><td>Clarify what discharge concentration this assessment refers to. Clarify if this statement applies to the commissioning or operational phase. Provide reference for the evidence of hydrazine having a low bioaccumulation potential.</td><td>Resolved</td></tr>
<tr><td>SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Co</td><td>5.3.27</td><td>Does this include trauma specific to the SZC location such as passage through 3km of pipe and barotrauma x2.</td><td>Potential underestimate of mortality as trauma specifically associated with the SZC cooling water loop may not be included.</td><td>Add detail of the additional trauma experienced from the SZC cooling water loop.</td><td>See comments in 3.4.2-3.4.9</td></tr>
</table>

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mpliance_Regulations_Assessment					
SZC_Bk6_ES_V2_Ch22_Marine_Ecology_Appx22O_Eels_Compliance_Regulations_Assessment	5.3.51	Migrating eels can use chemical signals to navigate to freshwater (Cresci 2020).	Has an assessment of the chemicals in the SZC cooling water discharge been undertaken to assess if it could act as an attractant to migrating eels seeking chemical cues.	Assess whether the SZC plume will attract or disrupt migrating eels.	Unresolved, issue dismissed without the provision of any evidence.

Appendix B: Issues raised in relation to revised DCO application

To help you, where possible, we have laid out our comments in the following format:
Issue – indicating a particular area of concern;
Comment – which discusses that issue in greater detail and the potential impact;
Suggested solution – which presents a potential solution to the issue in the form of information, or evidence that - if provided - might ensure that no adverse impact will arise, or identifies a potential mitigation measure for you to consider.

Document Title	Paragraph number	Issue	Comment	Suggested solution
Marine Ecology				
BEEMS Scientific Position Paper SPP103 Consideration of potential effects on selected fish stocks at Sizewell version 3.		The effort to consider localise impacts is welcomed. But the applicant has submitted a new approach to assessing localised stock, which we have not seen in submissions up to now. It appears to follow approaches used in other fish movement box models, but the model attributes are not provided in detail. The report highlights this is a conceptual model and gives a number of broad assumptions used in its application for fish. These assumptions will give a degree of uncertainty to the results, which is recognised but the level of which is not known. The assessment is also based on impingement/intake data that we have questioned, so that may not be the correct input data to apply, e.g. The LVSE factor	The assumptions that fish will not move out of the 4c area is perhaps not conservative for sprat given that there is a question over the localised nature of outer Thames stock. The exclusion of behavioural traits of fish and their more mobile nature will mean the model could be wrong. There is no tag recapture data to support the model, as has been used in movement models performing a similar purpose. The results may be accepted as a possible solution to help understand the scale of localised effects for some species, but the uncertainty in the outputs could be considerable and make it difficult to use this in more than a broad indication. The model includes the 'LVSE factor' of 0.357 as calculated in SPP099. . The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. Use of a different LVSE factor would affect the results of the Local Area Effect model. . The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable.	A precautionary LVSE factor should be applied to the Local Area Effect model. We welcomed the Report SPP103 to explore the local effects of SZB and SZC impingement on certain fish species. The model is noted to require a number of assumptions and there is inherent uncertainty in the outputs, but it is helpful as a broad relative indication of local impacts to use alongside other evidence We still raise the original issue over scales of assessment for a reduced number of fish species (which we refer to in Table 2 and in our comments in our the Marine Ecology section)
BEEMS Scientific	Table 1 (pg19)	Shows the changes to the scales of assessment for the	We are not sure of the references being used.	

Document Title	Paragraph number	Issue	Comment	Suggested solution
Position Paper SPP103 Consideration of potential effects on selected fish stocks at Sizewell version 3.		stocks taken from TR406 version 6. Dab areas have reduced, thornback ray have altered and increased further north of Norway. We expect a further revision (v7) of TR406. However, the table appears to have errors as a result possibly of taking it from an another report – references are not correct in the reference list and the sprat area is a mismatch	We continue to question the sprat scale of assessment as the text in table 1 contradict the references and subsequent text (section 2.6, p22). The sprat scale in table 1 states subarea 4 which is smaller than that given in other parts of the text (4 plus 3a).	We still require confirmation that the scale in table is incorrect as the continued text and underlying WKSPRAT 2018 report suggest it is 4 plus 3a that has been used in the assessment.
BEEMS Scientific Position Paper SPP103 Consideration of potential effects on selected fish stocks at Sizewell version 3.	2.7 Sea bass	We asked for more information on how the applicant had decided on the scale of assessment for seabass and extra information has been provided.	The extra information is useful but seems to not yet be conclusive as to whether bass in the North Sea should be considered part of a separate sub-population to the Irish Sea (or elsewhere) due to small sample sizes of tagged fish – something the applicant acknowledges, but argues that this as a reason for not splitting the stock. Splitting the stock into smaller scales of assessment would increase the proportion of fish in that stock impacted by entrapment in the cooling water intake	A more conservative approach using a smaller scale of assessment is required.
BEEMS Scientific Position Paper SPP103 Consideration of potential effects on selected fish stocks at Sizewell version 3.	2.6 Sprat	WKsprat 2018 can be considered the latest and therefore best advice on the stock from ICES, and we agree it supersedes the 2013 advice for this reason. But it does still leave untouched the original points provided in the 2013 ICES advice which highlights that there are potentially localised stocks of sprat in the outer Thames estuary (Section 4.5) which includes the GSB. Stating in relation to this area that "*there are several peripheral areas of the North Sea where there may be populations of sprats that behave as separate stocks from the main North Sea stock. Local depletion of sprats in such areas is an issue of ecological concern*". This raised concerns over stocks in ICES expert	WKSPRAT does not answer this issue but focuses on the difference or not between 4 and 3a more generally. It does create doubt over whether the sprat along the Sizewell coast stock can be as confidently aligned with the area 4 scale of assessment given ICES own doubts for coastal stocks and the possibility they are "separate stocks". Overall the 2018 ICES report provides new evidence that they used as part of a wider WoE (genetics, physical measures, etc.) to determine the merging of 4 and 3a. But did not look to resolve the questions over localised stocks.	No information is provided to resolve the question over localised stock, but the approach to use the local model in SPP103 for estimating sprat losses has perhaps superseded this approach in relation to HRA and impact on sprat as a prey species. As such we would draw attention to the comment on the local effect model in SPP103 above and the need to ensure the model uses an agreed LVSE reduction factor.

Document Title	Paragraph number	Issue	Comment	Suggested solution
		group over the stock structure given the further action needed on "*…, Moray Firth and English channel probably not well resolved, coastal sprat also an issue."* (WKsprat 2018)		
BEEMS Scientific Position Paper BEEMS Scientific Position Paper SPP103 Consideration of potential effects on selected fish stocks at Sizewell version 3.	Section 2.1, Allis shad, p13	The applicant proposes that the Garonne stock is the likeliest source for the occasional fish that are caught in summer feeding grounds that are present in the North Sea, although they acknowledge that there are smaller populations nearby. No evidence is presented as to why the North Sea fish would come from a more distant, larger, population as opposed to a closer, smaller, population. No population estimates are provided for rivers other than the Garonne. Self-sustaining populations in Brittany and Normandy are mentioned but no references/population estimates cited.	Predicted annual impingement of allis shad is small (mean = 2, L95 = 0, U95 = 13) and if shad come from a mixture of populations, then the chance of an impact on any one population is correspondingly reduced. However, comparing losses to the largest European population is potentially misleading.	Within EIA, consideration should be given to potential impacts on populations other than that of the Garonne. We acknowledge that in SPP103 (Rev 3) the Applicant says they will assess the potential impacts on population in the Tamar for the HRA, but we would want to see more evidence associated with the Brittany and Normandy Allis shad population to complete a more balanced assessment. See comments for SPP100.
TR339 Sizewell Comprehensive Impingement Monitoring Programme 2009-2017 Revision 3	General comment	Work to date on the audit has identified issues with the calculations made by the applicant. Our audit outcomes may result in us using different values for SZB impingement in our permit determination than those presented in TR339	In order to determine the Water Discharge Activity permit for SZC, we need to know the biomass of dead/dying fish and invertebrates that may be discharged. Consequently, we will be carrying out an audit of Comprehensive Impingement Monitoring Programme data and the production of annual impingement estimates as part of our permit determination. This may result in us using different values for SZB impingement in our permit determination than those presented in TR339.	We are awaiting some information within the WDA permit determination process from the applicant to address these issues. We will need to address this through that determination process. It is uncertain at present that the applicant will be able to provide the information requested via the WDA. If the information is not provided we will need to find a way of addressing the consequent uncertainty in scale of the SZB impingement. This maybe through conservative assumptions. The scale of mortality of fish from impingement is a fundamental part of the EIA. As such it is important that there is alignment as far as possible between the assessments undertaken for individual plans and permits associated with the SZC development, but this may not be possible
TR520: Sizewell C Influence of the fish recovery and return system on water quality and ecological receptors	General comment	The figures contained in this report depend upon factors such as the estimated performance of the Low Velocity Side Intake (LVSE) heads, the Fish Recovery and Return (FRR) system, and the scale of the SZB impingement. We will be investigating the performance of the LVSE and FRR and undertaking an audit of		We will be assessing this report during the determination of the Water Discharge Activity permit for SZC. Consequently, the values we use in our determination may differ from those presented in TR520. This may have implications beyond the WDA and effect work of other Defra organisations.

Document Title	Paragraph number	Issue	Comment	Suggested solution
		the impingement data as part of our determination and consequently, the values we use in our determination may differ from those presented in TR520.		
SPP099 Predicted performance of the SZC LVSE intake heads compared with the SZB intakes		Work to date on has identified issues with the approach taken by the applicant.	In order to determine the Water Discharge Activity permit for SZC, we need to know the biomass of dead/dying fish and invertebrates that may be discharged. Consequently, we will be reviewing SPP099 as part of our permit determination. This may result in us using different values for the 'LVSE factor' in our permit determination than those presented in SPP099.	The LVSE intake is proposed as a mitigation measure to reduce the impingement of fish. The Environment Agency considers that there is significant doubt on the degree of mitigation (LVSE reduction factor) that is offered by the LVSE. The consequence of this is that the predicted impingement at SZC may have been underestimated and the impacts to species of relevance under the EIA and WFD may be found to be unacceptable
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	Executive Summary, paragraph 2, p4 of 19	'*The purpose of this report is to identify the possible spawning populations and to estimate their sizes based upon existing monitoring data*'	SPP100 must include recognition that existing monitoring data is not consistently collected which prevents robust assessment of the populations It is also important as a conservation species that the historical carrying capacity is considered not just the vastly suppressed current population and distribution levels. Without recognising the level of uncertainty around the estimates presented, we cannot have confidence in them, given the many assumptions made during their calculation.	Confidence levels must be included in all estimates. If the confidence levels are not sufficient for the purpose then alternate monitoring (e.g. mark-recapture) or alternate (qualitative?) analysis of impact will be needed.
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	1.1 Twaite shad population in the North Sea	The biological population structure of twaite shad is not adequately described by the paper, which means that a reader may not fully understand the potential for impact. We do not agree that twaite shad on the European southern North Sea coast are from one population.	This may be a result of genetic distinction not having time to re-establish as the re-colonisation is likely to have come from a limited source. That does not mean there is one large inter-changeable population only that genetic diversification is yet to re-establish between catchments. Historically it is likely that the populations were genetically distinct to some degree - as supported by the distinction that remains between the North Sea and Baltic.	Include description of spawning site fidelity and the likelihood of there being discrete river populations in SPP100. Do not equate genetic homogeneity ('genetic stock') to there being 'one population', when there are almost certainly separate 'biological stocks' which may be detrimentally impacted if mortality exceeds immigration rate.
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	1.1 Twaite shad population in the North Sea	'*Sizewell C is expected to impinge fish from different European rivers on a pro-rata basis according to their abundance and it is therefore considered highly unlikely that there would be a significant effect on the population in any given river*'		Include consideration of other scenarios as to the river of origin of twaite shad and the proportions in which they might be impinged. Acknowledge that the proportions from different rivers are not known, and that these rivers a highly likely to be discrete populations (albeit with some unknown amount of straying from nearby rivers).

Document Title	Paragraph number	Issue	Comment	Suggested solution
		Without acknowledging other possible scenarios, the potential impacts of SZC are not adequately described.		
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	3.1 Population estimation	It isn't entirely clear, but it appears that the population estimates have been made by CEFAS using results from the Elbe and Scheldt. If so, it would be useful to explain in what form the people collecting the data present their results.	It is not clear whether the population estimates presented have been calculated by CEFAS, or by the German and Belgian researchers whose data is being used. Do they use abundance estimates (as in Magrath & Thiel, 2013)?	Clarify in the text whether the calculation of population estimates is a method employed by CEFAS alone.
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	3.1 Population estimation	There seems to be room for considerable uncertainty in the way in which population estimates have been multiplied up from the catch data, but no confidence limits are given around the estimates. This approach seems flawed in that shad do not migrate over the whole width of the river, nor do they migrate at a constant rate (fish/hour) over the whole of the migration season - their run is influenced by water temperature and lunar cycle. Further exploration of the ratio of day: night migration is also needed. EA staff have participated in anchor netting on the Scheldt, catches vary hugely each day (with zero catch days not being uncommon) and so scaling 24hr averages up to 30 days does not seem reasonable. No consideration is given to the shoaling behaviour of twaite shad. If a shoal is caught, the number of individuals per unit time may appear high but shad will not be evenly distributed in space and time (due to their shoaling behaviour as well as	The assumptions used in the method, the likelihood of these assumptions holding true, and the implications for the population estimate if they do not, are not adequately described in SPP100. Without confidence limits it is difficult to see how much reliance can be placed on these population estimates – based on 2-5hr samples of 8m wide nets in large estuaries. There seem to be numerous assumptions being made (constant migration rate over the season, no difference in diurnal and nocturnal migration rate, constant migration rate over the width of the channel). Without confidence limits it is difficult to interpret the population estimates. Also, the inherent uncertainty might be why Magrath & Thiel presented results as individuals per 10^6 m^3 rather than population estimates. If migration is not even throughout the 24hr period, populations may be over, or under, estimated.	Given that the analysis of impingement losses depends upon the population estimates provided, consideration of confidence limits is needed for the population estimates derived from multiplying up limited net samples. If the confidence levels are not sufficient for the purpose then alternate monitoring (e.g. mark-recapture, fish counter data, spawner counts) or alternate analysis of impact will be needed (qualitative assessment perhaps). It may help to refer to Thiel, Sepulveda and Oessman (1996) Occurrence and distribution of twaite shad (*Alosa fallax* Lacapede) in the lower Elbe River, Germany. Conservation of Endangered Freshwater Fish in Europe. Kirchhofer & Hefu (eds), which says 'Adults and Age 1+ group were less abundant in marginal areas than in the main channel'.

Document Title	Paragraph number	Issue	Comment	Suggested solution
		the way they respond to environmental cues).		
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	3.2 Shad population	There is large variation in the annual estimates for the Elbe and Scheldt presented in Figure 7 and Table 1. No confidence limits are placed around the estimates	It is difficult to understand how reliable the estimates in this table and figure are without recognition of the (considerable?) uncertainty in the estimates. Does the variation represent genuine population fluctuation, is it the result of particular environmental circumstances in some years, or is it just that the method produces that much error? Were there really 52,052 twaite shad in the Elbe in 2012 and >5 million in 2017? Were there really 8,904 twaite shad in the Scheldt in 2013 and 198,705 in 2016? The Scheldt population is a recovering one, first seen in 2010, a typical life strategy for twaite shad is 5 years. Is a 2016 population of 198K+ credible as having originated from (presumably) relatively few colonizing individuals?	Confidence levels need to be presented and the apparent fluctuation in population explained. Supplementary data (e.g. fish counter data) would also be useful to help verify the population estimates presented, or may actually provide better estimates. On the Elbe, the Deep Vertical Slot fish pass at the Geesthacht weir (forming the tidal limit upstream of Hamburg) has been monitored by the Institute of Applied Ecology (*Institut Für Angewandte Ökologie)* since its construction in 2010.
SPP100 Estimates of European populations of twaite shad and cucumber smelt of relevance to Sizewell	3.3 Smelt population	As with twaite shad, no confidence limits are given so it is difficult to interpret data	It is difficult to understand how reliable the estimates in this table and figure are without recognition of the (considerable?) uncertainty in the estimates. Does the variation represent genuine population fluctuation, is it the result of particular environmental circumstances in some years, or is it just that the method produces that much error? Were there really 2M smelt in the Elbe in 2009 and 2010 then 16M and 107M in 2011 and 2012 (i.e. was 2009 population really 1.8% of 2012 population)?	Confidence levels need to be presented and the apparent fluctuation in population explained. Include more information on how estimates have been derived e.g. number of samples, numbers of individual fish, CPUE.
SPP101 – Implications of tidal elevation and temperature on smelt, *Osmerus eperlanus*, impingement at Sizewell		We cannot provide further comments on this paper at this stage.	However this document will be assessed under the Water Discharge Activity (WDA) permit. The conclusions of which will inform the cumulative assessment of impacts to the fish element in the Ore & Alde and Blyth water bodies under the WFD compliance assessment in the DCO examination. If we are unable to conclude the assessment of the impact of the thermal plume in the determination of the WDA permit prior to the examination of the DCO we will be unable to advise the examining authority on the likely level of impact this could additionally place on the fish stocks in the WFD water bodies of	To be assessed as part of the WDA permit

Document Title	Paragraph number	Issue	Comment	Suggested solution
			concern and to species we have specific duties to conserve under the Environment Act 1995.	
SPP104 Worst case glass eel entrainment for Sizewell C Rev 3		The scale and impact of entrainment cannot be quantified with enough certainty.	The review we undertook of SPP104 and the comments we created have already been provided to the company. The impact being assessed in this report is from entrainment losses and sits within the DCO, although there may be some overlap with the Eels (England & Wales) Regulations assessment for our permit determination. While thermal plumes are unlikely to cause a problem to eel migration; hydrazine plumes around the Minsmere sluice are an area of concern that will need to be assessed as part of the WDA process. However, this impact is unlikely to alter the overall, assessment of impacts to the Anglian RBD eel stock BEEMS SPP104 v3 uses limited survey data and extrapolates this information to provide a worst case eel entrainment figure. Whilst this provides information on what entrainment might be at SZC, the speculative calculations do not allow conclusions to be drawn about the impact of entrainment. Looking at all available evidence it is likely that sampling missed peak migration at the location of the SZC intakes. Due to the presence of eel in catchments draining into Greater Sizewell Bay, the capture of yellow eel in impingement monitoring, and the capture of the single individual in the limited glass eel surveys (8.75 hrs of sampling) it is likely that glass eel pass Sizewell and that they will therefore be entrained at SZC. The scale and impact of entrainment cannot be quantified with certainty. Whilst this provides a useful scenario to consider, this assessment is not considered a worst case and does not provide clarification on the potential number of glass eels present or their vulnerability to entrainment at the location of the SZC intakes.	The Environment Agency understands that NNBGenCo (SzC) are preparing further information to consider what monitoring can be undertake. NNBGenCo (SzC) have indicated that they may not be able to undertake entrainment monitoring at SZC due to constraints with the station design and available space. If this is the case it will not be possible to quantify actual entrainment of glass eels. In the absence of this monitoring, it will be necessary to secure off site compensation. This will help offset the impact to eels.
BEEMS Scientific Position Paper SPP103 Consideration of potential effects on selected fish stocks at	3.4.1.2	Cannot assess what % replenishment rate would be appropriate to apply to smelt as no information has been provided on immigration rates to the GSB from stocks outside of the area. Biological studies are needed to produce the information required, in the absence of this information we	The issue is based on these statements: In the case of mobile pelagic species, a 10% per day replenishment rate applied in the original assessment appears suitably precautionary for most species. To simulate the case of species that spend longer periods in the coastal waters off Sizewell, for example smelt, the sensitivity to exchange rates following 253 days was assessed. With Sizewell C operating in combination with Sizewell B, exchange rates of	A precautionary LVSE factor should be applied to the Local Area Effect model. The appropriateness of applying this model will vary depending on the species, this limitation and the species this model will be less appropriate for should be highlighted more clearly.

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Sizewell version 3.		assume immigration to be limited, this is supported by the fact that smelt populations have previously been exploited to a point causing the collapse and loss of the species from some water bodies on the east coast, recovery from this collapse has taken a long time and has still not happened in some water bodies.	just 1% of fish between adjoining assessment cells resulted in localised fish depletion of 13.3% after 253 days. At 5% daily exchange across the boundaries, effects within the GSB + tidal excursion are reduced to 3.1% compared to 1.5% local depletion with a 10% exchange (Figure 12). Local depletion is therefore modest at 3% or below if there is greater than a 5% exchange rate of smelt within the GSB + tidal excursion each day from the wider area.	
6.14 Environmental Statement Addendum Volume 3: Appendices Chapter 2 Main Development Site Appendix 2.17.A Marine Ecology and Fisheries	Table 2 (p80)	Inappropriate stock comparators. Smelt stocks are being described as UK stock or River Elbe populations. Insufficient information provided on the UK stock area used. Figures are incorrect; both comparators give the same figure for mean landings and % landings. Insufficient evidence has been provided that demonstrates what the level of immigration could be from outside the of the Ore and Alde population for either stock comparator.	Smelt are not present in many of the east coast estuaries indicating that sub populations exist and are vulnerable to exploitation, this has led to the loss of smelt populations from some catchments, some of which have still not recovered.	We have a general duty to maintain, improve and develop salmon, trout, freshwater fish, eel, and lamprey and smelt fisheries (Section 6(6) of the Environment Act 1995). Ministers gave us statutory guidance in 2000, that we should interpret this as: Ensure the conservation and maintain the diversity of freshwater fish, salmon, sea trout and eels and to conserve their aquatic environment; Unless otherwise stipulated, our fisheries powers apply equally to smelt as to other species. In order to discharge our duties under the Environment Act we are highlighting the potential risk to the smelt population in the Ore & Alde waterbody from the operation of SZC power station.
6.14 Environmental Statement Addendum Volume 3: Appendices Chapter 2 Main Development Site Appendix 2.17.A Marine Ecology and **Fisheries	8.2.4	This states: Under all of the scenarios tested for fish manipulations, there was no deterioration of 'good' status when the 2019 TFCI was calculated without fyke net data. The report concluded that it is highly unlikely that the proposed development would cause a deterioration in the fish status of the Alde & Ore (BEEMS Scientific Position Paper SPP108). Concern remains that as a result of entrapment losses to some fish species from the operation of SZC that a reduction in the number of fish entering the Ore & Alde and Blyth water bodies has the potential to lead to a deterioration of this element under the Water Framework Directive (WFD).	Potential fish reduction scenarios have been run for the Ore & Alde Transitional Fish Classification Index (TFCI) looking at a targeted number of species of greatest importance in this water body. A within class deterioration is observed in all scenarios which brings the Ecological Quality Ratio (EQR) score close to the good/moderate boundary and reduces the confidence in the classification to uncertain or no confidence. Some additional scenarios have been considered which included minor manipulation of a small number of infrequently recorded species which featured in the Ore/& Alde TFCI in the 6 year reporting cycle (2013-2018), this resulted in a class deterioration from good to moderate potential for fish in this water body. Uncertainty remains as to what the final predicted entrapment loss figures will be from the operation of SZC, a significant amount of modelling, data analyses and technical review needs to be concluded (some of which still has not been provided) before we can conclude if the fish entrapment loss figures derived by the	We consider compensation to undertake improvements which will increase optimal habitat and improve fish passage in the affected water bodies, this will help increase productivity to offset losses.

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			company are accepted, we may need to produce our own calculations and figures if we disagree with the information provided. This could change what the predicted impact to fish species and WFD water bodies will be. If the impact to fish in the Ore & Alde water body changed negatively from what is currently predicted then a class deterioration from good to moderate for fish within this water body and by proxy the Blyth water body would be more likely.	