The Sizewell C Project

9.100 Written Summaries of Oral Submissions made at Issue Specific Hearing 11: Flooding, Water and Coastal Processes (14 September 2021)

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1 ISSUE SPECIFIC HEARING 11: FLOODING, WATER AND COASTAL PROCESSES

1.1 Introduction

1.1.1 This document contains the Applicant's written summaries of the oral submissions made at Issue Specific Hearing 11 (ISH11) on Flooding, Water and Coastal Processes, held on 14 September 2021.

1.1.2 In attendance at ISH11 on behalf of the Applicant was:

- Hereward Phillpot QC of Francis Taylor Building ('HPQC');
- John Rhodes of Quod (Planning Manager (Strategic));
- James Hanson of AECOM (Technical Lead – Water and Flood Risk);
- Jeremy Jones of Atkins (Drainage Lead);
- Stuart Smith of Atkins (Surface Water Lead);
- Mark Lee of Atkins (Groundwater Lead);
- Dr Ian Dennis of Royal HaskoningDHV (WFD Compliance Assessment Lead);
- Dr Tony Dolphin of Cefas (Principal Scientist (Coastal Geomorphology).

1.1.3 Where further information was requested by the Examining Authority (ExA), this is contained separately in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref. 9.104).

1.2 Agenda Item 2: Water Supply

The Water Supply Strategy and the availability of both potable and non-potable water to meet the full demands of the Project with particular regard to the early years of construction.

1.2.1 The ExA asked about the source of the water which is understood to be supplied by tanker in the first stage of the water supply strategy. Mr Rhodes stated that no source had been fixed. The Applicant was aware that there was a market for water and that there would be options for the supply but that no single source had been confirmed. In response to the ExA the Applicant agreed to provide details in writing about the options and about their implications. *[Such details are contained in the Applicant's **Written***

Submissions Responding to Actions Arising from ISH11 *(Doc Ref 9.104)].*

1.2.2 The ExA asked if there was a distinction in the Applicant's strategy between the supply of domestic and non-domestic water. Mr Rhodes referred to the **Water Supply Strategy** [REP7-036]. Whilst there were different legislative provisions for domestic and non-domestic supply, the Applicant's strategy looked at the Project's demand and supply requirements for the Project as a whole.

1.2.3 He referred to the helpful Technical Note submitted very recently to the examination by Northumbrian Water Limited (NWL) (there is currently no examination reference for the note). As that document explains (on page 6), until recently the parties had been proceeding on the assumption that the water supply for Sizewell C would be obtained via a transfer main from Barsham. Whilst Sizewell C was not included in the forecasts for the Water Resources Management Plan 2019, the Technical Note explains that it had not been understood that there was a risk to the availability of water and NWL was forecasting a surplus of supply and therefore had been working with SZC. Co to develop a supply scheme based on the Sizewell Transfer Main (Technical Note page 6). As the Technical Note also explains, the Environment Agency wrote on 26 August 2021 to advise that it may be necessary to constrain supply and to impose caps on abstraction from the River Waveney, which created potential supply constraints not only for Sizewell C but for NWL's water resources zones generally. In those circumstances, the Technical Note explains that NWL would need to develop new supply options and, potentially, to have those options in place by 2027 in order to restore headroom (as any cap imposed by the Environment Agency would come into force by that time).

1.2.4 The Technical Note explains that NWL is already undertaking options appraisals and has identified a series of feasible options, which are identified in a table on page 9 of the note.

1.2.5 SZC Co. is aware that there are a range of alternative options but that it is a matter for NWL to determine the most appropriate means of supplying Sizewell C. The parties were engaged in active and positive discussions to that effect.

1.2.6 Mr Rhodes explained that the introduction of the temporary de-salination plant would provide sufficient capacity for the Sizewell C project throughout the construction period. The change application documents explained that the capacity of the plant was up to 4 mega litres (ML) a day and the demand profiles within the **Water Supply Strategy** [REP7-036] showed that this was sufficient to meet the construction project peaks, which were

associated with particular construction events such as the cut off wall and tunnelling. The de-salination plant was applied for on a temporary basis but the change application made clear that it could be retained through the construction process so long as it continued to be needed.

1.2.7 Discussions with NWL have identified that the current WINEP modelling will be complete by 24 September, following which the Environment Agency may require 2 weeks to advise the consequences of the outcome. Mr Rhodes explained that he was aware that NWL had obligations for the supply of water. The Water Company's Water Resource Management Plan (WRMP 2019) was helpful in this respect.[1] SZC. Co had requested inclusion of Sizewell C in the WRMP in 2014, but the WRMP advised that it had not included Sizewell C due to uncertainty at that time about the progression of the SZC Project. The WRMP explains, however, that if there is sufficient certainty that Sizewell C is progressing '*we will consider this a material change and we will work with EDF to develop a new supply, albeit the capital cost of the scheme would be funded by EDF*'. SZC Co.'s application had triggered that policy, hence the parties have been working closely together funded by SZC. Co to develop options and then to work up the proposals for the Sizewell Transfer Main. The parties were committed to working together to find a suitable solution. Consequently, whilst the source of water was a matter for NWL and may not be concluded before the end of the examination, the proposals for the de-salination plant created the time within which a permanent supply solution would be resolved and provided.

1.2.8 Potential options did include the permanent provision of de-salination but that was not the expected outcome and only one of a number of options being considered by NWL to meet the commissioning and operational demand of SZC, and its other customers, should additional sustainable water resources need to be developed. However the need for such additional resources is presently not confirmed and will depend on the outcome of the additional WINEP modelling being carried out by NWL and the EA's position in respect of licence caps,

1.2.9 HPQC noted that the Applicant had not yet had an opportunity to respond in writing to the issues raised by NWL's most recent correspondence, and that the law, policy and guidance on this issue will need to be set out and explained, together with the factual background and the up-to-date factual position. That is best done in writing as a coherent whole, and the Applicant's position on those matters will be provided at Deadline 8. *[Such details are contained in the Applicant's* ***Written Submissions Responding to Actions Arising from ISH11*** *(Doc Ref 9.104)].*

[1] https://www.nwg.co.uk/responsibility/environment/wrmp/current-wrmp-2015-2020/

1.2.10 HPQC explained that the factual position is still evolving, and will continue to do so over the next few weeks. At Friday's Issue Specific Hearing on the DCO and related documents it would be appropriate to return to what needs to be in the DCO in relation to the matter.

1.2.11 Mr Keane QC (speaking on behalf of NWL) provided the ExA with a summary of its position in relation to the supply of water for SZC. Amongst other things, he explained that the principal concern centred around s.41 of the Water Industry Act 1991 and the absolute duty that it imposed in relation to a request for domestic supply.

1.2.12 In response to Mr Kean's submissions HPQC explained by way of overview that it was necessary to understand the provisions in the Act as a whole, and to understand that there were strategic as well as more immediate duties imposed on the privatised water companies. The strategic duty under section 37 of the Act must be considered alongside the provisions governing a specific request for supply made under s.55. This would be addressed in writing at Deadline 8 rather than being elaborated in oral submissions. In brief, whilst there are grounds under s.55(3) on which a water company can decline such a request, the Act provides safeguards to ensure that the public interest in ensuring adequate supply is met and water undertakers cannot simply prioritise their commercial interests and thereby thwart development. This is reflected in the ability under section 56 to refer disputes in relation to such refusal to the regulator OFWAT. HPQC confirmed that the Act does not provide a veto for a water company in relation to requests for non-domestic supply, and the view of the water company in relation to the application of the s.55(3) exceptions may not be shared by OFWAT. HPQC explained that the courts had recognised the important role of OFWAT in such matters, and the scope for the regulator to take a different view from the water undertaker on such matters. This would be covered in the note at Deadline 8. *[The note is appended to the Applicant's* ***Written Submissions Responding to Actions Arising from ISH11*** *(Doc Ref 9.104)].*

1.2.13 HPQC suggested that the issue raised by TASC about the relationship between the Water Framework Directive and the Water Industry Act would be most appropriately addressed in a note. However, HPQC pointed out that the Secretary of State will need to assess the implications of this proposed development in terms of the Water Framework Directive as part of the determination of the present application. Those considerations form part of the WINEP modelling and the review being undertaken by the Environment Agency. There was a written assessment demonstrating SZC Co.'s compliance with the Directive as part of the application material, and the application of the Directive to this application was the subject of a

separate agenda item later in the hearing. HPQC then asked Mr Rhodes to respond to the following two points:

- Mr Saunders questioned whether the suggestion that the desalination plant for which consent is sought was sufficient to cope with the full construction demand.
- The question raised by Ms Galloway about the supply for the Associated Development sites and where that was coming from.

1.2.14 Mr Rhodes reassured Mr Saunders that in terms of capacity the temporary desalination plant had capacity to deal with the full demand of the construction period. For the Associated Development sites, more local solutions were appropriate given the significantly smaller water demand. These can be explained in the Written Submissions following the ISH. *[The water supply for the Associated Development sites is explained in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104)].*

1.2.15 Mr Rhodes confirmed to the ExA that the application for the desalination plant concerned a temporary desalination plant and there was not an application to extend the use of the desalination through the operational period. However, that being said, in response to concerns raised by other parties at the hearing regarding its environmental suitability, Mr Rhodes was aware that these matters would be examined at the ISH on 5 October. It was relevant to recognise however that the current proposals for a plant of up to 4 ML/day had been the subject of environmental assessment, which had concluded that there would be no significant effects. The operational requirement was approximately half that capacity. The scale of water intake for the desalination plant, for example, was a very small proportion of the much larger cooling water intake already assessed for the operational phase of SZC.

1.2.16 In relation to Emma Bateman and Paul Collins' comments on non-potable water and the water supply strategy, Mr Rhodes said he would come back to this in the written submissions to cover:

- confidence in the recycling assumptions set out in the Water Supply Strategy;
- the environmental effects of using non-potable water for activities such as dust suppression; and
- any proposed use of local abstraction.

*[These issues are addressed in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104)].*

1.3 Agenda Item 3: Main Development Site Flood Risk Assessment

Outstanding issues with respect to the Applicant's assessment, in particular:

a) Coastal flood risk; and

b) Any other areas of outstanding concern for the MDS FRA.

1.3.2 Due to Mr Scarr's absence, Mr Humphries referred to his submissions at Deadline 7 particularly concerning the vulnerability of the Sizewell Dunwich Offshore Bank and whether the Applicant felt that the Flood Risk Assessment (FRA) was robust in this respect. Mr Hanson on behalf of the Applicant responded by stating that this had been picked up in our response in ExQ2 CG.2.10 and would be responded to further in SZC Co.'s responses to other submissions on the second round of questions [REP7-056].

1.3.3 Mr Hanson explained that they had taken a precautionary approach and that the assessment concluded that the conditions with the Sizewell - Dunwich banks in place resulted in worst case nearshore wave conditions than with their removal. This was adopted to ensure the most conservative assessment for the Main Development Site FRA, and that this approach had been reviewed and approved by the Environment Agency.

1.3.4 The Applicant accepted the ExA's suggestion that it should seek to agree some form of Statement of Common Ground over this issue with Mr Scarr. *[An update is provided in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104) regarding a Statement of Common Ground with Mr Nick Scarr].*

1.3.5 Mr Wilson on behalf of TASC raised concern surrounding the timeline for spent fuel storage and alignment of timeframes within the FRA, citing direct correspondence in August 2020 on fuel storage from the ONR to TASC. He explained that given his own calculations together with the information detailed in the ONR's written response, the storage of sufficiently cooled spent fuel would be far beyond the timeline set out in the Applicant's submission in REP5-120 at electronic page 1218, within Appendix J.

1.3.6 Mr Hanson responded by confirming that the timeline for the FRA was entirely consistent with the timelines set out in the overall application, but suggested that a note be produced to explain these timelines in the context of spent fuel storage. *[A note is appended to the Applicant's **Written***

Submissions Responding to Actions Arising from ISH11 *(Doc Ref 9.104)].*

1.3.7 Mr Sutherell raised concern over a recent article in The Times relating to work undertaken by a vulcanologist on ice loss in Greenland and resultant seismic and tsunami risk.

1.3.8 Mr Hanson confirmed that the Hard Coastal Defence Feature was designed both in respect to seismic activity, more generally, and specifically took account of the very low risk associated with tsunami risk. Mr Hanson noted that this work fell outside of the FRA but formed part of the Safety Case work required for the Nuclear Site Licence. *[Further information on the consideration of tsunami risk is contained in the Applicant's* ***Written Submissions Responding to Actions Arising from ISH11*** *(Doc Ref 9.104)].*

1.3.9 In response to Cllr. Woolf's concerns surrounding flooding in Valley Road in Leiston, Mr Hanson explained that the concerns are well known and well understood and that they had formed part of their discussions with the County Council, alongside the review of the SWMP (Lead Local Flood Authority's Surface Water Management Plan). Further to this, he explained that the drainage strategy and the way in which the drainage is dealt with is addressed in Appendix B to REP5-120 that includes the trackside drainage and the basin at the west side and demonstrates that the capacity of that system is more than equal to the storm event for which it is designed.

1.3.10 Mr Williams voiced concern on the proposal for the Bridleway 19 realignment to be set at the 1 in 100 fluvial event plus climate change and not at the 1 in 100 pluvial event plus climate change, which was higher. This would mean that Bridleway 19 would still be at surface water flood risk. Mr Hanson responded by explaining that SZC Co. is continuing to engage with the SCC on this issue. However, Mr Hanson restated the position that the fluvial flood modelling levels are the most appropriate to set the design, due to a relative lack of data refinement and resolution in the pluvial model, as set out in email correspondence between SZC Co. and SCC of 8 September 2021.

1.3.11 Mr Rowlands on behalf of the RSPB and Suffolk Wildlife Trust acknowledged that the Applicant had engaged with the RSPB on the issue of increased flood risk to RSPB land, but stated that there had not yet been discussions with regard to gaining landowner consent. Mr Hanson confirmed that the Applicant had provided a 'drill down' into the fine detail of the FRA to the RSPB and that the further analysis showed some non-significant additional flooding on top of the significant baseline depth and that the additional extent was characterised by small non-contiguous

pockets at the fringes of an existing flooded baseline area, to a depth of 5 or 6 centimetres. Mr Hanson confirmed that the Applicant was engaging with the RSPB with the aim of seeking acceptance to the additional flooding. *[An update on discussions with RSPB regarding the increased flood risk area is provided in the Applicant's* ***Written Submissions Responding to Actions Arising from ISH11*** *(Doc Ref 9.104)].*

1.4 Agenda Item 4: Associated Development Site Flood Risk Assessments

Outstanding issues relating to the following:

a) Sizewell Link Road FRA; and

b) Other Associated Development Sites.

1.4.1 No comments were made by the Applicant on this item.

1.5 Agenda Item 5: Outline Drainage Strategy

Outstanding issues relating to the Outline Drainage Strategy with particular reference to:

a) Main Development Site, including Water Management Zones

b) Drainage strategies for Associated Development Sites

1.5.1 The first point of discussion concerned Requirement 5 and how it works in relation to surface water drainage matters. Ms Tafur on behalf of ESC supported the requirement as currently drafted, whereby ESC was the discharging authority. Mr Bedford QC on behalf of SCC argued instead that that the discharging authority should be the lead local flood authority (SCC) and not ESC in its capacity as the local planning authority.

1.5.2 On behalf of the Applicant, HPQC submitted that the issue of drainage does not fall to be considered in isolation. Inevitably, there are balances to be struck between what might be considered ideal purely from the narrow perspective of drainage and the implications of such an approach having regard to other matters. This might include, for example, landscape and visual impact and the need for and wider implications of disruptive and environmentally damaging earthworks to implement some approaches to drainage. In those circumstances, the Applicant's position is aligned with that of ESC in that as local planning authority it is best placed as local planning authority to '*hold the ring*' on issues which ultimately require a planning balance to be struck. HPQC drew the ExA's attention to the way in which Requirement 5 is structured and in particular to paragraph 2 that

creates an extra safeguard for SCC in addition to their current consultation role. The current structure of Requirement 5 meant that there is no need for SCC to be the discharging authority for its interests to be protected – their interests were already more than adequately covered by what was already there.

1.5.3 In response to the list of technical points raised by Mr Williams of SCC (Lead Local Flood Authority), Mr Jones responded for the Applicant by providing an overview of the approach that had been adopted, and indicating that he would provide a written response to the technical issues raised. *[A response is contained in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104)].*

1.5.4 Firstly, Mr Jones explained the background to the approach that the drainage strategy is based on and how this protects the SSSI areas etc. He went on to explain that the main drainage strategy is in line with industry guidance and best practice and aims to mimic the way in which the site is behaving at the moment. The Applicant was following the sustainable urban drainage system (SuDS) approach which allows them to take the water into local source control elements (which act as the first point of runoff management) and give opportunities to return water to the ground as soon as possible. In order to ensure that the storm water stays within the site, the water is conveyed from those local source control elements into the SuDS detention basins which provides protection against flooding from long term return period storms. Mr Jones stressed that the use of retention and then greenfield rate release to ensure the prevention of external flooding risk was a key element of the approach.

1.5.5 Secondly, Mr Jones referred to a number of technical documents and notes that had been submitted as supplements to the Outline Drainage Strategy which test and validate its approach and set out the processes that will take place in individual sites. These documents provide an indicative approach, but serve to demonstrate that the sustainable principles of the drainage strategy can be secured at the detailed design stage.

1.5.6 Mr Jones noted that the detailed design to implement the Drainage Strategy and the Technical Notes supporting it will continue to be enhanced in consultation with stakeholders and as greater knowledge of the site becomes available through the progression of the detailed design, which is not yet complete.

1.5.7 Mr Jones addressed the question of infiltration testing, stating that the testing had been carried out in 2014, 2017, 2020 and 2021. He explained the team had learnt lessons about the local practicality of carrying out those tests:

- due to the remoteness of the sites there was a lack of local water resource to continually fill and refill the test pits;
- stability problems caused by the granular nature of the ground made it difficult for these types of tests to be conducted as sudden collapse was observed; and
- there were health and safety concerns as someone would have to enter the pit to manually measure the physical dimensions of the pit.

1.5.8 Mr Jones explained that the lessons learnt from the previous testing had delivered better methods for conducting the tests in 2021 that align closely with BRE365. This does not make the old tests worthless as they are an indicator of the infiltration rates and by taking the worst case of each of those early tests a conservative approach to the detention basin sizing process has been taken. The latest results from recent testing indicate a similar order of magnitude for infiltration rates providing confidence in the approach. The 2021 results are in draft form and will be updated shortly.

1.5.9 Mr Jones agreed to provide a written response in relation to SCC's concerns about discrepancies in the material that had been submitted, and the other technical issues raised. *[A response is contained in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104)].*

1.5.10 Mr Jones noted that in terms of the Associated Development sites, different areas have different requirements and have to be treated differently. In particular, certain SuDS drainage solutions involving onsite storage had been used on two sites, to avoid the need for greater land take, which would not be justified, as a sustainable outcome was achieved within the application site.

1.5.11 HPQC added that it was important to take account of the fact that much of the Associated Development was temporary in nature, and involved the use of compulsory powers over third party land. Where that was the case, different approaches to drainage and different drainage solutions might be appropriate than would be the case for a permanent development. Where powers of compulsion were being used, for example, there is an important balance to be struck, as some drainage solutions required more land, imposing a greater impact on the rights of the person(s) with the relevant interest(s) in the land. That had to be justified, and the balance was likely to be struck differently in the case of a temporary site than it would be in the case of a permanent site, particularly where the consequence was consistent with sustainable principles.

1.6 Agenda Item 6: Water Monitoring and Response Water

Outstanding issues relating to the Water Monitoring and Response Strategy.

1.6.1 HPQC noted that the Water Monitoring and Response strategy is the subject of Requirement 7, which requires the submission of a Water Monitoring Plan (which must accord with the Water Monitoring and Response Strategy) for approval, and then the implementation of that plan. HPQC then introduced Mr Smith to respond to the following matters:

- the relationship between trigger levels in the draft Water Monitoring Plan [REP7-075] and drainage consents; and
- question about micro-topographical differences and how that variation is to be addressed and, therefore, whether or not Plate 3.1 in the Water Monitoring Plan was fit for purpose.

1.6.2 In response to the concern regarding trigger levels Mr Smith explained that the Applicant had moved away from the use of published data to get more specific data for Sizewell Marshes SSSI as opposed to aggregated results for other fen meadow sites elsewhere across the country. This recognises the unique ecology of Sizewell Marshes SSSI and the role of the existing water management regime in supporting that. Furthermore, regarding the triggers Mr Smith made clear that they were looking to define the maximum range that had been observed. Mr Smith was confident that they have a relatively stable regime as they have decided to narrow their approach by focusing on the 30th to 70th centiles as the preferred thresholds. Mr Smith explained that the adoption of the 30th and 70th centile triggers is not final and can be discussed with other Interested Parties as the development of the draft Water Monitoring Plan continues.

1.6.3 With respect to microtopographic variations across Sizewell Marshes SSSI, Mr Smith explained that a topographic survey was undertaken to validate the accuracy of LiDAR data that had been used to prepare the groundwater model. The survey explored whether the LiDAR was systematically biased, for example if it recorded tussock tops or the ground surface between tussocks. This survey provided cross-sections through the fen meadow and targeted measurement of the tussock vegetation. The orientation of the cross-sections and targeted measurements was discussed and agreed with Suffolk Wildlife Trust. It concluded that there is no systematic bias and gave comfort that the LiDAR data was appropriate for modelling.

1.6.4 In relation to the point about Plate 3.1 in the Water Monitoring Plan and whether it is fit for purpose, Mr Smith explained that Plate 3.2 is a better

representation of how to use the data as it shows the ground level for a specific monitoring location and the ground level for the compartment that is being monitored, it also taps into the micro-topographic variations raised by Suffolk Coastal Friends of the Earth and described by Mr Smith.

1.6.5 In response to the point raised by Suffolk Wildlife Trust that whilst one was able to manage the water levels that would eventually come at the cost of water quality, Mr Smith confirmed that there is no plan to change the mechanism of water supply to the site, but rather to fine tune the regime in order to maintain it. Current interactions of groundwater and surface water will remain as per the existing regime and no change in water quality is anticipated. Mr Smith concluded by stating that there is no intention to irrigate the site with surface water from Leiston Drain.

1.6.6 Mr Smith explained that in the draft Water Monitoring Plan, the frequency of water quality sampling was carried across from the baseline monitoring. It is a secondary consideration to validate the effectiveness of water level management. Whilst this is thought to be an appropriate monitoring frequency, as it is a draft plan, alternative suggestions can be considered with stakeholders.

1.6.7 Mr Lee then addressed Dr Lowe's remaining comment about the means of water monitoring. Mr Lee clarified that, as set out in response to ExQ2, the water table is being monitored by the installations in the Sizewell Marshes rather than the piezometric surface as Dr Lowe appeared to be suggesting.

1.7 Agenda Item 7: Water Framework Directive Compliance Assessment

Outstanding concerns with respect to the Water Framework Directive Compliance Assessment

1.7.1 Mr Sked from the Environment Agency (EA) gave an update on the EA's position in terms of the SSSI crossing, with reference to the updated assessment received at Deadline 7. In summary, Mr Sked explained that the changes that had been made to the SSSI crossing design would further reduce impacts on ecology and minimise the risk of deterioration to an acceptable level. A Regulation 19 exemption is not required. Mr Sked also noted that the EA had requested that coastal modelling be extended beyond 2099 so that the long-term effects of the coastal defence features could be fully evaluated. This modelling was provided at Deadline 7 and the EA would provide any further comments at Deadline 8.

1.7.2 Mr Markham from the EA referred to the issue of entrapment losses and highlighted that in order to maintain WFD compliance, the EA

recommended that requirements to secure robust monitoring and mitigation were included within the draft Development Consent Order (DCO). He explained that these would be used to inform the development of improvements which would benefit fish in the Alde and Ore estuaries should a deterioration occur. The Applicant submitted further monitoring, mitigation and compensation proposals at Deadline 7 and the EA will provide comments at Deadline 8. Mr Markham also stated that they will ask for an in-combination assessment to consider impacts associated with construction and operational permits (e.g. Water Discharge Activity and Combustion Activity Permits).

1.7.3 Dr Dennis on behalf of the Applicant explained that, based on the Statement of Common Ground, there were outstanding issues with regards to the SSSI crossing and fish entrapment. The Applicant had digested the EA's comments received up to Deadline 7 and has changed the design for the SSSI crossing to address concerns regarding impacts on polarotactic invertebrates. The Applicant has also submitted revised plans for fish monitoring and installation of fish passes. On this basis, the Applicant believes that the proposals are compliant with the requirements of the WFD Regulations and that no further assessment for an exemption under Regulation 19 was required.

1.8 Agenda Item 8: Coastal Processes Update

Coastal processes update to include the following:

Modelling for SCDF through decommissioning to 2140; the SCDF design

1.8.1 The EA and ESC indicated their potential acceptance of the viability of the SCDF, although further assessment was being undertaken. Other interested parties including Ms Andrews were concerned about the geographical scope of monitoring and effects or the longevity of the proposals. By way of response Dr Dolphin was called upon by HPQC to comment on the following two preliminary points:

- the modelling that is to come in relation to the SCDF; and
- the geographical scope of the modelling.

1.8.2 Dr Dolphin began by explaining that, in relation to the results that had been published at Deadline 7, the EA had been referring to the use of the 1 in 20 storm case. He explained that model scenarios accounting for the Beast from the East (BfE) are running currently, and indeed, they are coming to completion. It is intended to fully update the other storm conditions at Deadline 10. The same models have been used for safety case design

conditions (the Reasonably Foreseeable Design Basis). The 1 in 10,000-year joint wave and water level probability with storm surge, pre-eroded beach have also been run, but they have not been reported yet. However, even under those very severe conditions using the modal particle size of 10 millimetres, Dr Dolphin explained that the hard coastal defence feature was not exposed

1.8.3 Secondly, in response to Ms Andrews, Dr Dolphin clarified that the model domain is 4.5km not 3km in extent, whereas the graphs (in TR545 [REP7-045]) tended to show the smaller range because the primary objective of the reporting was really to look at the viability of the soft coastal defence feature.

1.8.4 Dr Dolphin reassured Ms Andrews that the shingle material, and whether it moves or not, has been examined and it shows that there is no potential for any effect to move around the headland and all of the effects are predicted to be within the vicinity of the station. Dr Dolphin also explained that since the SZC project is not removing any sediment from the system, the impacts are really quite small, and the proposed monitoring extents are much larger than those impacts. The evidence also shows that the shingle material is contained within Sizewell Bay, so there is no potential or very, very minimal potential for any effect to move around the headland. And indeed, all effects will be contained, close to the station, well monitored and the Applicant will be able to see early, if any of the predictions are not correct and will be able to adjust for those if necessary.

1.8.5 Thirdly, Dr Dolphin explained that with respect to the losses it was important to realise that the difficult part of storm modelling is representing the recovery phase, noting the modelling conducted is for the erosion phase.

1.8.6 Dr Dolphin noted that in the reports (TR544 and TR545; [REP7-101 and REP7-045]), the Applicant details the sediment losses that follow straight after a storm. He further highlighted that the modelling does not include the natural recovery phase, therefore the results are very much worst case as they exclude the natural recovery phase that would follow after each storm.

1.8.7 Dr Dolphin explained that the pebbly-sized material that makes up most of the sediment on the coast (with the modal size around one centimetre) is confined to the beach above low tide. He further highlighted that the subtidal sediment sampling shows the sediments there are sandy – this is called a composite beach. At Sizewell the shingle or pebbles are retained up high on the beach whilst the subtidal contains only sand. In net terms, the pebbles are not lost since they are confined above low tide and remain in the bay (between Minsmere Sluice and the Thorpeness headland).

1.8.8 Dr Dolphin responded to the comment on sea level rise by explaining that the modelling had, indeed, considered sea level rise scenarios, all the way up to the end of decommissioning at 2140.

1.8.9 He also reiterated that the UKCP18 climate change predictions do not show that the storminess is increasing at Sizewell and, in fact, they show a slight decrease. He noted, however, that for the safety case modelling (Reasonably Foreseeable Design Basis) the approach taken, which is standard for that work, was to increase the wave conditions by 10%, and that has been done.

1.8.10 Ms McKay commented that the other storm modelling sought by the EA would be too late for comment and she queried whether the modelling could be submitted to an earlier deadline, (perhaps deadline 9 if not 8). She also suggested if it could be made available to be shared with the Environment Agency and others beforehand.

1.8.11 To this Dr Dolphin replied that the reason that the Applicant chose the 1 in 20 condition is that it was one that could be modelled on time (for Deadline 7), and that it was very similar to the Beast from the East and in some respects even worse. Therefore, Dr Dolphin explained that he did not consider that the conclusions would change as a result of the upcoming modelling. Dr Dolphin did not commit to providing any updates by Deadline 9, but offered to investigate the possibility of providing earlier than Deadline 10.

The SCDF design

1.8.12 HPQC called on Dr Dolphin to respond to the following four points:

- The issue raised by ESC relating to the size of the particles that are going to be used as part of the SCDF;
- In relation to the MMO:
  - Issues to do with particle size
  - In relation to the extent of the area;
- Questions raised on behalf of Old & Ore Association and what happens to the longshore drift; and
- The contribution by Paul Collins which dealt with the extent and significance of the SZB Salient and the effect of its defensibility on the SZC Hard and Soft Coastal Defence Features as well as the location of those features.

1.8.13 Dr Dolphin explained about the trade-offs of not coarsening the beach and emphasised that the Applicant had only ever raised the possibility of beach coarsening within the native particle size distribution. He further confirmed that for the bulk of the soft coastal defence material, the particles would not be larger than what is naturally there, but that coarsening could be conducted within the natural size range. The advantages that brings are decreasing beach maintenance and the mitigation activity and reduction in the disturbance that would be entailed. He went on to indicate that by using coarser material (within the native size range) that it decreases the (already low) risk of HCDF exposure because those bigger particle sizes are more difficult to erode.

1.8.14 Dr Dolphin explained that the concerns of various interested parties have been heard and SZC Co. is comfortable with the native particle size distribution, not to coarsen it and to take this as the default position going forward. He then stated that it may be better for that decision to be made later, once every piece of evidence is in place. Furthermore, he reminded the EXA that the encouraging point is that the modelling results for the native particle sizes show that the soft coastal defence feature is viable throughout the station lifetime.

1.8.15 Dr Dolphin explained that his interpretation the MMO's concern on monitoring extent was with regard to a coarsened SCDF, because coarser sediment may have effects on longshore transport and lead to increased uncertainty. Therefore, he surmised that having taken the native particle size distribution as the default for the soft coastal defence feature, that he doesn't think there's a rationale for enlarging the monitoring extents further.

1.8.16 Dr Dolphin explained that the way the Applicant had seen this operating is that the Soft Coastal Defence Feature and its maintenance – which is primarily secondary mitigation was to maintain the longshore transport corridor. Whilst it may serve other functions too – it would avoid impacts to longshore transport.

1.8.17 In the future, as a result of maintaining the soft defence feature whilst adjacent shorelines are likely to naturally recede, changes in shoreline angle may lead to a slight foreland and localised trapping of sediment moving from north to south.

1.8.18 Were that situation (a foreland at Sizewell C) to arise (which is a distinct possibility and hence it has been modelled in BEEMS Technical Report TR545 [REP7-045]), first principles and the modelling demonstrate that the SCDF would erode more quickly. Therefore, whilst the development of a foreland may increase trapping of beach shingle in the longshore transport

system, it would simultaneously be counter-balanced by increased erosion and sediment supply from the SCDF.

1.8.19 Dr Dolphin explained that the exact shoreline configuration and shape of a potential future foreland cannot be known, however there are two possibilities. The SCDF would either release more sediment than it traps (no deficit to longshore transport) or less sediment than it traps (deficit). The latter (deficit) is where the other mitigation methods set out in the **ES** (**Volume 2, Chapter 20** [APP-311]) would come into play. The CPMMP [REP5-059] is designed to measure the volumes across the SCDF, and to the north and south, in detail, and will be able to detect the formation of an SCDF foreland and whether it results in a net deficit to longshore sediment transport.

1.8.20 He explained that if there is a net deficit – that is the SCDF releasing less sediment than it traps – then beach recycling and bypassing could be used where there are obvious areas of accumulating sediments, or alternatively additional beach recharge could be applied if there are no obvious areas of accumulation, which is the more likely option. Dr Dolphin confirmed that the Applicant will be more explicit on this process of checking for SCDF foreland disruption and applying further mitigation in the next version of the CPMMP.

1.8.21 Looking at Mr Paul Collins detailed comments, Dr Dolphin and HPQC offered to provide a detailed written response to Mr Paul Collins comments in writing.

1.8.22 However, Dr Dolphin did respond on the topic of the Sizewell B salient (an accumulation of beach sediment opposite the Sizewell B outfall). The term Hydraulic Salient is a hangover from an initial hypothesis (by Prof. John Pethick) on how it was formed. Dr Dolphin explained that the salient is now considered to have formed as a result of the Sizewell B outfall interfering with the position of the outer longshore bar. Salients typically form behind small islands and reefs all around the world. Dr Dolphin stated that a salient was also observed at Sizewell A when it was operating, and that it disappeared within in a year or two (i.e., the coast straightened) once operation ceased. The sediment in the salient is then redistributed to the adjacent shorelines, and the same is expected once Sizewell B ceases operation.

1.8.23 Dr Dolphin stated that although the coast is expected to straighten, this would not correspond to continuous erosion as Mr Collins appeared to suggest. He stated that there would be a short phase of erosion whilst the Sizewell B salient's sediment is re-distributed and the shoreline straightens. He emphasised that the important point is shown by the TR544 and TR545

modelling reports [REP7-101 and REP7-045] (which do not include the Sizewell B outfall) – the models show that SCDF can be comfortably maintained throughout the life of the station.

Modelling relating to the detailed design of the adapted HCDF

1.8.24 East Suffolk Council was asked to provide an update on their position in relation to the details that have been provided in relation to the Hard Coastal Defence Feature (HCDF) design and explain any requests for additional information that they seek in relation to that.

1.8.25 Ms Isabella Tafur on behalf of ESC commented that they made certain requests in their comments on the coastal defences design report in REP3-062. And their understanding from the most recent discussions, which she understood took place on Friday of last week with the Applicant, is that the Applicant is proposing to provide a detailed response to those additional matters at Deadline 8, and ESC will be able to comment on them thereafter.

1.8.26 *[An update on the additional modelling work is contained in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104)].*

The Minsmere Sluice Operation Technical Note

1.8.27 HPQC stated he did not see an issue with what Mr Watson submitted and has nothing more to respond.

The monitoring, triggers, mitigation, and controls incorporated within the latest revisions of the draft DCO requirements, the DML and the CPMMP

1.8.28 In response to Ms. Tafur on behalf of ESC, HPQC agreed that the CPMMP should include provision for review, and this should be made clear within the scope of Requirement 7A, as he did not believe this to be controversial in principle.

1.8.29 The Applicant noted the drafting points raised by SCC and undertook to respond to these in writing.

1.8.30 *[A response is contained in the Applicant's **Written Submissions Responding to Actions Arising from ISH11** (Doc Ref 9.104)].*