



# The Sizewell C Project

SZC Co.'s Response to the Secretary of State's Request for Further Information dated 31 March 2022: Appendix 8 - Additional technical information to support Question 8.11 in relation to Natural England, RSPB and SWT comments on assessment of coastal processes

---

Revision: 1.0

---

April 2022

NOT PROTECTIVELY MARKED

---

## APPENDIX 8: ADDITIONAL TECHNICAL INFORMATION TO SUPPORT QUESTION 8.11 IN RELATION TO NATURAL ENGLAND, RSPB AND SWT COMMENTS ON ASSESSMENT OF COASTAL PROCESSES

This Appendix contains further information to support the SZC Co. written response to questions raised by the Secretary of State for Business, Energy & Industrial Strategy ("the Secretary of State") in Information Request No. 2 question 8.11 pertaining to Natural England, RSPB and SWT comments on the assessment of coastal processes and the Sizewell C sea defences. **Table 1** provides SZC Co.'s responses to Natural England and **Table 2** provides SZC Co.'s responses to RSPB/SWT.



NOT PROTECTIVELY MARKED

**Table 1: SZC Co.'s Responses to Natural England's Deadline 10 Submission: Comments on Deadline 7, Deadline 8 and Deadline 9 Submissions [\[REP10-200\]](#)**

Ref	Who	Question / Answer
<b>Summary</b>		
	NE	Natural England welcomes the work the Applicant has undertaken to incorporate the advice that we have previously provided on this issue and consider that progress has been made in addressing that advice. We consider that it is quite possible that our outstanding concerns about particle size and habitats can ultimately be addressed, but some recommended actions remain about further assessment needing to be done upfront in order to come to a view on whether or not adverse effects on the integrity (AEol) of Minsmere to Walberswick Heaths & Marshes (SAC, SPA, Ramsar site) and adverse effects on Minsmere to Walberswick Heaths & Marshes SSSI can be ruled out. The Applicant has stated their intention not to do some of that assessment work until after the close of the Examination and our position therefore remains that, on this basis, we are not yet able to agree with the Applicant's conclusion of no adverse effects to Minsmere to Walberswick Heaths & Marshes SAC, SPA, Ramsar site and SSSI arising from changes to coastal processes for the development as a whole.
	SZC Co	<p>SZC Co. welcomes Natural England's comments and provides responses to each of Natural England's detailed comments below. It is important to note that 9.12 <i>Preliminary Design and Maintenance Requirements for the Sizewell C Coastal Defence Feature - Revision 3.0</i> <a href="#">[REP7-101]</a> is superseded by Revision 4.0 at Deadline 10 <a href="#">[REP10-124]</a>, and many of the specific comments made pertain to changes that were addressed in Revision 4.0.</p> <p>SZC Co. has provided responses to Natural England's specific concerns in items NE1 to NE9 below. In light of these responses, SZC Co. considers that Natural England should be in a position to confirm that adverse effects on integrity (AEol) of Minsmere to Walberswick Heaths &amp; Marshes SAC) and/or adverse effects on Minsmere to Walberswick Heaths &amp; Marshes SSSI can be ruled out.</p>

NOT PROTECTIVELY MARKED

NOT PROTECTIVELY MARKED

Ref	Who	Question / Answer
<b>Comments on the applicant's Deadline 7 Submission - 9.12 Preliminary Design and Maintenance Requirements for the Sizewell C Coastal Defence Feature - Revision 3.0 <a href="#">[REP7-101]</a></b>		
NE1	NE	<p>The executive summary on pages 16-17 states that: <i>'Further work required to refine the SCDF's coastal processes design and finalise the buffer and sacrificial layer volumes includes:</i></p> <ul style="list-style-type: none"> <li>▪ <i>Setting the <math>V_{recharge}</math> (the threshold volume for SCDF recharge) for the CPMMP, which will form a separate report.</i></li> <li>▪ <i>Modelling a range of particle sizes between 10 and 80 mm to optimise SCDF particle-size selection, SCDF performance and, therefore, recharge intervals.</i></li> <li>▪ <i>Closer examination of the gravel model's ground water parameters to determine whether further field and laboratory measurements are needed, to reduce model uncertainty. "</i></li> </ul> <p><i>The separate report for setting the threshold volume for SCDF recharge will provide information to inform the final CPMMP, submitted for approval by ESC under DCO Requirement 7B and the MMO under Marine Licence condition 17 and will and cannot be submitted as part of the Sizewell C Public Examination because i) they do not material affect the assessment conclusions and ii) the detail of the SCDF and the CPMMP are subject to further approvals post DCO consent'.</i></p> <p>This suggests that the recharge volume threshold work, particle size modelling and groundwater work will be in a separate report and will not be known until after the examination. Consistent with our previous advice that this information should be provided now in order to inform conclusions on AEol/adverse effects, we remain unable to advise no AEol/adverse effects until this further assessment work is available.</p>
	SZC Co	<p>As Natural England has noted, the CPMMP is subject to further approvals post DCO consent by ESC under DCO Requirement 7B and the MMO under Marine Licence condition 17 of the Marine licence. This provides a practical and robust approach to addressing monitoring requirements which will vary over a 100+ year lifetime of the project due to changes to the environment and/or improvements in monitoring methodologies. ESC is and will be aware of NE's comments. Notwithstanding this, SZC Co. considers that sufficient detail has been presented to demonstrate that there will not be any AEol:</p>

NOT PROTECTIVELY MARKED

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		<p>1) <i>Response regarding recharge thresholds.</i></p> <p>Recharge thresholds have not yet been finalised but will be detailed in the CPMMP which will require approval by the ESC and MMO before works can commence.</p> <p><i>Preliminary Design and Maintenance Requirements for the Sizewell C Coastal Defence Feature</i> (Revision 4.0) <a href="#">[REP10-124]</a> reports the recharge interval (RI) based on modelling of sediment transport using various particle sizes. For the native particle size (represented by a modal particle size diameter of 10mm), the present-day RI is predicted to be 130 years, with a recharge volume of 4.6m<sup>3</sup>/m. The predicted 2099 RI is 42 years, with a recharge volume of 14.3m<sup>3</sup>/m (refer to Table 2 of <a href="#">[REP10-124]</a>). While it is difficult to make robust direct comparisons with other situations due to lack of verified data, the predicted recharge volume is well within the range of other beach recharge activities for which some information is available<sup>1</sup> (noting that the total volume of the SCDF is approximately 200,000m<sup>3</sup>). Whilst there are clear benefits to long RIs, the use of native particle sizes means that the SCDF and its maintenance would not alter the sediment properties of, or coastal processes acting on, supra-tidal shingle vegetation.</p> <p>2) <i>Response regarding particle size and finalising the design.</i></p> <p>SZC Co. has committed to the use of a native grain size as the SCDF's default particle size, which was agreed in the Sizewell C Public Examination subsequent to Revision 3.0 of <a href="#">[REP7-101]</a> and is reflected in Revision 4.0 (Pg 76) of <a href="#">[REP10-124]</a> (as</p>

<sup>1</sup> For example, Lincshire is presently committing 300-450,000m<sup>3</sup> of sand every year at locations over 24km of coast; an estimated 640,000m<sup>3</sup> of sand per year from Happisburgh to Winterton in Norfolk; at West Clacton to Jaywick in Essex, there was a sand recharge of 689,000m<sup>3</sup> in 1999, followed by 293,000m<sup>3</sup> at Jaywick in 2008 and 863,000m<sup>3</sup> at Clacton in 2014.

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		<p>well as the Storm Erosion Modelling report <a href="#">[REP9-020]</a>, Coastal Defences Design Report <a href="#">[REP8-096]</a> and the Coastal Processes Monitoring and Mitigation Plan (CPMMP) <a href="#">[REP10-041]</a>. The CPMMP is a control document and requires approval by ESC under DCO Requirement 12 and the MMO under Condition 14 of the Deemed Marine Licence (Schedule 21 to the draft DCO) prior to works commencing. Commitment to use the native grain size is stated as follows:</p> <p>Section 7.1.1 “<i>In comparison, the SCDF is a maintained sedimentary feature (using the native particle size distribution as a default without coarsening as agreed during the examination) designed to prevent HCDF exposure to wave action and...</i>” ; and</p> <p>Section 7.1.1.2 “<i>However, as the numerical SCDF erosion modelling in BEEMS Technical Report TR545 <a href="#">[REP9-020]</a> has demonstrated viability of the SCDF across the life of the station for the modal particle size (10 mm diameter), the default position is not to coarsen the SCDF sediments</i>”.</p> <p>Furthermore, sediment particle size is a defined design parameter that needs to be approved by the MMO under Condition 37 (37 (1c)) of the Deemed Marine Licence (Schedule 21 to the draft DCO).</p> <p>3) <i>Response regarding the groundwater parameter (technically the hydraulic conductivity parameter, ‘K’) in the XBeach-G modelling.</i></p> <p>The value for hydraulic conductivity (<i>K</i>) used in the XBeach-G modelling is worst-case; any future refinement of <i>K</i> would result in less predicted erosion and so would make the model outputs less conservative. In conclusion, the model results can be considered worst-case in terms of erosion and recharge intervals (for SCDF viability).</p> <p><i>Implications for the Shadow HRA conclusions</i></p> <p>In its Deadline 10 comments <a href="#">[REP10-200]</a>, Natural England refers to the statement in the <i>Preliminary Design and Maintenance Requirements for the Sizewell C Coastal Defence Feature</i> (Version 3.0) report <a href="#">[REP7-101]</a> which suggests that the northward dispersal and transport of sediment from the SCDF will nourish the beaches in front of Minsmere, potentially helping to maintain annual drift line communities. In responding to this statement, Natural England notes that:</p>

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		<p><i>“This might be plausible in principle but in practice it depends on eventual preferred grain size of the recharge sediment, how it disperses and sorts itself relative to the existing baseline sediment composition on the foreshore. Particle size is therefore important in reaching a fully evidenced conclusion with regards AEol/adverse effects on annual drift line communities.”</i></p> <p>Natural England's comments on SZC Co.'s Deadline 9 submission <i>Storm Erosion Modelling of the Sizewell C Soft Coastal Defence Feature using XBeach-2D and XBeach-G</i> (Revision 3.0) [REP9-020] are relevant when considering its comments on the importance of grain size in the context of the shadow HRA conclusions. Natural England states:</p> <p><i>“If this [retaining the native particle size] can be part of the default position for any beach recharge design, then it does help us move us towards being able to advise no AEol/adverse effects. However, it does depend on how the practical design of the beach recharge events plays out in practice on an intervention-by-intervention basis”.</i></p> <p>Given the additional studies and securing mechanisms with respect to grain size summarised under item 2 and the assessment of the implications of this commitment on the annual drift line communities reported in <i>Preliminary Design and Maintenance Requirements for the Sizewell C Coastal Defence Feature</i> (Revision 4.0) [REP10-124], SZC Co. assumes that this addresses Natural England's concern on this point.</p> <p>The implication of the commitment on particle size on the predicted RI and volume is reported under item 2 above. It can be seen that recharges are predicted to be required very infrequently. Recharge is likely to be undertaken by pumping sediment onshore from barges in the nearshore area, and while plant (e.g. excavators) will then be used to profile the beach, no works would be required within the boundary of the SAC (i.e. all works would be undertaken on the Sizewell C frontage). Consequently, there is no potential for direct physical disturbance to habitats within the SAC (e.g. from machinery movements) during recharge interventions. This detail of any recharge interventions would need to be developed as part of a method statement for any recharge works, which is secured under DML Condition 37.</p> <p>In conclusion, SZC Co. considers that the commitment to the use of a natural grain size as the SCDF's default particle size</p>

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		allows for a clear decision that adverse effects on integrity (AEol) of Minsmere to Walberswick Heath & Marshes SAC) and/or adverse effects on Minsmere to Walberswick Heath & Marshes SSSI will not arise. As the SCDF aim is to match the native sediments (and to avoid changes in particle size altering beach dynamics and the vegetated drift line on the designated sites), Revision 4.0 of <a href="#">[REP10-124]</a> presents the information required to make a full assessment of the potential for AEol. In conclusion, SZC Co. considers that there would be no change in either sediment particle size nor beach sediment dynamics and so AEol can be ruled out, in line with the conclusions of the Shadow HRA <a href="#">[APP-145 to APP-149]</a> .
NE2	NE	Page 21 of the report states that annual drift line communities on the south Minsmere frontage (designated site features of the Minsmere to Walberswick Heath & Marshes SAC) were reported as disappeared by 2010, although we understand that the RSPB have submitted evidence including photos showing that those communities are still present, which the Applicant has accepted.
	SZC Co	<p>Natural England is referring to text in Revision 3.0 of <a href="#">[REP7-101]</a>. Natural England correctly notes the subsequent discussions that SZC Co. had with the RSPB and that SZC Co. recognises the continued presence of these communities (as recorded in <i>Preliminary Design and Maintenance Requirements for the Sizewell C Coastal Defence Feature</i> (Revision 4.0) <a href="#">[REP10-124]</a>. This is also acknowledged in <a href="#">[REP6-025]</a> which concludes that this does not affect the conclusions of the Shadow HRA Report <a href="#">[APP-145]</a> (section 7.7 c) 1)) for the SAC qualifying features because there would not be any detectable change to bed levels along the shoreline, nor would there be change (beyond natural processes) to the supratidal beach (where drift line and stony bank vegetation reside).</p> <p>The text regarding the annual drift line communities was corrected in Revision 4.0 <a href="#">[REP10-124]</a>, Section 1.1 (page 21), which now reads:  <i>"Natural England condition surveys (DEFRA MAGIC, 2021) show that annual vegetated drift lines on the Sizewell C to Minsmere Sluice frontage were lost from Unit 113 due to coastal recession around 2010 – 2011, however the surveys noted that the drift line vegetation may have rolled back into the landward Unit 112. Subsequent RSPB surveys in 2015 and 2021 show that drift line vegetation is indeed present in the landward Unit 112, as acknowledged by SZC Co <a href="#">[REP6-025]</a>. The condition survey notes that</i></p>

**NOT PROTECTIVELY MARKED**



**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		<i>annual shingle vegetation was evidenced but appeared to be a single species of Atriplex (Atriplex prostrata). The condition survey also notes that perennial shingle vegetation was present including Rumex crispus, Crambe maritime and Glaucium flavum, all of which were abundant or frequent. Bitter stonecrop and sea sandwort are also recorded as being present."</i>
NE3	NE	Page 30 of the report suggests that the northward dispersal and transport of sediment from the Soft Coastal Defence Feature (SCDF) will nourish the beaches in front of Minsmere, potentially helping to maintain annual drift line communities. This might be plausible in principle but in practice it depends on eventual preferred grain size of the recharge sediment, how it disperses and sorts itself relative to the existing baseline sediment composition on the foreshore. Particle size is therefore important in reaching a fully evidenced conclusion with regards AEol/adverse effects on annual drift line communities.
	SZC Co	<p>Natural England is referring to text in Revision 3.0 of <a href="#">[REP7-101]</a>. The text regarding the SCDF's default particle size was agreed in the Sizewell C Public Examination subsequent to Revision 3.0 of <a href="#">[REP7-101]</a> and is reflected in Revision 4.0 (Pg 76) of <a href="#">[REP10-124]</a> (as well as the Storm Erosion Modelling report <a href="#">[REP9-020]</a>, Coastal Defences Design Report <a href="#">[REP8-096]</a> and the Coastal Processes Monitoring and Mitigation Plan <a href="#">[REP10-041]</a>). It states that '<i>...the recommended default position is to retain the native particle size distribution and not to coarsen the sediment</i>'.</p> <p>This matter is inherently related to the particle size of the SCDF and consequently the recharge interval. This is discussed above at item NE1, including the implications for the conclusions of the Shadow HRA.</p>
NE4	NE	On page 37 with regards SCDF composition, two scenarios are presented which we understand are new and different scenarios to those presented in Version 2 of this report. These are both at the larger end of the size scale so reinforces our advice that further modelling of particle size is needed at this stage to be confident on the conclusion with regards AEol/adverse effects on annual drift line communities.
	SZC Co	Revision 4.0 of the preliminary design report <a href="#">[REP10-124]</a> states that " <i>Whilst Option B is still being considered, SZC Co. is comfortable with retaining the native size distribution and not coarsening the pebble sediments as suggested below for Option A</i> " and further concludes (p76) that " <i>...the recommended default position is to retain the native particle size distribution and not to</i>

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		<i>coarsen the sediment</i> " and that "... 10 mm corresponds to the modal pebble size." Please see response to NE1 (item (2)) in relation to commitment to using the native particle size and the securing mechanisms.
NE5	NE	Page 45 (paragraph 3.1.2 onwards) refers to Natural England's previous comments about there being a lot of sediment needing to be sourced from somewhere for up to seven repeated beach nourishments. However, elsewhere in the report it refers to one of the beach models possibly reducing the number of interventions down to three or four, which would reduce disruption and disturbance to habitats. We would welcome this but advise that these inconsistencies need clarifying.
	SZC Co	Section 3.1.2 is retained in Revision 4.0 of <a href="#">[REP10-124]</a> . It specifically addresses the worst-case projections for recharge, based on an assessment of the fastest (short-term) rate of measured shoreline retreat and the assumption that this rate is maintained for the whole site life. Later sections present alternative (potentially more realistic) assessments of recharge to illustrate the extent to which the number of recharge events may actually be lowered compared to the worst case. There is no conflict in these separate estimates. It should be noted that this report is primarily focussed on demonstrating the <i>viability</i> of the proposed preliminary design via modelling of its stability in storm conditions and estimation of maximum recharge (maintenance) requirements. A range of values is a necessary outcome of thorough testing of SCDF options.
NE6	NE	Page 54 seems to be analysis of recharge intervals and volumes which reinforces the view that the larger the beach cobble size, the fewer number and interval of recharges would be required. This is obviously relevant to the question as to what the most appropriate sediment size and grain is to maintain condition of drift line habitat features.
	SZC Co	SZC Co agrees;– and in respect of the drift line habitat, SZC Co states on p76 of <a href="#">[REP10-124]</a> that "...the recommended default position is to retain the native particle size distribution and not to coarsen the sediment". <a href="#">[REP10-124]</a> tests the viability of the SCDF and, prior to committing to the default native particle size, examined how particle size could be used to influence SCDF viability – the results showed that although the SCDF performs better (less recharge) for coarser sediments, it is viable when retaining the native sediment size (modal diameter of 10 mm). As the SCDF aim is to match the native sediments (and to avoid changes in particle size altering beach dynamics and the vegetated drift line on the designated sites), Revision 4.0 of <a href="#">[REP10-124]</a> contains no further consideration of particle size and the drift line habitat. Please see response to NE1 (item (2)) in relation

**NOT PROTECTIVELY MARKED**

NOT PROTECTIVELY MARKED

Ref	Who	Question / Answer
		to commitment to using the native particle size and the securing mechanisms.
NE7	NE	Re the conclusion on page 71, this again emphasises the desirability of larger cobble sizes in the beach recharge material, with no exploration of what a different cobble composition from the existing default beach substrate might mean for the condition of foreshore habitats. It is repeated here that further work (as highlighted above in our comment 1) is still anticipated to refine the options. We therefore reiterate our advice that this information should be provided now in order to inform conclusions on AEol/adverse effects at this time.
	SZC Co	<p>Revision 4.0 of the preliminary design report <a href="#">[REP10-124]</a> states that "<i>Whilst Option B is still being considered, SZC Co is comfortable with retaining the native size distribution and not coarsening the pebble sediments as suggested below for Option A</i>". For clarity, Option A suggested applying sediment within the native size range, but with a bias toward the coarser end of the existing distribution; Option B referred to the addition of a coarse cobble core to the SCDF (which means it is very unlikely to be exposed as it would be deep within the SCDF buffer layer that is to be maintained via monitoring and mitigation as set out in <a href="#">[REP10-041]</a>).</p> <p>SZC Co reiterates its commitment to construct the SCDF with sediment matching as closely as possible (within the constraints of the aggregate supply) the existing distribution and median size (also called the D<sub>50</sub>) of the native material. Revision 4.0 of the report <a href="#">[REP10-124]</a> concludes (p76) that "...the recommended default position is to retain the native particle size distribution and not to coarsen the sediment" and that "... 10 mm corresponds to the modal pebble size."</p> <p>Thus, the sediment released from the SCDF would be the same particle size as the native sediments, all equally available to be transported during storms, so there would be no change in beach sediment dynamics and so no mechanism for AEol. Revision 4.0 <a href="#">[REP10-124]</a> retains the detail on the cobble layer as reference, and the relevant sections that demonstrate its effectiveness in preventing HCDF exposure under highly improbable extreme conditions. It should be noted that conservative modelling indicates that exposure of the cobble layer is unlikely even if two 1:10,000 year events occur sequentially without the opportunity to recharge the SCDF. Therefore, if a cobble layer was incorporated into the detailed design, it would be buried within the native-sized SCDF and would only be exposed in extreme (&gt;1:10,000 year) events and only for a short period before</p>

NOT PROTECTIVELY MARKED

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		recharge is possible. It is worth noting that, under such extreme conditions, the foreshore habitats would be wholly lost, along with much of the Minsmere shingle beach/barrier as well. The cobble layer would remain within the retained buffer layer of the SCDF and would not be exposed, so could never form part of the 'normal' shoreline dynamics nor influence associated habitats.
<b>Comments on the applicant's Deadline 9 Submission - 9.31 Storm Erosion Modelling of the Sizewell C Soft Coastal Defence Feature using XBeach-2D and XBeach-G - Revision 3.0 [REP9-020]</b>		
NE8	NE	Page 95 (paragraph 4.3.2) states that 'The default position for SCDF particle size is to match the native size distribution, which has a model pebble size of approximately 10 mm diameter'. This is significant and we advise that a firm commitment to it will go a long way to us being more confident about advising no AEol/adverse effects. However, we are not clear about how firm a commitment it is alongside the strong messages elsewhere about the erosion resistant benefits of larger cobble size. We therefore advise that the Applicant clarify how the two messages align with each other.
	SZC Co	Revision 4.0 (which supersedes Revision 3.0) of the preliminary SCDF design [REP10-124] concludes (p76) that "...the recommended default position is to retain the native particle size distribution and not to coarsen the sediment" and that "... 10 mm corresponds to the modal pebble size". SZC Co. committed to this during the SZC Public Examination [REP6-025], as cited in Section 1.1 of [REP10-124]. Regarding the potential use of a fine cobble layer, please see responses at NE 4, NE 6 and NE 7.
NE9	NE	Page 99 (paragraph 4.6.3) states that 'The benefit of retaining the native sizes is the retention of natural processes as much as possible, and it is understood that this is the preferred option of many interested parties as it reduces uncertainty'. This is a positive and welcome statement and indicates that the Applicant has acknowledged and accepted our previous advice on avoiding and minimising habitat impacts and maintaining as natural a functioning coastal frontage, with the aim of avoiding an AEol/adverse effects of foreshore drift line habitats and geomorphological features. If this can be part of the default position for any beach recharge design, then it does help us move us towards being able to advise no AEol/adverse effects. However, it does depend on how the practical design of the beach recharge events plays out in practice on an intervention-by-intervention basis.
	SZC Co	Please see response to NE 3 – NE 8 regarding retention of native particle sizes.

**NOT PROTECTIVELY MARKED**



**NOT PROTECTIVELY MARKED**

---

Ref	Who	Question / Answer
		Regarding the practical design of beach recharge events the detailed method statement must be approved under ML Condition 37 prior to works commencing. The proposed method is to pipe the sediment ashore from a barge, with machinery being used on create the beach profile.

**NOT PROTECTIVELY MARKED**

NOT PROTECTIVELY MARKED

**Table 2: SZC Co Responses to RSPB/Suffolk Wildlife Trust's Deadline 10 Submission – Final Submissions [\[REP10-204\]](#).**

Ref	Who	Question / Answer
<b>RSPB/Suffolk Wildlife Trust's Deadline 10 Submission – Final Submissions <a href="#">[REP10-204]</a></b>		
1.1.6 (Final Position)	RSPB / SWT	Concern that the Coastal Processes Monitoring and Mitigation Plan has identified appropriate mitigation should additional impacts arise from the marine transport facilities and the CDO/FRR outfalls.
	SZC Co	As identified in the project Environmental Statement Volume 2 Main Development Site Chapter 20 Coastal Geomorphology and Hydrodynamics <a href="#">[APP-311]</a> the impact assessment identified no significant effects arising from the nearshore structures and outfalls and so did not identify the need for any mitigation as a result . Nevertheless, SZC. Co has proposed several monitoring measures as reassurance in the Coastal Processes Monitoring and Mitigation Plan (CPMMP) <a href="#">[REP10-041]</a> , such as monitoring of drift line vegetation, the shoreline, longshore bars and the Soft Coastal Defence Feature (for natural and unnatural change) throughout the life of the station. The CPMMP is a control document and requires approval by ESC by DCO Requirement 7B and the MMO under DML Condition 17 prior to works commencing.
1.2 & 1.2.4 (Final Position)	RSPB / SWT	1.2 Given the significance of the concerns above, we remain of the position that the Application cannot be consented without significant harm to wildlife and the natural environment. In terms of the Habitats Regulations Assessment, we do not agree that adverse effects on the integrity can be excluded for the following sites and species: 1.2.4 Perennial vegetation of stony banks and Annual vegetation of drift lines of the Minsmere-Walberswick Heaths & Marshes SAC
	SZC Co	The responses provided to items NE1 to NE9 are also relevant to the RSPB/SWT concerns regarding potential for effect on the perennial vegetation of stony banks and annual vegetation of drift lines of the Minsmere-Walberswick Heaths & Marshes SAC. The responses provided in items NE1 to NE9 reflect the latest evidence submitted at Deadline 10, which the RSPB/SWT would not have had the opportunity to review when submitting their final comments at Deadline 10. SZC Co. assumes that these responses and the evidence referenced in items NE1 to NE9 adequately responds to the

NOT PROTECTIVELY MARKED

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		outstanding concerns raised by RSPB/SWT at Deadline 10.
4.2 & 4.8 (REIS)	RSPB / SWT	<p>Comments on the Report on Implications for European Sites (RIES)</p> <p>4.2 Paragraphs 4.2.29 to 4.2.49 set out the concerns of the RSPB/SWT and others with regard to the vegetated shingle qualifying features of the Minsmere to Walberswick Heaths and Marshes SAC and Ramsar site. We wish to confirm that the submissions at Deadlines 8 &amp; 9 have not resolved the concerns of RSPB/SWT. Further discussions up to Deadline 10 have provided more reassurance that our concerns regarding particle size and the status of the vegetated shingle have been better understood by the Applicant, but we are yet to be provided with evidence that this will remove our concerns regarding potential for adverse effects on integrity. We also have not been provided with convincing evidence that mitigation works are feasible should impacts arise affecting the vegetated shingle being monitored through the CPMMP.</p> <p>4.8 Paragraph 4.6.8 sets out the RSPB/SWT's position at Deadline 7 on those sites and species for which they did not agree that potential adverse effects on integrity could be excluded from the Proposed Development alone. We agree that this is an accurate representation of our position at that stage. Our position based on the submissions up to and including Deadline 9 and more recent discussions with the Applicant (including updates promised to e.g. the Outline Vessel Management Plan and the recreation Monitoring and Mitigation Plans) is that we do not agree that adverse effects on integrity can be excluded for these sites and species: (4<sup>th</sup> bullet): Perennial vegetation of stony banks and Annual vegetation of drift lines of the Minsmere- Walberswick Heaths &amp; Marshes SAC</p>
	SZC Co	<p>The responses provided to items NE1 to NE9 are also relevant to the RSPB/SWT concerns regarding potential for effect on the perennial vegetation of stony banks and Annual vegetation of drift lines of the Minsmere-Walberswick Heaths &amp; Marshes SAC. In particular, items NE1 (addressing particle size and recharge interval) and NE2 (status of the vegetated shingle) address the specific points raised by RSPB/SWT.</p> <p>The responses provided in items NE1 to NE9 reflect the latest evidence submitted at Deadline 10, which the</p>

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		RSPB/SWT would not have had the opportunity to review when submitting their final comments at Deadline 10. SZC Co. assumes that these responses and the evidence referenced in items NE1 to NE9 adequately responds to the outstanding concerns raised by RSPB/SWT at Deadline 10.
20.3 (Coastal Defences Design Report)	RSPB / SWT	We welcome the statement in section 3.10.14 (epage 27) that the default position is that the SCDF will match the native particle size, although would prefer that this is more specific so that it cannot be interpreted as within native particle size as has been used previously to justify a coarser particle size and not fully reflect the range of particle size on the existing and adjacent beach frontages. This is particularly important as the TR544 report referenced in this section is Revision 3.0 which advocates for a coarser grain size and does not conclude that the default position is to match the native particle size.
	SZC Co	<p>SZC Co. has committed to the use of a natural grain size as the SCDF's default particle size, which was agreed in the Sizewell C Public Examination subsequent to Revision 3.0 of <a href="#">[REP7-101]</a> and is reflected in Revision 4.0 (Pg 76) of <a href="#">[REP10-124]</a> (as well as the Storm Erosion Modelling report <a href="#">[REP9-020]</a>, Coastal Defences Design Report <a href="#">[REP8-096]</a> and the Coastal Processes Monitoring and Mitigation Plan (CPMMP) <a href="#">[REP10-041]</a>). The CPMMP is a control document and requires approval by ESC by DCO Requirement 12 and the MMO under Condition 14 of the Deemed Marine Licence (Schedule 21 to the draft DCO) prior to works commencing. Commitment to use the native grain size is stated as follows:</p> <p>Section 7.1.1 <i>"In comparison, the SCDF is a maintained sedimentary feature (using the native particle size distribution as a default without coarsening as agreed during the examination) designed to prevent HCDF exposure to wave action and..."</i> ; and</p> <p>Section 7.1.1.2 <i>"However, as the numerical SCDF erosion modelling in BEEMS Technical Report TR545 <a href="#">[REP9-020]</a> has demonstrated viability of the SCDF across the life of the station for the modal particle size (10 mm diameter), the default position is not to coarsen the SCDF sediments"</i>.</p> <p>Furthermore, sediment particle size is a defined design parameter that needs to be approved by the MMO under Condition 37 (37 (1c)) of the Deemed Marine Licence (Schedule 21 to the draft DCO).</p>

**NOT PROTECTIVELY MARKED**



**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
20.4 Part 1 (Coastal Defences Design Report)	RSPB / SWT	We also note that the statement in 3.10.25 (epage 29) that 'Once the SCDF is established, future recharge of the beach will be infrequent. Recharge is not expected to have any long-term impact on the established habitats and would occur in areas where vegetation is naturally lost, replenishing the sediment there and facilitating potential recolonisation of the supratidal habitat within the county wildlife site, just as currently happens after a storm event.' is somewhat misleading, as no beach recharge currently occurs and the current CWS is maintained by natural processes without any recharge intervention.
	SZC Co	To clarify, the key point is that because sediment from the SCDF would have the same properties as the native sediments, they would behave no differently if subsequently deposited on adjacent shores than sediment deposited by storms. This statement is further supported in Section 2.2 of Revision 4.0 of the Preliminary Design and Maintenance Requirements for the Sizewell C Soft Coastal Defence Feature report <a href="#">[REP10-124]</a> "SCDF recharge would occur in areas where vegetation is naturally lost, replenishing the sediment there and facilitating potential re-colonisation of the supratidal habitat". The sentence has two separate elements: first, recharge occurs where vegetation is naturally lost (on the Sizewell C frontage); while the additional phrase, 'as currently happens after a storm event', refers to the recolonisation process that follows natural loss during a storm event.
20.4 Part 1 (Coastal Defences Design Report)	RSPB / SWT	We also note that the statement in 3.10.25 (epage 29) that 'Once the SCDF is established, future recharge of the beach will be infrequent. Recharge is not expected to have any long-term impact on the established habitats and would occur in areas where vegetation is naturally lost, replenishing the sediment there and facilitating potential recolonisation of the supratidal habitat within the county wildlife site, just as currently happens after a storm event.' is somewhat misleading, as no beach recharge currently occurs and the current CWS is maintained by natural processes without any recharge intervention.
	SZC Co	To clarify, the key point is that because sediment from the SCDF would have the same properties as the native sediments, they would behave no differently if subsequently deposited on adjacent shores than sediment deposited by storms.

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		This statement is further supported in Section 2.2 of Revision 4.0 of the Preliminary Design and Maintenance Requirements for the Sizewell C Soft Coastal Defence Feature report <a href="#">[REP10-124]</a> "SCDF recharge would occur in areas where vegetation is naturally lost, replenishing the sediment there and facilitating potential re-colonisation of the supratidal habitat". The sentence has two separate elements: first, recharge occurs where vegetation is naturally lost (on the Sizewell C frontage); while the additional phrase, 'as currently happens after a storm event', refers to the recolonisation process that follows natural loss during a storm event.
20.4 Part 2 (Coastal Defences Design Report)	RSPB / SWT	We remain concerned that the applicant has been unable to provide any examples of evidence from around the UK coast where beach recharge operations have provided beneficial effects for vegetated shingle. We note that more frequent recharge is anticipated close to the Beach Landing Facility (BLF) and therefore only tens of metres from the boundary with the Minsmere – Walberswick SAC, Ramsar and SSSI site.
	SZC Co	<p>SZC. Co's response to RSPB and SWT at D8 and D10 (<a href="#">[REP10-164]</a>, CG.2.6), and written summary of oral submissions at ISH11 <a href="#">[REP8-121]</a> outline that the waves and tides affecting the frontage will be unchanged with or without the SCDF, and so the natural levels of disturbance that the drift line vegetation experiences to allow for its maintenance and succession would not change. Likewise, the sediment released from the SCDF would be the same particle size as the native sediments, all equally available to be transported during storms, so there would be no new mechanism for an adverse effect to the drift line vegetation.</p> <p>This understanding is not challenged by the RSPB/SWT, but in respect of further evidence, few studies are available since this method is not used routinely to protect vegetated drift habitats - recharge is a coastal defence measure primarily to maintain beach volumes, and so this is the main function that has been monitored and assessed to date in many examples in the UK and worldwide. However, it was noted in Revision 4.0 of the preliminary design report <a href="#">[REP10-124]</a> (Section 2.2, p29) that Hurst Spit (Hampshire, U.K.) provides an example where shingle recharge has promoted colonisation and recovery of shingle vegetation (of a barrier which would otherwise have been lost to the sea).</p> <p>SZC Co acknowledges RSPB's comments in <a href="#">[REP3-074]</a> regarding the recovery of Hurst Spit following severe winter</p>

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		<p>storms in 2013/14 and emergency recharge works. Burt et al. (2018)<sup>2</sup> suggest that beach management has aided towards 'a recovery in vegetated shingle, which is likely to have reached pre-storm extent by the end of 2017'. The report also further states the potential beneficial impacts of beach management (pg. 16): 'If beach management activities did not continue, it is likely that Hurst Spit will not be able to maintain its current beach profile naturally, due to a natural decline in beach volume. In the absence of beach management activities, the beach will be more vulnerable to extreme storm events. The potential for storm damage could then become more likely in any given year, resulting in more frequent and prolonged disruption to the vegetated shingle communities. It is also accepted that some species are more suited to mobile shingle, so stabilisation of the beach does not necessarily benefit all vegetated shingle species'.</p> <p>The proposed SCDF is relatively large and will supply sediment for a substantial period before requiring recharge (recharge intervals were estimated to be greater than 7 years ([<a href="#">REP10-124</a>]), which is well in excess of the observed recovery period of 3-4 years at Hurst Spit); furthermore the source material for the SCDF and any recharge events will be a natural grade material. The provision and management of extra sediment at the SCDF, adjacent to the Minsmere frontage, is designed to be 'a working with nature scheme', in which some of the sediments will be transported towards Minsmere. Therefore, the SCDF will lead to the release of sediment of the same native grain size that would be transported as part of a storm event. Ultimately, this supply of sediment will increase the resilience of the supratidal zone during inevitable future storm events and preserve the potential for vegetation to recolonise the shingle barrier for a longer period than would otherwise be possible.</p> <p>The above process in relation to the SCDF is secured pursuant to the CPMMP ([<a href="#">REP10-041</a>]) which is a control document and requires approval by ESC under DCO Requirement 12 and the MMO under Condition 14 of the Deemed Marine Licence (Schedule 21 to the draft DCO) prior to works commencing.</p>

<sup>2</sup> Burt, L., Eastick, C. & Ferguson, P. (2018) Assessing the dynamics of vegetated shingle – Hurst Spit case study 2013 – 2017. New Forest District Council

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		Further, the CPMMP ([ <a href="#">REP10-041</a> ]) itself will collect evidence, documenting the natural cycles of shingle vegetation loss and recovery across the life of the station for as long as the habitat is designated, including any periods when beach recharge is required.
20.4 Part 3 (Coastal Defences Design Report)	RSPB / SWT	We note in section 3.10.20 confirmation that the 'Coastal Processes Monitoring and Mitigation Plan (CPMMP) [ <a href="#">REP5-059</a> ], to be approved under DCO Requirement 7A and Marine Licence Condition 17, details the methods to monitor erosion of the SCDF and will define the levels at which recharge is required.' Whilst section 3.10.21 states 'The CPMMP would be periodically reviewed by the Marine Technical Forum (MTF) which is to be secured and funded through obligations in the draft Deed of Obligation'. Our understanding is that the revision of the Terms of Reference for the MTF have been deferred until after the Examination ends and we remain concerned that the mechanism to ensure ongoing protection of the neighbouring Minsmere-Walberswick SAC, Ramsar and SSSI feature has not been adequately defined in relation to recharge and other mitigation activities.
	SZC Co	An update of the Coastal Processes Monitoring and Mitigation Plan (CPMMP) was provided at D10 [ <a href="#">REP10-041</a> ]. MTF Terms of Reference are yet to be reviewed/revised but RSPB have been, and will continue to be, part of the MTF when discussing coastal processes. The CPMMP must be approved by and ESC and MMO pursuant to Requirement 12 of the DCO and Condition 14 of the Deemed Marine Licence (schedule 21 of the draft DCO), respectively, prior to works commencing.
20.5 (Coastal Defences Design Report)	RSPB / SWT	Section 4.2.1 (epage 40) states that 'Access to the foreshore from the Main Construction Area, to install the Temporary Sea Defences, is likely to be created via a limited excavation at the western toe of the Northern Mound and work around to the east.' As per fig x above, the northeast corner of the northern mound is situated on RSPB Minsmere. We are not sure how it is anticipated that works access will be achieved without more substantial removal of the northern mound than is indicated here.

**NOT PROTECTIVELY MARKED**



**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
	SZC Co	<p>During the Construction Phase of the station the Northern Mound will be removed and replaced with an engineered embankment to become a classified sea defence structure. These works are shown within the Applicant's red line boundary and Land ownership in <i>Sizewell C Coastal Defences Design Report</i> [REP8-096]. Figure 41 indicates the extent of the mound removal and Appendix A-3: Figure 3-5 indicates the extent of the permanent sea defences.</p> <p>The proposed early works at the Northern Mound area will facilitate construction of the temporary sea defence and the BLF via a temporary access road. This temporary road will be contained within the red line boundary and will precede the main sea defence activity, intersecting the Northern mound at the +2 to +4m contour and limiting the need for extensive early excavation. This is shown indicatively on the attached markup of Figure 3-5. The haul road will be within the landscaped and footpath areas as these areas will be disturbed already.</p> <p>The low-lying area to the east of the Bent Hills area, outside of the areas claimed as sea defence by SZB, will also be levelled, generally around existing contours, to create an access for smaller plant and site access servicing the temporary sea defence construction.</p>
21.1 (Coastal Processes Monitoring and Mitigation Plan)	RSPB / SWT	We note that for item 5 (epages 16 and 17) the spatial extent for monitoring the shoreline and longshore bar has been reduced from 1km to 500m either side. We would welcome further justification for this change, which increase our concern that threats to the Minsmere – Walberswick SAC, Ramsar, SSSI interest features to the north could be overlooked.
	SZC Co	This RSPB/SWT comment is with respect to the track changes ([REP8-068]) comparing Revision 3.0 [REP8-069] and Revision 2.0 [REP5-059] of the Coastal Processes Monitoring and Mitigation Plan (CPMMP). The comment pertains to text in Revision 2.0 (which refers to a monitoring extent of 1 km either side of facilities) that is corrected in Revision 3.0. As can be seen in Figure 45, Appendix 20A, Volume 2, Chapter 20 of the ES [APP-312], the alongshore impact extent has been defined by the area corresponding to +/-5% change in bed shear stress, which spans the frontage 200 m either side of the BLF. The proposed monitoring extent of 500 m either side of each facility is more than double the predicted impact and equates to a total frontage of 1180 m (500 m north of the BLF, 180 m between the BLF and MBIF,

**NOT PROTECTIVELY MARKED**

**NOT PROTECTIVELY MARKED**

Ref	Who	Question / Answer
		and 500 m south of the MBIF). The CPMMP is an adaptive monitoring plan and monitoring extents would be expanded were impacts found to exceed their predicted extents.
21.2 (Coastal Processes Monitoring and Mitigation Plan)	RSPB / SWT	Section 1.2.4 (epage 24) repeats the misleading statement that 'Supra-tidal shingle was also previously recorded on the Minsmere to Walberswick Heaths and Marshes SAC frontage but was destroyed (between 2010 and 2011) by natural coastal erosion.' Although we accept that SSSI site unit 113 was lost to coastal erosion around this time, it is incorrect to imply that supratidal shingle has been lost from the Minsmere to Walberswick SAC frontage as a whole.
	SZC Co	<p>SZC Co. accepted new evidence presented by the RSPB during the Sizewell C Public Examination and has updated the Section 1.2 in Revision 4.0 of the Coastal Processes Monitoring and Mitigation Plan (CPMMP) [<a href="#">REP10-041</a>] accordingly:</p> <p><i>"Supra-tidal vegetated shingle recorded on the Minsmere to Walberswick Heaths and Marshes SAC frontage was recorded as destroyed<sup>3</sup> in Unit 113 between 2010 and 2011 due to natural coastal erosion, however the surveys noted that the drift line vegetation may have rolled back into the landward Unit 112. Subsequent RSPB surveys in 2015 and 2021 show that drift line vegetation is indeed present in the landward Unit 112, as acknowledged by SZC Co [<a href="#">REP6-025</a>]. The condition survey notes that annual shingle vegetation was evidenced but appeared to be a single species of Atriplex (Atriplex prostrata). The condition survey also notes that perennial shingle vegetation was present including Rumex crispus, Crambe maritime and Glaucium flavum, all of which were abundant or frequent. Bitter stonecrop and sea sandwort are also recorded as being present."</i></p> <p>Section 1.1 of Revision 4.0 of the Preliminary Design and Maintenance Requirements for the Sizewell C Soft Coastal Defence Feature report [<a href="#">REP10-124</a>] was also updated to reflect this:</p> <p><i>"Natural England condition surveys (DEFRA MAGIC, 2021) show that annual vegetated drift lines on the Sizewell C to Minsmere Sluice frontage were lost from Unit 113 due to coastal recession around 2010 – 2011, however the surveys noted that the drift line vegetation may have rolled back into the landward Unit 112. Subsequent RSPB surveys in 2015 and 2021 show that drift line vegetation is indeed present in the landward Unit 112, as acknowledged by SZC Co. [<a href="#">REP6-025</a>]. The condition survey notes that annual shingle vegetation was evidenced but appeared to be a single</i></p>

**NOT PROTECTIVELY MARKED**

SZC CO.'S RESPONSE TO THE SECRETARY OF  
STATE'S REQUEST FOR FURTHER INFORMATION  
DATED 31 MARCH 2022 – APPENDIX 8

**NOT PROTECTIVELY MARKED**

---

Ref	Who	Question / Answer
		<i>species of Atriplex (Atriplex prostrata). The condition survey also notes that perennial shingle vegetation was present including Rumex crispus, Crambe maritime and Glaucium flavum, all of which were abundant or frequent. Bitter stonecrop and sea sandwort are also recorded as being present".</i>

**NOT PROTECTIVELY MARKED**