Pause Study – Scope

Date 17/05/2021 V8

EDDC has decided to pause the production of the Outline Business Case (the OBC) in order to carry out a Pause Study (the Study). The purpose of the Study is to carry out an investigation into a viable alternative option to the preferred option in the OBC. The scope of this study is as follows.

To avoid confusion. The preferred option, (or Working draft) and all work that has fed into it will be referred as the 'Paused OBC'

A) Pause Study - Aims

The Aims of the BMP & the BMS (including the Paused OBC) are:

Aim 1. Maintain the 1990's Sidmouth Coastal Defence Standard of Service (Sidmouth Beach);

Aim 2. Reduce the rate of beach and cliff erosion to the east of the R Sid (East Beach).

Aim 3. Carry out (1) and (2) in an integrated, justifiable and sustainable way

These Aims are to be carried forward to this, the Pause Study with the following clarification of Aim 1 and Aim 3.

Clarification of Aim 1.

a) When Aim 1 was agreed in 2014 it was assumed the existing scheme[1] along the Sidmouth Town frontage was designed and built as a Coastal Defence[2]. During the baseline research phase of the BMP it was discovered that it was only a coast protection scheme[3], and when it was designed in 1993[4] it had 50-year coast

[1] The existing scheme consists of: i) The sea wall along Sidmouth promenade, ii) rock armouring and the 'design beach' in front of the sea wall to protect it from erosion and structural damage, iii) three rock groynes and two off-shore breakwaters to retain the design-beach and iv) periodic recycling and recharging of the design-beach.

[2] Where a 'coastal defense' is… a 'coast protection' scheme (which is designed to protect land above sea level from coastal erosion) and a 'sea defense' scheme (which is designed to defend land below sea level from coastal flooding)

[3] The coast protection scheme was designed to protect the above-sea-level: promenade, road and sea-front residential and commercial property from coastal erosion.

[4] January 1993 is the date of HR Wallingford's report EX 2607 'Mobile bed physical modelling study'.

protection standard of protection. This design did not take climate change into account because it was not a design requirement at that time. Consequently the BMP consultants were instructed to assess the standard of sea defence that the 'maintained coast protection scheme' would provide. The BMP includes their findings and recommends how the existing coast protection scheme needed to be modified to provide a sea defence to industry standards.

b) The proposal to raise the splash wall in the preferred option in the Paused OBC has generated much discussion about when it needs to be raised to combat sea level rise. As you know this has been difficult to answer because of the uncertainties. The EA's User Guide SC110001/R1 'Accounting for adaptive capacity in FCERM options appraisal' sums up this problem in section 2.2.1 as follows:

> *"When the scale of uncertainty is such that it could affect the delivery and outcomes of a specific plan and subsequent project choices, decision makers need to be aware of and comfortable with postponing decisions that do not affect short-term outcomes provided that there are plans, monitoring processes and trigger points in place that allow more informed solutions to be developed in the future. This is a real choice which does not prevent decisions being made, but ensures that high regrets choices are not adopted in situations where there is no pressing need for an immediate decision. Ensuring true stakeholder collaboration and engagement is likely to take longer where managed adaptive approaches are being developed as these are a departure from traditional FCERM and involve more complexity. This needs to be built into the project planning process."*

EDDC is keen to ensure that the 'managed adaptive approach' is considered so a 'high regrets choice' is avoided.

c) Hence, in the light of a) and b) above, in effect Aim 1 means:

Maintain the 1990's Sidmouth Coast Protection scheme's 50 year SoP and provide a 200 year Sea Defence SoP, both of which should evolve with climate change in accordance with the managed adaptive approach if appropriate.

Note. Primary maintenance of the 1990's Sidmouth Coast Protection scheme is recycling and recharging the design-beach[5] to protect the sea wall from erosion and structural damage. This is described in the 1996, 1998, 2002 and 2005 BMPs, which include beach trigger levels and volumes for consideration of appropriate action. Hence it has been assumed that the design-beach needs to be maintained in

[5] The 'design-beach' is the beach profile to which Sidmouth beach was recharged as part of the existing scheme. It is a beach with a 10m wide berm about 1m below the level of the promenade with a 1in 7 slope to the sea-bed.

accordance with those triggers. We see no reason for changing those triggers unless you advise otherwise, for example in order to take climate change into account.

Clarification of Aim 3.

For the avoidance of doubt, 'sustainable' in Aim 3 is not limited to the sustainability of the scheme. It also applies to how the scheme affects the sustainability of the town, for example as a tourist destination. That has been the intention all along but it may have been overlooked.

B) Pause Study - objectives.

Introduction

The existing coast protection scheme relies on retaining the 'design-beach' in front of the sea wall with recycling and occasional recharging.

We can learn from what we can see in the bay and what has been indicated in reports that a strong beach in front of the sea wall is needed for coast protection and sea defence purposes.

HR Wallingford's report EX2067 and the 1996, 1998, 2002 and 2005 BMPs indicate that the **net movement of beach material is from east to west** (from the groyne bays where the design-beach erodes to the lea of the breakwaters where the design-beach accretes). We also know this material has to be recycled and occasionally recharged in order to maintain the coast protection SoP and the proposed sea defence SoP.

EDDC is concerned about the sustainability and the cost of this long-term requirement to recycle and recharge the beach, which is also part of the preferred option in the Paused OBC. The Pause Study is to consider options that will reduce this net movement of beach material in order to create a more stable beach along the whole of the Sidmouth sea front and thereby reduce the need for long-term beach recycling and recharging.

Objectives

1. Reduce the existing net movement of beach material from east to west in order to create a more stable beach along the whole of Sidmouth sea front and thereby reduce the need for long term beach recycling and occasional recharging.
2. Modify the existing coast protection scheme in order to reduce the flood damages to Sidmouth Town to a similar level of the Paused OBC to keep the project's economic eligibility roughly the same as the Paused OBC. This is the 1in200 now, and should ideally keep pace with climate change to 2121.

3. As per aim 2, reduce the erosion rate at East Beach (by creating and maintaining a stable beach of appropriate size)
4. Any new option must sit within the total project cost of £12m approximately as afforded by the conservative PF calculator[6]
5. Reduce or eliminate the need/length/height for the raising of the splash wall from the Paused OBC. With strong preference to offshore option, but acknowledging that a splash wall may need to be raised now or with climate change on certain but limited frontages.
6. Maintain Town Beach as safe for swimming
7. Solution needs to gain regulatory approvals (all consents including MMO/EDDC Planning) including East Beach long term being compatible with legitimate NE and WHS constraints.
8. Bring Sidmouth Main Beach up to the design beach level on 1. Future recharge volumes and recycling levels should be based on trigger levels in HR Wallingford report and the 1996, 1998, 2002 and 2005 BMPs.
9. Improve the 'future proofing' of Sidmouth against sea level rise and increased storminess. For instance; if the Aims and Objectives can be met with more offshore structures, then this will allow 'raising the splash wall' to be kept in reserve for the future.
10. The alternative option should seek to enhance the sustainability of the town, its economy and its sense of place

C) Additional considerations.

- This may, or may not include the recycling of the rock from the existing beach groynes into any offshore structures.
- Concern over potential for wave or tidal driven currents around structures.
- Access (launching) for fishing/recreational boats
- Allows the Sid to discharge to reduce the risk of fluvial flooding
- Public access to rock structures (safety)
- Improve Port Royal end of town.
- Improve access to the beach at Port Royal end slipway (some funding is conditional on achieving this objective)
- Improve amenity value of beach and esplanade.
- Integration of river and coastal defences.
- Maintain/improve water quality – especially in relation to the South West Water outfall

[6] This is total project cost and includes project management, design and a risk budget. Likely maximum construction cost is to be in the region of £8m but will vary depending on design and risk budget.

- Consideration of Geotubes
- Consideration of 'lower and wider' offshore structures /artificial barrier reefs, so waves break on then as opposed to against them.
- Should a leading idea be unaffordable, consideration needed to use the less conservative funding calculator if required.
- Reduce carbon footprint for construction and long-term maintenance.

- Alignment with Sid Valley Neighbourhood Plan and the Local Plan
- Splash wall raising, if needed, will be less disruptive to raise at Port Royal end
- Visual acceptance to residents and visitors
- Consideration of the orientation of offshore structures, not just the NW/SE of the existing breakwaters.

D) Consultant Scope

Part 1)

Undertake a desk study to explore potential offshore and onshore options that meet the aims and objectives outlined in A and B. Short-list feasible approaches for consideration by the Pause Sub-group for further investigations.

Options should be initially investigated for feasibility via a desk study (conceptual, qualitative or simple hand calcs based on previous work and experience eg HRW/BMP and literature/guidance e.g. Shore Protection Manual, Coastal Engineering Manual or similar). Assumptions need to be clearly documented so they can be sense checked by a wider group.

This desk study should

- Learn from how the existing coast protection scheme has performed for coast protection and sea defence purposes since it was built.
- Read and learn from previous BMPs, HRW's physical modelling report EX 2607 and all available reports and data sources such as YouTube.
- Outline pricing and cost risk (to confirm it is affordable)
- 'Textbook' and other examples for guidance
- Explain how they will maintain the 50 year standard of coast protection and provide a 200 year standard of sea defence for Sidmouth sea front, reduce the rate of erosion at East Beach, and explain the extent to which this keeps pace with climate change
    - Influence on incoming waves
    - Influence on beach eg potential to increase in beach
    - Influence on overtopping eg potential to decrease overtopping.
- Provide an estimate of the level of protection offered by a viable offshore only solution now and in 100 years with climate change

- Environmental and regulatory show stoppers
- Outline check of sustainability
- Technical/Project risk considerations eg influence of removing existing structure on the beach
- Identify any outstanding information or modelling required to evidence clear Project Appraisal Guidance decision rules.

Possible options to consider should include ideas similar to those presented below though these are not exhaustive so if there is option that meets the aims and objectives above this should not be excluded. The addition of new structures may or not be combined with amendment of existing groyne/pier structures. It is not expected the existing offshore structures will be changed unless there is a very strong case for doing so, which should be flagged early in the Study for a decision.

We would also like the consultant to attend up to 6 sub-group meetings to discuss progress on developing a successful alternative option.

Part 2)

Should any of the options be viable following part 1, we envisage one leading option to be selected in consultation with the Pause Sub Group to be modelled sufficiently to quantify its likely success, with the aim for it to be of sufficient standard to produce a revised OBC from it. Changing OBC to any new option will only occur following further consultation with the Advisory Group, and a decision by cabinet, and the production of a revised OBC is out of the scope of the Pause Study.

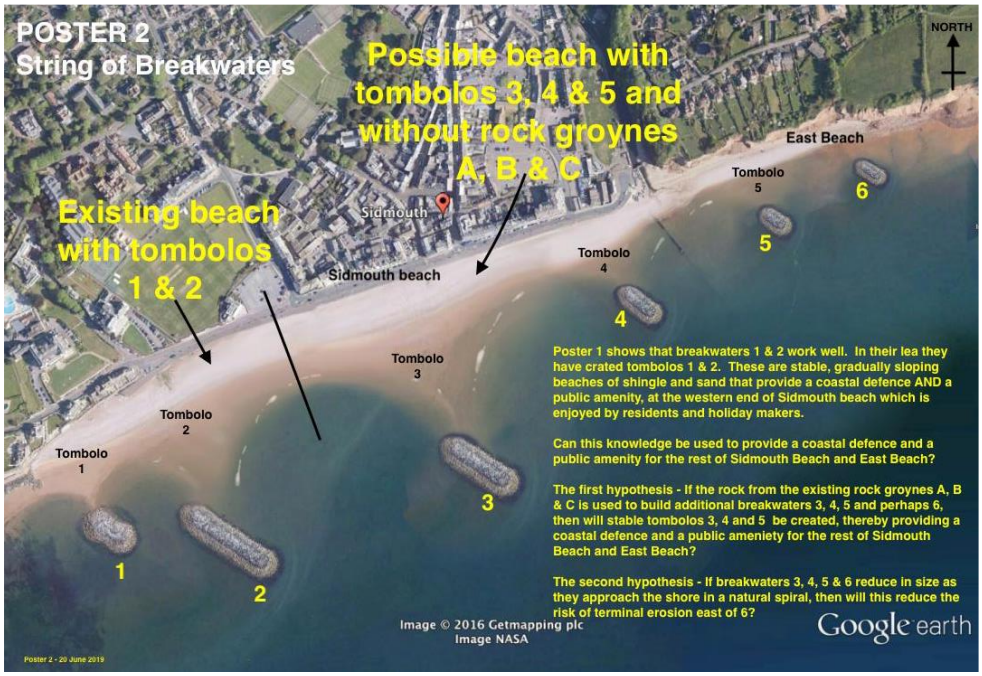
E) Outline ideas.

Although we expect the consultant to provide their own ideas, and work to what they believe will be a successful alternative idea, the Pause Sub-group has outlined the following outline ideas to help the consultant judge what could be publically popular.

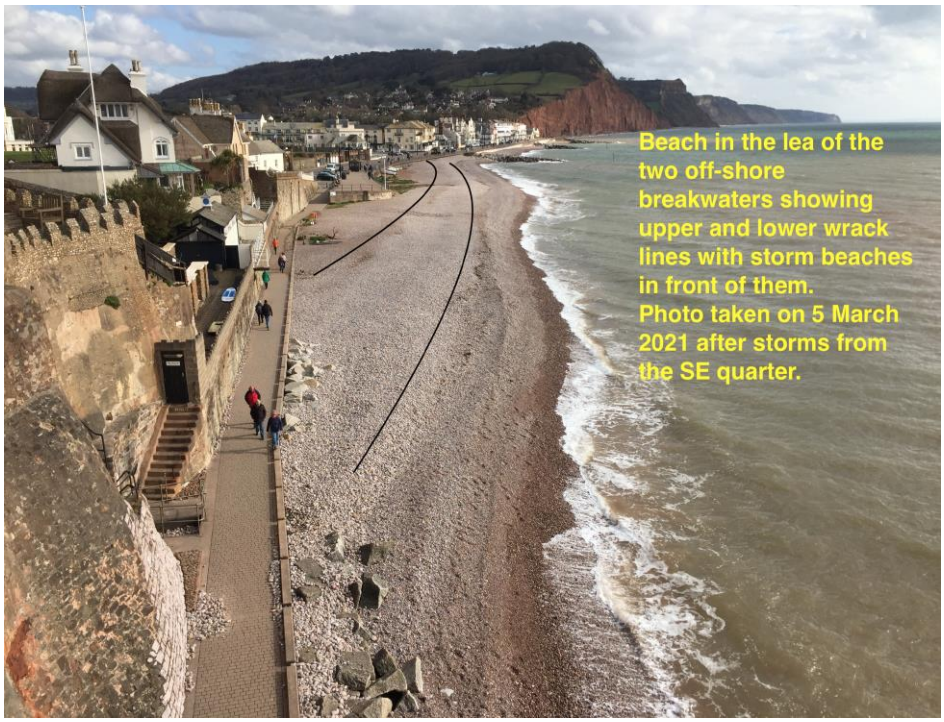
E1) Full offshore solution.

As the first the image below shows, this would be some form of multiple offshore rock islands, or indeed a single 'third island' perhaps in combination with other structures. Hoped outcomes would be the new rock islands will maintain a relatively stable, wide and healthy beach in their lee as the existing two rock islands have done, which protect the sea wall and reduce overtopping from storms from the south west AND the south east quarters. (Note: a) The breakwaters and the wide, healthy beach in their lea protect the frontage there from storms from the SW quarter. b) The same beach protects the frontage from storms from the SE quarter. The second image below illustrates this.) Can this be replicated

for the whole of the Sidmouth Town frontage?. Additional breakwaters would also break some of the storm waves also resulting in less overtopping combined with a bigger beach. The islands at east beach would be closer to shore to produce a classic tombola effect, with a high, wide beach being created in their lee, as well as the islands disrupting storm waves.

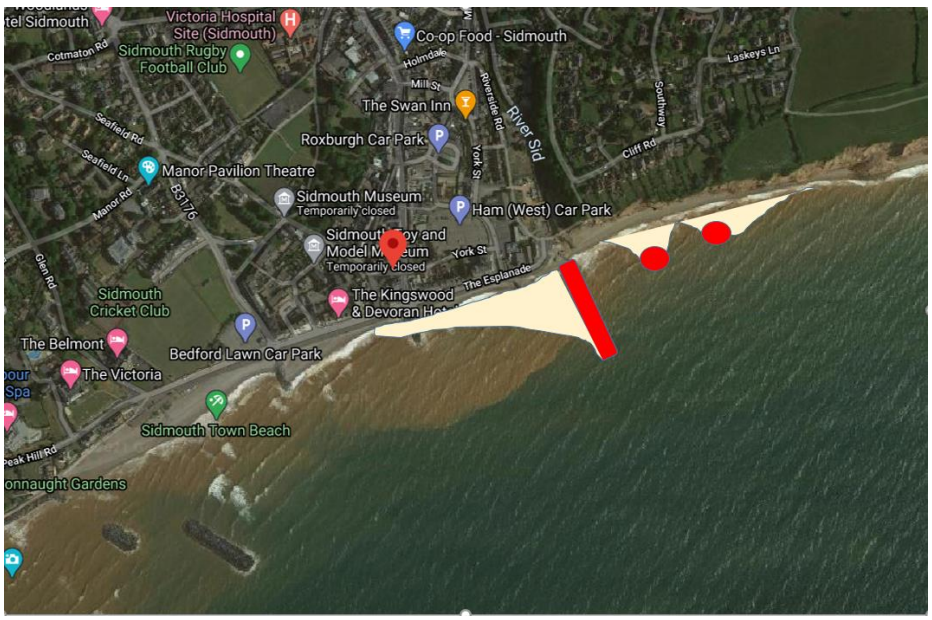


(note number, size and location of rock islands are indicative NB. HR Wallingford's physical modelling report EX 2607 gives information about how offshore structures will perform)



E2) Rock Armour Pier or Super Groyne2.

As the image below shows, this would likely involve an additional supergroyne being formed on town beach, which is hoped would keep a big healthy beach as per the East Beach Supergroyne in the paused OBC. The additional supergroyne could have some amenity value. It may also need to be T-headed as per one of the final options in the BMP. East Beach would either retain its proposed supergroyne, or another structure, such as nearshore rock islands or submerged geotubes to protect the cliffs.



E3) Submerged options

Due to some concerns over visual aspects, partially or fully submerged options of offshore defences should be considered. These may include Geotubes, or lower rock islands which may or may not be wide like a barrier reef so waves break on them not against them. They could be utilised to work with options E1 and E2.

E4) Hybrid option

Using elements of the above ideas to create a hybrid option that is in keeping with the aims and objectives.