CDF

Project Name	Sidmouth Beach Management Scheme						
Option	Baseline - Do Nothing	Option 1 - S1.1a	Option 2 - S1.1b	Option 3 - S1.1c	Option 4 - S1.1d	Option 5 - S1.1e	Option 6 - S4.4a
Overview / Description	No works undertaken. Hypothetical option as this is not in line with SMP or BMP policy. This option would not satisfy any Critical Success Factors.	Frontage B Sidmouth Town: Maintain existing defence configuration and repair training wall. Periodic beach recharge to maintain volume and supported by beach recycling. Raise existing splash wall to rear of promenade and install flood gates for access.					Frontage B Sidmouth Town: Maintain existing defence configuration and repair training wall. Periodic beach recharge to maintain volume and supported by beach recycling. Raise existing splash wall to rear of promenade and install flood gates for access. Build 1no. 70m long offshore breakwater. Delayed / not require to raise the splash wall at the back of the promenade in line with the breakwater.
		Frontage C East Beach: Construct 1no. rock groyne ~80m in length east of the River Sid. This will control beach levels and will be supported by periodic beach recycling and recharge. Construction of maintenance ramp. Note: details of ramp to be determined during detailed design.	Frontage C East Beach: Construct 2no. rock groynes ~80m in length east of the Frontage D River Sid This will control beach levels and will be supported by periodic beach recycling and recharge. Construction of maintenance ramp. Note: details of ramp to be determined during detailed design.	Frontage C East Beach: Construct 1no. rock groyne ~120m in length east of the Frontage D River Sid. This will control beach levels and will be supported by periodic beach recycling and recharge. Construction of maintenance ramp. Note: details of ramp to be determined during detailed design.	Frontage C East Beach: Construct 1no. rock groyne ~80m in length and 1no. rock groyne ~120m in length east of the Frontage D River Sid. This will control beach levels and will be supported by periodic beach recycling and recharge. Construction of maintenance ramp. Note: details of ramp to be determined during detailed design.	Frontage C East Beach: Construct 2no. rock groynes ~120m in length east of the River Sid. This will control beach levels and will be supported by periodic beach recycling and recharge. Construction of maintenance ramp. Note: details of ramp to be determined during detailed design.	Frontage C East Beach: Construct 1no. rock groyne ~120m in length east of the Frontage D River Sid. This will control beach levels and will be supported by periodic beach recycling and recharge. Construction of maintenance ramp. Note: details of ramp to be determined during detailed design.
		Frontage D River Sid Western Wall: Lowering of the training wall outer end and encasement, followed by replacement in year 30.					
Technical Issues	No works are undertaken.	Frontage B Sidmouth Town: None. The same works have been undertaken in the past.					
		Frontage C East Beach: Option will hold sufficient beach material to provide protection to cliff toe. Health and safety concerns due to cliff stability. However, beach will be at very high risk of drawn-down / erosion under sea storm conditions	Frontage C East Beach: Option will hold sufficient beach material to provide protection to cliff toe. Health and safety concerns due to cliff stability. However, beach will be at high risk of drawn-down / erosion under sea storm conditions.	Frontage C East Beach: Option will hold sufficient beach material to provide protection to cliff toe. Health and safety concerns due to cliff stability. Beach will be at some risk of drawn-down / erosion under sea storm conditions.	Frontage C East Beach: Option will hold sufficient beach material to provide protection to cliff toe. Health and safety concerns due to cliff stability. Beach will be at low risk of drawn-down / erosion under sea storm conditions.	Frontage C East Beach: Option will hold sufficient beach material to provide protection to cliff toe. Health and safety concerns due to cliff stability. Beach will be at very low risk of drawn-down / erosion under sea storm conditions.	Frontage C East Beach: Option will hold sufficient beach material to provide protection to cliff toe. Health and safety concerns due to cliff stability. Beach will be at some risk of drawn-down / erosion under sea storm conditions.
		Frontage D River Sid Western Wall: None.					
Monetary Benefit	PV Damage: £182,624,231	PV Damage:- £15,123,925	PV Damage:- £15,123,925	PV Damage:- £15,123,925	PV Damage:- £15,123,925	PV Damage:- £15,123,925	PV Damage:- £15,123,925
	PV Benefit: £0	PV Benefit: £197,748,156	PV Benefit: £197,748,156	PV Benefit: £197,748,156	PV Benefit: £197,748,156	PV Benefit: £197,748,156	PV Benefit: £197,748,156
	PV Total Cost: £0	PV Total Cost: £17,134,552	PV Total Cost: £17,699,265	PV Total Cost: £16,346,367	PV Total Cost: £16,633,053	PV Total Cost: £17,725,332	PV Total Cost: £18,477,726
	Benefit Cost Ratio: NA	11.54	11.20	12.10	11.90	11.20	10.70
Category	**Description and Quantification of Impacts**	**Description and Quantification of Impacts**	**Description and Quantification of Impacts**	**Description and Quantification of Impacts**	**Description and Quantification of Impacts**	**Description and Quantification of Impacts**	**Description and Quantification of Impacts**
Economic Impacts							
Properties	Flood risk remains: - 52 properties at Very Significant Risk - 0 properties at Significant Risk - 60 properties at Intermediate Risk - 1 property at Moderate Risk - 55 properties at risk from Erosion	Flood risk significantly reduces: - 0 properties at Very Significant Risk, - 0 properties at Significant Risk - 0 properties at Intermediate Risk - 37 properties at Moderate Risk - 24 properties at Low Risk - 0 properties at risk from erosion	Flood risk significantly reduces: - 0 properties at Very Significant Risk, - 0 properties at Significant Risk - 0 properties at Intermediate Risk - 37 properties at Moderate Risk - 24 properties at Low Risk - 0 properties at risk from erosion	Flood risk significantly reduces: - 0 properties at Very Significant Risk, - 0 properties at Significant Risk - 0 properties at Intermediate Risk - 37 properties at Moderate Risk - 24 properties at Low Risk - 0 properties at risk from erosion	Flood risk significantly reduces: - 0 properties at Very Significant Risk, - 0 properties at Significant Risk - 0 properties at Intermediate Risk - 37 properties at Moderate Risk - 24 properties at Low Risk - 0 properties at risk from erosion	Flood risk significantly reduces: - 0 properties at Very Significant Risk, - 0 properties at Significant Risk - 0 properties at Intermediate Risk - 37 properties at Moderate Risk - 24 properties at Low Risk - 0 properties at risk from erosion	Flood risk significantly reduces: - 0 properties at Very Significant Risk, - 0 properties at Significant Risk - 0 properties at Intermediate Risk - 37 properties at Moderate Risk - 24 properties at Low Risk - 0 properties at risk from erosion
Infrastructure	Frontage B Sidmouth Town: Losses from tourism due to failure of defence and increased flood risk. Erosion	Frontage B Sidmouth Town: Option protects tourism and infrastructure. Potential to enhance the promenade.					
	Frontage C East Beach: East Beach Cliff continue to erode. Loss of Almer bridge and exposure to River Sid	Frontage C East Beach: Option will reduce wave action at the cliff toe, but will have no impacts on cliff failures from the top of cliff. Revetment will provide cliff toe protection and reduce cliff toe failure. Option will act as a barrier to the natural sediment exchange between cliffs and the beach.					
	Frontage D River Sid Western Wall: Losses from tourism due to failure of the western wall and increases flood risk. Disruption to tourism	Frontage D River Sid Western Wall: Option protects tourism and infrastructure.					
Transport	Frontage B Sidmouth Town: Flooding of the seafront and streets would occur frequently.	Frontage B Sidmouth Town: Transport links along the esplanade and within Sidmouth town protected.					
	Frontage C East Beach: No impacts.	Frontage C East Beach: No impacts.					
	Frontage D River Sid Western Wall: Flooding via the western wall would increase as wall fails	Frontage D River Sid Western Wall: Transport links along the esplanade and within Sidmouth town protected.					
Environmental Impacts							
Landscape	Frontage B Sidmouth Town: As defences fail there will be significant changes to the landscape.	Maintaining/repairing the training wall and recharging the beach are unlikely to change the landscape setting. Raising the existing splash wall and installing flood gates may change the landscape setting, impacting views and the townscape. Negligible or slight impact.	Maintaining/repairing the training wall and recharging the beach are unlikely to change the landscape setting. Raising the existing splash wall and installing flood gates may change the landscape setting, impacting views and the townscape. Negligible or slight impact.	Maintaining/repairing the training wall and recharging the beach are unlikely to change the landscape setting. Raising the existing splash wall and installing flood gates may change the landscape setting, impacting views and the townscape. Negligible or slight impact.	Maintaining/repairing the training wall and recharging the beach are unlikely to change the landscape setting. Raising the existing splash wall and installing flood gates may change the landscape setting, impacting views and the townscape. Negligible or slight impact.	Maintaining/repairing the training wall and recharging the beach are unlikely to change the landscape setting. Raising the existing splash wall and installing flood gates may change the landscape setting, impacting views and the townscape. Negligible or slight impact.	Maintaining/repairing the training wall and recharging the beach are unlikely to change the landscape setting. Raising the existing splash wall, installing flood gates may change the landscape setting, impacting views and the townscape. Negligible or slight impact. Constructing a new offshore breakwater will change the landscape setting, impacting views and the townscape. Impact considered minor - moderate.
	Frontage C East Beach: East Beach cliff continue to erode back changing the landscape naturally.	Introducing one short groyne is likely to result in the smallest change to the setting of the landscape and seascape character in one discreet area, including the AONB and the World Heritage Site (WHS). Impact considered minor.	Introducing two short groynes is likely to result in a change to the setting of the landscape and seascape character in two areas, including the AONB and the World Heritage Site (WHS). The change is likely to be larger than expected for one groyne as more than one location will be impacted. Impact considered minor - moderate with localised substantial visual effects.	Introducing one long groyne is likely to result in a larger change to the setting of the landscape and seascape character in one discreet area when compared to one shorter groyne, including the AONB and the World Heritage Site (WHS). The change is likely to be smaller than if two short groynes were installed as it will be contained to one location. Impact considered minor - moderate. Impact considered minor - moderate with localised substantual visual effects.	Introducing two groynes (one short one long) is likely to result in a change to the setting of the landscape and seascape character in two areas, including the AONB and the World Heritage Site (WHS). The change is likely to be larger than expected for one groyne as more than one location will be impacted. Impact considered minor - moderate. Impact considered minor - moderate with localised substantual visual effects.	Introducing two long groynes is likely to result in a change to the setting of the landscape and seascape character in two areas, including the AONB and the World Heritage Site (WHS). The change is likely to be larger than expected for one groyne as more than one location will be impacted and also more than for options 2 and 4 with two groynes due to their length. Impact considered minor - moderate with localised substantual visual effects.	Introducing one long groyne is likely to result in a larger change to the setting of the landscape and seascape character in one discreet area when compared to one shorter groyne, including the AONB and the World Heritage Site (WHS). The change is likely to be smaller than if two short groynes were installed as it will be contained to one location. Impact considered minor - moderate. Impact considered minor - moderate with localised substantual visual effects.
	Frontage D River Sid Western Wall: As defences fail there will be significant changes to the landscape	No likely change in landscape.	No likely change in landscape.	No likely change in landscape.	No likely change in landscape.	No likely change in landscape.	No likely change in landscape.
Coastal Geomorphology	Frontage B Sidmouth Town: No impacts. Coast allowed to naturally function.	Baseline conditions remain the same. No impact on UNESCO World Heritage Site and nationally designed geological sites.					
	Frontage C East Beach: Coast allowed to naturally function so will continue to erode the cliff with potential	Small adverse impacts on UNESCO World Heritage Site and nationally designated geological sites. Key to designation is that the coast will be allowed to naturally function though at a reduced rate exposing the cliff slower as a result of erosion.					
	Frontage D River Sid Western Wall: No impacts. Coast allowed to naturally function.	Baseline conditions remain the same. No impact on UNESCO World Heritage Site and nationally designed geological sites.					
Coastal Processes	Frontage B Sidmouth Town: Positive impact on UNESCO World Heritage Site and nationally designated geological sites by allowing natural processes of erosion to enhance features.	No impact, coastal processes would continue as present with the current defences continuing to influence nearshore transport.					No impact, coastal processes would continue as present with the current defences continuing to influence nearshore transport. The construction of the offshore breakwater likely to have no im+I53pact on sediment transport.
	Frontage C East Beach: Positive impact on UNESCO World Heritage Site and nationally designated geological sites by allowing natural processes of erosion to enhance features.	Option will help to stabilise upper beach. Natural movement of beach material along this frontage will be significantly affected. Beaches to the east are generally healthy, therefore impacts updrift are likely to be minimal..					
	Frontage D River Sid Western Wall: Positive impact on UNESCO World Heritage Site and nationally designated geological sites by allowing natural processes of erosion to enhance features.	Possible construction impacts to UNESCO World Heritage Site and nationally designated geological sites. Baseline conditions likely to remain at same level subject to external driving forces.					

Option	Baseline - Do Nothing	Option 1 - S1.1a	Option 2 - S1.1b	Option 3 - S1.1c	Option 4 - S1.1d	Option 5 - S1.1e	Option 6 - S4.4a
Marine Ecology	Frontage B Sidmouth Town: Impact from infrastructure erosion debris causing possible temporary damage/ smothering of BAP habitat/reef habitat and inshore nursery and fish spawning grounds. The marine	There is likely to be a temporary increase in suspended sediment concentrations during beach recharge and recycling, this impact will be the same regardless of the selected option. These impacts are not anticipated to be significant and will only last for a short period of time. No other changes to the current condition are anticipated.					As per Option S1 with the addition of permanent loss of habitat due to the construction of the breakwater. Considered a negligible adverse / beneficial impact creating artificial reef habitat for fish.
	Frontage C East Beach: No impact as cliff erosion would continue in a natural manner.	Small loss of habitat within the footprint of the structures (smallest to largest - 1a, 1c, 1b, 1d, 1e). This will not affect any Priority Habitats or species of conservation importance. There is also likely to be a temporary increase in suspended sediment concentrations during construction with the impact slightly larger depending on the selected option (smallest to largest - 1a, 1c, 1b, 1d, 1e). The same impact can be expected during beach recharge and recycling though this impact will be the same regardless of the selected option. These impacts are not anticipated to be significant and will only last for a short period of time. A potential positive impact may occur from additional structures providing surfaces and crevices (e.g. for brown crab) that can be colonised by marine species resulting in an increase in the diversity of habitats found in this location. Potential for small impacts from vehicular movements along the beach and vessels moored on the beach or nearshore during the construction phase, this is not considered likely to result in any significant effects on the ecology. A Construction Environmental Management Plan (CEMP) will mitigate for spills, leaks etc.					
	Frontage D River Sid Western Wall: Potential for infrastructure to block the river Sid impeding fish migration.	No impact compared to present.					
Water Quality	Frontage B Sidmouth Town: No change to current conditions.	There is the possibility that the proposed beach management activities and construction could impact on water quality if undertaken within or from the water. However impacts will be managed with the implementation of a CEMP with a particular focus on reducing the risk of accidental spills and disturbance to the marine environment as far as possible.					
	Frontage C East Beach: No change to current conditions.	There is the possibility that the proposed beach management activities and construction could impact on water quality if undertaken within or from the water. However impacts will be managed with the implementation of a CEMP with a particular focus on reducing the risk of accidental spills and disturbance to the marine environment as far as possible. It follows that the potential for an unmitigated impact would be larger, the larger the scale of the works (smallest to largest - 1a, 1c, 1b, 1d, 1e).					
	Frontage D River Sid Western Wall: No change to current conditions.	There is the possibility that the proposed beach management activities and construction could impact on water quality if undertaken within or from the water. However impacts will be managed with the implementation of a CEMP with a particular focus on reducing the risk of accidental spills and disturbance to the marine environment as far as possible.					
Terrestrial Ecology	Frontage B Sidmouth Town: No change to current conditions.	No change to current conditions. The man made sea defence structures currently do not provide much habitat for terrestrial ecology and maintaining/repairing the sea defence will not change this, nor will raising the existing splash wall.					
	Frontage C East Beach: No change to current conditions.	The rate of erosion on the vegetated cliff will continue though it will be reduced by the introduction of the groynes.					
	Frontage D River Sid Western Wall: No change to current conditions.	No change to current conditions. The wall will be maintained.					
Archaeology & Cultural Heritage	Frontage B Sidmouth Town: As defences fail there will be significant changes to the Sidmouth Town Conservation Area with the potential for the listed buildings and structures within the town of Sidmouth located along the Esplanade and near to Chit Rocks to be lost.	The historic conservation area will potentially be negatively impacted by the new splash wall. During the detailed design phase the splash wall will need to be developed ensuring it is in keeping with the conservation area.					
	Frontage C East Beach: The cliff will continue to erode, with erosion rates likely to increase over time as the current defences fail.	Erosion of the cliff is a key issue. It is a feature of the designation that cliff erosion continues. At the same time the properties located at the top of the cliff would like the cliff to be maintained to safeguard their properties. The rate of cliff erosion depends on the option selected with the largest amount likely to be if Option 1 were selected followed by Option 3, Option 2, Option 4 and with the least amount of erosion taking place for Option 5.					
	Frontage D River Sid Western Wall: No change to current conditions.	No change to current conditions.					
Social Impacts							
Amenity Value	Frontage B Sidmouth Town: Loss of access to beach when defences fail.	Frontage B Sidmouth Town: Temporary changes during construction only. Amenity value maintained or improved with option.					Frontage B Sidmouth Town: Temporary changes during construction only. Amenity value maintained or improved with option.
	Frontage C East Beach: Loss of access to beach when defences fail.	Frontage C East Beach: Temporary changes during construction only. Amenity value maintained with option. Health and safety concerns due to cliff stability so access to beach to be discouraged.					
	Frontage D River Sid Western Wall: Loss of access to beach when defences fail.	Frontage D River Sid Western Wall: Temporary changes during construction only. Amenity value maintained with option.					
Community	Frontage B Sidmouth Town: Do Nothing is not supported with local community. Negative perception on Local Authority and Environment Agency.	Frontage B Sidmouth Town: Do Something option supported although no support received to raising of the splash wall along the whole frontage. Perception on Local Authority and Environment Agency partially damaged.					Frontage B Sidmouth Town: Do Something option supported. Positive perception on Local Authority and Environment Agency maintained.
	Frontage C East Beach: Do Nothing is not supported with local community. Negative perception on Local Authority and Environment Agency.	Frontage C East Beach: Do Something option supported. Positive perception on Local Authority and Environment Agency maintained.					
	Frontage D River Sid Western Wall: Do Nothing is not supported with local community. Negative perception	Frontage D River Sid Western Wall: Do Something option supported. Positive perception on Local Authority and Environment Agency maintained.					
Health and Wellbeing	Frontage B Sidmouth Town: Risk to life increases. Increased stress due to flood risk increasing over time.	Frontage B Sidmouth Town: Risk of flooding reduced. Positive impact on health and well being.					
	Frontage C East Beach: Risk to life increases. Increased stress due to flood risk increasing over time.	Frontage C East Beach: Risk of flooding reduced. Rate of erosion slowed down. Positive impact on health and well being.					
	Frontage D River Sid Western Wall: Risk to life increases. Increased stress due to flood risk increasing over time.	Frontage D River Sid Western Wall: Risk of flooding reduced. Positive impact on health and well being.					
Fears and Aspirations	Frontage B Sidmouth Town: Do Nothing would discourage investment in the area from existing and new businesses. Negative outlook from community in terms of job opportunities.	Frontage B Sidmouth Town: Option will maintain investment opportunities and potentially improve in the long term. Fears that raising the splash wall will be a deterrent to tourism. Fears of too high maintanance costs which will cause the options to fail in the medium to lon					Frontage B Sidmouth Town: Option will maintain investment oppo
	Frontage C East Beach: Do Nothing would discourage investment in the area from existing and new businesses. Negative outlook from community in terms	Frontage C East Beach: No significant changes to present situation.					
	Frontage D River Sid Western Wall: Do Nothing would discourage investment in the area from existing and new businesses. Negative outlook from community in	Frontage D River Sid Western Wall: Option will maintain investment opportunities and potentially improve in the long term					