North West and North Wales Coastal Group

North West England and North Wales Shoreline Management Plan SMP2

Appendix F – Policy Development and Appraisal

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Approved by
1	0	Draft for client review	22 August 2008	A Parsons
2	1	Draft Final	17 March 2009	A Parsons
3	2	Consultation Draft	1 October 2009	A Parsons
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The Supporting Appendices

These appendices and the accompanying documents provide all of the information required to support the Shoreline Management Plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policies being promoted is both transparent and auditable. The appendices are:

A: SMP2 Development	This reports the history of development of the SMP2, describing more fully the plan and policy decision-making process.
B: Stakeholder Engagement	All communications from the stakeholder process are provided here, together with information arising from the consultation process.
C: Baseline Process Understanding	Includes baseline process report, defence assessment, NAI and WPM assessments and summarises data used in assessments.
D: SEA Environmental Baseline Report (Theme Review)	This report identifies and evaluates the environmental features (human, natural, historical and landscape).
E: Issues & Objectives Evaluation	Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.
F: Policy Development and Appraisal	Presents the consideration of generic policy options for each frontage, identifying possible acceptable policies, and their combination into 'scenarios' for testing. Also presents the appraisal of impacts upon shoreline evolution and the appraisal of objective achievement.
G: Preferred Policy Scenario Testing	Presents the policy assessment and appraisal of objective achievement towards definition of the Preferred Plan (as presented in the Shoreline Management Plan document).
H: Economic Appraisal and Sensitivity Testing	Presents the economic analysis undertaken in support of the Preferred Plan.
I: Strategic Environmental Assessment (SEA) Report	Presents an overview of the environmental assessment process and shows how the requirements of the EU Council Directive 2001/42/EC (the Strategic Environmental Assessment Directive) are met.
J: Habitat Regulations Assessment	Presents an assessment of the effect the plan will have on European sites.
K: Water Framework Directive Assessment	Presents the Water Framework Directive assessment of the potential hydromorphological changes and consequent ecological impact of the preferred SMP2 policies.
L: Metadatabase and Bibliographic database	All supporting information used to develop the SMP2 is referenced for future examination and retrieval.

Within each appendix cross-referencing highlights the documents where related appraisals are presented. The broad relationships between the appendices are illustrated below.

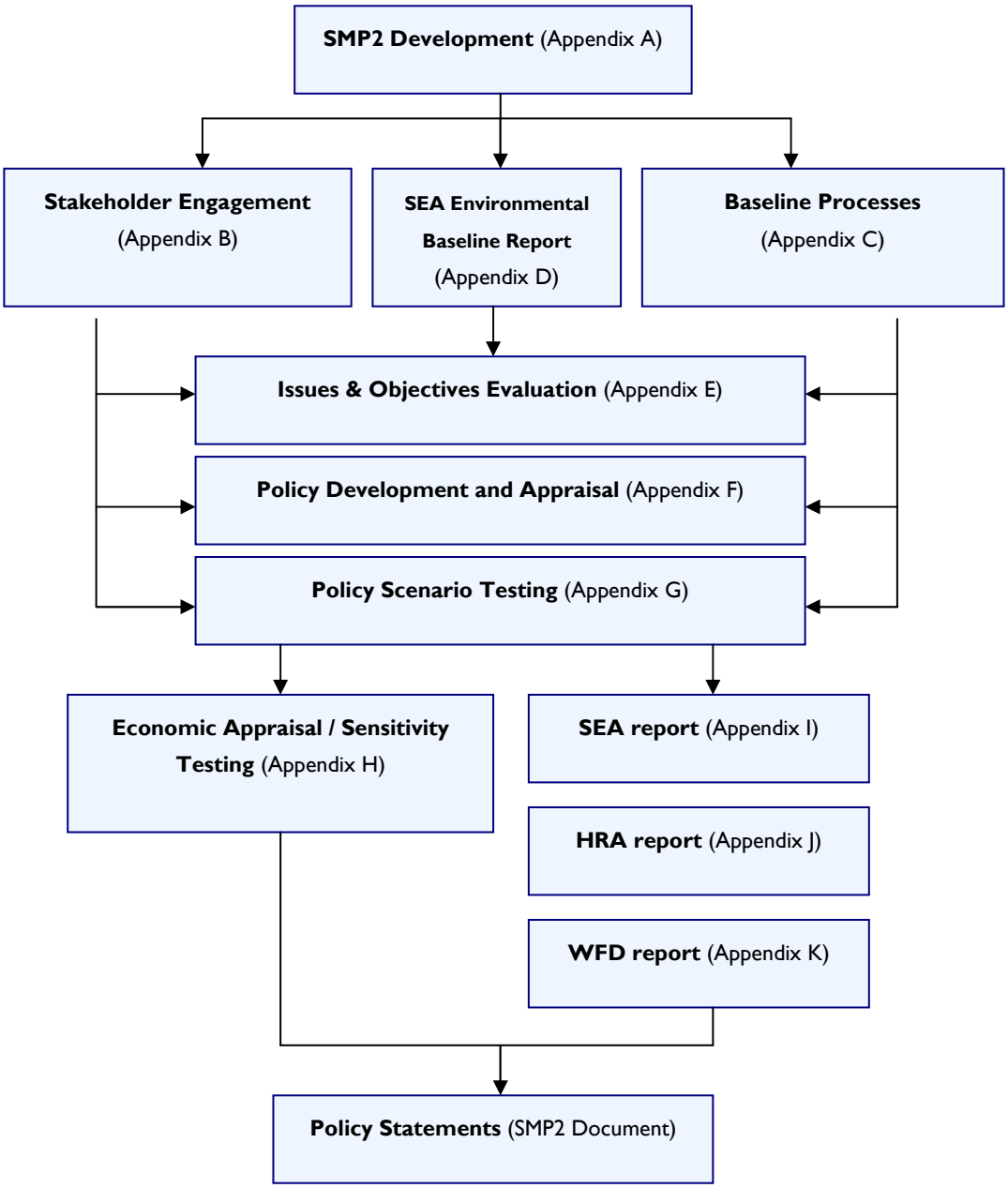

Table of Contents

F.1 Introduction

This Appendix outlines the key steps undertaken to identify policies for appraisal in the North West England and North Wales SMP2. Policy scenarios developed in this appendix have then been taken forward and appraised and the results of this appraisal are presented in **Appendix G**.

The recommended approach (Defra Guidance, 2006) for development of a sustainable final plan is through the assessment of policy scenarios; a string of policies together rather than considering a series of locations in isolation. The aim of this stage has therefore been to identify the appropriate combinations of policies to be appraised for the whole SMP2 frontage. This has involved the following activities:

- Identification of 'key policy drivers' (Section F.2);
- Identification of potential policy options through the broad-level appraisal of the four generic Defra policy descriptors (Section F.3); and
- Development of policy scenarios for assessment (Section F.4).

It should be noted that the first two tasks looked at requirements of individual locations in relative isolation, but wider-scale impacts of policies have been assessed during the policy scenario appraisal stage which has looked at the likely shoreline response and evolution both locally and along the SMP2 coast as a whole (see **Appendix G**).

F.2 Identification of 'Key Policy Drivers'

F.2.1 Definition

A 'key policy driver' can be defined as a feature that has sufficient importance in terms of the benefits it provides that it potentially has an overriding influence upon policy selection at the wider SMP2 scale. This may be through either promoting a policy, or discarding a policy, for a particular location or locations.

There are no specific criteria which define a key policy driver, rather it is dependant upon the specific nature of coastline and associated objectives and is slightly intuitive.

Examples of a key driver may include:

- A mainline railway which must be maintained, due to its regional and national significance; or,
- An internationally important habitat which relies on constant sediment feed, driving policy for the up-drift shoreline.

F.2.2 Methodology

The Issues and Objectives Tables (**Appendix E**) were used to identify draft key policy drivers which were put forward for discussion with the Elected Members, CSG and Stakeholders at a number of forums held between December 2008 and January 2009. The proposed key policy drivers presented at these meetings are listed for each sub cell below.

Major towns	Environmental features	Infrastructure
Sub Cell 11a – Great Orme to Southport		
Llandudno Colwyn Bay Abergele / Towyn Rhyl Prestatyn Chester Heswall and Newton West Kirby Hoylake Wallasey Birkenhead Liverpool Runcorn Bootle Warrington Formby Southport	Great Orme's Head Point of Ayr Sefton Dunes	Connahs Quay and Power Station Port of Mostyn Deeside Power Station Ellesmere Port Eastham Oil Refinery Fiddlers Ferry Power Station

Major towns	Environmental features	Infrastructure
Sub Cell 11b – Southport to Rossall Point		
Southport Preston Lytham St Annes Blackpool Cleveleys Fleetwood	St Annes Dunes	
Sub Cell 11c – Rossall Point to Haverigg		
Fleetwood Lancaster Morecambe Arnside Barrow-in-Furness	Silverdale Cliffs Humphrey Head	Hill House Power Station Heysham Port Heysham Power Station Barrow Power Station Barrow Docks
Sub Cell 11d – Haverigg to St Bees Head		
	St Bees Head	Sellafield Drigg Waste Repository
Sub Cell 11e – St Bees Head to the Scottish Border		
Whitehaven Workington Maryport	St Bees Head	

Following discussion by Elected Members, the CSG and Stakeholders at Stakeholder events held between December 2008 and January 2009, a number of additional Key Policy Drivers were identified. Minutes from these meetings (EMF 2, SF 2 and CSG 2), documenting all Key Policy Drivers identified, are included in the relevant Annexes in **Appendix B**.

In summary, the key policy drivers identified through this process were:

Sub Cell 11a – Great Orme to Southport

- The mainline railway along the North Wales coast and between the Point of Ayr and Chester (identified as a regionally and nationally important infrastructure asset);
- Developed areas along the coast, many of which are important for tourism and amenity (identified as important residential, commercial and economic assets);
- Environmental designations within the Dee estuary (identified as a internationally important for European and international designated features);
- Key highway routes and the Manchester Ship Canal (identified as important commercial and economic assets);
- Beaches along the North Wales coast (identified as important tourism assets of significant economic value to the region and an important natural defence);

- Point of Ayr and Formby dune systems (identified as important tourism assets of significant economic value to the region and an important natural defence); and,
- Regionally important industry, including a number of power stations (identified as important commercial and economic assets).

Sub Cell 11b –Southport to Rossall Point

- Developed areas along the coast, many of are important for tourism and amenity (identified as important residential, commercial and economic assets);
- Environmental designations within the Ribble estuary (identified as a internationally important for European and international designated features); and,
- Dunes at Lytham St Annes (identified as important tourism asset and natural defence).

Sub Cell 11c – Rossall Point to Haverigg

- The West Coast mainline railway (identified as a regionally and nationally important infrastructure asset);
- Developed areas along the coast, many of which are important for industry (identified as important residential, commercial and economic assets);
- Environmental designations within Morecambe Bay (identified as a internationally important for European and international designated features); and,
- Regionally important industry, including docks, gas terminals and power stations (identified as important commercial and economic assets).

Sub Cell 11d – Haverigg to St Bees Head

- The Cumbrian Coastal railway (identified as a regionally and nationally important infrastructure asset);
- Environmental designations within Morecambe Bay and the Duddon estuary (identified as a internationally important for European and international designated features); and,
- Regionally important industry, including Sellafield and Drigg Waste Repository (identified as strategically important assets).

Sub Cell 11d – St Bees Head to the Scottish Border

- The Cumbrian Coastal railway (identified as a regionally and nationally important infrastructure asset);
- Environmental designations within the Solway Firth (identified as a internationally important for European and international designated features); and,
- Developed areas along the coast, many of which are important ports (identified as important residential, commercial and economic assets).

F.3 Identification of Potential Policy Options & Scenarios

F.3.1 Methodology

In order to identify potential policy options and scenarios for appraisal, the baseline processes understanding (**Appendix C**), the issues and objectives tables (**Appendix E**), and stakeholder comments, were used to undertake a 'screening procedure' to identify potential suitable and feasible policy options to appraise for each section of coast. There are four generic Defra policy options to choose from and they are:

- **Hold the line (HTL)** - maintain the existing defence line;
- **Advance the line (ATL) -** build new defences seaward of the existing defence line;
- **Managed realignment (MR)** - allow the shoreline to change with management to control or limit movement; and
- **No active intervention (NAI)** - a decision not to invest in providing or maintaining defences.

To assign potential policy options the shoreline was sub-divided into a number of frontages based upon coastal and estuarine process interactions, each of which can be considered relatively discrete from adjacent frontages.

For each of these frontages the potential policy options to test were discussed with the CSG, Elected Members and with stakeholders at a series of Stakeholder Events in December 2008 and January 2009, from which final policy options were determined for the consultant to test. Minutes from these meetings (EMF 2, SF 2 and CSG 2), documenting discussions on potential policies to test, are included in the relevant Annexes in **Appendix B**. When consulting with the CSG, EMF and stakeholders, each were asked to:

- Provide a practical vision for the coastline over the short (0-20 years), medium (20-50 years) and long term (50-100) years;
- Consider the relative importance of their issues against those of others; and
- Where there might be a conflict of interest, consider possible areas for compromise or acceptable change, especially where the relative importance of a particular issue might alter over time.

F3.2 Potential Policy Options to Test

The following tables summarise the key policy drivers and potential policy options to test, identified from stakeholder engagement (EMF 2, CSG 2 and SF 2) and initial screening of policies.

The tables include a list of 'potential policy options to test' for different locations along each sub cell frontage:

HTL – Hold the Line

MR – Managed Realignment

NAI – No Active Intervention

ATL – Advance the line

These tables also include general comments, reasons for discounting certain policies and justification for other policies identified to test.

F3.2.1 Potential Policies to Test: Sub Cell 11a

Location	Policies to test*	Comments and justification for choice of policies to test
Sub-cell 11a – Great Orme's Head to Southport Pier		
Great Orme	NAI over 3 epochs	Resistant rock therefore erosion rates negligible, headland is undeveloped, no assets at risk. Internationally / nationally environmentally designated. Coastal processes are the key to the conservation of the geological SSSI. Great Orme identified as a Key Policy Driver where the policy needs to allow natural processes to continue.
Llandudno	HTL over 3 epochs	Llandudno identified as a Key Policy Driver where a policy of protection is required. The isolated, self-contained bay has little interaction with adjoining coastlines. Sediment movement from the west to east is limited by Little Orme's Head, therefore HTL policy will not impact on sediment linkages with adjacent frontages. Economics are likely to justify HTL where there are defences at present due to density of residential / tourism and large flood risk zone, therefore NAI is not suitable. No opportunities for MR along the frontage. Llandudno Beach identified as a Key Policy Driver where the policy needs to maintain the beach as a natural defence and amenity. Under a HTL policy, stabilisation of the upper beach may be an issue in the future as sea levels rise. ATL would result in the loss of the beach.
Little Orme	NAI over 3 epochs	Resistant rock therefore erosion rates negligible, headland is undeveloped, no assets at risk. Internationally / nationally environmentally designated. Coastal processes are the key to the conservation of the geological SSSI. Little Orme identified as a Key Policy Driver where the policy needs to allow natural processes to continue.
Penrhyn Bay	HTL over 3 epochs	Penrhyn Bay and Rhos-on Sea identified as Key Policy Drivers where a policy of protection is required. Economics are likely to justify HTL due to density of residential / tourism areas / infrastructure in flood risk area, therefore a NAI policy is considered to be unsuitable. No opportunity for MR along the frontage. Under rising sea levels coastal squeeze may result in further loss of beaches in the long term, therefore restoring / stabilising the upper beach as a natural form of defence and amenity will be

Location	Policies to test*	Comments and justification for choice of policies to test
		important in the future. ATL would result in further loss of the beach.
Colwyn Bay	HTL over 3 epochs	Rhos-on-Sea, Colwyn Bay and Old Colwyn Bay identified as Key Policy Drivers where a protect policy is required. Economics are likely to justify HTL due to density of residential / tourism areas and infrastructure (rail and road), therefore a NAI policy is considered to be unsuitable. No opportunity for MR along the frontage. Under rising sea levels coastal squeeze may result in further loss of beaches in the long term, therefore restoring / stabilising the upper beach as a natural form of defence and amenity will be important in the future. ATL would result in further loss of the beach.
Llandullas / Abergele / Pen-Sarn	HTL over 3 epochs MR at Llandullas and Pen-Sarn in medium / long term	Llandullas, Pen-Sarn and Abergele towns and associated infrastructure identified as Key Policy Drivers where a protect policy is required. Economics are likely to justify HTL due to major infrastructure (rail and road) and properties in flood risk zone, therefore a NAI policy is considered to be unsuitable. The Beach has been identified as a Key Policy Driver where the policy needs to maintain the beach as a natural defence and amenity. Under a HTL policy, stabilisation of the upper beach may be an issue in the future as sea levels rise. ATL would result in the loss of the beach. Test MR at Llandullas and Pen-Sarn, back to the railway line to allow the shingle beach to roll back – potential technical benefits.
Towyn / Kinmel Bay	HTL over 3 epochs Localised MR where the railway is set back, in medium / long term.	Towyn, Kinmel Bay and associated infrastructure identified as Key Policy Drivers where a protect policy is required. Economics are likely to justify HTL where defences at present due to density of residential / tourism / economic areas and infrastructure in large flood risk area, therefore a NAI policy is considered to be unsuitable. The Beach has been identified as a Key Policy Driver where the policy needs to maintain the beach as a natural defence and amenity. Under a HTL policy, stabilisation of the upper beach may be an issue in the future as sea levels rise. ATL rejected as would result in the loss of the beach. Test localised MR where the railway line moves away from the beach, to make accommodation

Location	Policies to test*	Comments and justification for choice of policies to test
		space for the beach to roll back under rising sea levels – potential technical benefits.
Clwyd Estuary SMP2 boundary is at Rhuddlan Road (A525) Bridge.	HTL over 3 epochs MR in discrete locations in medium / long term	The majority of the estuary lies within an extensive flood risk zone, therefore a NAI policy is considered to be unsuitable. Need to cross check with the CFMP as to recommended policies and potential areas for MR in future. Potential to test MR in discrete locations within the estuary, to create flood storage areas / areas for roll back as sea levels rise – potential technical benefits.
Rhyl	HTL over 3 epochs MR at Rhyl Golf Course in medium / long term.	Rhyl identified as a Key Policy Driver where a protect policy is required. Economics are likely to justify HTL due to density of residential / tourism / economic areas and infrastructure in the large flood risk area, therefore a NAI policy is considered to be unsuitable. The Beach has been identified as a Key Policy Driver where the policy needs to maintain the beach as a natural defence and amenity. Under a HTL policy, stabilisation of the upper beach may be an issue in the future as sea levels rise. ATL rejected as would result in the loss of the beach. Opportunity to test MR / set back defence at Rhyl Golf Course, with potential to encourage natural dune growth / system to re-establish as a natural defence line in the long term – potential technical and environmental benefits.
Prestatyn	HTL over 3 epochs	Prestatyn identified as a Key Policy Driver where a protect policy is required. Economics are likely to justify HTL due to density of residential / tourism / economic areas and infrastructure in large flood risk area, therefore a NAI policy is considered to be unsuitable. The Beach has been identified as a Key Policy Driver where the policy needs to maintain the beach as a natural defence and amenity. Under a HTL policy, stabilisation of the upper beach may be an issue in the future as sea levels rise. ATL rejected as would result in the loss of the beach. No opportunities for MR identified.
Talacre Dunes / Point of Ayr	NAI over 3 epochs Dune management	The dunes / spit are internationally and nationally designated. Landscape value of this feature is important along with maintenance of natural processes. Talacre Dunes has therefore been identified as a Key Policy Driver where the policy needs to allow natural processes to continue. There is unlikely to be economic justification to HTL along this frontage. The main assets at flood risk are caravan parks. However, breaching of dunes may threaten the gas works. Large flood risk area behind spit. Monitoring and management of the dunes will be important in the future to

Location	Policies to test*	Comments and justification for choice of policies to test
		maintain the integrity of the natural defence.
Dee Estuary (outer)	HTL – where defences exist, all 3 epochs NAI – Dee Cliffs all 3 epochs HTL – Dee cliffs where caravan parks are on top of the cliffs in medium / long term. NAI - Golf courses in medium / long term MR – localised in medium / long term	Little Neston, Park Gate, West Kirby and the railway line are identified as Key Policy Drivers where a policy of protection is required. Extensive saltmarsh on the north east bank, provides natural protection. Localised sections are currently defended, in some cases by embankments behind marshes, others are undefended. The Dee is internationally and nationally designated (key policy driver) for its intertidal areas which may be at risk of coastal squeeze as sea levels rise. Therefore localised opportunities for MR should be investigated for compensatory habitat / roll back areas – potential technical and environmental benefits. Contamination issues and flow rates associated with MR would need to be considered. Dee Cliffs are along the northern bank are designated. Coastal processes are the key to the conservation of the geological SSSI, therefore NAI should be tested in this location. Caravans are located on top of the cliffs in one section, therefore we should test the effects of HTL in the medium / long term in this location. Golf courses in the north are currently defended. There is an opportunity to test NAI in the medium to long term, as economics are unlikely to justify HTL in these locations. HTL in these areas is however unlikely to affect processes along adjacent frontages. Cross check with CFMP as to recommended policies. ATL is considered not suitable due to loss of designated intertidal habitats – potential environmental impacts resulting from movement of defences seaward.
Dee Estuary (inner – from A548) SMP2 boundary is at Chester Weir.	HTL over 3 epochs MR in medium / long term in discrete locations HTL over 3 epochs - Chester	Chester, the Airbus factory (short) and Power Stations (short / medium term) identified as Key Policy Drivers, where a policy of protection is required. This section is completely canalised. Industry and infrastructure along a significant section of the southern bank. The inner estuary lies within a large flood risk zone, therefore NAI is considered unsuitable. Safe navigation of river is important at present (training walls are present along this section). In the short term the dredging of the channel may affect policy, to restrict further sedimentation. If the industry was no longer there, there may not be a need for maintaining the training walls for navigation purposes, therefore policies should be tested with and without training walls. There may be opportunities for MR in some locations in the medium / long term, if no industry present – potential technical and environmental benefits. However, implications of MR (increased flows etc) may however cause an issue with navigation.

Location	Policies to test*	Comments and justification for choice of policies to test
		Cross check with CFMP as to recommended policies. ATL is considered not suitable due to loss of designated intertidal habitats – potential environmental impacts resulting from movement of defences seaward.
Wirral Frontage	HTL over 3 epochs MR - discrete areas along the Meols frontage; Leasowe Dunes; Wallasey Golf Course and New Brighton in medium / long term	Hoylake, Meols, Moreton, Wallasey and New Brighton identified as Key Policy Drivers where a policy of protection is required. Significant sections are at flood risk therefore economics are likely to justify HTL where defences are present, therefore a NAI policy is considered to be unsuitable. Intertidal areas fronting defences are internationally and nationally designated along sections of the frontage. ATL not recommended as would result in the loss of the beach. Potential opportunity for MR in a number of locations along the frontage where there appears to be enough space to set back the defence line. Potential to encourage natural dune growth / system to re-establish as a natural defence line in the long term? - potential technical and environmental benefits. However, this may create small embayments…..therefore, need to investigate how this would affect processes and longer, more expensive defence Length.
Mersey (Narrows and Inner)	HTL over 3 epochs ATL at Seaforth over 3 epochs	New Brighton, Seacombe, Birkenhead, Bebington, Ellesmere Port and Liverpool identified as Key Policy Drivers where a policy of protection is required. Economics are likely to justify HTL where defences at present due to significant level of port operations / industry / infrastructure, commercial and residential properties, therefore a NAI policy is considered to be unsuitable. Manchester Ship Canal is an important flood defence feature in its own right and has been identified as a Key Policy Driver along with the Ports, industry and major transport links between the Wirral and Liverpool (tunnels, bridges, road and rail) where a policy of protection is required. No opportunities identified for MR due to contamination issues and implications of attracting birds too near to the airport, which is already an issue. Parts of inner estuary are internationally and nationally designated, ATL has been disregarded due to potential loss of designated habitat – potential environmental impacts. Cross check with CFMP as to recommended policies. A new Terminal is being built at Seaforth (in The Narrows), therefore ATL needs to be tested in this location. Navigation is important both within the estuary and via training walls in the outer estuary.
Mersey (Liverpool	NAI over 3 epochs	The cliffs at Speke Garston Reserve are currently undefended, therefore NAI should be tested. In

Location	Policies to test*	Comments and justification for choice of policies to test
Airport)	HTL – In the long term	the long term erosion may threaten the integrity of the airport therefore test a HTL policy in the long term. MR unsuitable due to contamination issues and implications of attracting birds too near to the airport, which is already an issue. ATL considered to be unsuitable, would impact on the designated intertidal habitats – potential environmental impacts. Cross check with CFMP as to recommended policies.
Mersey (upper) SMP2 boundary is at the access to Arpley Landfill Site downstream of Warrington.	HTL over 3 epochs MR potential in medium term in discrete locations	Runcorn, Widness and Warrington identified as Key Policy Drivers where a policy of protection is required. Upper estuary is constrained on both banks by canals, sewage works and Power Station reservoirs within canal boundaries, industry, residential areas beyond canals, therefore NAI is considered to be unsuitable. There may be potential in the medium / long term for MR in discrete locations in the upper estuary- potential technical and environmental benefits. The Warrington Strategy has identified potential MR opportunity at Moss Side, however contamination may be an issue. Cross check with CFMP as to recommended policies.
Crosby / River Alt SMP2 boundary at the ALT is at the pumping station.	HTL over 3 epochs Where defences covered, HTL when defences are exposed. MR / NAI between Crosby and the River Alt in the medium / long term NAI to the north of the Alt over 3 epochs	Crosby, Waterloo, Hightown and the Alt pumping station have been identified as Key Policy Drivers where a policy of protection is required. Economics are likely to justify HTL where defences are present. However, defences are buried under dunes near the Marine Lake, therefore monitor and only use active intervention (HTL) when defences are exposed. MR identified in the Crosby Strategy between Crosby and the Alt, so should be tested in the medium / long term as well as NAI – potential technical and environmental benefits. However, buried infrastructure (sewage pipe) and contamination may be an issue along this frontage. Intertidal is internationally and nationally designated, therefore ATL rejected due to loss of intertidal – potential environmental impacts. Cross check with CFMP as to recommended policies. NAI test to the north of the Alt, where the spit / dunes are accreting.
Formby Dunes	NAI over 3 epochs Dune management	Formby Dunes are eroding at the Point and accreting to the north and south. Dunes and intertidal are internationally and nationally designated. Coastal processes are the key to the conservation of the geological SSSI therefore continue to test NAI.

Location	Policies to test*	Comments and justification for choice of policies to test
		Dune management and monitoring should be carried out to manage the erosion and maintain the integrity of the dunes as a natural defence. ATL policy rejected due to loss of designated intertidal – potential environmental impacts.
Southport	HTL over 3 epochs	Southport identified as a Key Policy Driver where a policy of protection is required. Marine Drive / marine lake, accretion in front of defences. Locally important road along perimeter of defences. HTL should not have implications on processes in the future. Surface water flooding has been identified as an issue, especially if the frontage continues to accrete. Intertidal is internationally and nationally designated, therefore ATL rejected due to loss of intertidal – potential environmental impacts. No MR opportunities identified or justified due to accreting intertidal.

F3.2.2 Potential Policies to Test: Sub Cell 11b

Location	Policies to test*	Comments and justification for choice of policies to test
Sub-cell 11b		
Douglas Estuary SMP2 boundary is at White Bridge, Rufford.	HTL over 3 epochs MR medium term in some locations	Cross check with CFMP as to recommended policies and potential areas for MR in future. HTL should be tested because of flood risk issues, therefore NAI discounted. MR could provide flood storage areas – potential long term technical / environmental benefits.
Ribble Estuary SMP2 boundary for Ribble is at Penwortham Bridge. SMP2 boundary for Crossens is at the pumping station.	HTL over 3 epochs – where defences exist at present NAI over 3 epochs where no defences at present MR in medium / long term in discrete areas HTL at previously undefended areas in medium / long term	Large areas of estuary internationally designated (key policy driver), therefore ATL considered unsuitable – potential environmental impacts.) Designated intertidal areas may be at risk of coastal squeeze as sea levels rise in long term. Therefore localised opportunities for MR should be investigated for compensatory habitat / roll back areas – potential technical and environmental benefits Realignment at Hesketh Out Marsh undertaken in 2008. Need to manage the risk of flooding within the estuary, large flood risk areas along the southern bank, and northern bank (except the airport which is on higher land). Continued siltation of the estuary may cause issues for land drainage. Therefore, need to test HTL and MR in localised areas – potential long term technical benefits. Contamination and birds may be an issue with MR. BAE Warton Aerodrome identified as a Key Policy Driver where a policy of protection is required in the short / medium term at least. This area is currently undefended, as is other sections of the estuary, but with sea level rise, these may require defences in the future, therefore need to test HTL as well as NAI in the long term. Cross check with CFMP as to recommended policies.
Lytham (to west of Fairhaven lake)	HTL over 3 epochs MR in medium / long term ATL east of Fairhaven Lake in medium / long term.	Lytham identified as a Key Policy Driver where a policy of protection is required. Large flood risk area therefore economics are likely to justify HTL where defences are present due to density of residential / economic / tourism areas. Consequently, a NAI policy would result in uncontrolled inundation of the flood risk area and therefore is not suitable. There is room to slightly set-back defence line along some of this frontage in the future, therefore MR should be considered in the medium / long term – potential technical and environmental benefits. This may provide an opportunity to reinstate dunes? Test ATL east of Fairhaven Lake to see impact of continuing the defence alignment towards Lytham.
St Annes (Fairhaven	HTL – where defences (Pleasure	Large residential / economic / tourism areas of St Annes identified as a Key Policy Driver where a

Location	Policies to test*	Comments and justification for choice of policies to test
to north St Annes)	Island to the pier) over 3 epochs HTL in medium / long term NAI over 3 epochs where undefended Dune management	policy of protection is required. A large section of the frontage is currently undefended, with dunes providing the natural defence line. Monitoring and management of the dunes will be important in the future to maintain the integrity of the natural defence. Continue to test HTL where defences are located at present. If dunes erode need to test HTL along the whole frontage in medium / long term.
St Annes to Starr Hills Dunes	NAI over 3 epochs Dune management HTL in med / long term	Intertidal areas are internationally designated while the dunes at Starr Hill are nationally designated. Coastal processes are the key therefore continue to test NAI. Pontins holiday centre is in the flood risk zone, dunes provide a natural form of defence. Also potential flood path outflanking Blackpool South Shore defences, so test HTL with secondary defence behind dunes in medium / long term. Monitoring and management of the dunes will be important in the future to maintain the integrity of the natural defence.
Blackpool	HTL over 3 epochs MR at Anchorsholme in medium / long term	Blackpool identified as a Key Policy Driver, where a policy of protection is required. Economics are likely to justify HTL due to density of residential / economic / tourism areas. If defences were removed there would potentially be rapid erosion of cliffs, and reclaimed areas resulting in cliff instability along the frontage, therefore a NAI policy is considered unsuitable. Anchorsholme Park has been identified as a potential area to test MR in medium / long term as there is space behind defences and less justification for HTL than elsewhere – there may be potential technical issues due to increased defence lengths, and creation of a small embayment. Therefore, need to investigate how this would affect processes and a longer, more expensive defence length. Beaches appear to be lowering in general therefore it will be important to continue to monitor beach levels in the future. Stabilisation of the upper 'recreational' beach may be an issue in the future under rising sea levels, therefore ATL would result in further loss of the beach and therefore is considered unsuitable. Approaches to HTL through stabilising the beach / managing beach lowering need considering.
Cleveleys	HTL over 3 epochs	Cleveleys identified as a Key Policy Driver, where a policy of protection is required. Economics are likely to justify HTL where defences are at present due to the large flood plain and density of residential / economic areas, therefore a NAI policy is considered to be unsuitable. Need for a consistent approach to residual risks across the whole north Flyde coast flood plain.

Location	Policies to test*	Comments and justification for choice of policies to test
		No opportunities / benefits identified for MR or ATL along the frontage.
Fleetwood	HTL over 3 epochs MR at Rossall Golf Course and Rossall School in medium / long term	Fleetwood identified as a Key Policy Driver, where a policy of protection is required. Economics are likely to justify HTL where defences are present due to the large flood plain and density of residential / economic areas, therefore a NAI policy is not suitable. Need for consistent approach to residual risks across the whole north Flyde coast flood plain. At Rossall Scar a terminal structure may be an option as part of a HTL policy, but this may have environmental implications to Morecambe Bay. Localised areas have been identified (Rossall Golf Course & Rossall School) where MR could be tested in the medium / long term – potential technical and environmental benefits. As the frontage is accreting, there may be potential to reinstate the natural dune system along the frontage and new setback defence? Or recycling of sediment to the eroding open coast frontage. Intertidal areas around the northern shore at Fleetwood are internationally and nationally designated, therefore ATL is not suitable – potential environmental impacts of seaward movement of defences. Need strategic approach to management of coastal risks on Wyre estuary and open coast frontages.

F3.2.3 Potential Policies to Test: Sub Cell 11c

Location	Policies to test*	Comments and justification for choice of policies to test
Section P		
Haverigg village	HTL over 3 epochs	Haverigg dunes are currently accreting and provide protection to Haverigg village. Flood risk to village, therefore NAI discounted. Defence would need future raising. Intertidal is internationally designated, therefore ATL discounted – potential environmental impacts. Localised HTL in the vicinity of the village is unlikely to have a significant effect on coastal processes and therefore decisions are likely to be made on the basis of economics.
Hodbarrow Nature Reserve and Lagoon	HTL over 3 epochs MR in long term	RSPB reserve. Breeding bird species using lagoon from SPA. Flood defence function for Millom. Test HTL due to environmental interests landward side of barrier and flood risk issues at Millom, therefore NAI discounted. Sustainability of the barrier and lagoon in the long term should be investigated, and therefore MR may become feasible in long term - potential long term technical benefits. Contaminated land may be an issue? Barrier could be holding channel away from Haverigg village.
Red Hills	HTL over 3 epochs MR medium / longterm	Possible MRA including set back embankments to protect the village Possible contaminants in slag material
Millom Marsh	NAI HTL where existing defences. MR	Saltmarsh currently stable/Accreting. Depending on risks to railway, may not be economically viable / affordable to HTL. First line of existing banks could be breached to allow the saltmarshes to roll back with SLR. Depending on SLR & future sediment / marsh accretion potential, HTL could cause coastal squeeze in later epochs, so HTL may not be justifiable & / or would require compensatory MR elsewhere. Railway embankment could form future defence alignment, although long term sustainability of railway should be considered. Backdoor flooding to Millom would need considering under NAI / MR scenario.
Estuary North of Viaduct (Inc Foxfield)	NAI over 3 epochs	Need to consider if local defences possible if required, at specific locations, but unlikely to have a significant estuary wide affect on estuary processes and therefore decisions are likely to be made on the basis of economics.

Location	Policies to test*	Comments and justification for choice of policies to test
		Check whether A595 is raised up on an embankment.
Herdhouse Moss	NAI over 3 epochs MR medium / long-term	Local defences possible if required, unlikely to have a significant affect estuary processes and therefore decisions are likely to be made on the basis of economics Importance of the railway may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the long term. MRA - culverts and bridges could be created in railway embankment to allow saltmarsh to roll back for future environmental gain opportunities / return to more natural processes. Potential to link Duddon Mosses nature reserve (freshwater SAC) back to main estuary? (environmental appraisal would need to be detailed studies in Action Plan).
Kirby-in-Furness	HTL over 3 epochs NAI over 3 epochs	HTL could be achieved by re-enforcing railway embankment If railway was removed or breached other defences may not be required due to topography.
Dunner Holme	NAI HTL at railway line	Railway extends along the whole frontage and provides the line of defence. Scenarios should be considered with and without railway in the long term. Unlikely to be economic justification to defend in the absence of railway
Askam-in-furness	NAI for 3 epochs HTL for 3 epochs	HTL could be achieved HTL for pier (manage risk of breaching to short section at base of pier at infuture) If pier were to breach, additional defences maybe required in front of village- channel is held offshore by the pier.
Sandscale	NAI for 3 epochs	No defences, Natural roll back with SLR
Lowsy Point	NAI for 3 epochs HTL	Existing short section of revetment was put in by council, NAI should tested for all three epochs to allow headland to function /evolve naturally. HTL should be reviewed to highlight consequences of installing hard defences on the frontage.
Section O		
Barrow-in-Furness	HTL over 3 epochs – Key Policy Driver	Town centre/ Docks etc
Walney Island (Seaward)	HTL over 3 epochs NAI short and long term	Refer to Strategy Study Sediment eroded from the middle of the west coast of the island moves north and south to feed

Location	Policies to test*	Comments and justification for choice of policies to test
	MR	spit features which provide protection to Barrow and the approaches to the docks. Sediment supply must be maintained whilst controlling erosion where necessary. Northern Tip – NAI, ensure sediment supply is maintained to maintain spit. Westshore Park possible MR – could relocate buildings & realignment back be advantageous to maintaining sediment supply northwards? Earnse point groyne – test MR re location & longer term impacts? Possible MR has already been considered at strategy level near to Biggar Village with the creation of embankments inland to control flood waters. Southern Half of island- HTL to protect refuse tips, Possibility of NAI for the first 20-50yrs, then HTL in long term. Threat of breaching should be considered in the long term. Southern Tip – NAI (effects of existing groyne should be investigated) Groynes & breakwaters (rather than seawalls/revtments) could be employed to control erosion and sediment supplies
Peil Island	HTL over 3 epochs NAI	Test HTL around castle (scheduled monument) NAI elsewhere on island.
Roa Island	HTL over 3 epochs	Island is currently fully defended with no potential to consider any alternative scenarios – (SMP2 to refer to sustainability study)
Barrow Power station and Gas Terminal	HTL over 3 epochs – Key Policy Driver (short / medium term)	.Gas Terminal considered to be Key Policy Driver in (short / medium term)
Section L		
Rampside Village to Newbiggin	HTL over 3 epochs NAI – medium / long term	Main road is currently protected, accreting saltmarsh limits erosion risk at west. Preferred scenario will be based on economics as any defences will have little or no impact on surrounding frontages and coastal processes. Long term it may be cheaper to re-locate the road locally rather than maintaining the defences against SLR
Newbiggin to	NAI	

Location	Policies to test*	Comments and justification for choice of policies to test
Bardsea woods inc Aldingham	HTL where existing defences over 3 epochs	Maintaining local defences unlikely to have any significant impact on bay wide processes; but limited assets unlikely to justify intervention
Section N – Leven Estuary		
Ulverston Sands	HTL/NAI	Localised defences where economically justified, otherwise natural undefended coastline
Glaxo Factory site	HTL/NAI	Defence would be probably be justified on economic basis, localised defences would have negligible effect on surrounding frontages. Contaminates in the ground resulting from the previous & / or current industrial usage should be considered in any long term MRA options.
Leven Viaduct to Haverthwaite	NAI MR	NAI - Frontage is largely natural with very few existing defences. MR could be achievable on Eastern side of Estuary as there are very few built assets and the topography would allow habitat creation with minimal intervention. Would need to consider potential risk & opportunities for existing designated terrestrial / freshwater? Habitats. to
Greenodd	HTL	On economic basis testing HTL for main road (A590) likely to be justified.
Section L (cont)		
Cartmel Sands	HTL/MR//NAI HTL / HTL / HTL	Currently Railway embankment provides defence from flooding, due to limited assets within the flood risk area the railway provides the justification for the defences. Therefore in the long term consideration should be given to HTL and NAI depending on the future use of the railway. MR for potential habitat creation / environmental gain could be achieved by either removing the railway embankment (long term) or by creating culverts and bridges through the embankment to allow the saltmarsh to roll back with SLR and facilitate habitat creation.
Cartmel Peninsula	HTL/MR//NAI HTL / HTL / HTL	Low lying land with few assets allow for MR in some locations, such as to the west of the lake land leisure park where the 'Old Embankment' could be breached to allow the saltmarsh to roll back. The caravan park and airfield has a large newly constructed revetment around the seaward extent, HTL locally is likely to be economically justified for at least the medium term. MRA to be tested in longer term. Natural Coast around Humphrey Head - NAI locally.
Grange-Over-Sand	HTL	HTL to Holme Island, the railway embankment provides the line of defence, however assets within

Location	Policies to test*	Comments and justification for choice of policies to test
		Grange-over-Sand are directly behind the railway and therefore even if the line becomes disused there will probably be the economic justification to maintain the defences. The saltmarsh has developed extensively within the last 20 years fronting the town, (due to the position of the channels in the estuary) if this accretion continues a policy of NAI could be adopted providing the condition of the saltmarsh and position of the channels is monitored sufficiently so as to provide adequate warning of potential future erosion..
Section M – Kent Estuary		
Milnthorpe Sands Kent Estuary	HTL/MR/NAI	Depending on SLR & future sediment / marsh accretion potential, HTL could cause coastal squeeze in later epochs, so HTL may not be justifiable & / or would require compensatory habitat through MR elsewhere. 3 rivers enter the estuary which is all low lying with large areas of reclaimed land, therefore there is potential for MR for habitat creation and to allow the narrow band of saltmarsh to expand and roll back with SLR. The eastern side of the estuary has village of Sandside and a main access road running along the coast which is likely to justify HTL. Investigation would be required on the effects of MR on the surrounding channel/estuary flows eg – would MR increase flows and produce increased erosion where the channel is against the bank at Arneside. Kent SMP1 & related studies will provide further info.
Arneside	HTL	Saltmarsh has switched to the opposite side of the estuary in recent years due to the position of the channel. Should this remain the case in the long term more substantial erosion protection could be required along the promenade in Arneside.
Section L (cont)		
Blackstone Point to Arneside	NAI over 3 epochs	High ground with natural coastline. Localised defences could be included for private houses where required with no effect on surrounding coastline and processes.
Leighton Moss	HTL MR	Leighton Moss Nature reserve is freshwater SAC & likely to provide the justification to hold the line at the railway on environmental grounds. MR should be looked at in the long term.

Location	Policies to test*	Comments and justification for choice of policies to test
Bolton Le-sands	HTL, MR	Existing embankment could be breached to allow the saltmarsh to roll back to the railway line
Morecambe	HTL	Morecambe considered a Key Policy Driver due to large urban area at coastal flood risk. Future maintenance of defences highly likely to be justified in future due to the high value of assets at flood risk in Morecambe, Residual risk from flooding in the future will need to be monitored / managed.. Action Plan recommendation suggested to investigate possible methods of controlling channel positioning to ensure beaches fronting the town for both amenity and coastal defence.
Section J		
Heysham Sands	NAI HTL locally	Currently erosion is threatening to expose graves at St Patricks Chapels, local defences could be constructed if required, but risks to the surrounding coastline does not provide the justification for works. HTL should be tested at the headland as it is eroding and there are currently local defences in place to control the erosion
Heysham Port and power station	HTL – Key Policy driver	Considered a KPD due to significant commercial assets value, nuclear site and headland controlling bay-wide processes.
South of Heysham Port	NAI/HTL	HTL to be tested if there is economic justification.
Sunderland Point	NAI/HTL/MR	NAI in long to medium term to be tested – SLR will further restrict access to the waterfront properties HTL to be tested to demonstrate the effects on the development of the point and surrounding saltmarsh MR for localised areas of saltmarsh to allow roll back.
Lune Estuary (Outer)	NAI/MR	Depending on SLR & future sediment / marsh accretion potential, HTL where defences exist could cause coastal squeeze in later epochs, so HTL may not be justifiable & / or would require compensatory MR elsewhere. Possible MR to allow rollback with SLR, but also opportunity for active creation of new saltmarshes for environmental opportunity or compensatory habitat provision. Previous Lune Studies to provide information for testing.
Lancaster	HTL	Key Policy Driver. Assets and landfill sites restrict scenarios to HTL only

Location	Policies to test*	Comments and justification for choice of policies to test
Glasson Dock	HTL	Assets provide economical justification to HTL (key policy driver?).
Thurnham Moss	NAI / MR HTL	Low lying land with few assets would allow MR- Cockersand Abbey (on localised high ground) is a Scheduled Monument, MR would return surrounding area back to original marsh and could improve value of monument (?) . Test HTL to protect Scheduled monuments
Cockerham	HTL / HTL / HTL HTL / HTL / MR	Large revetment constructed in recent years will provide protection well into medium term, following this MR could be tested to allow development of saltmarshes.
Preesall;	HTL / MR	Limited scope for MR due to proximity of assets and roads, although for localised areas MR could be a possibility. Existing secondary defence could aid local MR & residual risk management.
Knott End-on-Sea	HTL	HTL is likely to be justified due to assets in proximity to the coast. Considered a Key Policy driver, so no point in testing MR. East side of estuary mouth located on relatively harder geological outcrop.
Wyre Estuary to Cartford Bridge	HTL/ MR ATL[?]	Depending on SLR & future sediment / marsh accretion potential, HTL at existing defences could cause coastal squeeze in later epochs, so HTL may not be justifiable & / or would require compensatory habitat created through MR elsewhere. Largely HTL with testing of potential for localised areas of MR to allow saltmarsh and habitat creation. (Environmental opportunities or compensation). Advance the line was discussed due to the potential for putting a barrier across the Wyre for flood protection to avoid having to work on the existing defences, - could constitute residual risk management rather than 'Advancing the line'
Fleetwood (northern frontage)	HTL over 3 epochs	Fleetwood identified as a Key Policy Driver, where a policy of protection is required. Economics are likely to justify HTL where defences are present due to the large flood plain and density of residential / economic areas, therefore a NAI policy is not suitable. Need for consistent approach to residual risks across the whole north Flyde coast flood plain. Intertidal areas around the northern shore at Fleetwood are internationally and nationally designated, therefore ATL is not suitable – potential environmental impacts of seaward movement of defences. Need strategic approach to management of coastal risks on Wyre estuary and open coast frontages.

F3.2.4 Potential Policies to Test: Sub Cell 11d and e

Location	Policies to test*	Comments and justification for choice of policies to test
Sub-cell 11d – Hodbarrow Point to St Bees Head		
Hodbarrow Outer Barrier	HTL over 3 epochs MR in long term	RSPB reserve. Breeding bird species using lagoon from SPA. Flood defence function for Millom. Test HTL due to environmental interests landward side of barrier and flood risk issues at Millom, therefore NAI discounted. Sustainability of the barrier and lagoon in the long term should be investigated, and therefore MR may become feasible in long term - potential long term technical benefits. Contaminated land may be an issue? Barrier could be holding channel away from Haverigg village.
Haverigg Village	HTL over 3 epochs.	Flood risk to village, therefore NAI discounted. Defence would need future raising. Intertidal is internationally designated, therefore ATL discounted – potential environmental impacts. Localised HTL in the vicinity of the village is unlikely to have a significant affect coastal processes and therefore decisions are likely to be made on the basis of economics.
Haverigg village to Selker	NAI over 3 epochs Localised HTL over 3 epochs	Haverigg dunes provide protection to Haverigg village and area around prison, coastal processes are key, therefore continue to test NAI. Eroding cliffs along frontage provide some sediment to littoral system, therefore continue to test NAI. Test HTL in localised areas to protect properties. Localised HTL is unlikely to have a significant affect coastal processes (JBA report). River Annas spit is undefended.
Selker to Eskmeals Range	NAI over 3 epochs Localised HTL; MR in long term	South of Eskmeals, potential flood risk area extending behind Eskmeals is a future risk, therefore, test HTL in long term. Coastal road at Stubb Place at erosion risk in short term, but low bridge on access road from north. Test localised MR in long term – potential technical and environmental benefits.
Eskmeals	NAI over 3 epochs Dune management in medium / long term	Localised defences present. Dune system provides natural protection to Ravenglass Estuary Dune monitoring and management may be required in the future to maintain dune integrity and ensure continued natural defence.

Location	Policies to test*	Comments and justification for choice of policies to test
Ravenglass Estuary	NAI over 3 epochs HTL (Saltcoats and Ravenglass villages) over 3 epochs	Estuary complex (intertidal, Drigg Dunes and north of Eskmeals spit) internationally designated, therefore ATL discounted – potential environmental impacts. Saltcoats in flood risk zone and parts of railway, therefore test localised HTL. HTL at villages (eg with ring bank) may not be economically viable, but HTL would not affect coastal processes and could be implemented out of the designated area.
Drigg Dunes	NAI over 3 epochs Dune management in medium / long term	Dunes currently undefended and accreting into estuary. Provide natural protection to Drigg and Drigg Waste repository (contamination risk). Erosion estimates to repository are >500 years. Dune monitoring and management may be required in the future to maintain dune integrity and ensure continued natural defence.
Seascale	HTL over 3 epochs NAI in long term	Village mainly on higher ground. Railway identified as a Key Policy Driver in the short / medium term where a policy of protection is required. Railway embankments provide the line of defence in the north of the village, dunes in front of railway. However, importance of the railway may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the long term. Cliffs in the south mainly undefended. Short section of defences in the middle of the section.
Seascale to north Sellafield Ehen SMP2 boundary is at Ehen railway viaduct Calder SMP2 boundary is at Calder railway viaduct	HTL over 3 epochs	Seascale Nuclear Power Station, nationally important to defend; identified as a Key Policy Driver where a policy of protection is required. Economics are likely to justify HTL where defences at present. Risk of contamination. Railway extends along the frontage, important for the Power Station, industry and Cumbria residents. Railway provides the line of defence and has been identified as a Key Policy Driver in the short / medium term where a policy of protection is required. No opportunities / benefits for testing MR and ATL policies.
North Sellafield to Pow Beck (St Bees)	HTL over 3 epochs NAI medium / long term Local ATL medium / long term	Railway extends along the whole frontage, provides the line of defence and has been identified as a Key Policy Driver in the short term where a policy of protection is required. HTL to test due to importance of the railway, however this importance may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the medium / long term.

Location	Policies to test*	Comments and justification for choice of policies to test
		Flood risk area immediately north of Sellafield. Cliffs back railway along the rest of frontage. Braystones and Nethertown: properties on beach in front of defences. Access to these will continue to reduce the effectiveness of the shingle ridge. Need to test ATL to prove if defence to properties viable.
St Bees Golf course	NAI for 3 epochs	Golf course currently undefended. Unlikely to be economic justification to defend in the future.
St Bees promenade	HTL for 3 epochs NAI, MR,HTL	Defences present. Groynes rebuilt about 10 years ago but need rebuild again. Could be more sustainable if realigned landward. Properties not at flood risk. Only one café at erosion risk. Economic justification of hold the line may be questionable therefore need to test letting defences deteriorate then move the defence line landward as potential space to move the defence line back – potential technical benefits.
St Bees to St Bees Head	NAI for 3 epochs	Resistant undefended cliffs. Key Policy Driver controlling coastal processes for section alignment, where the policy needs to allow natural processes to continue. Supply only limited amount of sediment to the littoral system Cliffs designated as SSSI and Heritage Coast
Sub-cell 11e St Bees Head to Scottish Border		
St Bees to Whitehaven Harbour	NAI over 3 epochs Local HTL / HTL / NAI at Saltom Pitt	Resistant undefended cliffs along majority of frontage, slumping and landsliding towards Whitehaven. Supply only limited amount of sediment to the littoral system Defences around SM at Saltom Pit - continued defence is unlikely to have an adverse affect to coastal processes but may not be sustainable.
Whitehaven Harbour – South Beach	NAI over 3 epochs MR / HTL / HTL	Eroding spoil area south of south breakwater. Minimal assets at risk - new path down cliff & public open space. Potential breach through into harbour in med / long term. Opportunity to test MR in the short term – potential technical benefits.
Whitehaven Harbour	HTL over 3 epochs ATL harbour arms	Economics are likely to justify HTL where defences exist at present due to commercial, port and residential assets. Considered a Key Policy Driver (KPD) where a policy of protection is required. Test sensitivity of ATL (harbour arms).

Location	Policies to test*	Comments and justification for choice of policies to test
Whitehaven North	HTL over 3 epochs	Recent development on reclaimed area likely to justify HTL, therefore NAI discounted. No opportunities / benefits for testing MR / ATL policies.
Whitehaven to Parton	HTL over 3 epochs NAI in medium / long term	Railway forms line of defence in front of cliffs with few assets behind. Railway identified as a Key Policy Driver in the short term where a policy of protection is required. However railway importance may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the medium / long term.
Parton	HTL over 3 epochs NAI in medium / long term MR in medium / long term where defences seaward of railway	Railway line extends along the whole frontage, railway provides the defence line in the north and south. Behind railway there is a combination of properties and cliffs with properties on edge. Defences are in front of railway in central section. There may be potential for moving these defences back towards the railway in the future. Railway identified as a Key Policy Driver in the short term where a policy of protection is required. However railway importance may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the medium / long term.
Parton to Harrington	HTL over 3 epochs NAI – medium / long term	Defences in various states of repair protect railway. No other assets as risk apart from sewage works north of Parton. Railway identified as a Key Policy Driver in the short term where a policy of protection is required. However railway importance may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the medium / long term.
South Harrington Harbour	HTL over 3 epochs NAI over 3 epochs NAI, MR, MR	Groynes now ineffective? Defences protect large area of open space land, which is site of former industrial facilities on reclaimed slag waste. Opportunities to test HTL, NAI and MR – potential technical benefits. However, contaminated land issues may limit potential to move defence line landward in this location. Railway route more inland at this point.
Harrington Harbour	HTL over 3 epochs ATL harbour arms	Economics are likely to justify HTL where defences exist at present due to commercial, port and residential assets. Considered a Key Policy Driver (KPD) where a policy of protection is required. Test sensitivity of ATL (harbour arms)
Harrington to Steel	HTL over 3 epochs	Railway line on raised embankment, cliffs behind.

Location	Policies to test*	Comments and justification for choice of policies to test
works site.	NAI – medium / long term	Railway identified as a Key Policy Driver in the short term where a policy of protection is required. However railway importance may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the medium / long term.
Workington Steel works site to Workington	Steel Works: HTL – over 3 epochs MR – long term NAI – long term Rest of frontage: NAI over 3 epochs	Southern and northern section is undefended slag waste cliffs. Defences around steel works. Development proposals in place for steel works site following site clearance in 2008. MR could provide more sustainable alignment for parts of site. Need to test NAI and MR in long term. Development plans include defence works. Site understood to be at flood risk.
Workington Harbour SMP2 boundary is at river Derwent mouth.	South of harbour arm: HTL over 3 epochs NAI over 3 epochs Harbour: HTL over 3 epochs ATL harbour arms	South of the harbour arm, defences protect high land and very few assets, therefore NAI should be tested in this location. Flood risk zone behind harbour. Economics are likely to justify HTL where defences exist at present due to commercial, port and residential assets. Considered a Key Policy Driver (KPD) where a policy of protection is required. Test sensitivity of ATL (harbour arms)
Workington to Siddick (windfarm)	HTL over 3 epochs HTL / MR / HTL	Large area seaward of railway is former industrial / brownfield sites. Potential contaminated land, therefore need to test HTL. Existing wind turbines <10 years remaining design life. Opportunity to test MR in medium term – potential technical benefits.
Siddick to Maryport	Railway: HTL over 3 epochs NAI in medium / long term Elsewhere: NAI over 3 epochs	Railway line along majority of frontage. Rail embankment provides line of defence in places, additional defences in other sections. Railway identified as a Key Policy Driver in the short term where a policy of protection is required. However railway importance may reduce in the future / railway may be decommissioned, therefore NAI should also be tested in the medium / long term. Small strip of dunes front the railway in some locations. Some sections are undefended cliffs, potentially sites of slag waste – check issues with slag contamination - refer back to old OS maps, admiralty charts.
Maryport harbour SMP2 boundary is at river Ellen mouth.	HTL over 3 epochs ATL harbour arms	Economics are likely to justify HTL where defences at present due to commercial, port and residential assets. Considered a Key Policy Driver (KPD) where a policy of protection is required. Test sensitivity of ATL (harbour arms)

Location	Policies to test*	Comments and justification for choice of policies to test
Maryport North seawall / promenade	HTL over 3 epochs NAI over 3 epochs	Promenade in front of cliffs. Only assets on cliff top are in the south at Maryport and Roman fort / road. Seawall built under job creation scheme in 1930s depression. HTL may not affect process in adjacent sections? HTL is not likely to be economically justified therefore also need to test NAI
Maryport Golf club to Saltpans	NAI over 3 epochs HTL over 3 epochs	As hoc defences present – eg Gabions at Saltpans. Saltpans area, flood risk zone appears to reach the road. Erosion relatively high rates. HTL may not affect process in adjacent sections? HTL may not be economically justified therefore also need to test NAI
Allonby Bay	NAI over 3 epochs Where defences: HTL over 3 epochs HTL/ NAI/NAI Allonby: Dune management in medium / long term	Only small sections of defence protecting road. HTL in discrete sections may not affect process in adjacent sections? Parts of Allonby are in the flood risk zone. Dunes in front of the road around Allonby. In future potential to move the road in the medium / long term, therefore test NAI? In Allonby some properties may be at risk in the future as dunes erode back. Dune monitoring and management may be an option
Dubmill Point	HTL in the south over 3 epochs MR – in medium / long term NAI over 3 epochs	Defences along the southern section. Exposed area. Road extends around the point. B300 & one farm house are only built assets. Road frequently closed due to wave overtopping and damage. County Council currently considering diverting the main road route away from the coast. Flood risk to the north of the point. Need to assess wider benefits – possible that the point controls coastal evolution in bay to south and shelters coast to north. Economics unlikely to justify HTL, therefore also test NAI and MR in medium / long term.
Dubmill Point to Silloth	NAI over 3 epochs Beckfoot and road: HTL over 3 epochs Dune management in medium / long	Majority of the frontage is undefended dunes. The road is close to the shore at Beckfoot, though a narrow strip of dunes fronts the road. Test HTL at Beckfoot, unlikely to have adverse affect on coastal processes. HTL could be in the form of dune management?

Location	Policies to test*	Comments and justification for choice of policies to test
	term	
Siloth harbour	HTL over 3 epochs	Considered a Key Policy Driver (KPD) where a policy of protection is required. No opportunity / benefits identified for testing MR or NAI policies.
Silloth - Skinburness	HTL over 3 epochs	Some residential areas in flood risk zone, therefore NAI considered unsuitable. Economics may justify HTL where defences at present due to commercial and residential assets in the flood risk area. Test sensitivity of channel movement, closer and away from shore. No opportunity / benefits identified for testing MR or ATL policies.
The Grune	NAI over 3 epochs HTL in medium / long term	Provides natural protection to Moricambe Bay. North end of spit is accreting. Narrowing at the neck, therefore risk of a breach in the future. If breach occurs The Grune may become a barrier island, though still providing some protection to Moricambe Bay. Test HTL in medium / long term to combat threat of breach occurring. Test sensitivity of Solway channel movement, closer and away from shore
Skinburness (Moricambe Bay side)	HTL over 3 epochs MR in medium / long term	Flood risk area, village may be at risk of 'back door' flooding from Moricambe Bay. Large areas of saltmarsh providing a natural defence. Potential MR opportunity to allow rollback of saltmarsh in the future – technical and environmental benefits.
Moricambe Bay Waver SMP2 boundary is at Schedule IV boundary at Brownrigg. Wampool SMP2 boundary is at NTL at The Lathes.	NAI over 3 epochs Where existing defences test HTL in short term and MR in medium / long term	Large flood risk area, but mainly agricultural land. Large areas of saltmarsh providing a natural defence. Potential MR opportunities to allow rollback of saltmarsh in the future. MR potential at Sea Dyke?
Anthorn village	NAI over 3 epochs HTL in medium / long term	Village is on the outside of a meander, erosion could become an increasing problem in the future if the channel stays in the same location, therefore test HTL in longer term. Currently undefended (?) No opportunity / benefits identified for testing MR or ATL policies.

Location	Policies to test*	Comments and justification for choice of policies to test
Anthorn radio station.	NAI over 3 epochs HTL in medium / long term	Currently undefended, slightly higher ground. Important radio station. Intertidal internationally environmentally designated. Test sensitivity of channel movement, closer and away from shore No opportunity / benefits identified for testing MR or ATL policies.
Cardurnock to Scottish Border Eden SMP2 boundary is at NTL at Kingsmoor. Esk North SMP2 boundary is at Metal Bridge.	NAI over 3 epochs Where existing defences test HTL over 3 epochs MR in discrete locations in medium /long term	Intertidal, saltmarsh and some shoreline internationally designated, therefore ATL discounted – potential environmental impacts. Large flood risk area between Glasson and the River Sark. Large expanse of saltmarsh acts as a natural defence. Opportunities to test MR in some locations to move the defence line to allow saltmarsh rollback in the medium / long term or for habitat creation – potential technical and environmental benefits. Road between Drumburg and Burgh by Sands is in front of defence and currently floods at high tide. CCC considering options. Main coastal route B5037 further back on higher ground. May be potential MR / compensatory habitat creation opportunities in long term.

F.4 Development of Policy Scenarios for Assessment

Having identified potential policy options to test for each section of shoreline, the policies were combined into '**policy scenarios'** for appraisal. The development of these policy scenarios needed to allow for consideration of the interactions between adjacent areas, for example if a Key Policy Driver (a feature that has sufficient importance in terms of the benefits it provides that it potentially has an overriding influence upon policy selection at the wider SMP2 scale) requires HTL in one area, then policy setting for adjacent and interacting frontages need to take account of the implications of this on wider shoreline management into account.

The following tables for Sub-Cells a, b, c d and e, contain the final policy scenarios identified to test for each 'Scenario area'. Between one and three policy Scenarios were identified per area. Policies highlighted in blue represent changes to the policy tested in the previous scenario.

F4.1 Policy Scenarios for Assessment: Sub-Cell 11a

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Great Ormes Head	1	1	NAI	NAI	NAI							Great Orme and Little Orme KPD to allow natural processes. Llandudno KPD: protection.
Llandudno	2		HTL	HTL	HTL							
Little Ormes Head	3		NAI	NAI	NAI							
Penrhyn Bay (Little Orme to Rhos Point)	1	2	HTL	HTL	HTL	HTL	HTL	HTL				Towns and railway / infrastructure KPD to protect. Along some frontages there may be opportunity for MR back to the railway for technical benefits (accommodation space for shingle beach / dune roll back under rising sea levels). Did not test MR at Hortons nose as integrity of the spit is important for
Rhos Point to Tan Penmean Head (Colwyn Bay west)	2		HTL	HTL	HTL	HTL	HTL	HTL				
Tan Penmean Head to Llandulas start of groynes	3		HTL	HTL	HTL	HTL	HTL	HTL				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Llandulas start of groynes to Beach House	4		HTL	HTL	HTL	HTL	MR	HTL				the protection to Foydd Harbour. Therefore only tested HTL. ATL (Tidal Barrages) not tested at this stage, but will be discussed as part of sensitivity testing (**Appendix H**).
Beach House to Hen Wrych Farm	5		HTL	HTL	HTL	HTL	HTL	HTL				
hen Wrych Farm to Pentre Mawr Park	6		HTL	HTL	HTL	HTL	MR	HTL				
Pentre Mawr Park to Towyn Funfair Embankment7	7		HTL	HTL	HTL	HTL	HTL	HTL				
Towyn funfair embankment	8		HTL	HTL	HTL	HTL	MR	HTL				
The Promenade (Towyn)	9		HTL	HTL	HTL	HTL	HTL	HTL				
The Promenade to the Hortons Nose (Kinmel Bay)	10		HTL	HTL	HTL	HTL	HTL	HTL				
Hortons Nose to Foryd Railway Bridge	1	**3**	HTL	HTL	HTL	HTL	HTL	HTL				HTL with localised MR where opportunities exist to provide potential technical benefits (flood storage area / areas for roll back). Ties in with CFMP Policies. MR opportunities dependant on further studies.
Foryd Railway Bridge to Rhuddlan Road Bridge (west bank)	2		HTL	HTL	HTL	HTL	MR	MR				
Rhuddlan Road Bridge to Forydd Railway Bridge (east bank)	3		HTL	HTL	HTL	HTL	MR	MR				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Forydd Railway Bridge to Forydd Road Bridge	4		HTL	HTL	HTL	HTL	HTL	HTL				
Forydd Bridge A548 to Rhyll Golf Links (Rhyll)	1	**4**	HTL	HTL	HTL	HTL	HTL	HTL				Towns and infrastructure KPD to protect. There may be opportunity for MR back to the golf course to reinstate dune systems for technical benefits (accommodation space for dune roll back under rising sea levels). MR opportunities dependant on further studies. MR through dune management and monitoring tested at Point of Ayr for all three epochs as breach may occur in epoch 1.
Rhyll Golf Links	2		HTL	HTL	HTL	HTL	MR	HTL				
y-Frith to Barkby Beach (Prestatyn)	3		HTL	HTL	HTL	HTL	HTL	HTL				
Barkby Beach to Point of Ayr	4		MR	MR	MR	NAI	NAI	NAI				
Point of Ayr to south Mostyn Dock	1	**5**	HTL	HTL	HTL	HTL	HTL	HTL				Localised opportunities for MR investigated for compensatory habitat / roll back areas – potential technical and environmental benefits. Potential locations identified by assessing Lidar data / expert assessment. Appropriate to test NAI at Caldy golf club as potentially little economic justification to HTL. However need to acknowledge contamination risks which would need to be investigated. Also, the EA 1 in 1000 flood risk zone is nearly 1km inland from the Royal Liverpool Golf Club, therefore there
Mostyn Dock to Flint Marsh	2		HTL	HTL	HTL	HTL	MR	MR				
Flint Marsh to Chester Weir	3		HTL	HTL	HTL	HTL	MR	MR				
Chester Weir to Sealand Rifle Range	4		HTL	HTL	HTL	HTL	MR	MR				
Sealand Rifle Range to Burton Point	5		HTL	HTL	HTL	HTL	MR	MR				
Burton Point to Burton Marsh Farm	6		NAI	NAI	NAI	NAI	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Burton Marsh Farm to Thurstaston Cliffs	7		HTL	HTL	HTL	NAI	NAI	NAI				appears to be no risk of backdoor flooding under a NAI scenario in this location, therefore testing NAI still appropriate. However, it is acknowledged that this map may underestimate the actual area at risk and therefore should be reassessed following the SMP. Chester KPD for protection. Assumes industry still present, therefore need to retain navigation and protection.
Thurstaston Cliffs	8		NAI	HTL	HTL	NAI	NAI	NAI				
Caldy Golf Club	9		HTL	HTL	HTL	NAI	NAI	NAI				
Croft Drive Caldy to West Kirby Marine Lake	10		HTL	HTL	HTL	HTL	NAI	NAI				
West Kirby Marine Lake	11		HTL	HTL	HTL	HTL	HTL	HTL				
Royal Liverpool Golf Club to Hilbre Point	12		HTL	HTL	HTL	NAI	NAI	NAI				
Hilbre Island	13		HTL	HTL	HTL	NAI	NAI	NAI				
Hilbre Point to Wallasey Embankment	1	**6**	HTL	HTL	HTL	HTL	HTL	HTL				Potential to encourage natural dune growth / system to re-establish as a natural defence line in the long term under MR - potential technical and environmental benefits.
Wallasey Embankment	2		HTL	HTL	HTL	HTL	HTL	HTL				
Wallasey Embankment to Harrison Groyne	3		HTL	HTL	HTL	HTL	HTL	MR				
Harrison Groyne to Perch Rock	4		HTL	HTL	HTL	HTL	HTL	HTL				
Perch Rock to Eastham Park (Narrows - south)	1	**7**	HTL	HTL	HTL	HTL	HTL	HTL				Potential for technical and environmental benefits with MR in the upper estuary. Identified locations for potential MR through assessment of Lidar data / expert assessment.
Eastham Park to Eastham ferry (Inner Mersey – south)	2		NAI	NAI	NAI	NAI	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Eastham Ferry to Runcorn Bridge (Inner Mersey – south)	3		HTL	HTL	HTL	HTL	HTL	HTL				Recommend any MR proposed should be subject to separate studies in the first epoch.
Runcorn Bridge to Arpley landfill Site (Upper Mersey - south)	4		HTL	HTL	HTL	HTL	MR	MR				
Arpley Landfill site (Upper Mersey - south) to SMP2 boundary to west of Sewage works (Upper Mersey - north)	5		HTL	HTL	HTL	HTL	HTL	HTL				
Sewage works to Runcorn Bridge (Upper Mersey - north)	6		HTL	HTL	HTL	HTL	MR	MR				
Runcorn Bridge to Pickerings Pasture (Inner Mersey – north)	7		HTL	HTL	HTL	NAI	NAI	NAI				
Pickerings Pasture to Garston Industrial Estate (inner Mersey – north)	8		NAI	NAI	NAI	NAI	NAI	NAI				
Garston Industrial Estate to Seaforth (Narrows – north)	9		HTL	HTL	HTL	HTL	HTL	HTL				
Seaforth to Blundellsands (The Serpentine Road)	1	**8**	HTL	HTL	HTL	HTL	NAI	NAI				Tested NAI between Seaforth and Blundellsands, reflecting strategy policies.

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Blundellsands - The Serpentine Road to Hall Road West	2		HTL	HTL	HTL	HTL	HTL	HTL				MR identified in the Crosby Strategy – potential technical and environmental benefits. However, buried infrastructure (sewage pipe) and contamination may be an issue along this frontage, may need relocating.
Hall Road west to MEPAS pumping station	3		HTL	HTL	HTL	HTL	HTL	HTL				
MEPAS pumping station to Hightown	4		HTL	HTL	HTL	MR	MR	MR				
Hightown to mouth of the River Alt	5		HTL	HTL	HTL	HTL	HTL	HTL				
River Alt mouth (east and west banks) to Alt pumping station	6		HTL	HTL	HTL	HTL	HTL	HTL				
Mouth of the River Alt to Formby Point	1	**9**	NAI	NAI	NAI	MR	MR	MR				Coastal processes key to conservation of the dunes therefore tested NAI. Also, opportunity for MR through dune management for potential technical benefits.
Formby Point to Weld Road, Southport	2		NAI	NAI	NAI	MR	MR	MR				

F4.2 Policy Scenarios for Assessment: Sub-Cell 11b

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Weld Road to Fairways	1	1	HTL	HTL	HTL	HTL	HTL	HTL				Southport KPD, policy of protection required. Marine Drive / marine lake, accretion in front of defences. Locally important road along perimeter of defences. HTL should not have implications on processes in the future. Test MR in localised areas to provide long term technical and environmental benefits. HTL through dune management at Lytham to provide technical and environmental benefits. This may provide an opportunity to reinstate dunes in some locations? Test ATL at Fairhaven Lake for potential technical benefits.
Fairways to Crossens Pumping Station	2		HTL	HTL	HTL	HTL	HTL	HTL				
Crossens Pumping Station to Hesketh Out Marsh West	3		HTL	HTL	HTL	HTL	HTL	MR				
Hesketh Out Marsh West	4		HTL	HTL	HTL	HTL	HTL	MR				
Hesketh Outmarsh East	5		HTL	HTL	HTL	MR	HTL	HTL				
Hesketh Outmarsh East to White Bridge, Rufford	6		HTL	HTL	HTL	HTL	HTL	MR				
White Bridge, Rufford, to Old Railway Embankment, Much Hoole Marsh House	7		HTL	HTL	HTL	HTL	HTL	MR				
Old Railway Embankment, Much Hoole Marsh House to	8		HTL	HTL	HTL	HTL	HTL	MR				

Potential Policy Unit		Scenarios to test									Comments
		Scenario A			Scenario B			Scenario C			
		0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Hutton Marsh											
Hutton Marsh	9	HTL	HTL	HTL	MR	HTL	MR				
Hutton Marsh to Penwortham Golf Course	10	HTL	HTL	HTL	HTL	MR	HTL				
Penwortham Golf Course to Penwortham Bridge	11	HTL	HTL	HTL	HTL	HTL	HTL				
Penwortham Bridge to Freckleton Marsh (W end of sewage works)	12	HTL	HTL	HTL	HTL	HTL	HTL				
Freckleton Marsh (W end of sewage works) to Naze Point	13	HTL	HTL	HTL	HTL	HTL	MR				
Naze Point to Warton Bank	14	NAI	NAI	NAI	NAI	NAI	NAI				
Warton Lodge Bank to Lytham Dock	15	HTL	HTL	HTL	HTL	HTL	HTL				
Lytham Dock to Land Registry	16	HTL	HTL	HTL	HTL	HTL	HTL				
~~Lytham Land Registry~~	17	~~HTL~~	~~HTL~~	~~HTL~~	~~HTL~~	~~HTL~~	~~HTL~~				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
to Fairlawn Road												
Fairlawn Road to Fairhaven Lake	18		HTL	HTL	HTL	HTL	ATL	HTL				
Fairhaven Lake	19		HTL	HTL	HTL	HTL	HTL	HTL				
Fairhaven Lake to Miniature Golf Course	20		HTL	HTL	HTL	HTL	HTL	HTL				
Miniature Golf Course to St Anne's Pier	21		HTL	HTL	HTL	HTL	HTL	HTL				
St Annes's Pier to St Annes' Northern Boundary	22		HTL	HTL	HTL	HTL	HTL	HTL				
Lytham St Annes (northern boundary) to Squires Gate	1	**2**	MR	MR	MR	MR	HTL	HTL				Opportunity to construct set back defences behind dunes to manage flood risk while maintaining the natural dune system as a first line of defence. Blackpool & Cleveleys KPD, protection required. MR tested at north side of Rossall School and at Anchorsholme Park in the medium / long term – potential technical benefits.
Squires Gate to Blackpool Tower	2		HTL	HTL	HTL	HTL	HTL	HTL				
Blackpool Tower to Anchorsholme Park	3		HTL	HTL	HTL	HTL	HTL	HTL				
Anchorsholme Park	4		HTL	HTL	HTL	HTL	MR	HTL				
Anchorsholme Park to Jubilee Gardens	5		HTL	HTL	HTL	HTL	HTL	HTL				
Jubilee Gardens to Five	6		HTL	HTL	HTL	HTL	HTL	HTL				

Potential Policy Unit		Scenarios to test									Comments
		Scenario A			Scenario B			Scenario C			
		0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Bar Gate											
Five Bar Gate to Rossall Hospital (Rossall School)	7	HTL	HTL	HTL	HTL	MR	HTL				
Rossall Hospital to Chatsworth Avenue	8	HTL	HTL	HTL	HTL	HTL	HTL				
Chatsworth Avenue to Rossall Point	9	HTL	HTL	HTL	HTL	HTL	HTL				

F4.3 Policy Scenarios for Assessment: Sub-Cell 11c

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Rossall Point to Marine Lake (east)	1	1	HTL	HTL	HTL	HTL	MR	HTL	HTL	HTL	HTL	Fleetwood KPD, protection required. MR could be tested at the Fleetwood golf course in the medium / long term – potential technical and environmental benefits. As the frontage is accreting, there may be potential to reinstate the natural dune system along the frontage and new setback defence? Or recycling of sediment to the eroding open coast frontage. Potential for localised MR or NAI (as small flood plain extends back to high land in many places) in the Inner Wyre Estuary for technical and environmental benefits.
Marine Lake to Fleetwood Pier	2		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Fleetwood Pier to Fleetwood Ferry	3		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Fleetwood to Stanah	4		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Stanah to Cartford Bridge (south bank) and Cartford Bridge to Shard Bridge (north bank)	5		HTL	HTL	HTL	HTL	MR	HTL	HTL	NAI	NAI	
Shard Road (A588) to Golf Course	6		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Knott End Golf Course	7		HTL	HTL	HTL	HTL	HTL	HTL	NAI	NAI	NAI	
Golf Course to Knott End on Sea	8		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Knott End	1	2	HTL	HTL	HTL	HTL	HTL	HTL				Knott End KPD to protect. Test MR in localised areas to provide long term technical and environmental benefits. Existing set back defences may facilitate
Knott End to Fluke Hall	2		HTL	HTL	HTL	HTL	HTL	HTL				
Fluke Hall to Cocker Bridge	3		HTL	HTL	HTL	HTL	MR	HTL				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Cocker Bridge to Glasson Dock	4		HTL	HTL	HTL	HTL	MR	MR				this. Large flood risk area therefore NAI not appropriate.
Glasson Dock to Condor Green Farm	1	**3**	HTL	HTL	HTL	HTL	HTL	HTL				Glasson Dock and Lancaster KPD. Opportunities to test MR and NAI (where flood plain extends to higher land) in localised areas to provide long term technical and environmental benefits.
Conder Green Farm to Aldcliffe	2		HTL	HTL	HTL	NAI	NAI	NAI				
Aldcliffe Marsh	3		HTL	HTL	HTL	NAI	NAI	NAI				
Freemans Wood to Skerton Weir (east banks) and Skerton Weir to Lythe Bridge (west bank)	4		HTL	HTL	HTL	HTL	HTL	HTL				
Lythe Bridge to Riverside Farm	5		HTL	HTL	HTL	HTL	MR	HTL				
Riverside Farm to Overton Cattle Grid	6		HTL	HTL	HTL	NAI	NAI	NAI				
Overton Cattle Grid to Sunderland Village	7		HTL	HTL	HTL	HTL	MR	HTL				
Sunderland Village to Potts Corner	1	**4**	HTL	HTL	HTL	NAI	NAI	NAI				Scenario A protects assets, however, economic justification not likely, therefore also test NAI.
Potts Corner to Heysham Power Station	1	**5**	NAI	NAI	NAI							HTL to protect key assets. Limited assets at risk elsewhere therefore NAI only viable option

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Heysham Power Station to Heysham Dock	2		HTL	HTL	HTL							to test.
South End of Halfmoon Bay to Chapel Hill (Lower Heysham)	1	**6**	NAI	NAI	NAI							HTL to protect key assets. Limited assets at risk elsewhere therefore NAI only viable option to test.
Chapel Hill to Hest Bank (Morecambe)	2		HTL	HTL	HTL							
Hest Bank to north of West Cain House	1	**7**	NAI	NAI	NAI	HTL	MR	HTL				Local MR back as far as railway embankment where potential exits. Railway KPD to protect. In absence of railway MR could be option in long term connecting Leyton Moss to estuary - to provide technical and environmental benefits.
West Cain House to Red Bank farm	2		NAI	NAI	NAI	NAI	NAI	NAI				
Red Bank Farm to Bolton-le-Sands Caravan Park	3		HTL	HTL	HTL	HTL	MR	HTL				
Bolton-le-Sands Caravan Park to River Keer	4		NAI	NAI	NAI	NAI	NAI	NAI				
River Keer to Heald Brow	5		HTL	HTL	MR	NAI	NAI	NAI				
Heald Brow to Frith Wood	1	**8**	NAI	NAI	NAI	NAI	NAI	NAI				Resistant cliffs therefore NAI is the only appropriate policy to test. Arnside and Grange-over-Sands KPD to protect.
New Barns	2		HTL	HTL	HTL	NAI	NAI	NAI				
Grubbins Wood	3		NAI	NAI	NAI	NAI	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Arnside – Ash Meadow to the Kent Viaduct	4		HTL	HTL	HTL	HTL	HTL	HTL				Test NAI at New Barns as unlikely economic justification to protect the small flood zone.
Kent Viaduct to Holme Island	5		HTL	HTL	HTL	HTL	HTL	HTL				
Holme Island to Humphrey Head	6		HTL	HTL	HTL	HTL	HTL	HTL				
Kent Viaduct to Duck Fell Road	1	**9**	HTL	HTL	HTL	HTL	MR	MR	HTL	HTL	HTL	Potential large scale MR to allow saltmarsh to roll back and create new habitat. Sandside KPD to protect. Test NAI in medium to long term, assuming defences uneconomic to maintain.
Sandside (Duck Fell Road to Hollins Well Road)	2		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Hollins Well Road North to Levens Bridge (East Bank) and Levens Bridge to Kent Viaduct (West Bank)	3		HTL	HTL	HTL	HTL	MR	MR	HTL	NAI	NAI	
Humphrey Head	1	**10**	NAI	NAI	NAI	NAI	NAI	NAI				Humphrey Head resistant headland, KPD – allow natural processes. Current embankment around Cartmel Peninsula is likely to provide protection well into the medium term. Potential for MR when current defences expire, for environmental and technical benefits.
Humphrey Head to Cowpren Point	2		HTL	HTL	HTL	HTL	MR	MR				
Cowpren Point to Cark	3		NAI	NAI	NAI	NAI	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Cark to Leven Viaduct	1	I1	HTL	HTL	HTL	HTL	MR	MR				MR possible in longterm in localised areas to allow saltmarsh creation behind - potential technical and environmental benefits. NAI at Glaxo site may have contamination issues. NAI in other areas where there are currently no defences and only isolated assets at risk, therefore only appropriate policy to test.
Leven Viaduct to Canal Foot	2		NAI	NAI	NAI	NAI	NAI	NAI				
Canal Foot	3		HTL	HTL	HTL	HTL	HTL	HTL				
Glaxo Factory Site	4		NAI	NAI	NAI	NAI	NAI	NAI				
Sandhall	5		HTL	HTL	HTL	HTL	MR	MR				
Conishead Priory to Bardsea	6		NAI	NAI	NAI	NAI	NAI	NAI				
Leven Viaduct to Windy Hills	1	I2	HTL	HTL	HTL	HTL	MR	NAI				Largely natural coastline with few existing defences. Village and A590 would justify HTL. MR is possible (except at Greenodd) as any existing defences fail may be uneconomic to repair due to topography and lack of assets. NAI appropriate to test in the long term as the flood zone is restricted by high land throughout much of the estuary.
Windy Hills to Lady Syke	2		HTL	HTL	HTL	HTL	MR	NAI				
Lady Syke to Greenodd	3		HTL	HTL	HTL	HTL	MR	NAI				
Greenodd to Barrow End Rocks	4		HTL	HTL	HTL	HTL	HTL	HTL				
Barrow End Rocks to Leven Viaduct	5		HTL	HTL	HTL	HTL	MR	NAI				
Bardsea to Newbiggin	1	I3	NAI	NAI	NAI	NAI	NAI	NAI				HTL to continue protecting A5087, but test MR as road could be diverted as maybe unsustainable to maintain in current position against SLR.
Newbiggin to Rampside	2		HTL	HTL	HTL	HTL	MR	HTL				
Rampside	3		NAI	HTL	HTL	NAI	HTL	HTL				
Roa Island	4		HTL	HTL	HTL	HTL	HTL	HTL				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Piel Island	5		HTL	HTL	HTL	NAI	NAI	NAI				HTL likely to be required at Rampside to protect assets in medium / long term. Test NAI to the north and at Piel Island as economic justification for defences is unlikely and NAI supports natural processes.
South End Hawes to Biggar (east side)	1	**I 4**	NAI	NAI	NAI	NAI	NAI	NAI				Test HTL to protect land fill sites and towns and also to prevent long term breaching of the island. Naturally functioning coastline should be maintained elsewhere to ensure sediment supply spits. MR has already been considered at strategy stage around Biggar village. Also potential for other MR opportunities elsewhere.
Biggar to Lenny Hill (east side)	2		HTL	HTL	HTL	HTL	HTL	HTL				
South End Hawes to Hare Hill (open coast)	3		NAI	NAI	NAI	NAI	NAI	NAI				
Hare Hill to Hillock Whins	4		HTL	HTL	HTL	HTL	HTL	HTL				
Hillock Whins to Nanny point Scar	5		HTL	HTL	HTL	NAI	MR	MR				
Nanny Point Scar to Mill Scar	6		NAI	NAI	NAI	NAI	NAI	NAI				
Mill Scar to north of West Shore Park	7		HTL	HTL	HTL	MR	MR	MR				
North Walney	8		NAI	NAI	NAI	NAI	NAI	NAI				
Rampside to Westfield Point	1	**I 5**	NAI	NAI	NAI							Barrow-in-Furness and key power generation and dock assets KPD to protect. Elsewhere is currently undefended
Westfield Point to	2		HTL	HTL	HTL							

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Hindpool												therefore NAI is the only appropriate policy to test.
Hindpool to Lowsy Point	3		NAI	NAI	NAI							
Lowsy Point to Askham Pier	1	**16**	NAI	NAI	NAI	NAI	NAI	NAI				Test HTL to protect assets such as Railway and environmental designations. Test MR opportunities throughout the estuary for habitat creation - potential technical and environmental benefits. Opportunities to test NAI in other locations where flood plain extend back to high land, where there are eroding cliffs and where there are no assets at risk.
Askham-in-Furness	2		HTL	HTL	HTL	HTL	HTL	HTL				
Askham to Dunnerholme	3		NAI	NAI	NAI	NAI	NAI	NAI				
Dunnerholme to Sand Side	4		HTL	HTL	HTL	HTL	HTL	MR				
Kirkby-in-Furness	5		HTL	HTL	HTL	HTL	HTL	NAI				
Herdhouse Moss	6		NAI	NAI	NAI	NAI	NAI	NAI				
Galloper Pool to Viaduct	7		HTL	HTL	HTL	HTL	HTL	HTL				
Inner Estuary (Viaduct to Duddon Bridge, both banks)	8		MR	NAI	NAI	MR	MR	MR				
Viaduct to Green Road Station	9		MR	NAI	NAI	MR	MR	MR				
Millom Marshes	10		HTL	HTL	HTL	HTL	MR	HTL				
Red Hills (Industrial area)	11		HTL	HTL	HTL	NAI	NAI	NAI				
Hodbarrow Mains	12		NAI	NAI	HTL	NAI	MR	HTL				

Potential Policy Unit		Scenarios to test									Comments
		Scenario A			Scenario B			Scenario C			
		0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Hodbarrow Nature Reserve & Lagoon	13	HTL	HTL	HTL	HTL	MR	NAI				

F4.4 Policy Scenarios for Assessment: Sub-Cell 11d

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Haverigg	1	**1**	HTL	HTL	HTL	HTL	HTL	HTL				Coastal processes key for eroding cliffs and dunes, therefore test NAI. Localised HTL where properties at risk should not have any significant affect on adjacent frontages however, HTL unsustainable in long term at Hartrees Hill and potentially uneconomic, therefore need to also test NAI over 3 epochs.
Haverigg to Silecroft	2		NAI	NAI	NAI	NAI	NAI	NAI				
Silecroft (Hartrees Hill)	3		HTL	HTL	NAI	NAI	NAI	NAI				
Silecroft to Selker	4		NAI	NAI	NAI	NAI	NAI	NAI				
Selker to Stubb Place	1	**2**	NAI	NAI	NAI	NAI	NAI	NAI				Continue natural processes through NAI but also test with dune monitoring and management at Eskmeals. South of Eskmeals, potential flood risk area extending behind Eskmeals is a future risk, therefore, test HTL.
Stubb Place to Eskmeals Range	2		NAI	NAI	NAI	HTL	HTL	HTL				
Eskmeals Dunes	3		NAI	NAI	NAI	MR	MR	MR				
Eskmeals Dunes to Newbiggin	1	**3**	HTL	HTL	HTL	NAI	NAI	NAI				Opportunities to test NAI throughout most of the estuary. Ravenglass village KPD to protect.
Newbiggin to Muncaster Bridge (River Esk)	2		NAI	NAI	NAI	NAI	NAI	NAI				
~~Muncaster Bridge to~~	3		~~NAI~~	~~NAI~~	~~NAI~~	~~NAI~~	~~NAI~~	~~NAI~~				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Brighouse												
Brighouse to Ravenglass Village	4		HTL	HTL	HTL	HTL	NAI	NAI				
Ravenglass	5		HTL	HTL	HTL	HTL	HTL	HTL				
Ravenglass Viaduct to NTL at Muncaster Mill (River Mite)	6		NAI	NAI	NAI	NAI	NAI	NAI				
Muncaster Mill to Ravenglass Viaduct	7		NAI	NAI	NAI	NAI	NAI	NAI				
Ravenglass Viaduct to north of Saltcoats village	8		HTL	HTL	HTL	HTL	NAI	NAI				
Saltcoats village to NTL at Drigg Holme (River Irt)	9		NAI	NAI	NAI	NAI	NAI	NAI				
Drigg Holme to Drigg Point	10		NAI	NAI	NAI	NAI	NAI	NAI				
Drigg Point to Barn Scar	1	**4**	NAI	NAI	NAI	MR	MR	MR				Continue natural processes by testing NAI and MR, realigning through dune management.
Barn Scar to Whitriggs Scar	2		NAI	NAI	NAI	NAI	NAI	NAI				
Seascale	1	5	HTL	HTL	HTL	HTL	NAI	NAI				Nuclear Power Station, nationally important to defend; identified as a Key Policy Driver where a policy
Seascale to River Calder	2		HTL	HTL	HTL	HTL	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Calder Viaduct to Sellafield Station (Sellafield Nuclear Site)	3		HTL	HTL	HTL	HTL	HTL	HTL				of protection is required. Railway also KPD. Assumes railway is still as important through all epochs. Braystones, Nethertown and Coulderton: properties on beach in front of defences. Access to these will continue to reduce the effectiveness of the shingle ridge. Long term sustainability of properties and economic viability of defences here is questionable.
Sellafield Station to Ehen Viaduct	4		HTL	HTL	HTL	HTL	NAI	NAI				
Ehen Viaduct to Warborough Nook (Braystones)	5		HTL	HTL	HTL	HTL	NAI	NAI				
Braystones & Nethertown	6		HTL	HTL	HTL	HTL	NAI	NAI				
Coulderton	7		HTL	HTL	HTL	HTL	NAI	NAI				
Coulderton to Seamill	8		HTL	HTL	HTL	HTL	NAI	NAI				
Sea Mill to Pow Beck	9		HTL	HTL	HTL	HTL	NAI	NAI				
Pow Beck to St Bees Promenade (St Bees Golf Course)	1	6	NAI	NAI	NAI	NAI	NAI	NAI				Properties not at flood risk. Only one café at erosion risk. Sustainability of the beach is questionable under HTL in the long term, therefore need to test moving the defence line landward to create accommodation space for beach roll back - potential technical benefits.
St Bees Promenade to Gutter Foot	2		HTL	HTL	MR	NAI	NAI	NAI				
Gutter Foot (St Bees) to St Bees Head	1	**7**	NAI	NAI	NAI							St Bees Head, KPD to allow natural processes.

F4.5 Policy Scenarios for Assessment: Sub-Cell 11e

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
St Bees Head to Saltom Pit	1	1	NAI	NAI	NAI	NAI	NAI	NAI				Assumed protection of Saltom Pit is likely to be unsustainable in the long term. Test NAI at Whitehaven South Beach to allow erosion back to natural cliff alignment. Also test MR of cliffs.
Saltom Pit	2		HTL	HTL	NAI	HTL	HTL	NAI				
Saltom Pit to Whitehaven	3		NAI	NAI	NAI	NAI	NAI	NAI				
Whitehaven South Beach	4		NAI	NAI	NAI	MR	HTL	HTL				
Whitehaven Harbour and north beach	1	2	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	Scenarios A and B assume railway in commission. Railway KPD to protect. Contamination may be an issue. Scenario C assumes railway is decommissioned, therefore also test NAI. Scenario A and B assumes development potential of steel works site. Opportunities for MR in some locations, however, contamination may be an issue. Ports KPD to protect.
Whitehaven to Parton	2		HTL	HTL	HTL	HTL	HTL	HTL	HTL	NAI	NAI	
Parton	3		HTL	HTL	HTL	HTL	MR	HTL	HTL	NAI	NAI	
Parton to Harrington Parks	4		HTL	HTL	HTL	HTL	HTL	HTL	HTL	NAI	NAI	
Harrington Parks to Harrington Harbour	5		HTL	HTL	HTL	HTL	MR	HTL	HTL	NAI	NAI	
Harrington Harbour	6		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Harrington to Steel Works Site	7		HTL	HTL	HTL	HTL	HTL	HTL	HTL	NAI	NAI	
Steel Works Site	8		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Harrington Steel Works to The Howe	9		NAI	NAI	NAI	NAI	NAI	NAI	NAI	NAI	NAI	
The Howe to Workington Harbour	10		HTL	HTL	HTL	MR	MR	MR	NAI	NAI	NAI	
Workington Harbour	11		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Workington Harbour to Siddick	1	**3**	HTL	HTL	HTL	HTL	NAI	NAI	HTL	MR	MR	Railway is KPD to protect. However, Scenario B assumes the railway line has been decommissioned. Between Siddick and Risehow test MR followed by HTL, due to flood protection required to assets in the large flood risk area. Scenario C assumes railway line still there, but tests MR between Workington Harbour and Siddick in medium / long term. This scenario would require relocation of some wind turbines. Contamination may be an issue with NAI in the future.
Siddick to Risehow	2		HTL	HTL	HTL	HTL	MR	HTL	HTL	HTL	HTL	
Risehow to Maryport Marina	3		NAI	NAI	NAI	NAI	NAI	NAI	NAI	NAI	NAI	
Maryport Harbour / Marina	4		HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	HTL	
Maryport Harbour to Bank End (Maryport Promenade)	1	**4**	HTL	HTL	HTL:	NAI	NAI	NAI				Scenario A protects assets (Allonby, golf club and B5300 road). Scenario B allows a more natural frontage to be reinstated north of
Maryport Golf Course to north of Swarthy Hill (inc	2		HTL	HTL	HTL	NAI	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Saltpans)												Maryport. May require moving the road to a more sustainable position. Need to consider possibility that the Dubmill Point controls coastal evolution in bay to south and shelters coast to north. Assumed road at Dubmill Point is relocated / lost in Scenario B in the medium term.
Swarthy Hill to Allonby	3		NAI	NAI	NAI	NAI	NAI	NAI				
Allonby	4		HTL	HTL	HTL	NAI	NAI	NAI				
Allonby to Seacroft Farm	5		NAI	NAI	NAI	NAI	NAI	NAI				
Seacroft Farm to Dubmill Point	6		HTL	HTL	HTL	HTL	NAI	NAI				
Dubmill Point to Beckfoot	1	**5**	NAI	NAI	NAI	NAI	NAI	NAI				Important to allow natural processes. Test HTL by hard defences in Scenario A at Beckfoot and NAI (as MR through dune management considered unworkable) in Scenario B for all 3 epochs.
Beckfoot	2		HTL	HTL	HTL	NAI	NAI	NAI				
Beckfoot to Silloth	3		NAI	NAI	NAI	NAI	NAI	NAI				
Silloth Harbour	1	**6**	HTL	HTL	HTL	HTL	HTL	HTL				Integrity of the Grune may be an issue in the future, is important feature providing protection to Moricambe Bay, therefore test HTL at Grune in future.
Silloth to Skinburness (open coast)	2		HTL	HTL	HTL	HTL	HTL	HTL				
The Grune	3		NAI	NAI	NAI	NAI	HTL	HTL				
Skinburness (east)	1	**7**	HTL	HTL	HTL	HTL	HTL	HTL				Skinburness village may be at risk of flooding from the back door. Intertidal internationally designated. Opportunity to realign defences to more sustainable position and / or
Skinburness to Wath Farm	2		HTL	HTL	HTL	HTL	MR	HTL				
Wath Farm to Brownrigg (Waver)	3		NAI	NAI	HTL	NAI	NAI	NAI				

Potential Policy Unit			Scenarios to test									Comments
			Scenario A			Scenario B			Scenario C			
			0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Rabycote Marsh (Waver) to Salt Coates	4		NAI	NAI	NAI	NAI	NAI	NAI				NAI - potential for technical and environmental benefits.
Newton Marsh	5		NAI	MR	HTL	NAI	NAI	NAI				
Newton Marsh to NTL The Laythes (Wampool)	6		NAI	NAI	NAI	NAI	NAI	NAI				
NTL The Laythes (Wampool) to Anthorn	7		NAI	NAI	NAI	NAI	NAI	NAI				
Anthorn	8		HTL	HTL	HTL	HTL	HTL	HTL				
Anthorn to Cardurnock	9		NAI	NAI	NAI	NAI	NAI	NAI				
Cardurnock to Bowness-on-Solway	1	**8**	NAI	HTL	HTL	NAI	NAI	NAI				Intertidal internationally designated. Strip of hinterland between Glasson and R Eden also designated. Large flood risk area between Glasson and R Sark. Scenario A one of protection, but by limited intervention until required. Between Drumburgh and Dykesfield no justification for HTL, road seaward of substantial embankment (dismantled railway and Hadrians Wall), embankment does not protect hinterland, culverts are beneath which have allowed inundation landwards and creation of new habitat, no assets in this floodplain which goes back to high land, therefore only test
Bowness-on-Solway	2		HTL	HTL	HTL	NAI	NAI	NAI				
Bowness-on-Solway to Drumburgh	3		NAI	HTL	HTL	NAI	NAI	NAI				
Drumburgh to Dykesfield	4		NAI	NAI	NAI	NAI	NAI	NAI				
Dykesfield to NTL Kingsmoor (Eden)	5		HTL	HTL	HTL	NAI	NAI	NAI				
NTL Kingsmoor (Eden) to Rockliffe	6		HTL	HTL	HTL	NAI	NAI	NAI				
Rockliffe	7		HTL	HTL	HTL	HTL	HTL	HTL				
Rockliffe to Demesne Farm	8		HTL	HTL	HTL	NAI	NAI	NAI				
Demesne Farm to Metal	9		HTL	HTL	HTL	MR	NAI	NAI				

Potential Policy Unit		Scenarios to test									Comments
		Scenario A			Scenario B			Scenario C			
		0-20 yr	20-50 yr	50-100 yr	0-20 year	20-50 year	50-100 year	0-20 year	20-50 year	50-100 year	
Bridge (Esk)											NAI.
Metal Bridge (Esk) to the River Sark	10	HTL	HTL	HTL	MR	MR	HTL				Scenario B tests NAI for potential technical and environmental benefits. Flood plain extends back to high land in areas. Potential MR opportunities in the north.