

SWANSEA BAY COASTAL ENGINEERING GROUP



SHORELINE MANAGEMENT PLAN SUB-CELL 8b : Worm's Head to Lavernock Point

PLAN DOCUMENT (Volume 4)

March 2001

Shoreline Management Partnership

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SWANSEA BAY COASTAL ENGINEERING GROUP

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Vale of Glamorgan Council

Glamorgan & Gwent Archaeological Trust (observer)
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SHORELINE MANAGEMENT PLAN
Sub-Cell 8b : Lavernock Point to Worm's Head

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APPENDICES

- A RELEVANT PLANNING POLICIES
- B DRAFT MONITORING PROPOSAL



GUIDANCE ON USE OF THE SHORELINE MANAGEMENT PLAN

1. The Shoreline Management Plan comprises four separate volumes, as follows :

VOLUME 1	Data Collation Report
VOLUME 2	Context Report
VOLUME 3	Consultation Reports
VOLUME 4	Shoreline Management Plan

2. The Data Collation Report is held by the following organisations :

S	Associated British Ports
S	Bridgend County Borough Council
S	British Petroleum
S	City & County of Swansea
S	Countryside Council for Wales
S	Environment Agency
S	Neath Port Talbot County Borough Council
S	Vale of Glamorgan Council

The report contains background information not needed for normal use of the Shoreline Management Plan.

2. The Context Report provides a digest of relevant data to support the Shoreline Management Plan and will normally be available as a companion to the SMP report.

3. A user interested in the form of the SMP and procedures used in its development should refer to the Shoreline Management Plan and read the document in the normal way. A user interested in the SMP policies for specific locations should refer to the same document and follow the procedure set out below and summarised by block diagram overleaf :

- (i) Go to Section 3 "Form of Management Unit & Policy Assessment" of the Shoreline Management Plan.
- (ii) Refer to the Coastal Process Unit (CPU) Plan, location listings and "Management Units" (MU) Figure 1 (Section 3) and identify the CPU and MU relevant to the zone of interest.
- (iii) Go to the relevant Management Unit in Section 4.
- (iv) Each Management Unit is considered against a fixed format comprising three parts :
 - A. Objectives, Issues and Statutory Details
 - B. Benefits and Cost Appraisal
 - C. Strategic Policy Appraisal

Direct reference to Part C will provide a summary of the policy rationale presented in a matrix format followed by the preferred policy definition and associated issues.

- (v) The Shoreline Management Plan includes summaries for the whole plan area in respect of studies and monitoring in Sections 5 and 6.
- (vi) Refer to the Context Report for supporting information both strategically and local to the point or zone of interest in respect of coastal processes, coastal defences, natural environment and the human and built environment.

**VOLUME 4 : Section 3
Plan Wide Plan**

**VOLUME 4 : Section 4
Coastal Process Unit**

Management Unit

A

Objectives
Issues
Statutory Details

B

Benefits Cost
Appraisal

C

Strategic Policy
Appraisal

Matrix Summary of
Policy Rationale

Preferred Policy Definition
and associated Issues

Associated
Monitoring / Studies

**VOLUME 4 : Section 5 and 6
Plan Summaries**

- Studies
- Monitoring
- Potential Works Investment Programme

Context Report (VOLUME 2)

- Coastal Processes
- Coastal Defences
- Natural Environment
- Human & Built Environment
- Development and Land Use

1.0 BACKGROUND & INTRODUCTION

The shoreline of England and Wales was examined by HR Wallingford (HR Report Mapping of Littoral Cells, Jan 1993) to provide initial guidance on suitable divisions of the coastline, within which a strategic framework for the development of sustainable polices for coastal defences could be identified, based on natural process behaviour.

The South and South West Wales coastline was identified as a major cell (Denoted as Cell 8) extending from St David's Head to the mouth of the River Severn (Wellhouse). Within this cell four sub-cells were identified as follows:

S	Sub-cell 8a	Wellhouse to Lavernock Point
S	Sub-cell 8b	Lavernock Point to Worms Head (Overlap to Penarth Head)
S	Sub-cell 8c	Worms Head to St Govans Head (Amended to St Anns Head)
S	Sub-cell 8d	St Govans Head (Amended to St Anns Head) to St David's Head

In order to provide the framework for sustainable future coastal defence, the Ministry of Agriculture, Fisheries & Food and National Assembly for Wales have required those bodies with a statutory responsibility for the provision of coastal defence to produce Shoreline Management Plans for their particular area, in accordance with guidelines laid down (MAFF / Welsh Office Publication 'SHORELINE MANAGEMENT PLANS - A Guide for Coastal Defence Authorities' 1995, refers). Shoreline Management Plans have been promoted by coastal engineering groups and the relevant coastal engineering group for this plan is the Swansea Bay Coastal Engineering Group (SBCEG).

The specific objectives of the Plan are :

- " to improve understanding of the coastal processes operating within the sediment cell or sub-cell and their influence on the shoreline;
- " to predict the likely future evolution of the coast;
- " to identify all the assets within the area covered by the Plan which are likely to be affected by coastal change including the developed and natural environment, amenity, leisure facilities and other infrastructure;
- " to identify the need for regional or site specific research and investigations;
- " to facilitate consultation between those bodies with an interest in the shoreline;
- " to assess a range of coastal defence policy options;
- " to define future monitoring requirements, management of data and research related to the shoreline;
- " to inform the statutory planning process and related coastal zone planning;
- " to identify opportunities for maintaining & enhancing the natural coastal environment;
- " to set objectives for the future management of the shoreline;
- " to set out arrangements for continued consultation with interested parties

Plan preparation needs to address the following four key issues which have been identified in the guidelines. These are:

- S Coastal processes;
- S Natural environment;
- S The human and built environment;
- S Coastal defence

Prior to the preparation of Plans local coastal defence authorities, the Environment Agency and other bodies with an interest in management of the shoreline had formed groups to facilitate exchange of information. These 'coastal groups' acting as informal partnerships between the various bodies became the vehicle for promotion of the Shoreline Management Plans.

Within Cell 8 there are three Groups as follows :

- The Severn Estuary Coastal Group** : Wellhouse to Lavernock Point
- The Swansea Bay Coastal Engineering Group** : Lavernock Point to Worms Head
- The Carmarthen Bay Coastal Engineering Group** : Worms Head to St Anns Head

This document relates to the preparation of a Shoreline Management Plan for sub-cell 8b which extends from Lavernock Point to Worms Head. The Swansea Bay Coastal Engineering Group decided to acknowledge the shoreline extending east to Penarth Head and relevant information from the Severn Estuary Plan has been acquired.

The Coastal Group promoting and financing the Plan (assisted by grant-aid from National Assembly) are as follows:

- Lead Authority** : City and County of Swansea (CCS)
- Group Members** : Neath Port Talbot County Borough Council (NPTCBC)
- : Bridgend County Borough Council (BCBC)
- : Vale of Glamorgan Council (VOGC)
- : Environment Agency (EA)
- : Countryside Council for Wales (CCW)
- : Associated British Ports (ABP)
- : BP Chemical (Baglan) (BP)
- : Corus (formally British Steel, Port Talbot) - Corrus has withdrawn membership.
- Observers** : Glamorgan Gwent Archaeological Trust (GGAT)
- : National Assembly for Wales (NAW - formally Welsh Office - WO)

Preparation of the Plan for sub-cell 8b commenced in late 1997 and in accordance with guidelines published by the Ministry of Agriculture, Fisheries and Food (MAFF) and Welsh Office (WO/ NAW). The elements and sequence of plan production are outlined as follows :

STAGE 1 Data Collation and Objective Setting

The aim of Stage 1 was to gather information on the key issues to enable objectives to be set and initial division of the shoreline to be defined. At this stage only previously collected data was available, although the need for any additional data desirable for the development of the Plan was highlighted.

Stage 1 culminated in the production of three separate volumes of information, as follows :

- “ VOLUME 1, **Initial Consultation Report**: An A4 volume collating details of the individual responses received from consultees to an original scoping document.
- “ VOLUME 2, **Data Collation Report**: An A4 volume containing details of the database collected and collated for preparation of the Plan, up to the end of Stage 1.
- “ VOLUME 3, **Stage 1 Consultation Document** : An A3 sized volume providing a summary of the initial consultation exercise carried out, synopses in graphical and text format of the data collated, setting of plan wide and local objectives for the sub-cell and preliminary division of the shoreline into units in which coastal process behaviour may be considered as reasonably consistent (Coastal Process Units - CPU's) and within the limits of which strategic policies for future coastal defence were preliminarily assessed.

The Stage 1 Consultation Document was circulated to all those consultees that had responded positively to the original scoping document.

Comments received from the Stage 1 Consultation exercise have been used, where appropriate, to update the information presented in Stage 1 to amend objectives and shoreline division limits and to provide input into the presentation of the initial Plan document within the second and final stage.

STAGE 2 Appraisal of Coastal Defence Policy Options

This stage of Plan preparation provides for secondary division of the coast into shoreline management units (MU's) based on land use and other relevant criteria, involves an appraisal of strategic coastal defence policy options for each management unit and leads to the development of the Plan. The steps to be followed in Stage 2 are :

- S definition of management units;
- S appraisal of coastal defence policy options;
- S selection of the preferred coastal defence policy option;
- S compiling and agreeing the Plan; and
- S definition of plan review procedure and monitoring system.

Completion of Stage 2 and culmination of the preparation of the Shoreline Management Plan for sub-cell 8b has produced the following final four volumes :

- “ VOLUME 1, **Shoreline Management Plan Stage 2, Data Collation Report** : This A4 document represents an update of the Stage 1 Volume 1 database document, including addenda or corrigenda to the information collated by the end of Stage 1.
- “ VOLUME 2, **Shoreline Management Plan Data Context Report** : This A3 sized document represents an update of the Stage 1 Consultation Document including addenda or corrigenda from the consultation process and any additional information obtained during Stage 2. A resumé of all the consultation that took place during preparation of the Plan - Initial, Stage 1 and Stage 2 and the general objectives developed is also included. The preliminary coastal process unit wide policy appraisal originally included within the Stage 1 Consultation Document is not included in the Context Report but is included within the Shoreline Management Plan document (Volume 4).
- “ VOLUME 3, **Shoreline Management Plan Consultation Responses** : This A4 volume also provides an update to the information included at the end of Stage 1, collating details of individual responses at all stages of Plan development.

The document is split into three discrete sections :

- S Initial Consultation Responses
- S Stage 1 Consultation Responses
- S Stage 2 Consultation Responses

“ VOLUME 4, ***The Shoreline Management Plan***: The volume **presented here** is the working Plan document which formalises the division of the shoreline and defines the preferred Shoreline Management policy for each management unit.

This document, together with the database (Volume 1), provides the `living' sections of the Shoreline Management Plan that will be continually updated and reviewed throughout the life of the Plan via a pre-defined review procedure. This approach ensures that new information and data are regularly incorporated within the overall Shoreline Management Plan to reconfirm or amend those details and policies previously defined within the Plan, at an agreed review frequency.

This Shoreline Management Plan document, once adopted will become the basis for future Shoreline Management and Planning of the Swansea Bay Shoreline. The document is not however a `one-off' project applicable for the next 50 years. This SMP has been put together on the basis of information that is known and that which has been made available during initial plan preparation and is designed to evolve as further information, e.g. from future studies and monitoring that are proposed herein, become available. An important aspect of this first issue is the identification of uncertainties to enable further work to be prioritised appropriately against available resources.

The format of this SMP document has been created to act as a base document for shoreline management within sub-cell 8b. The intention is that the document is used as a whole, but individual sections (e.g. any particular Coastal Process or Management Unit) can be easily extracted as a stand alone document. It is also important that future changes in planning policy, environmental characteristics, or knowledge of coastal processes which may in turn result in changes to the developed strategy can be integrated, with revision to parts of the document rather than the complete report.

The Plan is split into six discrete sections including this Introduction and Background (Section 1).

Section 2 provides details of the agreed Objectives for development of the Shoreline Management Plan, following Stage 1 Consultation. The Coastal Group voted to retain the objectives set out in the Stage 1 consultation document.

Section 3 provides the general background, framework and rationale for the development of the preferred shoreline management policies for each management unit.

Section 4 provides relevant information in respect of each management unit as follows :

- Relevant Issues, Objectives and Statutory Planning Policies applying or best available information.
- Brief Summary of Coastal Processes; Natural, Human & Built Environment; Land Use and Coastal Defence data applying.
- Maps detailing the lengths of shoreline covered by each Coastal Process Unit and each Management Unit.
- Consideration of the Value of Assets being protected.
- Preliminary assessment of the costs and overall economic viability of Alternative Intervention Options, if appropriate.

- Matrix consideration of the strategic policy options for future coastal defence.
- Recommendations for preferred policy option and identification of future study / monitoring requirements.

Section 5 deals with the on-going development of the Plan following its initial adoption including priorities for future monitoring, specific studies and potential intervention together with proposals for on-going plan updates and review.

Section 6 provides a summary in tabular and graphical form of the policies applying within each unit.

A users guide to the Shoreline Management Plan is provided diagrammatically with accompanying text as a fold out at the back of the document.

2.0 OBJECTIVES

The following set of objectives have been set by the Coastal Group for the Swansea Bay sub-cell 8b :

Objective OB1:

To be compatible with natural coastal processes and avoid adverse effects elsewhere on the shoreline

Objective OB2:

To continue and enhance present coastal process monitoring to provide further data from which the scale and magnitude of policy actions can be defined together with their effect on the historic and natural environment throughout the life of the SMP.

Objective OB3:

To be adaptable to predicted changes in sea level rise

Objective OB4:

To maintain, manage and encourage where appropriate the utilisation and development of natural coastal defences.

Objective OB5:

To guide future development requiring a shoreline position to locations which are not under threat from flooding or coastal erosion, or which can be defended appropriately

Objective OB6:

To discourage future development and upgrading of existing development in areas that cannot be appropriately defended

Objective OB7:

To defend to appropriate standards that development which can be sustainably be defended against flooding and coastal erosion

Objective OB8:

To minimise and mitigate against adverse effects on the natural shoreline environment and where possible enhance it.

Objective OB9:

To comply with national and international obligations to conserve natural habitats.

Objective OB10:

To sustain and where possible enhance landscape quality.

Objective OB11:

To manage visitor pressure to protect the environment and improve enjoyment and understanding.

Objective OB12:

To safeguard the character of the main holiday areas and improve or enhance the amenity and recreational value of the shoreline.

Objective OB13:

To maintain and where possible improve access to the foreshore for emergency vehicles, fisheries activities and recreational usage.

Objective OB14:

Where possible to enhance the rural economy (farm diversification, maintenance and improvement of the countryside).

Objective OB15:

To minimise and mitigate against any adverse on the fishing industry and other developments and the operation of water/power company infrastructure.

Objective OB16:

To minimise and mitigate against any adverse effects on the historic environment.

Objective OB17:

To avoid interference or adversely affect navigation into and out of ports and harbours.

All the above objectives are of equal standing and the order in which they have been placed in no way confers degree of importance or any hierarchy in respect of their consideration.

The objectives identified will not all apply to each specific coastal process unit or subsequent management unit defined in Stage 2 of Plan development. The above objectives are defined to apply generally across the whole of the plan wide frontage with a number of them only applicable to specific areas dependent on such criteria as land use, conservation status etc.

These objectives are to provide the basis whereby consideration of eventual management unit policies with Stage 2 of Plan preparation can be carried out against a background of agreed objectives for the sub-cell.

The following general actions are considered appropriate to re-appraisal of objectives during the lifetime of the Plan.

Action G1:

(i) To analyse monitoring data over sufficient time intervals collected under the coherent system recommended with this plan to determine trends in coastal processes and thence to re-examine the sustainability of the specific policies defined.

Action G2 :

- | |
|---|
| <p>(ii) To utilise the data from the recommended further studies and any future studies that may be required during the lifetime of the Plan to confirm or modify the specific objectives and/or policies for the Plan frontage.</p> |
|---|

The objectives set out above provide a framework within which the plan may be developed in greater detail and the basis for initial boundary limits may be considered. These more detailed considerations of the shoreline are then used to develop a rationale for setting coastal process unit boundaries.

3.0 THE FORM OF MANAGEMENT UNIT & POLICY ASSESSMENT

This section provides an explanation of the general definition of management unit limits and standard form of approach adopted for the evaluation of strategic policy options. This section should be read in conjunction with Section 4 - Management Unit Appraisals.

This section is divided into two sub-sections and these comprise an examination of management unit definition and a review coastal policy options including an explanation of the assessment format for determining management unit policy to be used in section 4.

3.1 MANAGEMENT UNIT DEFINITION

A framework of Coastal Process Units and Management Units has been established within which sustainable shoreline management and coastal defence strategies are to be established for the future. This sub-section is split into two parts and each describes the methodology and rationale behind sub-dividing the shoreline into coastal process and management units for the purpose of future shoreline management.

3.1.1 COASTAL PROCESS UNITS

Stage 1 of Shoreline Management Plan preparation identified the primary division of the shoreline into units based on coastal process evaluation.

The criteria examined in definition of coastal process behaviour can be split essentially into two sets of parameters as follows :

Forcing parameters Action of Wind, Waves, Tides, River Flows etc.

Reaction parameters Sediment Movement, Shoreline Position, Shoreline Orientation, Form (Geology and Geomorphology Features); Function etc.

These coastal process units (CPU's) represent lengths of shoreline across which the behaviour of coastal processes, as defined above, may be considered as essentially consistent and with identifiable linkages to adjacent lengths of coastline. Coastal process units were loosely defined in Stage 1 of plan preparation and refined in this document. An explanation of the selection of coastal process unit boundaries was provided in the Stage 1 consultation document and is repeated in Section 4.1 below (Matrices included).

Evaluation of coastal process behaviour within sub-cell 8b identified eight CPU's numbered 1 to 8 from Worms Head to Penarth Head**, as shown in **Figure 1**, which are defined as follows :

CPU Ref.	FROM	TO
CPU 1	Worms Head	Mumbles Head
CPU 2	Mumbles Head	Swansea Docks
CPU 3	Swansea Docks	Port Talbot Docks
CPU 4	Port Talbot Docks	Ogmore
CPU 5	Ogmore	Nash Point
CPU 6	Nash Point	Barry
CPU 7	Barry	Lavernock Point
CPU 8**	Lavernock Point	Penarth Head

** CPU 8 lies outside the strict boundaries of sub-cell although the Swansea Bay Coastal Engineering Group considered that it would be appropriate to acknowledge this section of coastline within this Plan for geological, coastal process and administrative reasons. Information and extracts, if available at time of printing, may be included in this plan but will not attempt to re-visit work undertaken by the adjoining coastal group.

3.1.2 MANAGEMENT UNITS

The MAFF/Welsh Office (Now National Assembly for Wales - NAW) guidelines for Shoreline Management Plans define a shoreline management unit as “a length of shoreline with coherent characteristics in terms of coastal processes and land use”. However, whilst this identifies in broad terms the primary criteria that should be used in this sub division of the coast, there are further criteria that, where possible, should be considered such as the following:

- S Coherence in terms of nature conservation interest.
- S Hinterland topography.
- S Compatibility with flooding / erosion risks of adjacent sections of shoreline.

These primary and secondary criteria have been used in respect of management unit boundary definition within the Shoreline Management Plan presented here.

Management Units within each Coastal Process Units have been numbered sequentially in a generally west to east direction as follows :

CPU Ref.	FROM	TO	Referencing	No of MU's in each CPU
	Coastal Process Units		Management Units	
CPU 1	Worms Head	Mumbles Head	MU 1/1, MU ½ through to MU 1/9	9 No
CPU 2	Mumbles Head	Swansea Docks	MU 2/1, MU 2/2 & MU 2/3	3 No
CPU 3	Swansea Docks	Port Talbot Docks	MU 3/1, MU 3/2, MU 3/3 & MU 3/4	4 No
CPU 4	Port Talbot Docks	Ogmore	MU 4/1, MU 4/2 through to MU 4/7	7 No
CPU 5	Ogmore	Nash Point	MU 5/1, MU 5/2 & MU 5/3	3 No
CPU 6	Nash Point	Barry	MU 6/1, MU 6/2 through to MU 6/7	7 No
CPU 7	Barry	Lavernock Point	MU 7/1, MU 7/2 through to MU 7/6	6 No
CPU 8**	Lavernock Point	Penarth Head	MU's as per adjoining sub-cell	NONE
TOTAL No of MU's				39 No

MANAGEMENT UNIT SUMMARY Matrix Table									
CPU	MU1	MU2	MU3	MU4	MU5	MU6	MU7	MU8	MU9
1	T	T	T	T	T	T	T	T	T
2	T	T	T						
3	T	T	T	T					
4	T	T	T	T	T	T	T		
5	T	T	T						
6	T	T	T	T	T	T	T		
7	T	T	T	T	T	T			
8	MU's as per adjoining sub-cell								

Each management unit will be identified by local geographical features and/or a start / finish OS Grid Reference. Each management unit is analysed in detail in Section 4.2 below.

3.2 COASTAL POLICY EVALUATION

With the shoreline effectively split into units for future management purposes the SMP guidelines require the appraisal of four strategic coastal defence options, from which a preferred option is identified, for each management unit. The nomenclature and definitions used in this respect are as follows :

(i) Do-Nothing

A 'without project' case where there is no flood or coastal defence activity. The effects of doing nothing should be costed in a project appraisal as a basis for comparison with options involving intervention.

(ii) Hold the existing defence line

To maintain the shoreline in its present position / location.

(iii) Advance the existing defence line

To relocate the shoreline to seaward of its present position / location.

(iv) Retreat the existing defence line

To allow the shoreline to relocate landward of its present position. Note - along sections of natural cliff shoreline, the term retreat has been applied to coastal paths only and not strictly applied to the coast defence element comprising the natural cliff shore. In coast defence terms, the strict definition of retreat refers to the natural rock cliff coast so that the actual policy may be regarded as 'do-nothing'. However it was felt to be more appropriate to identify the coastal path - serves by referencing a policy of retreat.

In association with each of the above strategic options a secondary policy of monitoring and observation will be carried out in order to confirm or modify throughout the life of the Shoreline Management Plan, the appropriateness of the preferred coastal defence option identified.

3.2.1 POLICY APPRAISAL RATIONALE

Section 4 of the Shoreline Management Plan contains the policy appraisal and supporting information in respect of each of the management units. Management units have been evaluated in sequence as detailed in 3.1.2 above on a coastal process unit by unit basis starting at the north end of the Plan frontage. For each coastal process unit the rationale for the choice of the unit boundaries is provided together with the preliminary policy appraisal carried out within Stage 1, as amended by consultation. A map showing the boundaries and position of the individual management units in relation to the overall coastal process unit, is provided for reference. The appraisal for each management unit in turn is then presented in a series of parts as follows :

- Part A**
- A.1 Identification of Specific Issues raised during Initial and Stage 1 Consultations
 - A.2 Relevant Coastal Defence Planning Policies (Full policies are reproduced in Appendix A)
 - A.3 Conservation Designations
 - A.4 Details, where available, of land ownership / occupiers (Full details, if approved, to be released).
 - A.5 Coastal Defences
 - A.6 Resume of Objectives applying

Part B Intervention Appraisal : The economic viability of the various strategic defence options is dependent on two principal criteria :

- S The value of land, infrastructure and property being protected;
- S The cost of providing that protection.

For the 'Do-Nothing' strategic option the former represents the economic value or loss that would occur if no actions are taken. In order to assess this it is necessary to define if the shoreline would wish to relocate, i.e. is it eroding, in the event of no action being taken and if so where it would locate to. Relocation of the shoreline depends on a number of factors :

- Form of defence (natural / artificial)
- Residual structure life if artificial
- Mechanism for failure of artificial structure
- Ground conditions applying behind the defences
- Intertidal Zone behaviour - water mark movement; beach profile; gradients etc.
- Coastal Process behaviour - wave and tide energies; littoral drift etc.
- Issues that require detailed appraisal which is outside the scope of the SMP.

For defined sections of shoreline where beach levels are falling preliminary evaluations of likely recession have been made using historic profile and where available, hinterland geotechnical data. For natural defences estimates based on historic rates, where available, of erosion have been made.

For the Advance, Hold the Line and Retreat options, the required investment provides the economic cost of preventing the loss evaluated under a policy of 'Do-Nothing'.

Should the value of the benefits (evaluated under 'Do-Nothing') exceed the cost of the intervention when considered over the predicted life of the scheme - generally 40-60 years dependent on the form of the defences - then the option may be considered as economically viable.

The Ministry of Agriculture, Fisheries & Food and Welsh Office (Now NAW) provide strict guidance and methodology for the full evaluation of the economic viability of coastal defence schemes in the Project Appraisal Guidance Note 1994 (PAGN). The criteria used in the assessment of economic justification is currently being questioned by a number of Welsh Authorities and the views of NAW may be sought in due course. Such assessments are beyond the scope for the Shoreline Management Plan, whose aim is to define which of the strategic options are likely to be viable. Should defence improvements be identified, post SMP completion, then a more detailed appraisal would be required in order to confirm suitability and viability of any particular scheme of works proposed. Notwithstanding this it is important for plan development that scheme viability is reasonably assessed and strategic technical options for intervention identified, where appropriate.

Significant sections of the coastline around the Vale of Glamorgan and Gower may be described as prime agricultural land. Although local concerns have been expressed in respect of high value agricultural land loss due to erosion, it is generally acknowledged that it would not be economic or environmentally acceptable to protect natural eroding coastal cliffs adjacent to farm land.

The appraisal carried out provides the following :

- B.1 A resume of the land use, developments and specific shoreline activities and interests applying within the management unit.
- B.2 A statement regarding the evolution of the coastline, as detailed above.
- B.3 Preliminary quantitative, where sufficient information is available, economic appraisal of the intervention options considered.
 - B.3.1 Identification of the basis for evaluation of the assets at risk within the management unit together with generic headings under which the assets would be valued e.g. property loss, transport disruption etc. A preliminary valuation of the assets at risk from flooding or erosion, whichever is applicable, is also carried out, where sufficient information is available. This information has been derived from the following sources :
 - S National Assembly Coastal Survey and NRA/EA data
 - S Land Use Maps, Database and Local Infrastructure Data.

Areas of land at risk from either erosion or flooding were identified within Stage 1 of Plan preparation and these have been used in deriving an overall value of benefits applying in the Do-Nothing case.

In order for losses or costs that might occur in the future to be evaluated it is necessary for their values to be discounted back to a common base date (usually the present). At present the Treasury base rate for discounting is 6% per annum. Evaluation of benefits occurring regularly e.g. flooding can be equated to an equivalent annual figure that can be readily discounted over the evaluation period as discussed above. For 'one-off' benefits however e.g. losses due to erosion, the timing is critical and, particularly if this involves the failure of an existing coastal defence, crucial to establishing the total discounted value of the losses that would occur.

Establishment of such criteria is outside the scope of the Shoreline Management Plan, however for the purposes of providing a preliminary assessment of losses, reference has been made to the residual life figures for the specific artificial defences within the management unit taken from the Welsh Office /NAW and EA/NRA Coastal Defence Surveys which are detailed in Part A.5 as defined above. In addition, specific factors affecting the valuation of benefits are detailed for further consideration at the detailed assessment stage.

Benefit values where defined are expressed in terms of the total value of assets that would be lost or affected.

B.3.2 Identification of the likely capital and maintenance costs where defined are based on typical per metre run values or lump sums for the most appropriate technical form of intervention for each generic policy option. Information in this respect is derived from a database of cost estimates and, where available, tender values for different forms of construction around the coast of the United Kingdom over the past ten years.

B.3.3 This section of the appraisal concludes with a statement on the economic viability of the policy options considered.

The assessment carried out can only be considered as providing 'ballpark' figures for consideration and in many cases ranges of typical figures may be used to emphasise the uncertainty in the accuracy of the figures derived. Notwithstanding this the analysis provides a general assessment of the viability of each of the generic options and provides the basis for more detailed examination during any subsequent scheme strategies that may be submitted for approval, post initial SMP completion.

Part C Strategic Policy Appraisal : Each of the strategic defence options is assessed based on its effects on coastal process behaviour, the natural environment, the human and built environment, development and land use within the coastal zone and the interface with adjacent management units. The implications for the on-going provision of coastal defence within the management unit and the effects of predicted sea level rise and increased storminess on each of the options are also considered. The appraisal is completed by assessment of four criteria that ultimately identify which of the policies provides the preferred policy for the management unit:

Concordance with the objectives	:	Whether the policy meets the objectives laid down in Section 2 of the Plan.
Opportunities for environmental enhancement	:	Whether the policy provides any opportunities for improvement of the environmental resource within the management unit frontage.

- Biodiversity Action Plans (BAP) : Plans to conserve and enhance biological diversity creating rehabilitation targets for a number of habitat types (ref Rio Convention). BAP's are referred to in recent reviews of Shoreline Management Plans and therefore it has only been possible to acknowledge Biodiversity Issues as a brief comment in the strategic policy appraisal.
- Economic Viability : A single statement as to whether the policy is considered viable in Economic terms, based on the analysis carried out in Part C above.
- Sustainability : Sustainability is generally considered in respect of three criteria: Economic, Environmental and Social. The third of these is outside the scope of the Shoreline Management Plan which confines itself to a single assessment carried out in respect of the other two criteria generally covered by Yes, No, Uncertain, Possibly or Probably. Where the sustainability of a policy is categorised as either Possibly, Probably or Uncertain then generally the sustainability of the policy will be subject to confirmation from the results of future studies and monitoring.

The guidelines for preparation of Shoreline Plans define a sustainable scheme as one 'which takes account of the inter-relationships with other defences, developments and processes within a catchment or coastal sediment cell or sub-cell, and which avoids as far as possible, tying future generations into inflexible and expensive options for defence'.

In addition a general comment on the suitability of each policy is provided to identify any criteria or parts that need specific consideration.

Details are presented in a matrix format for ease of comparison of the options - (C.1).

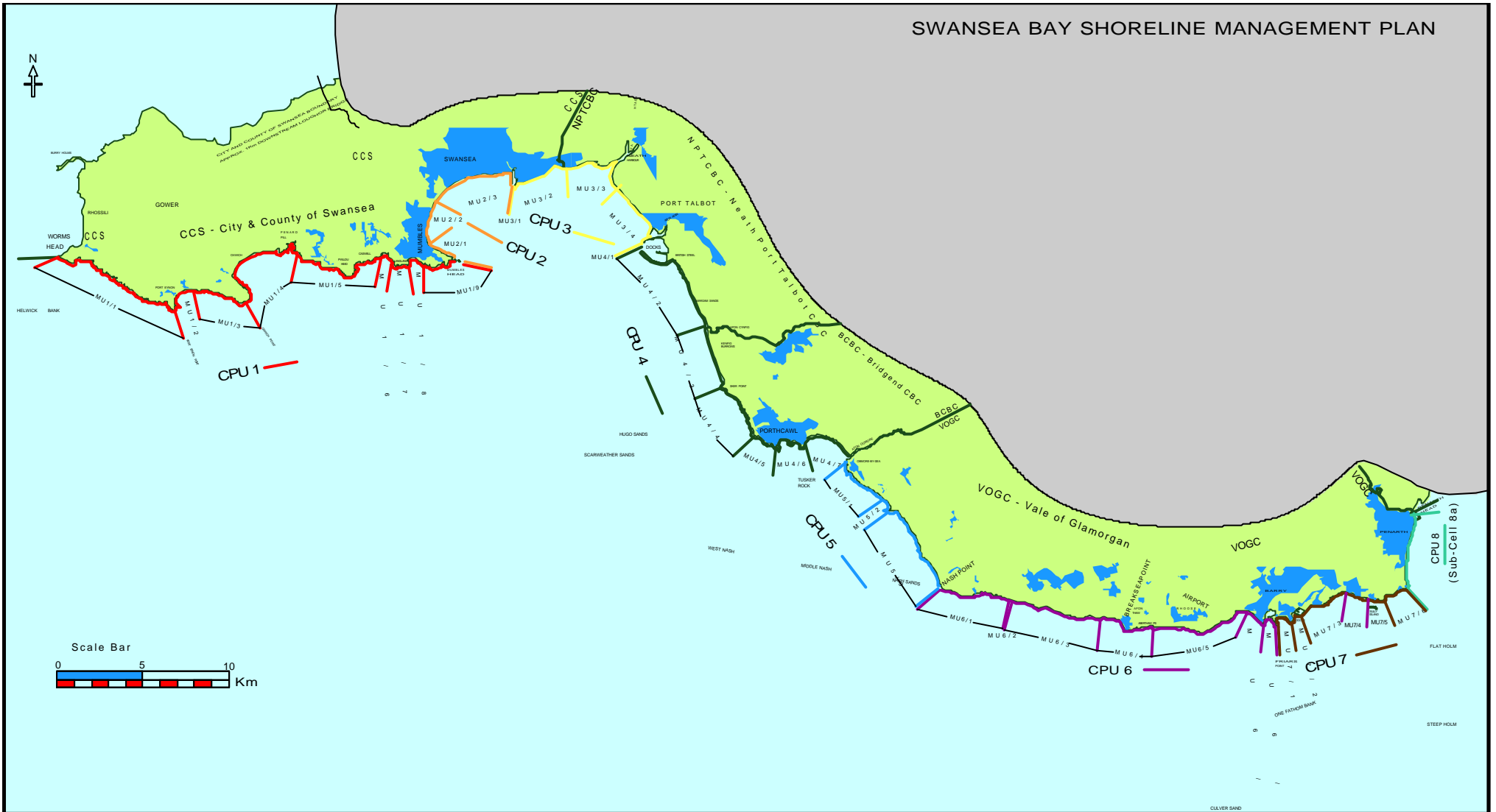
The preferred policy is generally the one that provides for the minimum interference to the natural and built environment, accords with the objectives defined and is viable economically and may be generally considered as best meeting the sustainability criteria applying.

The above mirrors the preliminary policy appraisal carried out at coastal process unit level within Stage 1 of Plan preparation, and this appraisal is repeated here such that any differences between the large and small scale appraisal carried out become immediately apparent.

The overall strategic policy assessment is summarised in Section C.2 with statements regarding the present and proposed strategic policies for coastal defence within the management unit, definition of the present uncertainties and dependencies of the preferred policy within the management unit and which of the future studies and proposed monitoring system are relevant to the particular management unit. The section concludes with an assessment of the anticipated timescale for both Capital and Revenue intervention either within the first 5 years, within years 5-10 or beyond 10 years, following initial plan adoption.

Part C of the Policy Appraisal is completed with a reconciliation of the issues identified in Section A.2 to the preferred policy (C.3) and a definition of the requirements associated with the preferred policy in order to meet objectives set for the management unit (C.4).

SWANSEA BAY SHORELINE MANAGEMENT PLAN



KEY:	
CPU 1 - WORMS HEAD TO MUMBLES HEAD	
CPU 2 - MUMBLES HEAD TO SWANSEA DOCKS	
CPU 3 - SWANSEA DOCKS TO PORT TALBOT DOCKS	
CPU 4 - PORT TALBOT DOCKS TO OGMORE	
CPU 5 - OGMORE TO NASH POINT	
CPU 6 - NASH POINT TO BARRY	
CPU 7 - BARRY TO LAVERNOCK POINT	
CPU 8 - LAVERNOCK POINT TO PENARTH HEAD (Sub-Cell 8a)	

COASTAL PROCESS UNIT - CPU
MANAGEMENT UNIT - MU

LOCAL AUTHORITY BOUNDARIES
CCS - CITY AND COUNTY OF SWANSEA
NPTCBC - NEATH PORT TALBOT COUNTY BOROUGH COUNCIL
BCBC - BRIDGEND COUNTY BOROUGH COUNCIL
VOGC - VALE OF GLAMORGAN COUNCIL BOUNDARY

TITLE: MANAGEMENT UNITS			
SWANSEA BAY SHORELINE MANAGEMENT PLAN <small>SEASIDE CELL 8a - WORMS HEAD LAVERNOCK POINT</small>		LEAD AUTHORITY: CITY AND COUNTY OF SWANSEA DEPARTMENT OF HIGHWAYS/TECHNICAL AND PROPERTY SERVICES COUNTY HALL SYDNEY ROAD SWANSEA SA1 3SN TEL: 01792 836000 GROUP CHAIRMAN: M.R.P. THOMAS	
STAGE 2 CLIENT: SWANSEA BAY COASTAL	PLAN-WIDE PLANS ENGINEERING GROUP	GROUP MEMBERS: NEATH PORT TALBOT COUNCIL BRIDGEND COUNTY BOROUGH COUNCIL VALE OF GLAMORGAN COUNCIL ENVIRONMENT AGENCY COUNTRYSIDE COUNCIL FOR WALES	BRITISH PETROLIUM BRITISH STEEL/ Corus <small>(Walesman Iron Works)</small> ABP CITY AND COUNTY OF SWANSEA <small>(Lead Authority)</small>
		FIGURE No 1 SCALE: NOT TO SCALE See Scale Bar DATE: October 2000 DRAWN BY: HGB CHECKED BY: PCB	

4.0 MANAGEMENT UNIT APPRAISALS

Introduction

The following section is divided in three sub-sections and begins with a review of the preliminary policy appraisal applying to Coastal Process Units (CPU's) originally presented at the end of the Stage 1 Consultation Document. The extents of the CPU's are illustrated in Figure 1. The second sub-section provides a summary of the Management Units (MU's) determined by the Swansea Bay Coastal Group. The MU summary comprises a spread sheet listing the location/limits, coast edge/shore type and land use/assets for each MU. The location of the MU's is also illustrated in Figure 1. The third sub-section houses the 39 No. management unit appraisals and forms the bulk of this report as each MU comprises up to eight sides of A4 paper. The template for each MU appraisal is explained in section 3.1.3 The Management Units.

4.1 COASTAL PROCESS UNIT (CPU) APPRAISAL

The preliminary policy appraisal provided in the Stage 1 Consultation Document applied to individual CPU's and referred to a significantly larger area than would be used later in this document when smaller sections of shoreline or management units will be considered. The principle of working from the large a scale or strategic view towards a more detailed, section by section, analysis has been established as good practice in the coastal environment. The four generic policy options for coastal defence considered for all geographic limits remains the same and are quoted below:

- " Do-Nothing
- " Hold the existing line
- " Advance the existing line
- " Retreat

The criteria set for determining the boundaries of CPU's are principally coastal processes. The setting of boundaries for the more detailed examination of specific management units considers factors in addition to local coastal process. These additional factors include land use, land form and local natural and historic environment.

The overall policy for the CPU will be considered against each of these smaller management units and local policies, appropriate technical approaches and preliminary economic considerations set down. This approach is taken to ensure that the prime importance of coastal processes is maintained throughout the plan development process. These more localised considerations of shoreline management will therefore provide the major addition to progress Stage 1 to Stage 2 consultation and then production of the first plan.

The CPU appraisal undertaken at Stage 1 was a preliminary examination of policy options and has been reviewed as part of Stage 2 plan preparation. A summary of the extents of CPU's is illustrated on Figure 1 as introduced above.

COASTAL PROCESS UNIT	:	CPU 1 - Worms Head to Mumbles Head			
SHORELINE COMPOSITION	:	Extensive rock cliffed shore, dune/burrows and seaside villages			
COASTAL MANAGERS	:	City & County of Swansea			
		DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES		Minor eventual increase in sediment release from areas currently protected as they deteriorated and collapse.	Major impact if applied to cliffed coastline with reduction in littoral regime. Minor impact if policy applied only to those areas currently protected.	Loss of beach area / reduction in width accompanied with an increase in wave disturbance.	Alteration to littoral drift in medium to long term - introduction of limited new sediment sources.
EFFECTS ON NATURAL ENVIRONMENT		No significant change to habitats and landscape.	Significant alteration to intertidal and hinterland habitats and landscape if applied unit wide. No significant impact if applied only to those area currently protected.	Major alteration of intertidal and hinterland habitats and coastal landscape if applied to whole unit. Alteration to habitats through duned frontages and along protected areas of the coastline.	Gradual increase in the intertidal habitat area. Evolving changes to cliffed landscape.
EFFECTS ON HUMAN & BUILT ENVIRONMENT		Loss of hinterland assets particularly behind areas currently protected.	No significant affects in short to medium term.	Increase in protection of existing assets.	Loss of existing promenades, coastal paths unless relocated to landward.
EFFECTS ON DEVELOPMENT & LAND USE		Increase pressure on hinterland with reduced potential for development along the coastal fringe.	No significant affects	Increased opportunities for development including tourism. Potential loss of vantage for existing properties.	Increase pressure on undeveloped land.
IMPLICATIONS FOR COASTAL DEFENCES		Ongoing erosion resulting in increased exposure leading to failure.	On-going maintenance, improvement and renewal of existing defences. Potential for additional new works at specific locations. Holding the present general cliff line - significant implications for coastal defence.	Increased exposure at location of new defences will need to be taken account of in design and construction.	Coastal defence requirement will be determined by the extent to which retreat will be permitted. That is - if retreat is unrestricted then no defences will be required
EFFECTS ON ADJACENT CPU'S		Little anticipated change	Insignificant unless applied to whole unit (cliffed coastline)	Potential minor changes to littoral drift regime (assumes cliffed shoreline is not advanced)	Potential minor changes to littoral drift regime.
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS		Affects accelerated as shoreline exposure increases.	Enhancement of existing defences over time and additional defences as necessary.	increased exposure of new defences.	Eventual strengthening of "Set-Back" defences where applicable or accelerated retreat.
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT		Viable along majority of cliffed coastline. non-viable in protected areas with significant coastal assets.	Selectively viable and non-viable.	Non-viable	Selectively viable
SUSTAINABILITY			Unlikely unit wide; likely at specific locations	Unlikely	Monitoring to determine

COASTAL PROCESS UNIT	:	CPU 2 - Mumbles Head to Swansea Docks			
SHORELINE COMPOSITION	:	Mumbles, Swansea, coast pathway and mostly protected			
COASTAL MANAGERS	:	City & County of Swansea			
		DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES		Erosion of the shoreline and eventual release of additional sediment in to system. This scenario does not attempt to evaluate any effects from maintenance dredging at Swansea Docks.	On-going beach movement within bay.	Loss of upper beach with potential for increased wave disturbance.	Increase in littoral/sediment supply from eroding shoreline
EFFECTS ON NATURAL ENVIRONMENT		Minor change over time of intertidal habitats.	Minimal - short to medium term.	Reduction of width of intertidal zone affects foreshore habitats - particularly birds.	Potential for modest increase in intertidal habitats
EFFECTS ON HUMAN & BUILT ENVIRONMENT		Eventual loss of coast and hinterland assets such as Cycle-way / coast path, road, housing and other buildings, parks and other leisure activities.	Minimal - short to medium term	Increased opportunities for leisure and tourism. Potential loss of vantage for existing shoreline properties.	Significant asset loss including promenades, cycle/coast path, highway, buildings, leisure assets etc.
EFFECTS ON DEVELOPMENT & LAND USE		Changes in land use and pressure on developed and undeveloped land.	No significant effects	Reclaimed land for development.	Increase in pressure to undeveloped land resulting in changes to current land use.
IMPLICATIONS FOR COASTAL DEFENCES		Increased exposure and deterioration leading to failure.	On-going maintenance and renewal as appropriate.	New defences required with increased exposure.	New coastal defences are likely to be needed inland eventually to arrest progressive recession.
EFFECTS ON ADJACENT CPU'S		Potential littoral drift changes.	minimal - short to medium term.	Changes to littoral drift regime affecting the shoreline to the east	Littoral drift changes likely (potential changes resulting from dredged not included)
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS		Accelerated loss of existing sea defences and coastal assets.	Increased wave exposure. Modification of defences as required.	Further increase in wave exposure.	Increased energy reaching the shoreline will accelerate recession.
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT		Non-viable	Viable	Potentially viable at specific locations, probably in west at Mumbles. Elsewhere non-viable.	Non-viable.
SUSTAINABILITY			Likely in short to medium term to be confirmed with monitoring in longer term.	Unlikely unless supported at specific locations with monitoring.	Unlikely.

COASTAL PROCESS UNIT	:	CPU 3 - Swansea Docks to Port Talbot Dock			
SHORELINE COMPOSITION	:	Ports (3 No.), dune/burrows, industrial frontage and Aberavon			
COASTAL MANAGERS	:	City & County of Swansea and Neath Port Talbot County Borough Council			
		DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES		Erosion and accretion trends along the coast likely to continue (changes to dredging activities not assessed)	On-going erosion at some locations resulting from increased wave disturbance.	Loss of beach area with and increase in wave disturbance/exposure	Altered littoral drift - introduction of new sediment source (impacts on ports not assessed)
EFFECTS ON NATURAL ENVIRONMENT		Eventual alteration of existing habitats	minimal in short to medium term.	Loss of intertidal habitats	potential increase in intertidal habitats
EFFECTS ON HUMAN & BUILT ENVIRONMENT		Eventual loss of hinterland assets including roads, promenades housing and industry	Minimal in short to medium term.	Increase in opportunities for leisure/tourism and industrial development	loss of promenade, roads, leisure and industry
EFFECTS ON DEVELOPMENT & LAND USE		Loss of development along coastline and increased pressure on undeveloped hinterland areas.	Potential for hinterland developments	Reclaimed land for development, existing shoreline development becomes effectively displaced to landward	Loss of potential development land and increased pressure on remaining undeveloped hinterland areas
IMPLICATIONS FOR COASTAL DEFENCES		Increased exposure and deterioration leading to failures	On-going maintenance and renewal as appropriate.	New defences will be required and will be subject to greater wave exposure	New defences may eventually be required depending upon the extent of permitted retreat
EFFECTS ON ADJACENT CPU'S		Limited changes in littoral regime (changes to dredging activities not assessed)	No significant change anticipated	Changes to littoral drift regime (changes and or consequences for port operations not assessed)	Littoral drift changes
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS		Affects accelerated with potential reversal of trend at accreting shorelines.	Modification of existing defences and additional defences as necessary	Greater increase in exposure of new defences referred to above	Early installation of new defences to arrest retreat or increased recession.
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT		Generally non-viable	Viable	Non-viable	Generally non-viable
SUSTAINABILITY			OK in short to medium term with monitoring to confirm longer term.	Unlikely	Possible - subject to determination by monitoring

COASTAL PROCESS UNIT : CPU 4 - Port Talbot Docks to Ogmore SHORELINE COMPOSITION : Industrial frontage, two extensive dune systems, Porthcawl COASTAL MANAGERS : Neath Port Talbot / Bridgend County Borough Council				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Erosion and increased release of sediment into system	On-going beach erosion and increase in wave disturbance	Loss of beach, increased wave exposure and changes to littoral drift.	Altered littoral drift with introduction of new sediment sources.
EFFECTS ON NATURAL ENVIRONMENT	Changes to intertidal and hinterland habitats	Not significant if policy excludes duned frontages	Loss of intertidal habitats. Major disruption if applied to dunes frontages for intertidal and hinterland habitats	Potential increase of intertidal habitats and loss of hinterland habitats
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Loss of hinterland and coastal habitats including eventual threat to industry and Porthcawl	Minimal in short to medium term	Increase protection for existing coastal assets and provide development opportunities	Loss of promenades, coastal structures, industry, roads and property
EFFECTS ON DEVELOPMENT & LAND USE	Limit development potential along coastal fringe	Potential for undeveloped land to be developed	Increase in land available for development. Affect vantage of existing coastal properties	Loss of development potential and increase pressure on undeveloped hinterland
IMPLICATIONS FOR COASTAL DEFENCES	Increased deterioration leading to failure	Maintenance, modification and new defences will be required	New and more robust defences required	New defences will be required if a limit is determined for set-back.
EFFECTS ON ADJACENT CPU'S	Progressive change to littoral drift	Minimal unless dune protection is considered	Significant potential changes to littoral drift regimes	Changes to littoral drift regime.
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Affects accelerated	Increase in burden for maintenance, modification with renewed defences needing to be more robust	Increased exposure of new defences. new defences would need to be more robust.	Increased recession rate requiring either more rapid set-back or further coast protection.
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT	Selectively viable - viable along duned frontages; non-viable along frontages with high value coastal assets	Viable (not including dune frontage)	Generally non-viable	Selectively viable - that is - along dune frontage
SUSTAINABILITY		Likely - subject to confirmation with monitoring	Unlikely	Unlikely along developed shoreline

COASTAL PROCESS UNIT	:	CPU 5 - Ogmere to Nash Point			
SHORELINE COMPOSITION	:	Rock cliffed shoreline with main exception at Dunraven Bay - Potential impact from marine aggregate extraction are not proven and are therefore not considered			
COASTAL MANAGERS	:	Vale of Glamorgan Council			
		DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES		On-going erosion of cliffs and release of sediments into drift	Limited effects provided line is held only in areas where major assets are threatened - excludes coast path and therefore general cliff protection	Loss of sediment drift and increase in wave energy impacting on advanced line.	Release of additional sediment into drift
EFFECTS ON NATURAL ENVIRONMENT		Little anticipated change	Minor disruption provided scope is limited - that is excludes general protection of cliff	Major disruption to coastal habitats and landscape if applied unit wide	No significant change
EFFECTS ON HUMAN & BUILT ENVIRONMENT		Loss of specific assets such as access to Dunraven Bay, coast path and other beach access points	Minimal if above comments apply	Increased opportunities for leisure and tourism	Loss of coastal assets including car parks, roads and coast path - potential to set-back coast path.
EFFECTS ON DEVELOPMENT & LAND USE		Loss of foreshore access and coast path would modify current land use along coastal fringe. Visitor number to Dunraven bay would dramatically reduce if no vehicular access was available. significant coastal development is unlikely.	Maintains hinterland for agriculture. Major hinterland development is unlikely	Increased development potential	Minimal affects provided an alternative hinterland road access to Dunraven Bay is established.
IMPLICATIONS FOR COASTAL DEFENCES		Eventual deterioration/modification (modification applies to natural storm beaches) leading to failure.	On-going maintenance and new defences required	New, robust defences required	Minimal, unless a limit to the extent of the recession was determined.
EFFECTS ON ADJACENT CPU'S		No significant change	Insignificant change unless cliff protection was considered	Significant alteration in drift regime if policy is applied unit wide.	Potential for modest additional sediment
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS		Increase in rate of cliff line recession (sediment yield) and accelerated loss of assets.	Earlier modification and renewal of defences as necessary	Increased exposure of new defences	Increase rate of recession and strengthen set-back defences as necessary
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT		Viable provided the loss of the coast path is accepted	Viable if general cliff line is excluded. Non-viable if "blanket" application of policy is considered	Non-viable	Generally viable and acceptable along cliffed shoreline assuming coast path set-back
SUSTAINABILITY			Targeted hold line - Likely	Unlikely	Generally likely

COASTAL PROCESS UNIT : CPU 6 - Nash Point to Barry SHORELINE COMPOSITION : Mostly Cliffed, isolated valleys onto foreshore and beaches, Aberthaw power station COASTAL MANAGERS : Vale of Glamorgan Council				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little change with on-going release of sediment from cliffs and easterly drift along upper foreshore	Minor alteration if applied to protected and low lying areas only. That is - cliff line is not held	Modest loss of sediment supply with potential significant interruption to drift flow along upper foreshore. Advancing general cliff not considered	Release of additional sediment into drift supply
EFFECTS ON NATURAL ENVIRONMENT	Little anticipated change to current trend of on-going erosion of natural cliffs	Significant disruption to habitats and landscape if applied unit-wide.	Significant disruption and loss of habitats and landscape is applied unit-wide.	No significant affects with exception of few specific locations
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Loss of hinterland low lying areas and loss of coastal assets.	Minimal in short to medium term with specific exception (s)	Increase protection for existing coastal assets	Loss of existing coastal assets including footpaths, Power station and other buildings / car parks etc.
EFFECTS ON DEVELOPMENT & LAND USE	Limit development potential and may eventually restrict foreshore access.	Potential for undeveloped hinterland to be developed.	Increase in land available for development.	loss of development potential
IMPLICATIONS FOR COASTAL DEFENCES	Increased exposure and eventual failure	On-going maintenance and renewal of defences as necessary. Major implications if applied unit wide	New and more robust defences required. Major implications if policy is applied to whole unit	None, unless a limit is determined for the extent of set-back
EFFECTS ON ADJACENT CPU'S	No significant change	Significant modification to longshore sediment drift supply if applied to whole unit.	Significant changes to littoral drift if applied to whole unit. Potential short to medium term drift disruption from construction of isolated reclamation areas.	Potential increase in sediment supply.
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Increase in cliff line recession, accelerated loss of assets	Accelerate affects	Need to further increase design specification for new defences or strengthen existing.	Accelerated retreat and increase in sediment release into supply
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT	Non-viable unit wide. Generally viable and likely along natural cliffed coastline	Non-viable along whole unit. Generally viable at locations with significant assets	Non-viable	Generally viable along cliffed shoreline and also potentially viable at some specific sites
SUSTAINABILITY		Likely at specific locations subject to conformation by monitoring	Unlikely	Likely subject to confirmation by monitoring

COASTAL PROCESS UNIT	:	CPU 7 - Barry to Lavernock Point			
SHORELINE COMPOSITION	:	Barry beaches / tourism areas, harbour and industry, Sully and natural cliffed coastline			
COASTAL MANAGERS	:	Vale of Glamorgan Council			
		DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES		On-going erosion will release more sediment into drift	Significant affects if applied unit wide. Minimal if extent of hold line policy is limited to high value assets	Significant changes in drift and wave exposure	Additional sediment in littoral drift supply
EFFECTS ON NATURAL ENVIRONMENT		No significant change anticipated	Significant disruption to of habitats and landscape if policy applied to whole unit. Minimal affect if policy is targeted to high value assets	Significant impact on intertidal habitats and landscape if applied to whole unit. Less significant and localised affect for moderate reclamation at specific sites	Not significant in short to medium term
EFFECTS ON HUMAN & BUILT ENVIRONMENT		Progressive loss of coastal assets including coast paths and eventually housing, roads and other assets	Provide protection to existing assets under threat	Secure existing assets under threat	Progressive loss of existing coastal assets
EFFECTS ON DEVELOPMENT & LAND USE		Limit development potential along coastal strip	Increase potential for development along coastal fringe	Increase area with development potential including housing, leisure and tourism	Sterilise undeveloped coastal area.
IMPLICATIONS FOR COASTAL DEFENCES		increase exposure and failure	Maintain, upgrade and provide new defences as required	Major new defences required is applied to whole unit. Localised advance would also require robust protection	Limited dependant on permitted extent of set-back/retreat
EFFECTS ON ADJACENT CPU'S		No significant change	Changes in littoral regime are likely to affect sediment supply around Lavernock point	Alteration to littoral drift regime	Modest increase in littoral drift supply
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS		Accelerate affects	Increased exposure at defences and early upgrades required	Accelerate affects and increase wave impacts	Accelerate affects
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT		Non-viable unit wide	Selectively viable	Non-Viable	Generally viable along cliffed shoreline (Coast path set-back)
SUSTAINABILITY			Likely at specific frontages subject to monitoring	Unlikely	Monitoring to determine

COASTAL PROCESS UNIT : CPU 8 - Lavernock Point to Penarth Head				
SHORELINE COMPOSITION :				
COASTAL MANAGERS :				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	On-going erosion will feed sediment into littoral drift supply	Not significant if applied only to currently protected areas. Significant impacts if applied unit wide	Significant changes to littoral drift regime if applied to whole unit. Potential impacts depending on form for specific/localised reclamation.	Increase littoral drift supply with little anticipated benefit known at present
EFFECTS ON NATURAL ENVIRONMENT	No significant affects	Significant disruption to intertidal habitats and landscape if applied to whole unit. Minimal impact if applied currently protected areas.	Significant impact on intertidal habitats and landscape if applied to whole unit.	Not significant in short to medium term
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Loss of coastal assets including promenade, coast path, properties, roads and commercial premises	Provide protection to existing assets under threat	Secure existing coastal assets	Loss of significant assets including Penarth promenade etc and eventually adjacent cliff top housing.
EFFECTS ON DEVELOPMENT & LAND USE	Limit development potential along coastal strip	Increase development potential if applied to whole unit	Allows potential for further development	Eliminate development potential and increase pressure on hinterland
IMPLICATIONS FOR COASTAL DEFENCES	Increased exposure leading to failure	Maintain, upgrade and re-new as necessary. Significant implication if policy applied to whole unit	Major new works required	No defence required if retreat allowed to develop naturally
EFFECTS ON ADJACENT CPU'S	No significant affects	Not significant if restricted to maintenance of protecting coastline only	Likely impact to north	No significant impacts in short to medium term
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Accelerate affects	Increased exposure of defences and early upgrade/renewal as necessary	Increase in wave impacts on new defences. Possible early modification/enhancement	Accelerate recession
PRELIMINARY QUALITATIVE ECONOMIC ASSESSMENT	Non-Viable along coastline with significant assets	Viable along protected coastline	Generally non-viable with possible site specific exceptions	Non-viable
SUSTAINABILITY		Likely subject to confirmation by monitoring	Monitoring to determine	Unlikely, Monitoring to determine policy for presently unprotected cliffed areas

4.2 MANAGEMENT UNIT SUMMARY			
CPU / MU No	UNIT LOCATION / LIMITS	COAST EDGE / SHORE TYPE	LAND USE / ASSETS
COASTAL PROCESS UNIT 1			
MU1/1	Worms Head to Port Eynon Point	Rock Cliff Shore	Agricultural / Landscape / Environmental Asset
MU 1/2	Port Eynon Point to Eastern end of Horton	Rock Headland to west extending to Horton forming part of south easterly facing embayment with wide sandy beach backed by dunes / burrows.	Rock cliffs either side of Port Eynon Bay; hinterland mainly agricultural, Landscape & Environmental asset throughout. Port Eynon is a tourist beach. Sea/sun bathing, boating & surfing
MU 1/3	Eastern end of Horton to Oxwich Point	Rock Shore	Environmental & agricultural
MU 1/4	Oxwich Point to east side of Three Cliffs Bay	Rock Headland or Oxwich Point Bounding South easterly facing embayment with wide sandy beach backed by dunes / burrows (Three cliffs bay orientation to south)	Significant environmental and tourism interest with some hinterland agricultural use. Sun/sea bathing, boating, surfing & sub aqua
MU 1/5	East side of Three Cliffs Bay to West side of Caswell Bay.	Rock promontory punctuated by small bay at Pwlldu	Environmental, agricultural and archaeological interest
MU 1/6	Caswell Bay	Caswell bay comprises two parts - west and east and each part varies in orientation and is separated by a short section of rock shore.	Private and CPA coastal defences with property behind private defences and highway / car park behind CPA section.
MU 1/7	East side of Caswell Bay to Snaple Point	Rock shore	Environmental interest and golf course.
MU 1/8	Snaple Point to Rother Tor Including Langland and Rotherlade	Rock cliffed shore and defended sections with sand/shingle beaches at Langland and Rotherlade.	Significant tourism interest with coast path. Generally built coast edge / hinterland with promenades, residential areas, beach huts and hotel accommodation. Surfing sun/sea bathing (beach huts)
MU 1/9	Rother Tor to Mumbles Head	Rock cliff shore with deep ravines and softer material bands. Small defended section at Limeslade bay.	Coast path, road and residential properties at Limeslade. Coast Guard station and car park. SSSI at Bracelet Bay and archaeological interest at Mumbles Head.
COASTAL PROCESS UNIT 2			
MU 2/1	Mumbles Head to Oystermouth (B4593)	Mostly defended shoreline with coast path / cycle track & road. Defences comprise seawalls & revetment.	Mumbles pier (paddle steamer) and adjacent hinterland complex. Cycle track, roadway, cafes, car parks, boating, boatyards, launching areas, residential, business and other infrastructure. Part SSSI on foreshore
MU 2/2	Oystermouth to Black Pill	Revetments with cycle track / coast path. Sand/silt foreshore.	Cycling, walking, road, residential and business premises. SSSI foreshore. Shopping centre (Mumbles) , boating and car park.
MU 2/3	Black Pill to Swansea Docks	Seawall, revetment, dune frontage. Wide sand/silt intertidal zone	Cycle track / foot path, mini golf course, highway, residential properties including blocks of flats and County Hall. Part SSSI foreshore. Coast edge development form part of hinterland marina development.

4.2 MANAGEMENT UNIT SUMMARY			
CPU / MU No	UNIT LOCATION / LIMITS	COAST EDGE / SHORE TYPE	LAND USE / ASSETS
COASTAL PROCESS UNIT 3			
MU 3/1	Swansea Docks & Channel	Training wall and breakwaters forming approaches to docks with marine dredged navigation channel. Swansea / Tawe barrage.	Major commercial port to the east and leisure/fishing marina to the west. Commercial port comprises three principal dock basins with a dry dock and ferry terminal. Swansea barrage. Leisure & boating interests in the river Tawe.
MU 3/2	Swansea Docks to BP Tank Farm (Nr County Boundary)	Revetment fronting seawall with sandy lower intertidal zone forming boundary to docks. Tank farm fronted in part by sea wall and part revetment.	Docks infrastructure and Oil storage (Tank Farm). Note also treatment works and outfall.
MU 3/3	BP Tank Farm to Whiteford Point - Crymlyn Burrows, Neath Estuary Baglan Burrows and Dunes	Dune burrows either side of neath training walls. Crymlyn to west and Baglan to east. Sandy intertidal zone with areas of marsh.	Training walls, port and port navigation. SSSI at Crymlyn Burrows. BP chemical plant behind Baglan Burrows. Neath estuary - marina & commercial wharfs and also site of Energy Park development.
MU 3/4	Aberavon Beach	Seawall and stepped concrete revetment giving way to linear armour stone revetment and breakwater at east end forming entrance to river Afan. Wide sandy foreshore.	Seawall, promenade, RNLI facility, road and hinterland residential area with hotel and leisure complex. Coast edge / hinterland development, surfing, sun/sea bathing.
COASTAL PROCESS UNIT 4			
MU 4/1	Port Talbot Docks	River Afan and Major iron ore port for steel plant comprising two very large breakwater structures and marine dredged navigation access channel. Inshore spending beach and revetment	Iron ore Port serving local steel making industry. River Afan is used as a haven for small private and fishing craft. Included redundant access to former docks.
MU 4/2	Port Talbot Docks to Afon Cynfig (County Boundary)	Slag revetment and sandy intertidal zone	Steel Works including significant spoil ground for stock piling waist material from steel making process (slag). Local archaeological interest and Margam Moors SSSI.
MU 4/3	Afon Cynfig to Sker Point	Dune frontage with wide sandy intertidal zone.	Significant environmental interest throughout Kenfig Burrows including the foreshore area (cSAC). Popular area for walking, bird and wildlife interests. Surfing.
MU 4/4	Sker Point to Hutchwns Point (Porthcawl)	Rock shore with several small high water defended bays. Generally wide sandy intertidal zone.	Coast path, tourist beach, golf links, environmentally important open space (LNR - Lock Common). Sun / sea bathing, surfing, boating, lifeguards.
MU 4/5	Hutchwns Point to Porthcawl Point	Rock shore with seawalls and revetment adjacent to coast path and road.	Promenade, coast walks, roadway. Important area for tourism. Also residential and hotel accommodation. Sun bathing & surfing

4.2 MANAGEMENT UNIT SUMMARY			
CPU / MU No	UNIT LOCATION / LIMITS	COAST EDGE / SHORE TYPE	LAND USE / ASSETS
MU 4/6	Porthcawl Point to Rhych Point (to Newton Bay Slipway)	Breakwater, masonry seawalls, Rock Shore, Revetments, harbour and miscellaneous other minor structures. Wide sandy intertidal zone punctuated with Porthcawl, Rhych and Newton Points.	Leisure and fishing harbour (RNLI station), tourist beaches, caravan parks and amusement park. Assets include the breakwater, harbour, roadways, funfair, caravan park etc. Sun / sea bathing, surfing, boating & lifeguards.
MU 4/7	Merthyr Mawr (Traeth yr Afon) including River Ogmore	Mixture of rocky and sandy intertidal zone with dune or shingle bank coast edge. River Ogmore discharges to east of unit.	Boating, tourism, environmental interest throughout Methyr Mawr Warren including SSSI and cSAC. Local archaeological interest. Sun / sea bathing.
COASTAL PROCESS UNIT 5			
MU 5/1	River Ogmore (East side) to Dunraven Bay (west side)	Low level rock shore with several minor bays formed between hard points to west of unit with high nr vertical rock cliffs to east into Dunraven bay.	Tourism at Ogmore-by -Sea, car park life guard station and hinterland residential areas in west. SSSI & Heritage Coast
MU 5/2	Dunraven Bay to Trwyn y Witch	Rock cliffs dipping in centre to valley (Seamouth) where a cobble storm beach is present. Sandy intertidal zone.	Tourism, environmental and archaeological interest. Cliff top access drop steeply into car park area behind cobble storm beach. Surfing, bathing, walking (coast path) etc. SSSI & Heritage Coast (HQ).
MU 5/3	Trwyn y Witch to Nash Point	Rock cliffed shore with a mixture of outcropping rock and sandy foreshore.	Coast Path, SSSI's and Heritage coast. Hinterland given to agriculture. Several small valleys allowing access to foreshore (some residential properties)
COASTAL PROCESS UNIT 6			
MU 6/1	Nash Point to Cwm Col Huw (Including Atlantic Collage)	Rock cliffed coast and rock shore with defended sections at Atlantic Collage (St Donat's) and Nash lighthouse..	Nash Point lighthouse, Atlantic Collage, Tresilian bay (small valley), coast path. Significant archaeological interest at Atlantic Collage. RNLI station. Hinterland is generally agricultural. SSSI & Heritage Coast. Local marine based activities from collage.
MU 6/2	Cwm Col Huw	Armour stone revetment, seawall and shingle bank with central river outlet. Rock/sand shore	Surf lifesavers building, café and car park. Tourism interest and on route of coast path. Sun / sea bathing & surfing.
MU 6/3	Cwm Col Huw to Limpert Bay	Rock cliff and outcropping rock shore.	Mainly agricultural use with coast path and important landscape interest (Heritage Coast). Sea bathing at Limpert Bay.
MU 6/4	Limpert Bay to Leys Beach (East side including Power Station)	Sea Wall protecting power station with groyne field.	Aberthaw (coal fired) Power Station. Caisson offshore for sea water intake / outflow.
MU 6/5	Fontygary to Bullcliff Rocks including Rhoose Point development)	Rock Cliffs and rock shore	Coast Path and Rhoose Point development. Agricultural, caravan site and country park including SSSI. Sun / sea bathing at Fontygary.
MU 6/6	Bullcliff Rock to Cold Knap Point - Cold Knap	Rock shore with shingle beach leading to cold knap point.	Tourism, residential, and archaeological interests. Sun / sea bathing.

4.2 MANAGEMENT UNIT SUMMARY			
CPU / MU No	UNIT LOCATION / LIMITS	COAST EDGE / SHORE TYPE	LAND USE / ASSETS
MU 6/7	Cold Knap Point to Friars Point - Barry Harbour	Rock shore with revetments, a sea wall and breakwater. Sand and silt in old harbour.	Breakwater as landing stage for paddle steamer, residential properties and access road to Barry Island. Archaeological interest and SSSI at Friars Point.
COASTAL PROCESS UNIT 7			
MU 7/1	Friars Point to Nell's Point - Whitmore	Rock headlands with sandy embayment backed by Seawall.	Fun Fair and development at former holiday camp. Residential properties above Jackson's bay and coast path around Nell's Point. Tourist beaches, archaeological interest and SSSI's.
MU 7/2	Nell's Point to Barry Docks - Jackson's Bay	Rock cliff edge fronted by sandy beach.	Tourist beach with access via coast path or steps to east. Residential area and highway above.
MU 7/3	Barry Docks to West end of Sully	Breakwaters at dock entrance with general rock (some soft) shore to Sully	Industrial estate, dock development area, Sully hospital, Ty Hafon and eroding coast path
MU 7/4	Sully extending east to Swanbridge	Shingle storm bank above rocky foreshore with large sand inclusion	Sully residential area with coast edge properties, caravan park, playing fields, yacht club, boating,
MU 7/5	Swanbridge extending east to Ball Rock	Sea wall and revetment at Swanbridge with cliff top coast access road to Ball Rock.	Swanbridge car park, residential properties, access road and Captains Wife Pub. SSSI's and Sully Island SPA. Cliff top access road.
MU 7/6	Ball Rock to Lavernock Point (including St Mary's Well Bay)	Rock cliff shore with sandy beach and extensive rock outcrops.	SSSI, caravan parks / tourism.
COASTAL PROCESS UNIT 8			
MU 8/1	Lavernock Point to Penarth Head - Sub Cell 8a	Rock cliff shore with defended area through part of Penarth. Sea walls, revetment and stone shingle beach - See Sub Cell 8a	Residential properties, promenade, tourism, Penarth Pier, RNLI Station, Yacht Club and other local businesses - See Sub Cell 8a

Management Unit 1/1

MANAGEMENT UNIT No. 1/1**Worms Head to Port Eynon Point**

From	Worms Head	238300E 187700N
To	Port Eynon Point	247000E 184300N
Approximate Length	7.5Km	

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Worms Head to Port Eynon Point
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile monitoring
CP2	Shingle Storm Beach Behaviour	Mewslade
CP3	Coincidence of high tides and storms	Cliff erosion/storm beach disruption
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	In small pocket bays such as Fall Bay. Also Mewslade.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Bay wide issue applicable to all MU's
CP9	Sea level rise and increased storminess	Cliff erosion and impacts on storm beaches and areas of sandy intertidal zone.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Impacts on shingle bank and beaches.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant local concern and further monitoring/studies required.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Significant local concern and bay wide issue.

NATURAL ENVIRONMENT		Worms Head to Port Eynon Point
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Important environmental area
NE2	Protection of areas designated under international conventions.	Designated areas apply - NNR HC SSSI AONB. Now a new SAC site known as Carmarthen Bay and Estuaries has been proposed. Note also cSAC Limestone Coast of South West Wales.
NE3	Water Quality	MU is adjacent to tourist beach and rich marine environment.

Management Unit 1/1

NATURAL ENVIRONMENT		Worms Head to Port Eynon Point
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concerns apply to many MU's crossing MU boundaries.

HUMAN & BUILT ENVIRONMENT		Worms Head to Port Eynon Point
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	
HB2	Public access to the foreshore	Access to foreshore is limited. Mass or formal access is likely to be discouraged.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Coast paths and NT areas present
HB4	Fisheries interests	Boat and shore angling interests.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Conservation interest would be prominent
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Effect adjacent MU's and could effect this section of coast in future.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Coastal archaeological interests present in this MU.
HB8	Vehicular access/parking/road congestion	General concern in Gower but not directly effecting this MU with exception of parking for walkers at tourist centres.
HB9	Importance of beach quality to tourism	Not specific to this MU
HB10	Balance between traditional and green tourism	Green tourism would dominate.
HB11	Importance of recreational use of foreshore and contribution to local economies	Limited application with exception of rock climbing and sub aqua - would not significantly contribute to local economy.
HB13	Human pressure on natural assets such as dunes	
HB14	Beach texture - sand/silt	Generally sand lower foreshore or rock adjacent to cliffs (ie no beach)
HB15	Access for emergency services (incl. life boat)	Access is limited.
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Marine aggregate extraction is a significant local & bay wide issue

COASTAL DEFENCE		Worms Head to Port Eynon Point
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	May apply to footpaths
CD2	Cliff erosion	Cliff erosion occurs - slowly.
CD3	Adequacy/condition of existing defences	Defences are all hard rock shore.
CD8	CPA funding of coast protection	Qualifying assets under CPA rules - Footpaths, Highways etc
CD9	The role of the foreshore/beach as a defence	Limited in scope to Fall and Mewslade.

Management Unit 1/1

DEVELOPMENT		Worms Head to Port Eynon Point
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Development very unlikely
D2	Sustainability	Natural processes will be allowed to continue to mould shoreline.
D3	Preservation/enhancement of landscape value	Very important (Heritage Coast, NNR etc)

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Worms Head to Port Eynon Point
	Refer to Gower Management Plan and City and County of Swansea policies CL2 to CL5 heavily weighted towards conservation and the protection of the environment including the landscape. Presumption against development or where development is permitted it would be necessary to provide mitigating measures.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Worms Head to Port Eynon Point
	Statutory: AONB, NNR, SSSI Non-Statutory: Heritage Coast, GCR's Note National Trust have significant interests in the this area. Now a new SAC site known as Carmarthen Bay and Estuaries has been proposed. Note also cSAC Limestone Coast of South West Wales.	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Worms Head to Port Eynon Point
	Significant area owned by the National Trust. Some coastal sections are also private.	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)
	The following coastal defences presently exist within this management unit :
	All defences comprise Hard Rock Shore as defined by National Assembly for Wales and the rock shore is subject to a high degree of exposure

A.6	OBJECTIVES							
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	

Management Unit 1/1

PART B Intervention Appraisal	Worms Head to Port Eynon Point
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Ref.	Topic			
B.1	<p>Shoreline Description - (Refer to Context Report Section 3)</p> <p>Coast Edge Type - Material - Hard rock shore Foreshore Type - Material - Rock with sand at Fall and Mewslade Bay Developed/Undeveloped - Undeveloped Defended/undefended - Undefended Orientation/exposure - South South West with high exposure</p>			
	B.1.1	Land Use:	Mainly agricultural hinterland. Environmental assets - walking/green tourism	
	B.1.2	Specific Shoreline Interests:	Walking, rock climbing, sub aqua, enjoyment of the landscape	
B.2	<p>SHORELINE EVOLUTION - (Refer to Context Report Section 3)</p> <p>Geology - Carboniferous Limestone cliffs and rock shore with overlying fine sand sediment. Hard limestone erodes very slowly. Worms head has evolved into an island with a low water causeway connecting the mainland.</p> <p>Shoreline Movement/Historic Maps - Limited data applying to Fall and Mewslade indicates a general pattern of advancing mean high water mark and retreating low water mark resulting in beach steepening. Historic maps cannot be guaranteed to be accurate and therefore the results should be treated with caution,</p> <p>Development/Industry - No development; No industry</p> <p>Gains/Losses - Evidence of advance mean high water mark and retreating low water in early part of Century resulting steep intertidal zone. Some variation however and picture is not conclusive.</p>			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Slowly eroding cliff with no known significant assets under threat.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. Possible increase in exposure resulting from loss of foreshore/beach steepening at Fall and Mewslade Bay.	
		<u>Preliminary Value of Assets at Risk:</u>	Mostly environmental. Coast paths** should be assessed	** CPA funding is not necessarily available for coast paths. Also applies to highways resulting in a mixed picture whereby funding responsibility is derived from many sources. Potential impacts upon economic justification.
	B.3.2	Cost Implications: Public access and possible safety hazard management - cost of retreating coastal path should include the cost of land acquisition to allow room for set-back		
	B.3.3	Economic Viability: Retreat is likely to be viable.		

Management Unit 1/1

PART C Strategic Policy Appraisal**Worms Head to Port Eynon Point**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No change	Significant	Significant	Little or no change
EFFECTS ON NATURAL ENVIRONMENT	gradual changes likely - evolutionary	Significant	Significant	No Change
EFFECTS ON HUMAN & BUILT ENVIRONMENT	None known	None	None	Possible relocation of coastal path. This may effect access
EFFECTS ON DEVELOPMENT & LAND USE	Development not permitted.	Would change current land use and allow coastline to be developed	Would change current land use and allow coastline to be developed	Little or no change from present
IMPLICATIONS FOR COASTAL DEFENCES	No change to current slow rate of cliff erosion - Fall and Mewslade may be effected to a greater extent	Significant	Very Significant	None
EFFECTS ON ADJACENT M.U'S	None	Effect are likely, extent would need to be studied if this options was to be seriously considered	Effect are likely, extent would need to be studies if this options was to seriously considered	None or no change
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Slight increase in erosion rate and changes likely at Fall and Mewslade.	Increase cost of hold line	Increase cost of maintaining defences.	Rate of erosion would slightly increase, possible loss of more fine sediment overlying rock.
CONCORDANCE WITH OBJECTIVES	Accords with relevant objectives	Does not accord generally with objectives	Does not accord generally with objectives	Accords with relevant objectives
(A) OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) BIODIVERSITY ISSUES	(A) - Little change. (B) - Natural Evolution - Losses/Gains	(A) - None (B) - Losses	(A) - None (B) - Losses	(A) - Little change (B) - Subject to method used - losses and gains likely
ECONOMIC VIABILITY	Viable	Not viable	Not viable	Viable
GENERAL COMMENT ON POLICY SUITABILITY	Suitable - apart from potential loss of coast path	Not suitable	Not suitable	Suitable
RELATIVE SUSTAINABILITY				
Social	Baseline	- ve	- ve	Neutral
Economic	Baseline	- ve	- ve	Unknown
Environmental	Baseline	- ve	- ve	Neutral

Management Unit 1/1

Ref.	TOPIC	DESCRIPTION
C.2	PREFERRED POLICY DEFINITION Worms Head to Port Eynon Point	
C.2.1	Existing Coastal Defence Policy:	Short Term: Monitor/managed retreat of coast paths Anticipated Long Term: Do Nothing/Managed Retreat 0 - 5 years 5 + years
C.2.2	Future Coastal Defence Policy:	Funding & Possible need to purchase land for set back
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess.
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S9, S10, S11, L2 (Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M11, M13, M15 (Ref. Sect 5.2)
C.2.6	Intervention Priority:	Public safety applying to coast path

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1, CP2	CP5, CP12
C.3.1.2	Natural Environment:	NE1, NE2	
C.3.1.3	Human and Built Environment:	HB1, HB3	HB10
C.3.1.4	Coastal Defence:	CD1, CD2	CD8
C.3.1.5	Development:	D1, D3	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Cliff Edge	
C.3.2.2	Access:	Coast path and congestion at 'gateways' to coast path	
C.3.2.3	Industrial Activities:	No specific issues	
C.3.2.4	Human Pressures:	No specific issues	
C.3.2.5	Tourism/Recreation:	Retain area for green tourism.	

Management Unit 1/1

C.4	OBJECTIVES RECONCILIATION Worms Head to Port Eynon Point		
	The preferred policy accords with the following objectives for this management unit	OB's 1, 2, 4, 5, 6, 8, 9, 10, 11, 14, 15, 16	Includes objectives that may be described as neutral
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit	OB's 12, 13	
	OB 12 - To safe guard the character of the main holiday areas and improve or enhance the amenity and recreational value of the shoreline.		
	OB 13 - To maintain and where possible improve access to the foreshore for emergency vehicles, fisheries activities and recreational usage.		

Management Unit 1/2

MANAGEMENT UNIT No. 1/2		Port Eynon
From	PORT EYNON POINT	247000E 184300N
To	HORTON - EAST END	248000E 185500N
Approximate Length	5Km	

PART A Objectives, Issues and Statutory Details	Port Eynon
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A.1	ISSUES (For further detail on this section refer to the Consultation Responses Report) The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :
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COASTAL PROCESSES		Port Eynon
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile and NAW (Dredging) monitoring.
CP3	Coincidence of high tides and storms	Upper foreshore and dune edge erosion
CP4	Dune toe behaviour - erosion/regeneration	Dune erosion
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Possible relevance at Port Eynon Point
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Bristol Channel Marine Aggregate Study
CP9	Sea level rise and increased storminess	Potentially significant impacts
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	The need to be aware of cyclic changes and to differentiate them from trend behaviour
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major issue
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major issue

NATURAL ENVIRONMENT		Port Eynon
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Dune system is important local environmental area
NE2	Protection of areas designated under international conventions.	Port Eynon Point - SSSI. Also Carmarthen Bay cSAC and Limestone coast of South-West Wales cSAC.
NE3	Water Quality	Important for water activities/tourism
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General issue important to Gower beaches - outfalls at Overtone & Oxwich.

Management Unit 1/2

HUMAN & BUILT ENVIRONMENT		Port Eynon
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Port Eynon Point
HB2	Public access to the foreshore	
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Footpath either side of dune.
HB4	Fisheries interests	
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Damage to dunes from visitor pressures
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Mixture of water based activities including boating, water skiing, bathing, surfing, wind surfing.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Finds on foreshore
HB8	Vehicular access/parking/road congestion	Summer peak road congestion.
HB9	Importance of beach quality to tourism	Port Eynon is an important resort beach and used by local population.
HB10	Balance between traditional and green tourism	Port Eynon is bounded by rock cliff coastline with high landscape value. Conflict possible but unlikely
HB11	Importance of recreational use of foreshore and contribution to local economies	Very important - (caravan sites)
HB12	Marine access - Port/harbour/launching facilities	Boat club and launching facility at west end
HB13	Human pressure on natural assets such as dunes	Dunes suffer damage from trampling
HB14	Beach texture - sand/silt	Beach draw down and dune erosion has exposed under layer in places.
HB15	Access for emergency services (including life boat)	RNLI station at Horton access alongside stream and through dunes
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Cable believed to be located under beach - no further information
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major concerns regarding Dredging on Helwick Bank.

COASTAL DEFENCE		Port Eynon
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Coastal properties will become increasingly threatened and dune system appears to be relic and is likely to continue to erode.
CD2	Cliff erosion	Limited possible concern at SSSI Port Eynon Point
CD3	Adequacy/condition of existing defences	Existing man made and natural defences are not adequate.
CD4	Maintenance of existing defences	Responsibility should be confirmed
CD5	Dune erosion	Significant concern requiring intervention and management

Management Unit 1/2

COASTAL DEFENCE		Port Eynon
REF	ISSUE DESCRIPTION	Specific to MU
CD6	Condition of flood banks/sea defences	Hinterland levels behind dune should be checked for flood risk.
CD7	Private sea defences	Defences located in front of private houses, History of works to rock promontory on foreshore should be confirmed
CD8	CPA funding of Coast Protection	Study required to assess viability under CPA funding - including intangible benefits appraisal
CD9	The role of the foreshore/beach as a defence	Dune and foreshore are important to defences

DEVELOPMENT		Port Eynon
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Traditional tourism such as caravan parks and potential conflict with landscape and natural environment.
D2	Sustainability	Development, if approved, would need to fund appropriate coast protection
D3	Preservation/enhancement of landscape value	Finds are located on foreshore
D5	Impacts of coastal development.	Would need to be assessed
D6	Integration and conflict with other management plans	Gower management plan

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Port Eynon
	General policies applying to Heritage Coast include CL2 to CL6 and give priority to the environment and landscape value - Refer to Context report and City & County of Swansea plans (including Gower Management Plan).	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Port Eynon
	Statutory: Gower Coast SSSI, NNR Non-Statutory: Nearby GCR's & Heritage Coast - significant land scape value Also Carmarthen Bay cSAC and Limestone coast of South-West Wales cSAC.	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Port Eynon
	Full details of land ownership are not known although there is likely to be a mixture of private and public ownership including National Trust.	

Management Unit 1/2

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	<p>W.84.5089 - Port Eynon Point - 0.1km Long Hard Rock Shore - Exposure High</p> <p>W.84.5092 - Port Eynon, Salt House - 0.27km Long Seawall - Exposure High - Residual life is less than 5 years</p> <p>W.84.5095 - Port Eynon Bay - 1.25km Art Ptn/Dunes - Exposure High - Residual life is less than 5 years</p>

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 1/2

PART B Intervention Appraisal		Port Eynon				
Ref.	Topic					
B.1	<p>Shoreline Description (Refer to context report Section 3)</p> <p>Coast Edge Type - Material - Hard rock shore, artificial defences and dunes.</p> <p>Foreshore Type - Material - Sand with outcropping rocks. Some finer sediment appearing in recent times</p> <p>Developed/Undeveloped - Mostly undeveloped along coast edge but with hinterland extensively developed (exception dunes)</p> <p>Defended/undefended - Mostly undefended.</p> <p>Orientation/exposure - South to South East orientation - exposure is moderate to high. Some protection from Port Eynon point from dominant wave direction and exposed to south east. (Ref joint probability of storms & high water from south east)</p>					
	B.1.1	Land Use:	Tourism is important, foreshore/coast is also used by local residents.			
	B.1.2	Specific Shoreline Interests:	Boating, sea and sun bathing, sub aqua, sea/shore angling.			
B.2	<p>SHORELINE EVOLUTION (Refer to context report Section 3)</p> <p>Geology - Bay dune geomorphological type dune system.</p> <p>Shoreline Movement/Historic Maps - Toe erosion along dunes with modest past attempts at protection.</p> <p>Anecdotal evidence of depletion of sand foreshore. NAW monitoring is noted over short time base and shows no significant recent change - Time base - too small</p> <p>Development/Industry - Tourism</p> <p>Gains/Losses - Historic indication of reducing beach gradient which links with anecdotal evidence of upper foreshore depletion and dune erosion. (Refer to Section 3.4.2 of Context Report specifically).</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Dunes and private residences.	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding	U	Historic Environment	U
			Land Flooding	U	Losses	
			Transport disruption			
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increase storminess, dune erosion. Potential impacts of dredging operations since those operations commenced. Intangible impact of loss of tourism is likely to be significant if major detrimental changes to the foreshore occur.			
		<u>Preliminary Value of Assets at Risk:</u>	Properties in east of bay under varying degrees of threat. Intangible benefits are difficult to assess but have a major role in local and Gower economics. Tangible value likely to be over £1m.			
	B.3.2	Cost Implications: £0.5m - £1m				
	B.3.3	Economic Viability: likely to be viable subject to foreshore level trend behaviour				

Management Unit 1/2

PART C Strategic Policy Appraisal	Port Eynon
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C.1 MATRIX ASSESSMENT		Coastal Managers : CC Swansea		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little anticipated change	Dependant on form of works. Some effects likely	Effect will depend upon extent of encroachment onto foreshore	Little known change
EFFECTS ON NATURAL ENVIRONMENT	Dune erosion will effect local natural environment.	Dependant on form of works	Effect likely - subject to environmental assessment	likely detrimental effect resulting from further erosion of the dunes
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Threat to coastal properties.	Secure coastal properties and generally assist local area	Secure existing built environment - form of advance may effect human environment	Properties will be lost
EFFECTS ON DEVELOPMENT & LAND USE	Potential impacts from beach loss.	Would secure current land use assuming appropriate scheme were installed	may impact upon land use and increase development potential	Land use will change impacts upon tourism are likely
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences, including natural defences, will be severely effected in short to medium term.	Civil engineering scheme would be required although beach nourishment, dune creation and management could form part of a sustainable solution	Civil engineering works are likely to be significant and dependent upon the extent the line is advanced	continued erosion and loss of what remains of the coastal defence
EFFECTS ON ADJACENT M.U'S	Little or no effect known	Little or no impact	Impact are possible and would need to be checked	Little or no effect known
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Further dune loss and beach draw down likely. Built defences will be lost early	May effect form of civil engineering scheme and reduce scope for environmentally sensitive solution	Increased exposure to new/advanced line.	Rate of recession will increase
CONCORDANCE WITH OBJECTIVES	OB1, 4, 5, 6, Concordance with some objectives may be subjective	Concordance will be dependant upon form in which policy is applied	Concordance will be dependant upon form and extent of application of policy.	Would depend upon whether retreat was by large scale intervention and to what assets the policy was applied
(A) OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) BIODIVERSITY ISSUES	(A) - None (B) - Natural evolution - possible gain through intertidal zone/losses in hinterland	(A) - Dune creation, beach nourishment (B) - Balance of gains and losses between hinterland and foreshore to be confirmed	(A) - None known (B) - Losses possible along coast edge and on intertidal zone	(A) - None (B) - Losses possible through hinterland with potential gains in intertidal zone
ECONOMIC VIABILITY	Unlikely to be viable or acceptable	Subject to usual economic justification criteria	Not likely to be viable	Not likely to be viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable	Not suitable	Not suitable
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline	- ve	- ve
Economic	- ve	Baseline	- ve	- ve
Environmental	Unknown	Baseline	- ve	- ve

Management Unit 1/2

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Port Eynon
C.2.1	Existing Coastal Defence Policy:	Ad hoc measures to protect dunes	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold line in east, viability of hold dune should be investigated. Anticipated Long Term: Hold line - possible future retreat	0 - 5 years 5 years +
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess - beach loss	
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L1, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M9, M11, M15, M16, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Assessment of existing defences and dunes, possible re-charge	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1, CP3, CP5, CP8, CP11, CP12	CP9
C.3.1.2	Natural Environment:	NE1, NE3	
C.3.1.3	Human and Built Environment:	HB5, HB6, HB8, HB9, HB11, HB15, HB17	
C.3.1.4	Coastal Defence:	CD3, CD5	
C.3.1.5	Development:	D1, D6	D2
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Beach Safety/water users	
C.3.2.2	Access:	RNLI station in west and access to east, Access management through dunes - dune trampling	
C.3.2.3	Industrial Activities:	Potential impacts resulting from dredging	
C.3.2.4	Human Pressures:	Dune trampling	
C.3.2.5	Tourism/Recreation:	Sand beach is very important	

Management Unit 1/2

C.4	OBJECTIVES RECONCILIATION		Port Eynon
	The preferred policy accords with the following objectives for this management unit	OB's 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	Objectives that are neutral are included in this section
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 1/3

MANAGEMENT UNIT No. 1/3**Horton (East) to Oxwich Point**

From Horton (East) 248000E 185500N
 To Oxwich Point 251000E 184800N
 Approximate Length 3.5Km

PART A Objectives, Issues and Statutory Details**Horton (East) to Oxwich Point**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Horton (East) to Oxwich Point
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	No Monitoring along this cliffed coastline
CP3	Coincidence of high tides and storms	Minor potential impact on cliff coast
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Drift supply from cliffs will be low
CP9	Sea level rise and increased storminess	Minor impact upon cliff erosion
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Drift direction will fluctuate as shoreline faces prevailing weather
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Impact below low water possible - further work required
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Generally important issue throughout sub cell

NATURAL ENVIRONMENT		Horton (East) to Oxwich Point
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Heritage Coast with high landscape value. Nearby GCR's
NE2	Protection of areas designated under international conventions.	SSSI/NNR to East (towards Oxwich Point). Also Carmarthen Bay cSAC and Limestone Coast of South-West Wales cSAC.
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern

Management Unit 1/3

HUMAN & BUILT ENVIRONMENT		Horton (East) to Oxwich Point
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Cliff top path extending across MU
HB2	Public access to the foreshore	Limited because of cliff/not encouraged - public safety
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Potential threat although erosion rates are likely to be low
HB4	Fisheries interests	General interest
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Recreation/conservation in long term
HB10	Balance between traditional and green tourism	Adjacent to popular tourist beaches at Port Eynon and Oxwich
HB15	Access for emergency services (including life boat)	Possible concern as high water mark reaches cliff line
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern

COASTAL DEFENCE		Horton (East) to Oxwich Point
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Would apply to footpath
CD2	Cliff erosion	Hard rock shore - slow erosion
CD8	CPA funding of coast protection	Issue of funding of set-back option for coast paths.
CD9	The role of the foreshore/beach as a defence	Hard rock intertidal zone forms breaker zone.

DEVELOPMENT		Horton (East) to Oxwich Point
REF	ISSUE DESCRIPTION	Specific to MU
D3	Preservation/enhancement of landscape value	Important landscape value - Heritage Coast

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Horton (East) to Oxwich Point
	General presumption against development and development is very unlikely to be permitted along this frontage as it comprises SSSI and agricultural land with high landscape value.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Horton (East) to Oxwich Point
	Statutory: NNR/SSSI/AONB Non-Statutory: Heritage Coast/Nearby GCR's	

Management Unit 1/3

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Horton (East) to Oxwich Point
	National Trust	

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :	
	W.84.5150; 5155;5157;5158 = 4.6km Hard Rock Shore with high degree of exposure	

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5			OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 1/3

PART B Intervention Appraisal	Horton (East) to Oxwich Point
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Ref.	Topic			
B.1	Shoreline Description (Refer to context report Section 3) Coast Edge Type - Material - Erosion resistant limestone Foreshore Type - Material - Hard rock shore with exception at Slade Developed/Undeveloped - Undeveloped Defended/undefended - Undefended natural rock shore Orientation/exposure - High exposure facing south west			
	B.1.1	Land Use:	Agricultural and natural assets in SSSI	
	B.1.2	Specific Shoreline Interests:	Walking, appreciation of landscape value and environment	
B.2	SHORELINE EVOLUTION (Refer to context report Section 3) Geology - Carboniferous Limestone Shoreline Movement/Historic Maps - No conclusive data as Hard rock shore movements are small and fall within the measurement tolerances. Development/Industry - None along coast Gains/Losses - Data is limited along rock cliffed coast although movement would be small. Intertidal zone is generally rock shore. No data below low water.			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Natural assets.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
			U	U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess.	
		<u>Preliminary Value of Assets at Risk:</u>	Valuation not feasible to produce figures at present - Natural assets. Coast path	CPA funding of is not for all coastal assets such as coast paths.
	B.3.2	Cost Implications: Set back coast paths		
	B.3.3	Economic Viability: Set back paths would be viable		

Management Unit 1/3

PART C Strategic Policy Appraisal**Horton (East) to Oxwich Point**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	*** HOLD THE EXISTING LINE	*** ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No change			No change if applied to coast path only
EFFECTS ON NATURAL ENVIRONMENT	Losses/changes to natural environment over long term			No change if apart from evolutionary changes apart from set back coast path
EFFECTS ON HUMAN & BUILT ENVIRONMENT	effects on coast path			Coast path effected
EFFECTS ON DEVELOPMENT & LAND USE	little or no effects.			Little change
IMPLICATIONS FOR COASTAL DEFENCES	None apart from slow erosion of hard rock shore			None apart from slow erosion of hard rock shore
EFFECTS ON ADJACENT M.U'S	None			None
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Modest increase in erosion rate and impact on sand foreshore at Slade ##			##
CONCORDANCE WITH OBJECTIVES	Accords with objective generally			Accords with objectives generally
(A) OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) BIODIVERSITY ISSUES	(A) - unknown - shoreline with evolve naturally (B) - Long term changes - balance of gains and losses to be confirmed			(A) - None known (B) - Potential Losses along coast edge
ECONOMIC VIABILITY	viable			Viable
GENERAL COMMENT ON POLICY SUITABILITY	suitable with possible exception applying to long term effects on coast path			Suitable
RELATIVE SUSTAINABILITY		*** Option discounted	*** Option discounted	
Social	- ve	- ve	- ve	Baseline
Economic	+ ve	- ve	- ve	Baseline
Environmental	Neutral	- ve	- ve	Baseline

Management Unit 1/3

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Port Eynon
C.2.1	Existing Coastal Defence Policy:	Do Nothing	
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing/Monitor > Set Back Path Anticipated Long Term: Monitor & Set Back Path	0 - 5 years 0 - 50 years
C.2.3	Uncertainties/Dependencies:	Sea Level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M6, M7, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Set back path in line with public safety requirements	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP5	
C.3.1.2	Natural Environment:	NE1	
C.3.1.3	Human and Built Environment:	HB10	
C.3.1.4	Coastal Defence:	CD1, CD2, CD8	
C.3.1.5	Development:	D3	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Coast path	
C.3.2.2	Access:	Coast path	
C.3.2.3	Industrial Activities:	No specific issue	
C.3.2.4	Human Pressures:	No known issue	
C.3.2.5	Tourism/Recreation:	Importance of this section as part of green tourism	

Management Unit 1/3

C.4	OBJECTIVES RECONCILIATION		Port Eynon
	The preferred policy accords with the following objectives for this management unit	OB's 1, 2, 3, 4, 5, 8, 9, 10, 11, 14, 15	Includes neutral objectives
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit	OB's 12, 13	
	OB 12 - To safeguard the character of the main holiday areas and improve or enhance the amenity and recreational value of the shoreline.		
	OB 13 - To maintain and where possible improve access to the foreshore for emergency vehicles, fisheries activities and recreational use.		

Management Unit 1/4

MANAGEMENT UNIT No. 1/4**Oxwich Point to Three Cliffs Bay**

From

Oxwich Point

251000E 184800N

To

Three Cliffs Bay

254000E 187700N

Approximate Length

6Km

PART A Objectives, Issues and Statutory Details**Oxwich Point to Three Cliffs Bay**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Oxwich Point to Three Cliffs Bay
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile monitoring + Helwick Bank dredging monitoring
CP3	Coincidence of high tides and storms	Upper foreshore and dune erosion
CP4	Dune toe behaviour - erosion/regeneration	Extensive dune system at Oxwich
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Relevant to Oxwich Point and possible beach feeding of coarse sediment. Shingle 'strandline' drift noted across dune/burrows area.
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Nicholaston Pill, Penard Pill - impacts across intertidal zone
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Bristol Channel Marine agg. Study and general local concern regarding dredging
CP9	Sea level rise and increased storminess	Potentially significant impacts along natural and defended shoreline
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Identification of cyclic and trend behaviour
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major issue
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major issue

NATURAL ENVIRONMENT		Oxwich Point to Three Cliffs Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Important environmental area sensitive to coastal changes - SSSI NNR. Also AONB and dunes are important for habitat Biodiversity.

Management Unit 1/4

NATURAL ENVIRONMENT		Oxwich Point to Three Cliffs Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	Long term management of impact along shoreline - dunes
NE3	Water Quality	Major local concern at Oxwich - bathing water quality
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Outfall at Oxwich. Cases of medical problems possibly linked with bathing.

HUMAN & BUILT ENVIRONMENT		Oxwich Point to Three Cliffs Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Water activities
HB2	Public access to the foreshore	Congestion on peak Summer days
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Various paths through dune system
HB4	Fisheries interests	Trailer boating and shore angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Conflict exists because of proximity of tourist areas conservation areas - overlap.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Mixture of water base activities.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Interest in Penmaen area
HB8	Vehicular access/parking/road congestion	Summer peaks in traffic on approaches to Oxwich and within village
HB9	Importance of beach quality to tourism	Acknowledged as being very important
HB10	Balance between traditional and green tourism	Proximity of conservation area to tourist beach
HB11	Importance of recreational use of foreshore and contribution to local economies	Very important to local and Gower economy
HB12	Marine access - Port/harbour/launching facilities	Trailer launching facility via slipway and beach.
HB13	Human pressure on natural assets such as dunes	Potential erosion along 'lines-of-desire'
HB14	Beach texture - sand/silt	No significant issue known
HB15	Access for emergency services (including life boat)	Generally good
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local Issue

COASTAL DEFENCE		Oxwich Point to Three Cliffs Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Impacts for dunes and built areas in west of the bay
CD2	Cliff erosion	Little impacts upon Great Tor or Oxwich point - modest drift supply

Management Unit 1/4

COASTAL DEFENCE		Oxwich Point to Three Cliffs Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD3	Adequacy/condition of existing defences	Condition survey required - sea wall and revetment
CD4	Maintenance of existing defences	Funding and responsibility
CD5	Dune erosion	issue - extensive dune range subject to erosion at high tides with storms
CD6	Condition of flood banks/sea defences	Potential for flooding in west is not clear
CD7	Private sea defences	No information
CD8	CPA funding of Coast Protection	Issue likely to relate to revenue generated by car park.
CD9	The role of the foreshore/beach as a defence.	Shallow sloping and wide intertidal zone performs coastal defence function.

DEVELOPMENT		Oxwich Point to Three Cliffs Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Possible demands for development in west. Development pressure within SSSI's is unlikely
D2	Sustainability	Development near the shoreline would need to address the long term coastal defence issue.
D3	Preservation/enhancement of landscape value	Oxwich church
D5	Impacts of coastal development.	Not likely to be appropriate along coast edge.
D6	Integration and conflict with other management plans	Gower management plan


A.2	STATUTORY PLANNING POLICIES (Appendix A)	Oxwich Point to Three Cliffs Bay
	General presumption against development. Most of the unit is SSSI with the exception of Oxwich village including the south western corner of Oxwich Bay. Priority given to environmental and landscape value - refer also to Gower Management Plan	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Oxwich Point to Three Cliffs Bay
	Statutory: SSSI, NNR. SSSI covers Oxwich Point with a break at Oxwich village before the extensive SSSI throughout the burrows area. The SSSI's are also classified as NNR's. Most of Three Cliffs bay is not a SSSI and Penard Valley extends to the coast at the eastern boundary of the MU. Non-Statutory: Heritage Coast throughout the MU, GCR's	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Oxwich Point to Three Cliffs Bay
	National Trust is a significant Land Owner in the MU	

Management Unit 1/4

A.5	<p><u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :</p> <p>W.84: 5158 - Oxwich Point - 0.85km hard rock shore with high exposure 5159 - Oxwich Wood - 0.11km hard rock shore with high exposure 5160 - Oxwich Hotel Road - 0.11km Seawall with medium exposure 5161 - Oxwich - 0.35km embankment with medium exposure 5162 - Oxwich Bay - 1.0km dunes with medium exposure 5175 - Nicholaston Burrows - 1.4km dunes with high exposure and less than 5 years residual life 5180 - Three Cliffs Bay - 1.0km Hard Rock Shore & Dunes with high exposure and little residual life 5184 - Penard Beach, Penard - 0.82km sand with high exposure and residual life of 2-5 years</p>
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A.6	<p><u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :</p>								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	

Management Unit 1/4

PART B Intervention Appraisal**Oxwich Point to Three Cliffs Bay**

Ref.	Topic					
B.1	<p>Shoreline Description (Refer to context report Section 3)</p> <p>Coast Edge Type - Material - Mixture of dunes, hard rock shore and short section of seawall</p> <p>Foreshore Type - Material - Sand</p> <p>Developed/Undeveloped - Undeveloped apart from small area in Oxwich village - also note access road.</p> <p>Defended/undefended - Mostly undefended</p> <p>Orientation/exposure - South east orientation with medium exposure and fetch to south east.</p>					
	B.1.1	Land Use:	Tourist beach with important conservation area			
	B.1.2	Specific Shoreline Interests:	Sea bathing, sub aqua, surfing, windsurfing, sea/shore angling, boat launch site, water skiing			
B.2	<p>SHORELINE EVOLUTION (Refer to context report Section 3)</p> <p>Geology - Multiridge dune system forming bay type geomorphology</p> <p>Shoreline Movement/Historic Maps - historic trend of reducing gradient in Oxwich and steepening to the east at Three cliff bay as exposure increases to in an easterly direction.</p> <p>Development/Industry - No development but important tourist area supporting part of the local economy.</p> <p>Gains/Losses - Possible losses along coast edge may explain reducing gradient as material builds near high water mark. Minor shingle ridge noted during inspection suggests high beach levels in west of bay. East area is more exposed and data suggests an eroding shore.</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Coastal car parking area at Oxwich. Long term potential losses of highway and church. Dune/burrows areas.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses	U U U U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. General movement of fine sediment supporting present foreshore.			
		<u>Preliminary Value of Assets at Risk:</u>	Mostly natural and assessment of value is not possible at present. It is anticipated that guidance in the future will enable natural assets to be valued.	Eligibility for grant aid funding for may be problematical under current CPA rules		
	B.3.2	Cost Implications: Costs likely to be focussed in south western corner where main access to foreshore is located. Condition of sea wall should be confirmed with specific inspection. Costs likely to range from £100K to 500K.				
	B.3.3	Economic Viability: Dune management works may be viable in medium term. Local detailed investigation of options should be undertaken				

Management Unit 1/4

PART C Strategic Policy Appraisal**Oxwich Point to Three Cliffs Bay**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Current process trends are likely to continue	Possible reduction in sediment supply from dunes onto upper beach	Impacts likely - would need to be studied	May allow more fine sediment onto foreshore - released from dunes
EFFECTS ON NATURAL ENVIRONMENT	Possible draw down and beach loss incertain sections along with dune erosion in storm events.	Would depend upon form of protection.	would secure dune system but with possible impact on intertidal zone	erosion of part of dune would be permitted
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Limited short term impacts Long term concerns about road.	Could secure existing built assets such as access roads	Would secure existing built environment.	Would effect access facilities including parking for beach users
EFFECTS ON DEVELOPMENT & LAND USE	Possible effects at car park in medium term.	Could secure land for development - unlikely to be acceptable	Would increase development potential and modify current land use	Would reduce development potential and modify current land use
IMPLICATIONS FOR COASTAL DEFENCES	Revetment/embankment at car park may become more vulnerable to storms. Natural defences (dunes) are likely to suffer erosion	Significant if applied to whole frontage - more modest approach may be appropriate - dune management/nourishment	Significant civil engineering works would be required	Man made and natural defences would be lost over time
EFFECTS ON ADJACENT M.U'S	No known effects	possible impacts - subject to study	likely impacts on adjacent MU to east.	Possible increase in general sediment volume down drift
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Significant effect on upper foreshore and dune line.	May effect decision of the type of defence	Increase cost of civil engineering works and vulnerability of remaining foreshore	Would increase rate of erosion
CONCORDANCE WITH OBJECTIVES	Concordance with objectives will be crucially dependant upon the form of any coastal defence works and the sensitivity adopted in policy detail area by area along the foreshore.			
(A) OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT	(A) - No significant change, possible damage to dune system	(A) - Possible if dune management and nourishment options are considered	(A) - would need to be confirmed but unlikely to provide such opportunities.	(A) - None known
(B) BIODIVERSITY ISSUES	(B) - Natural evolution - Gains intertidal vs losses through hinterland	(B) - Potential losses (subject to method)	(B) - Likely losses intertidal zone	(B) - Losses in hinterland and potential gains in marine and intertidal environment
ECONOMIC VIABILITY	Should be confirmed with further examination	Unknown at present	Not likely to be economic	Not likely to be viable - particularly in west
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable but actions are likely to be restricted by funding limitations	Potentially feasible and suitable	Not suitable	Although subject to further analysis this option may be suitable
RELATIVE SUSTAINABILITY				
Social	- ve (1 & 2)	Baseline 1 West	- ve	Baseline 2
Economic	- ve (1) + ve (2)	Baseline 1 West	- ve	Baseline 2
Environmental	Neutral (1), Unknown (2)	Baseline 1 West	- ve	Baseline 2

Management Unit 1/4

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION	Oxwich Point to Three Cliffs Bay	
C.2.1	Existing Coastal Defence Policy:	Do Nothing/minimum to hold line in south west - some dune management believed to carried-out	
C.2.2	Future Coastal Defence Policy:	<p>Short Term: Review management strategy by carrying out a specific investigation of various options including natural solutions such as dune management and beach nourishment including the use of storm beaches. Options for management at south western end should be included in such an investigation</p> <p>Anticipated Long Term: Retreat with selective hold in south west (strategic elements such as highway/hotel)</p>	<p>0 - 5 years</p> <p>5+ years</p>
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L1, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M9, M11, M14, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Hold south west end	
C.2.7	Reason for Change:	To prepare for informed approach for setting policy	

Management Unit 1/4

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1,3,4,9,10,11,12	
C.3.1.2	Natural Environment:	NE 1,2,3,4	
C.3.1.3	Human and Built Environment:	HB 1,2,3,6,8,9,10	
C.3.1.4	Coastal Defence:	CD 1,3,5,9	
C.3.1.5	Development:	D1,2	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Beach and water users	
C.3.2.2	Access:	Road to shoreline and slipway to beach	
C.3.2.3	Industrial Activities:	Concern about pollution and water quality	
C.3.2.4	Human Pressures:	Visitor pressure in summer - Bank Holidays	
C.3.2.5	Tourism/Recreation:	Importance to local & Gower economy	

C.4	OBJECTIVES RECONCILIATION	Oxwich Point to Three Cliffs Bay	
	The preferred policy accords with the following objectives for this management unit	OB's 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	Objectives that are neutral are including in this section
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 1/5

MANAGEMENT UNIT No. 1/5**Three Cliffs (east) to Caswell (west)**

From	Three Cliffs (east)	254000E 187700N
To	Caswell Bay (west)	258900E 187500N
Approximate Length	6Km	

PART A Objectives, Issues and Statutory Details**Three Cliffs to Caswell**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Three Cliffs to Caswell
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile at Pwlldu
CP3	Coincidence of high tides and storms	Cliff erosion limited/possible impacts at Pwlldu from south easterlies
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Coarse drift from cliff. Pwlldu Point.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern that may have implications at Pwlldu
CP9	Sea level rise and increased storminess	General concern - long term impacts on cliffs
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Possible increase in exposure east of Pwlldu point - South east orientation.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern applying throughout Swansea Bay
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern applying throughout Swansea Bay

NATURAL ENVIRONMENT		Three Cliffs to Caswell
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Area has important designated areas including Heritage Coast, AONB, SSSI and Limestone Coast or South-West Wales cSAC
NE2	Protection of areas designated under international conventions.	Area has important designated areas including Limestone Coast of South-West Wales cSAC
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern

Management Unit 1/5

HUMAN & BUILT ENVIRONMENT		Three Cliffs to Caswell
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Coast path along cliff top
HB2	Public access to the foreshore	Access to the foreshore is limited
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Erosion rates are slow. Set back to paths may need to be considered
HB4	Fisheries interests	General interest applies
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Proximity of tourist beaches and launch site at Oxwich
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	See above
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Range of archaeological sites - some near coast edge.
HB8	Vehicular access/parking/road congestion	Access is limited - exception is car park at West Cliff.
HB9	Importance of beach quality to tourism	There are no tourist beaches
HB10	Balance between traditional and green tourism	Green tourism is the only option for land based activities. Conflicts in marine environment are possible.
HB15	Access for emergency services (including life boat)	Access is restricted.

COASTAL DEFENCE		Three Cliffs to Caswell
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Coast path
CD2	Cliff erosion	No data but believed to be slow
CD8	CPA funding of coast protection	Issue regarding funding of coast path monitoring and retreat.
CD9	The role of the foreshore/beach as a defence	Rock shore and wide intertidal zone at Pwlldu performs defence role

DEVELOPMENT		Three Cliffs to Caswell
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Possible future demands from nearby villages - unlikely - ref development limits set in local plans
D3	Preservation/enhancement of landscape value	Heritage coast
D6	Integration and conflict with other management plans	eg - National Trust plans/Gower Management Plan

Management Unit 1/5

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Three Cliffs to Caswell
Presumption against development outside designated village boundaries - refer to local plans for details and appendix A		

A.3	CONSERVATION DESIGNATIONS (Context Report)	Three Cliffs to Caswell
Statutory: SSSI Pwlldu Head and Bishopston Valley + Caswell Bay Non-Statutory: Heritage Coast; GCR's (many) Note National Trust own much of the land throughout this MU		

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Three Cliffs to Caswell
National Trust - Penard Cliff, Nothill and Bishopston Valley. Wildlife Trust Reserve - Redley Cliff.		

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :	
<p>W.84: 5186 West Cliff, Pennard - 0.5km - Hard Rock Shore - High exposure 5188 High Tor - 0.8km - Hard Rock Shore - High exposure 5190 Pwlldu Head - 2.06km - Hard rock Shore - High exposure 5192 Pwlldu Bay - 0.3km hard rock shore - High exposure - less than 5 years life 5195 Bishopston Area - 0.9km Hard rock shore - high exposure 5200 Brandy Cove - 0.3km Shingle - High exposure - less than 5 years</p>		

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	XXXX	OB 4	OB 5	OB 6	XXXX	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	XXXX OB 17

Management Unit 1/5

PART B Intervention Appraisal	Three Cliffs to Caswell
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Ref.	Topic			
B.1	<p>Shoreline Description (Refer to context report Section 3)</p> <p>Coast Edge Type - Material - Generally hard rock shore - slowly eroding limestone Foreshore Type - Material - Generally rock intertidal zone with exception at Pwlldu and Brandy Cove. Developed/Undeveloped - Undeveloped Defended/undefended - Undefended Orientation/exposure orientation, and therefore exposure, varies from south/south west top south east.</p>			
	B.1.1	Land Use:	Environmental and landscape interests	
	B.1.2	Specific Shoreline Interests:	Archaeological; SSSI; National Trust; rock climbing; sea bathing and fishing (Brandy Cove only)	
B.2	<p>SHORELINE EVOLUTION (Refer to context report Section 3)</p> <p>Geology - Limestone of the Lower Carboniferous deposited in the shallow water marine environment. Limestone typically extending 1Km to landward and backed by Glacial Till over Limestone. Shoreline Movement/Historic Maps - No data apart from slowly eroding cliffs. Monitoring underway at Pwlldu Development/Industry - No development Gains/Losses - Cliff erosion likely to result in changes over time and not able to conclude whether overall gain or loss - evolution is against a very long time base (more than 50 years)</p>			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Environmental assets through erosion and evolution - notably GCR's. Coast path network generally set-back a reasonable distance from coast edge. Localised pinch points.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess	
		<u>Preliminary Value of Assets at Risk:</u>	Environmental/landscape/geological	
	B.3.2	Cost Implications: Not tangible		
	B.3.3	Economic Viability: Not tangible - Set back path where and when appropriate		

Management Unit 1/5

PART C Strategic Policy Appraisal**Three Cliffs to Caswell**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No change	Significant	Significant	Little or no change
EFFECTS ON NATURAL ENVIRONMENT	Gradual changes - evolutionary	significant	significant	No change
EFFECTS ON HUMAN & BUILT ENVIRONMENT	None Known	None	None	Possible relocation of coastal path
EFFECTS ON DEVELOPMENT & LAND USE	Development not likely to be permitted	Would change current land use and increase development potential	Would change current land use and increase development potential	Little or no change
IMPLICATIONS FOR COASTAL DEFENCES	Generally no change to current slow rate of erosion	Significant	Very Significant	None
EFFECTS ON ADJACENT M.U'S	None	Effects are likely	Effects are likely	None or no change from current trend
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Slight increase in rate of erosion. Specific issues at Pwlldu and Brandy Cove	Increase cost of hold the line	increase cost of hold the line	Slight increase in rate of erosion
CONCORDANCE WITH OBJECTIVES	Accords with majority of Objectives	Does not accord with objectives	Does not accord with objectives	Dependant upon retreat mechanism.
OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT	Little change	None	None	Little change
ECONOMIC VIABILITY	Viable	Not viable	Not viable	viable
GENERAL COMMENT ON POLICY SUITABILITY	Suitable	Not suitable	Not suitable	Suitable
SUSTAINABILITY				
Social	Baseline 1	-ve	-ve	Baseline 2
Economic	Baseline 1	-ve	-ve	Baseline 2
Environmental	Baseline 1	-ve	-ve	Baseline 2

Management Unit 1/5

Ref.	TOPIC	DESCRIPTION
C.2	PREFERRED POLICY DEFINITION	Three Cliffs to Caswell
C.2.1	Existing Coastal Defence Policy:	Do Nothing/Retreat coast path when required
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing, Monitor > Retreat Anticipated Long Term: Do Nothing with retreat when required
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M15
C.2.6	Intervention Priority:	Coast Path set-back when and where appropriate
C.2.7	Reason for Change:	Public safety

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 9, 10,11,12	
C.3.1.2	Natural Environment:	NE 1, 2	
C.3.1.3	Human and Built Environment:	HB1, 3, 5, 6, 15	HB 7, 15
C.3.1.4	Coastal Defence:	CD1, 2, 8, 9	
C.3.1.5	Development:	D3, 6	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Cliff path	
C.3.2.2	Access:	Access to foreshore is restricted	
C.3.2.3	Industrial Activities:	No specific issue	
C.3.2.4	Human Pressures:	No specific issue although need for management is recognised by NT	
C.3.2.5	Tourism/Recreation:	Sustainable access in terms of environmental assets by NT	

Management Unit 1/5

C.4	OBJECTIVES RECONCILIATION		Three Cliffs to Caswell
	The preferred policy accords with the following objectives for this management unit	OB's 1, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16	Includes objectives that may be described as neutral
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 1/6

MANAGEMENT UNIT No. 1/6		Caswell Bay	
From	Caswell Bay	258900E	187500N
To	Caswell Bay East	259500E	187500N
Approximate Length	2Km		

PART A Objectives, Issues and Statutory Details	Caswell Bay
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A.1	ISSUES (For further detail on this section refer to the Consultation Responses Report) The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :
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COASTAL PROCESSES		Caswell Bay
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile monitoring
CP2	Shingle Storm Beach Behaviour	Monitoring - Swansea Bay Group
CP3	Coincidence of high tides and storms	Defences vulnerable to storm events
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Rock cliffs to either side and sandy foreshore effected by near shore coastal processes
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Possible impacts upon sand foreshore - breaker zone
CP9	Sea level rise and increased storminess	Potentially significant impact in medium to long term with possible short term failure in west of bay - private sea defences
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Potential local effects within MU
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major issue - further studies and monitoring required
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major issue throughout whole sub-cell

NATURAL ENVIRONMENT		Caswell Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI throughout Caswell (GCR's) boundary of Heritage Coast and AONB
NE3	Water Quality	Important for beach users
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern

Management Unit 1/6

HUMAN & BUILT ENVIRONMENT		Caswell Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	General concern regarding water activities and cliff top paths
HB2	Public access to the foreshore	Good access at public section of Caswell
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Sustainability/set-back - note soft rock shore on east side of bay.
HB4	Fisheries interests	Angling interest noted at Caswell
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Relatively new revetment at Caswell east provides good access for recreation including slipway.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential conflicts - particularly at high water as beach width reduces significantly
HB8	Vehicular access/parking/road congestion	Parking facilities adjacent to east beach, main road rises steeply to either side.
HB9	Importance of beach quality to tourism	Acknowledged as important.
HB10	Balance between traditional and green tourism	Possible access point to GCR's from car park and Bishop's Wood
HB11	Importance of recreational use of foreshore and contribution to local economies	Acknowledged as important.
HB12	Marine access - Port/harbour/launching facilities	Slipway at east beach for trailer boating
HB14	Beach texture - sand/silt	Wide intertidal zone is exposed and generally sandy.
HB15	Access for emergency services (including life boat)	Access is good
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local issue

COASTAL DEFENCE		Caswell Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Difficult at both east and west sections - squeeze
CD2	Cliff erosion	Soft rock shore to east side
CD3	Adequacy/condition of existing defences	East side appears to be in good condition. Defences to west are life expired and in very poor condition.
CD4	Maintenance of existing defences	East side is CPA/West side is private
CD7	Private sea defences	West side - very poor condition
CD8	CPA funding of Coast Protection	Private defences, highway and foot paths
CD9	The role of the foreshore/beach as a defence	Wide breaker zone will be less effective during high tides - this will increase pressure on existing coast edge defences.

Management Unit 1/6

DEVELOPMENT		Caswell Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Refer to Local plan for details - development limits will be set within UDP
D2	Sustainability	
D5	Impacts of coastal development..	Historic impacts resulting from construction of inadequate sea wall.
D6	Integration and conflict with other management plans	Gower Management Plan

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Caswell Bay
General presumption against development - refer to local plan and Appendix A for detail		

A.3	CONSERVATION DESIGNATIONS (Context Report)	Caswell Bay
Statutory: SSSI - Caswell Bay Non-Statutory: End of Heritage Coast, GCR's, Nature reserve between brandy cove and Caswell.		

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Caswell Bay
Mixture of private and public ownership - Coastal flats, large property and hinterland chalet park		

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
W.84: 5202 Caswell 0.32km Hard Rock Shore 5204 Caswell Bay West 0.2km Hard Rock Shore ?? 5205 Caswell Bay Hotel 0.2km Hard Rock Shore 5206 Caswell Bay East 0.08km Sea Wall 5208 Summer Cliff	

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	XXXXX OB 17

Management Unit 1/6

PART B Intervention Appraisal		Caswell Bay			
Ref.	Topic				
B.1	<p>Shoreline Description (Refer to context report Section 3)</p> <p>Coast Edge Type - Material Varies from hard rock shore to artificial protection to soft rock shore.</p> <p>Foreshore Type - Material - Sand</p> <p>Developed/Undeveloped - Varies - some developed/some undeveloped</p> <p>Defended/undefended - ranges from defended to undefended</p> <p>Orientation/exposure Exposed to prevailing approaches - South west.</p>				
	B.1.1	Land Use:	Tourism and private frontages (residential)		
	B.1.2	Specific Shoreline Interests:	Sea/sun bathing, angling, trailer boating, surfing, wind surfing and surf life saving.		
B.2	<p>SHORELINE EVOLUTION (Refer to context report Section 3)</p> <p>Geology - high, hard rock shore promontories in centre and to west with soft rock shore to east</p> <p>Shoreline Movement/Historic Maps - recessed embayment with hard rock mid bay promontory dividing MU into two high water bays. Softer rockshore elsewhere.</p> <p>Development/Industry - Coast road drops into the valley to the east of the bay - important Gower sand.</p> <p>Gains/Losses - Generally eroding coastline with coastal defences effecting movements along upper foreshore in recent history. General picture of steepening foreshore - important to continue monitoring.</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Behind the private defences to the west a block of private flats and large property are under threat because of the dilapidated conditions of the private sea defence. To the west the road carpark and lifesavers building (WC) will come under increasing threat over time.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses U U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increase storminess; the condition of private defences.		
		<u>Preliminary Value of Assets at Risk:</u>	Over £2m	Justification for grant aid for protection of coastal assets may be problematical - Further work required.	
	B.3.2	Cost Implications: New defences required in west of bay and a review of long term viability of defences to the east (crest levels/threshold/overtopping in storms)			
	B.3.3	Economic Viability: Works to hold the existing line will be viable set-against known assets			

PART C Strategic Policy Appraisal	Caswell Bay
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C.1 MATRIX ASSESSMENT				Coastal Managers : CCS
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No anticipated change in current trends	Effects on coarse sediment drift supply if applied to area presently undefended	Effects on coarse sediment drift supply if applied to areas presently undefended. Impacts upon near shore wave climate	Little anticipated change
EFFECTS ON NATURAL ENVIRONMENT	Erosion of cliff and soft rock shore effect landscape & SSSI	Significant impact unless applied to area currently defended.	Significant effect if applied across MU. Scale of works would determine impact if applied to areas presently defended	No significant effect known unless applied with intervention on cliff coast - very unlikely
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of properties in west of bay with dramatic loss in value in short term	Secure present built environment	Secure present built environment	major parts of built environment would be effected. Likely to effect highway
EFFECTS ON DEVELOPMENT & LAND USE	Restrict development potential	Secure present land use	Increase development potential along coast edge	Land use would change and development would not be feasible
IMPLICATIONS FOR COASTAL DEFENCES	Defences in west will be lost in the short term. Defences will overtopped more regularly	Significant if applied to whole MU. Relatively large in scale and cost if applied to private frontage in west	Significant - influenced by scale and extent of advanced line	Defences would be lost either by natural erosion or by intervention - removal - unlikely in east. Intervention possible in west following collapse - public safety
EFFECTS ON ADJACENT M.U'S	Little or none	Little anticipated effect unless applied to whole MU - that is cliff coast	Effect only likely if applied to cliff coast unless scale of advance was great along presently defended sections	No significant effects - long term marginal increase in general drift supply
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Accelerated loss of defences and assets	Standard of defence would increase	Standard of defence would increase	Increase rate of recession
CONCORDANCE WITH OBJECTIVES	Does not accord with OB 7, 12,	Dependant upon extent to which policy is applied	Dependant upon scale and extent to which policy is applied	Concordance will vary dependant upon detail of policy proposals.
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - No firm conclusions	(A) - None (B) - Likely losses	(A) - None (B) - Losses	(A) - Possible (B) - Potential gains in intertidal zone. Changes along cliff shore.
ECONOMIC VIABILITY	Not viable	Yes if applied to areas currently defended	Not likely unless limited in extent to support existing assets	Not viable over currently defended areas
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable - for defended sections	Not likely to be suitable	Not suitable for defended sections
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline	- ve	- ve
Economic	Not Clear	Baseline	- ve	Not clear - likely - ve
Environmental	+ ve	Baseline	- ve	+ ve

Management Unit 1/6

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Caswell Bay
	C.2.1	Existing Coastal Defence Policy:	Hold line in east, do nothing along private frontage in west.
	C.2.2	Future Coastal Defence Policy:	<p>Short Term: Hold Line. Discharge any CPA obligation in respect of private frontages. Adopt liaison & public safety role. Retreat coast paths.</p> <p>Anticipated Long Term: Hold Line. Note environmental interests with specific reference to Landscape Value of Caswell Bay</p>
	C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess, stability of private sea wall in west of MU and consequences of failure (hinterland ground conditions - flats)
	C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2, L3 (Ref. Sect 5.3)
	C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M11, M15, M16, M17 (Ref. Sect 5.2)
	C.2.6	Intervention Priority:	Make private defence safe, liaise with residents
	C.2.7	Reason for Change:	Public safety and general CPA responsibility

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
	C.3.1.1	Coastal Processes:	CP1, CP3, CP10, CP11, CP12 CP9
	C.3.1.2	Natural Environment:	NE1, NE3
	C.3.1.3	Human and Built Environment:	HB1, HB2, HB3, HB6, HB9, HB11, HB12, HB14, HB17
	C.3.1.4	Coastal Defence:	CD3, CD4, CD7, CD8
	C.3.1.5	Development:	D5
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	C.3.2.1	Safety:	Safety of water users (low water). Safety issues following collapse of private defences.
	C.3.2.2	Access:	Shoreline location of main road
	C.3.2.3	Industrial Activities:	No specific issue
	C.3.2.4	Human Pressures:	Busy peak Summer traffic
	C.3.2.5	Tourism/Recreation:	Importance to local economy

C.4	OBJECTIVES RECONCILIATION	Caswell Bay
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Management Unit 1/6

	The preferred policy accords with the following objectives for this management unit	OB's 1, 2, 4, 5, 8, 9, 10, 11, 12, 13, 14, 16	Includes Objectives interpreted as neutral
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit	OB's 3, 7	
	OB 3 - To be adaptable to predicted changes such as sea level rise.		
	OB 7 - To defend to appropriate standards that development which can be sustainably defended against flooding and coastal erosion.		

Management Unit 1/7

MANAGEMENT UNIT No. 1/7		East side Caswell to Snaple Point	
From	East Side Caswell	259500E	187500N
To	Snaple Point	260500E	186900N
Approximate Length	1Km		

PART A Objectives, Issues and Statutory Details **Caswell to Langland**

A.1 **ISSUES** (For further detail on this section refer to the Consultation Responses Report)
 The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Caswell to Langland
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Observation/inspections - no measurement
CP3	Coincidence of high tides and storms	Slow erosion of soft rock shore
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Cliff is eroding slowly as a result of coastal processes - supply of coarse drift to Langland - very slow/small volume.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern
CP9	Sea level rise and increased storminess	Potential increase in erosion rates
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern

NATURAL ENVIRONMENT		Caswell to Langland
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI
NE3	Water Quality	General importance - note adjacent to important beach
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Adjacent to important beach

HUMAN & BUILT ENVIRONMENT		Caswell to Langland
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Coast path along cliff.
HB2	Public access to the foreshore	None

Management Unit 1/7

HUMAN & BUILT ENVIRONMENT		Caswell to Langland
REF	ISSUE DESCRIPTION	Specific to MU
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Some set-back possible - note golf course at top of slopes.
HB4	Fisheries interests	General interest
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Proximity of golf course, coast path and SSSI to each other is noted
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No significant issue
HB10	Balance between traditional and green tourism	As HB5
HB15	Access for emergency services (including life boat)	Access is restricted
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Walking interest would support local economy to limited extent
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern throughout sub-cell

COASTAL DEFENCE		Caswell to Langland
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Need to examine suitability of zone between existing path and golf course.
CD2	Cliff erosion	Natural processes will continue resulting in cliff erosion.
CD9	The role of the foreshore/beach as a defence	Rock shore would provide some protection

DEVELOPMENT		Caswell to Langland
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Golf course
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Caswell to Langland
	General presumption against development - refer to local plan and Appendix A	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Caswell to Langland
	Statutory: SSSI - Caswell Bay extends across most of this MU to just west of Snaple point. Non-Statutory: Whilst the eastern limit of the Gower Heritage coast is located at Caswell bay, the rock cliff along this MU (Newton cliff) has landscape value.	

Management Unit 1/7

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Caswell to Langland
Understood to be private - Golf Course		

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :	
<p>W.84: 5212 Whiteshell Point 0.45km Hard Rock Shore, high exposure 5214 Newton Cliff 0.9km Hard Rock Shore, high exposure</p>		

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
OB 1	OB 2	X	OB 4	OB 5	OB 6	X	OB 8		
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17	

Management Unit 1/7

PART B Intervention Appraisal	Caswell to Langland
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Ref.	Topic			
B.1	Shoreline Description Coast Edge Type - Material - Soft rock shore Foreshore Type - Material - Rock Developed/Undeveloped - Undeveloped Defended/undefended - Undefended Orientation/exposure - South West - High Exposure			
	B.1.1	Land Use:	Coast Path and Golf Course, Environmental interest along coast with SSSI	
	B.1.2	Specific Shoreline Interests:	Walking, golf, SSSI	
B.2	SHORELINE EVOLUTION: Geology - Slowly eroding soft rock shore, (Carboniferous (Lower) Limestone) Shoreline Movement/Historic Maps - no data but known to be eroding slowly Development/Industry - None apart from the golf course occupying hinterland across whole unit.			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Natural cliff with coast path and in long term possible impact on the golf course	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea Level rise and increased storminess.	
		<u>Preliminary Value of Assets at Risk:</u>	Not readily valued - economic value of golf course will not be significant in terms of coast protection cost and will not be effected for some time. Foot path benefits?	CPA funding not necessarily available for foot path retreat - potential squeeze effecting viability of path (safety issues)
	B.3.2	Cost Implications: Likely to be the cost of coast path retreat. This could be expensive if encroachment of golf course results.		
	B.3.3	Economic Viability: Subject to availability of land for retreat of the coast path.		

Management Unit 1/7

PART C Strategic Policy Appraisal**Caswell to Langland**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little or no change from current trend	Change in drift regime	Change in drift regime	Would release more drift into supply
EFFECTS ON NATURAL ENVIRONMENT	Erosion of SSSI	Would damage part of SSSI	Would damage part of SSSI	Would impact on SSSI
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Effect coastal Path	Would secure coast path	Would secure coast path	Effect coast path and golf course in longer term
EFFECTS ON DEVELOPMENT & LAND USE	Effect coastal Path and eventually golf course	Would increase development potential	Would increase development potential	Current land use would eventually be modified. No development potential.
IMPLICATIONS FOR COASTAL DEFENCES	None	Significant civil engineering works would be required	Significant civil engineering works would be required	Natural cliff defence would be reduced.
EFFECTS ON ADJACENT M.U'S	No change	Effects in Langland would be likely	Effects in Langland would be likely	Possible beneficial effects in Langland through release of sediment although possible increase in exposure
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion will increase	Increase scale of works	Increase scale of works	Rate of retreat would increase
CONCORDANCE WITH OBJECTIVES	OB 1	OB 12	OB 12	OB 1, 4, 5, 6, 11
OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT	None	Unlikely	Unlikely	None known
ECONOMIC VIABILITY	Viable	Not Viable	Not Viable	Possibly viable
GENERAL COMMENT ON POLICY SUITABILITY	Suitable with exception of policy for coast path	Not suitable	Not suitable	Possibly Suitable
SUSTAINABILITY				
Social	Baseline 1	-ve	-ve	Baseline 2
Economic	Baseline 1	-ve	-ve	Baseline 2
Environmental	Baseline 1	-ve	-ve	Baseline 2

Management Unit 1/7

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Caswell to Langland
C.2.1	Existing Coastal Defence Policy:	Do Nothing	
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing + Monitoring > set-back path Anticipated Long Term: Do Nothing moving towards retreat of coast path	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess, proximity of coast path to golf course	
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M6, M7, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Public safety audit	
C.2.7	Reason for Change:	Public safety	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP5, CP9	
C.3.1.2	Natural Environment:	NE1	
C.3.1.3	Human and Built Environment:	HB1, HB3	
C.3.1.4	Coastal Defence:	CD1, CD2	
C.3.1.5	Development:	D1	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Cliff path	
C.3.2.2	Access:	Path	
C.3.2.3	Industrial Activities:	No specific issue	
C.3.2.4	Human Pressures:	Potential conflict between golfing and walking	
C.3.2.5	Tourism/Recreation:	Coast path and golf course are important	

Management Unit 1/7

C.4	OBJECTIVES RECONCILIATION		Caswell to Langland
	The preferred policy accords with the following objectives for this management unit	OB's 1,2,4,5,6, 9, 10, 11, 12, 14, 15	Including neutral objectives
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit	OB's 13 - To maintain & where possible enhance access to the foreshore for emergency vehicles, fisheries activities and recreational usage	

Management Unit 1/8

MANAGEMENT UNIT No. 1/8**Langland & Rotherslade**

From	Snaple Point	260500E 186950N
To	Rothers Sker	261100E 187200N
Approximate Length	0.7Km	

PART A Objectives, Issues and Statutory Details**Langland & Rotherslade****A.1****ISSUES** (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Langland & Rotherslade
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic and local beach profiling underway
CP2	Shingle Storm Beach Behaviour	Important at both Langland and Rotherslade. Undercutting of sea wall foundation at Langland during storm seasons. Need for beach management
CP3	Coincidence of high tides and storms	Storm shingle beach vulnerability directly impacts upon security of sea wall
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Supply to shingle storm beach typically low from cliff erosion.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Further updating required as knowledge increases.
CP9	Sea level rise and increased storminess	Potential significant impact upon future of Langland.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Sand and shingle beach draw down including longshore drift has potential to significantly effect sea wall over one season.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Further updating required as knowledge increases
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Shingle beach reduction has occurred over time at Langland. The cause of this erosion can not clearly be defined at present.

NATURAL ENVIRONMENT		Langland & Rotherslade
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Non-designated area but with high landscape value. Note SSSI and AONB
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concerns regarding pollution; specific concern regarding debris

Management Unit 1/8

HUMAN & BUILT ENVIRONMENT		Langland & RotherSlade
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Identification of specific hazards - cliff volatility
HB2	Public access to the foreshore	Langland - Access steps collapsed and removed, new beach ramp installed to east - maintenance of shingle covering is a potential maintenance issue
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Cliff top path extends across MU.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Coastal defence and recreation requirements
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential conflict between surfing and sea bathing
HB8	Vehicular access/parking/road congestion	Narrow approach roads and summer congestion - potential conflicts with local residents.
HB9	Importance of beach quality to tourism	
HB10	Balance between traditional and green tourism	Cliff Path passes through Langland
HB11	Importance of recreational use of foreshore and contribution to local economies	Applies to both Langland & RotherSlade
HB14	Beach texture - sand/silt	Shingle/Sand
HB15	Access for emergency services (including life boat)	Life Guard Station
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern in respect of all dredging activity

COASTAL DEFENCE		Langland & RotherSlade
REF	ISSUE DESCRIPTION	Specific to MU
CD2	Cliff erosion	Cliff erosion more relevant to public safety - (shafts resulting from undercutting of softer material)
CD3	Adequacy/condition of existing defences	RotherSlade - OK. Langland - Poor - Recent collapse of steps and undercutting of sections of masonry wall - proposed scheme
CD4	Maintenance of existing defences	New defence at RotherSlade; maintenance of Langland defences becoming uneconomic - toe works have been proposed
CD7	Private sea defences	Cliffed shoreline - Land Ownership
CD8	CPA funding of Coast Protection	Intangible benefits - social consequences of retreat.
CD9	The role of the foreshore/beach as a defence	Rock and sand intertidal zone with high tidal range produces wide breaker zone

Management Unit 1/8

DEVELOPMENT		Langland & Rotherslade
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	No specific demand known but potential exists for long term changes in use
D2	Sustainability	Works along the shoreline would need to support appropriate defences
D3	Preservation/enhancement of landscape value	See D5
D5	Impacts of coastal development.	Development in terms of modernising coast protection & impact upon traditional landscape
D6	Integration and conflict with other management plans	None known - subject to further work for first review.

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Langland & Rotherslade
Policies generally refer to landscape and conservation - refer to Appendix A.		

A.3	CONSERVATION DESIGNATIONS (Context Report)	Langland & Rotherslade
Statutory: Langland (Rotherslade) SSSI - Geological/Coastal (GCR) Non-Statutory: General landscape value of bay and cliff line. Note SSSI and AONB		

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Langland & Rotherslade
Understood to be a mixture of private and Local Authority ownership.		

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)					
The following coastal defences presently exist within this management unit :						
Defence Code	LOCATION	Length Km	Asset Type - Ownership	Crest Level m (AOD)	Deg. of Exp.	Min Res Life (yrs)
W.84.5214	Newton Cliff	0.9	HRS	7.3	High	>5
W.84.5216	Langland Bay	0.4	Sea Wall	7.0	High	>5
W.84.5217	Rothers Tor	0.2	HRS		High	
W.84.5218	Rothers Bay	0.08	Art Ptn (Sea Wall)		High	
W.84.5220	Rothers to Rams Tor (part of)	Part	HRS		High	

A.6	OBJECTIVES							
The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
OB 1	OB 2	OB 3	OB 4		OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

PART B Intervention Appraisal	Langland & Rotherslade
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Ref.	Topic			
B.1	<p>SHORELINE DESCRIPTION (Refer to context report Section 3)</p> <p>Coast Edge Type - Ranges from rock shore to defended central sections at Langland and Rotherslade</p> <p>Foreshore Type - Ranges from outcropping rock to rock overlain with sand with upper storm shingle beaches in front of defended sections</p> <p>Developed/Undeveloped - Mostly developed with margins at either end of MU either undeveloped or in recreational use (golf course)</p> <p>Defended/undefended - Mostly defended with exception of cliff adjacent to golf course at Snaple Point and section of shoreline between Langland and Rotherslade. A cliff top path links Langland and Rotherslade and residential properties are located landward of the path.</p> <p>Orientation/exposure - Orientations range from east to south west with Langland defences generally south to south east and Rotherslade to south west.</p>			
	B.1.1	<p>Land Use: Parking, Tourist Beach; sea/sun bathing; surfing; surf life saving; walking (beach & coastal foot path); golf; beach huts; tennis; Promenade; café.</p>		
	B.1.2	<p>Specific Shoreline Interests: Surfing; walking; surf life saving; tourist beach</p>		
B.2	<p>SHORELINE EVOLUTION (Refer to context report section 3)</p> <p>Geology - Solid geology comprises Limestone of the Lower Carboniferous and forms the coastal cliffs. Drift comprises sand with parts of the upper foreshore containing limestone shingle and cobble yielded from local cliffs.</p> <p>Shoreline Movement/Historic Maps - Limited historic data; more recent monitoring indicates beach loss trend particularly from the upper foreshore.</p> <p>Development/Industry - Residential development and stabilisation works at the site of former Rotherslade shelter.</p> <p>Gains/Losses - Generally eroding coast with variation in beach gradient trends. Evidence of recent losses along upper foreshore with beach draw down effecting integrity of coastal defences.</p>			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		<p>Short/Medium Term: Sea wall; promenade; beach huts; beach buildings; sections of coast path</p> <p>Long Term: Car park; tennis courts & some residential & commercial properties</p>	<p>Property Loss T</p> <p>Infrastructure Loss T</p> <p>Land Loss T</p> <p>Property Flooding</p> <p>Land Flooding</p> <p>Transport disruption</p> <p>Recreation Losses T</p>	<p>Environmental Losses T</p> <p>Tourism T</p> <p>Social Effects T</p> <p>Historic Environment Losses</p>
		<p>Factors influencing the evaluation of benefits in this MU: Sea Level Rise and Increased storminess; Maintenance/remedial work/renewal of sea defences; Foreshore integrity - beach levels.</p>		
		<p>Preliminary Value of Assets at Risk Further studies required to assess tangible and intangible benefit loss set against a timescale. Losses are likely to be many millions of pounds. Coast path and coast edge properties should be surveyed to confirm whether or not they are at risk or level of risk. CPA funding of footpaths is doubtful thereby affecting grant aid.</p>		
	B.3.2	<p>Cost Implications: Assets at risk include the presently defended line at Langland, hinterland assets and some sections of the coast path. An extension to the toe of the masonry wall at Langland has been considered along with natural shingle re-nourishment. A modest linear revetment along with a running programme of nourishment would be estimated in hundreds of thousands of pounds.</p>		
	B.3.3	<p>Economic Viability: Within the criteria for Coast Protection Act further clarification in respect of benefits would be required to confirm justification and eligibility for grant aid from central funds . In terms of the local social/economic criteria, works are likely to be readily justified.</p>		

Management Unit 1/8

PART C Intervention Appraisal**Langland & Rotherslade**

C.1 MATRIX ASSESSMENT				Coastal Managers : CCS
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Local beach draw down resulting from wave reflections as shingle beach erodes and water depths increase - Langland	Limited impact subject to form of defence being confirmed along currently defended sections. Significant impact if natural cliff were to be defended.	Subject to extent of intrusion. Little or no impact anticipated from a well engineered scheme along presently defended shoreline. Significant impact if applied to natural cliff shore	Little change apart from an increase in drift supply and higher shingle storm beach locally.
EFFECTS ON NATURAL ENVIRONMENT	Natural erosion trend would continue	Significant impacts if applied to currently undefended shoreline	Significant impacts if applied to currently undefended shoreline	Increase in drift and loss/change to GCR
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Access using the coast path would eventually be restricted	Current human and built environment would be maintained	Current human and built environment would be maintained	Significant loss
EFFECTS ON DEVELOPMENT & LAND USE	Limited effect upon development unless a change of use were planned at car park/tennis courts. Medium term changes resulting from the loss of beach huts and promenade.	Status Quo. Development potential subject to change of use. Hold the line not considered along natural cliff shoreline - possible implications for coast path.	Development potential with impacts for current use of foreshore. Impacts directly relate to extent and form of advance.	Limit future development potential and current land use would be modified.
IMPLICATIONS FOR COASTAL DEFENCES	Langland coastal defences progressively collapse onto foreshore and would need to be removed or made safe by Authority	Existing defences would need to be upgraded/extended.	Significance of engineering works would be governed by the extent	Removal of existing defences. Significant impact throughout MU with particular concern for properties behind the retaining structure at Rotherslade - Note - new works here.
EFFECTS ON ADJACENT M.U.'S	None	No change if works applied to areas currently defended	Potential effects - drift regime would need to be studied - dependant upon extent	Potential increase (modest) in general drift supply.
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Early loss of shoreline assets and failure resulting from storm event(s)	Form of defence would need to consider impact of increased nearshore still water levels.	Form of defence would need to consider impact of increased nearshore still water levels.	Rate of recession would increase
CONCORDANCE WITH OBJECTIVES	Not OB12	Not applied to shoreline currently unprotected	Not applied to shoreline currently unprotected	Not OB12
(A) OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT	(A) - Opportunities exist at the expense of infrastructure and property loss.	(A) - Little or none	(A) - None expected	(A) - Opportunities exist at the expense of infrastructure and property loss.
(B) BIODIVERSITY ISSUES	(B) - General gains	(B) - Neutral	(B) - General losses.	(B) - General gains
ECONOMIC VIABILITY	Not likely to be acceptable	Viable	Potentially viable - dependant upon form of engineering	Not viable
GENERAL COMMENT ON POLICY SUITABILITY	No	Yes	Possibly	No
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline	Neutral	- ve
Economic	- ve	Baseline	Neutral	- ve
Environmental	Neutral	Baseline	- ve	+ ve

Management Unit 1/8

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Langland & Rotherslade
C.2.1	Existing Coastal Defence Policy:	Hold line along defended frontage (using a combination of hard engineering with shingle/cobble nourishment to maintain storm beach) with reactive maintenance repairs.	Urgent at Langland
C.2.2	Future Coastal Defence Policy:	Short Term: Hold the line & monitor/set back paths Anticipated Long Term: Hold the line.	ASAP
C.2.3	Uncertainties/Dependencies:	Sea level rise & increased storminess; foreshore behaviour including storm beach. Littoral drift sustainability. Cliff stability.	
C.2.4	Further Studies :	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring :	M1, M2, M3, M4, M6, M7, M8, M9, M11, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority :	Prevent Masonry sea wall from further deterioration and collapse. Review cliff stability adjacent to coast path and coast edge properties.	
C.2.7	Reason for any Change:	No change - Urgency of required intervention is noted	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP's 1, 2, 3, 9, 12	
C.3.1.2	Natural Environment:	NE 4	NE 3
C.3.1.3	Human and Built Environment:	HB's 1, 2, 5, 6, 9, 11, 14	
C.3.1.4	Coastal Defence :	CD's 2, 3, 8, 9	
C.3.1.5	Development :	D's 2, 3	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	To warn public of hazards along cliff that have resulting from specific events/collapses; To monitor masonry walls and prepare for closure of promenade if sea wall becomes vulnerable; Conflict between surfers and bathers.	
C.3.2.2	Access:	To review access arrangements to foreshore	
C.3.2.3	Industrial Activities:	No specific issues - general concern over effects of dredging at Helwick Bank on littoral drift.	
C.3.2.4	Human Pressures:	Peak summer season days associated with day time high tides; Parking & local traffic congestion	
C.3.2.5	Tourism/Recreation:	Review impact on tourism of beach loss.	

Management Unit 1/8

C.4	OBJECTIVES RECONCILIATION Langland & Rotherslade	
	The preferred policy accords with the following objectives for this management unit	OB's 1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 13 - ALL in A6.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 1/9

MANAGEMENT UNIT No. 1/9**Rothers Tor to Mumbles Head**

From	Rothers Sker	261100E	187200N
To	Mumbles Head	261400E	186900N
Approximate Length	3Km		

PART A Objectives, Issues and Statutory Details**Limeslade**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Limeslade
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile - Limeslade
CP2	Shingle Storm Beach Behaviour	Topographic survey of storm beach
CP3	Coincidence of high tides and storms	increased impact on cliff coast and bays
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Cliff have softer erodible bands increasing drift supply and destabilising rock faces - swallow holes.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General issue.
CP9	Sea level rise and increased storminess	Impacts upon cliff coast and bays, infrastructure in longer term.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Limited effects of short term fluctuations in drift direction.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major general concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern although Limeslade and Bracelet bay are mostly rock shore with coarse sediment storm beaches

NATURAL ENVIRONMENT		Limeslade
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI at Bracelet bay including GCRs
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Recent improvement in treatment

Management Unit 1/9

HUMAN & BUILT ENVIRONMENT		Limeslade
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Safety issues concerning coast path - deep ravines/swallow blow holes
HB2	Public access to the foreshore	Limited along cliff coast. Good access at Limeslade and Bracelet
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Set-back is likely to be the only means of sustaining access by foot around the coast
HB4	Fisheries interests	Local shore and boat angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No known conflict - small revetment at Limeslade only
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known significant conflict - rocky foreshore does not encourage water sports
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Recorded site on Mumbles head only.
HB8	Vehicular access/parking/road congestion	Parking and access is good although congestion along Mumbles road is common
HB9	Importance of beach quality to tourism	Generally coarse sediment, landscape interest.
HB10	Balance between traditional and green tourism	SSSI/GCR is located in most popular area to west. Green tourism most likely in east of MU along coast path.
HB11	Importance of recreational use of foreshore and contribution to local economies	Important in Limeslade and Bracelet bays.
HB12	Marine access - Port/harbour/launching facilities	None known
HB14	Beach texture - sand/silt	Coarse material
HB15	Access for emergency services (including life boat)	Good in west at popular bays - Note coastguard control centre
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	No industry although some commercial premises - leisure based
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major issue

COASTAL DEFENCE		Limeslade
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Coast path - only option. Limited scope for retreat at Bracelet & Limeslade
CD2	Cliff erosion	Relatively high and event lead
CD3	Adequacy/condition of existing defences	Limeslade defences appear to be in good condition
CD4	Maintenance of existing defences	Likely to an issue if and when maintenance is required - budgets
CD7	Private sea defences	None known
CD8	CPA funding of Coast Protection	No specific issue

Management Unit 1/9

COASTAL DEFENCE		Limeslade
REF	ISSUE DESCRIPTION	Specific to MU
CD9	The role of the foreshore/beach as a defence	Rock shore and headlands play major role


DEVELOPMENT		Limeslade
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Important issue for Planning/coast protection Authority
D2	Sustainability	Any new development would need to be sustainable - self financing
D3	Preservation/enhancement of landscape value	Ref - Mumble Head (next MU)
D4	Future of large industrial frontages	Not applicable - secondary - coastguard stations
D5	Impacts of coastal development.	Impacts likely to be significant - subject to scale of any proposal.
D6	Integration and conflict with other management plans	No information at present

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Limeslade
Presumption against development with general policies referring to landscape and conservation - see Appendix A		

A.3	CONSERVATION DESIGNATIONS (Context Report)	Limeslade
Statutory: SSSI - Bracelet Bay (2 No GCRs) Non-Statutory: - Outside Heritage coast but as part of Gower has relevant landscape value		

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Limeslade
Believed to be a mixture of private and public ownership		

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
W.84.5220 Rothers Tor to Limeslade - Hard Rock Shore - high exposure W.84.5223 Limeslade Bay - Revetment/sea wall 0.11Km - high exposure W.84.5225 to Mumbles Head - 1.2Km - high exposure	

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	

Management Unit 1/9

PART B Intervention Appraisal		Limeslade				
Ref.	Topic					
B.1	<p>Shoreline Description (See context report Section 3)</p> <p>Coast Edge Type - Material - Limestone with deep ravines of softer material bands</p> <p>Foreshore Type - Material - Rock Shore</p> <p>Developed/Undeveloped - Mostly undeveloped apart from Limeslade and part of Bracelet Bay where the highway and coastal properties are, in places, near the edge of the cliff.</p> <p>Defended/undefended - Undefended rock shore with exception of revetement/sea wall at Limeslade.</p> <p>Orientation/exposure - South west to south east and with high exposure.</p>					
	B.1.1	Land Use:	Coastal slopes and agriculture in west of MU with coast path. Residential, highway and caravan site in east.			
	B.1.2	Specific Shoreline Interests:	Residential, environmental, tourism, walking, coastguard			
B.2	<p>SHORELINE EVOLUTION (See context report Section 3)</p> <p>Geology - Limestone of the Lower Carboniferous with inclusions of softer material (Glacial Til which generally form the overlayer inland) form part of soft rock shore. Sea bed sediments are generally gravelly sand.</p> <p>Shoreline Movement/Historic Maps - No information</p> <p>Development/Industry - Development location at Limeslade with large parking area at Bracelet.</p> <p>Gains/Losses - Limited data although general trend of slow erosion assumed. Beach gradient increasing at Limeslade, however, absolute trend behaviour not established.</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Coast road, coast path and adjacent properties.	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment	U
			Land Flooding		Losses	
			Transport disruption	U		
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess, Coastal geology including softer material bands effectively de-stabilising part of the cliff.			
		<u>Preliminary Value of Assets at Risk:</u>	More than £2m - Would be influenced by alternative feasible access. Assets apply to the Built areas.		Value/eligibility for set back of coast path would be difficult to establish under CPA rules.	
	B.3.2	Cost Implications: Long term cliff protection for road and properties at specific locations - Limeslade. Less than £1m				
	B.3.3	Economic Viability: Viable to safeguard highway access and adjacent properties at Limeslade.				

Management Unit 1/9

PART C Strategic Policy Appraisal	Limeslade
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C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little anticipated change	Significant if applies to presently undefended cliffs	Significant if applies to presently undefended cliffs	Potential increase in sediment supply
EFFECTS ON NATURAL ENVIRONMENT	Evolutionary erosion of environmental assets	Would impact upon SSSI and landscape unless selectively applied	Would impact upon SSSI and landscape unless selectively applied	Significant if applied across MU with intervention
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of highway, properties and associated infrastructure	Would secure built environment long term	Would secure built environment long term	Significant impact at Limeslade and Bracelet
EFFECTS ON DEVELOPMENT & LAND USE	Restrict development and change land use in long term - effects upon coast path & built areas in east	Would increase development potential along coastline	Would increase development potential along coastline	Remove any development potential
IMPLICATIONS FOR COASTAL DEFENCES	Natural cliff defences will slowly erode and revetment/seawall at Limeslade will deteriorate over time	Significant if applied across MU and likely to be prohibitively expensive and undesirable	Significant is applied across MU and likely to be prohibitively expensive and undesirable	Reduction in defence standard - possible removal of revetment and sea wall and Limeslade
EFFECTS ON ADJACENT M.U'S	No known effects	Would effect coarse sediment drift - severity of impact unknown	Would effect coarse sediment drift - severity of impact unknown	Not likely to be significant
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion will increase	Civil engineering works would need to be more robust	Civil engineering works would need to be more robust	Rate of recession would increase
CONCORDANCE WITH OBJECTIVES	Does generally accord with the objectives	Accords with objective if applied only to currently defended are a or cliff where road may be vulnerable	Degree of concordance would depend upon extent and scale of any advance	Does not accord with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT 2 BIODIVERSITY ISSUES	(A) - None known (B) - Losses (geological)	(A) - None Known (B) - Losses	(A) - None Known (B) - Losses	(A) - Potential improvements to environment assets (B) - Losses (geological) potential for gains elsewhere
ECONOMIC VIABILITY	Not likely to be viable in longer term	Selectively viable	Not viable	Not viable apart from cliff coast
GENERAL COMMENT ON POLICY SUITABILITY	No suitable in long term	Selectively suitable	Not suitable	Not suitable apart from cliff coast
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline (Limeslade/Built)	- ve	Baseline (coast - Path)
Economic	- ve	Baseline (Limeslade/Built)	- ve	Baseline (coast- path)
Environmental	+ ve or neutral	Baseline (Limeslade/Built)	- ve	Baseline (coast - path)

Management Unit 1/9

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Limeslade
C.2.1	Existing Coastal Defence Policy:	Maintain existing defences - Hold. Retreat/set back along remainder - Path	
C.2.2	Future Coastal Defence Policy:	Short Term: As Existing Anticipated Long Term: As Existing	0 - 50 years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M13, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Not determined - review of risk is required	
C.2.7	Reason for Change:	No Change	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1, CP5, CP9, CP11, CP12	
C.3.1.2	Natural Environment:	NE1	
C.3.1.3	Human and Built Environment:	HB1, HB2, HB9, HB10, HB17	
C.3.1.4	Coastal Defence:	CD1, CD2, CD4, CD8	
C.3.1.5	Development:	D1	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety along coast path	
C.3.2.2	Access:	Vehicular access to coast properties	
C.3.2.3	Industrial Activities:	No specific issue	
C.3.2.4	Human Pressures:	No specific issue	
C.3.2.5	Tourism/Recreation:	No specific issue	

Management Unit 1/9

C.4	OBJECTIVES RECONCILIATION		Limeslade
	The preferred policy accords with the following objectives for this management unit	The preferred policy generally accords with the objectives.	
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 2/1

MANAGEMENT UNIT No. 2/1		Mumbles Head to Oystermouth	
From	Mumbles Head	263500E	187100N
To	Oystermouth (B4593)	261650E	188200N
Approximate Length	2.5Km		

PART A Objectives, Issues and Statutory Details	Mumbles
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A.1	<p>ISSUES (For further detail on this section refer to the Consultation Responses Report)</p> <p>The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :</p>
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COASTAL PROCESSES		Mumbles
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles throughout
CP3	Coincidence of high tides and storms	Effectiveness of wide intertidal zone reduces with increasing in water level - Potential major impact.
CP4	Dune toe behaviour - erosion/regeneration	Effects adjacent MU in Black pill area only - Potential drift impacts in this MU.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Potential impacts on rock cliff coast and Mumbles Head.
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Not applicable
CP7	Siltation of estuaries and ports;	Siltation of foreshore in mooring area and possible impacts at RNLI launch site.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Major general concern
CP9	Sea level rise and increased storminess	Potentially significant impacts for shoreline
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Shoreline orientation varies around MU and adjacent MU's and sediment drift will be effected.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Possible impacts from dredging operations at Swansea Docks.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local issue

NATURAL ENVIRONMENT		Mumbles
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Very large SSSI - Black Pill extends over most of the intertidal zone. Mumbles Hill - hinterland.

Management Unit 2/1

NATURAL ENVIRONMENT		Mumbles
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	Not applicable
NE3	Water Quality	Important local issue
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Major treatment scheme east of Swansea - historic issues

HUMAN & BUILT ENVIRONMENT		Mumbles
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	General safety concerns - Swansea bike and walkway + water activities
HB2	Public access to the foreshore	Generally good
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Coast path and cycle way is a major asset of significant local and regional importance.
HB4	Fisheries interests	Sea and shore angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Maintenance and new works would need to take account of various interests.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Launching facility nr Knab can become busy during peak summer periods.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Mumble head and Mumble pier. Note recent works on Mumbles pier.
HB8	Vehicular access/parking/road congestion	Road congestion is a problem on weekends and peak summer periods - applies throughout - MU 2/2 & 2/3
HB9	Importance of beach quality to tourism	Upper foreshore is used by public - lower foreshore is sand/silt
HB10	Balance between traditional and green tourism	Area is built-up but benefits from high landscape value - linking into Bracelet Bay
HB11	Importance of recreational use of foreshore and contribution to local economies	Foreshore is important. Coast path may be described as very important.
HB12	Marine access - Port/harbour/launching facilities	Slipway nr Knab. Also RNLI facility towards Mumble Head. Paddle streamer uses Mumble pier.
HB13	Human pressure on natural assets such as dunes	Effects adjacent MU 2/2
HB14	Beach texture - sand/silt	Generally sand/silt with upper foreshore more sandy
HB15	Access for emergency services (including life boat)	Mumble head has a large and a small craft at the lifeboat station.
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	No industrial activities recorded
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Maintenance dredging at Swansea Docks

Management Unit 2/1

COASTAL DEFENCE		Mumbles
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Coastal squeeze - limited scope for coast path set back because of proximity of coast road and built-up areas
CD2	Cliff erosion	Limited impacts likely towards Mumbles Head
CD3	Adequacy/condition of existing defences	Mixture of defences in varying condition. Mostly old and requiring regular maintenance.
CD4	Maintenance of existing defences	Regular maintenance required
CD5	Dune erosion	Not applicable in this MU
CD6	Condition of flood banks/sea defences	No known defences - would be EA responsibility.
CD7	Private sea defences	None known
CD8	CPA funding of Coast Protection	Potentially significant future issues in respect of cost and form of appropriate defences.
CD9	The role of the foreshore/beach as a defence	Significant role reducing during very high tides

DEVELOPMENT		Mumbles
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Recent attempts for development at Oystermouth including land reclamation
D2	Sustainability	Would need to be sustainable in terms of coastal defence.
D3	Preservation/enhancement of landscape value	Assets concentrated at Mumbles Head
D4	Future of large industrial frontages	Secondary potential impacts from outside this MU
D5	Impacts of coastal development.	Would need to be carefully assessed
D6	Integration and conflict with other management plans	No information

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Mumbles
	<p>Policies NE2 & TRS25 apply throughout "Swansea Bay" and is referred to as an <u>Urban Greenscape</u>: NE2 - Within the defined Landscape protection areas, the existing landscape, wildlife, and geological features will be conserved. Development will only be permitted in exceptional circumstances in service of agriculture, landscape improvements, woodland planting, management measures for landscape and nature conservation, appropriate sustainable recreation and essential operational development by statutory undertakers.</p> <p>TRS25 - The landscaping around Swansea Bay will be extended and enhanced through sensitive and imaginative improvements. Leisure development opportunities are identified at Black Pill and within the maritime quarter. Other than environmental improvement works, development will be restricted to these areas. Measures to improve the amenity and the safety of the Swansea Bay cycle route will be implemented.</p>	

Management Unit 2/1

A.3	<u>CONSERVATION DESIGNATIONS (Context Report)</u>	Mumbles
	Statutory: SSSI Blackpill - large SSSI extending across much of Swansea Bay intertidal foreshore between Mumbles and Brynmill. Non-Statutory - Hinterland wildlife trust site at Peel Wood.	

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Mumbles
	Understood to be a mixture of Private and Public ownership	

A.5	<u>COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)</u> The following coastal defences presently exist within this management unit :	
	W.84: 5230 - Mumbles Head; 0.5Km; Hard Rock Shore; High Exposure 5233 - Mumbles Pier; 0.12Km; Seawall; High Exposure 5237 - The Knab; Mumbles 1; 0.4Km; Hard Rock Shore; High Exposure 5240 - The Knab; Mumbles 2; 0.11Km; Seawall; High Exposure 5870 - The Knab; Mumbles 3; 0.75Km; Sea Wall; High Exposure 5245 - The Mumbles; 0.7Km; Revetment; High Exposure 5247 - Oystermouth Castle area;0.4Km; Revetment; High Exposure 5250 - West Cross to Blackpill; 1.2Km ; Revetment; High Exposure	

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 2/1

PART B Intervention Appraisal		Mumbles				
Ref	Topic					
B.1	<p>Shoreline Description (Refer to Context Report)</p> <p>Coast Edge Type - Material - Mixture of hard rock shore, sea walls and revetments</p> <p>Foreshore Type - Material - Generally sand and sandy mud with rock outcrops towards mumbles head.</p> <p>Developed/Undeveloped - All developed with commercial and residential premises. Also highway comprising A 4067 & B 4433</p> <p>Defended/undefended - All defended with exception of approximately 400m of hard rock shore at the Knab (Nr Mumble Head & including Mumble Head))</p> <p>Orientation/exposure - Sheltered from prevailing seas (Note refraction/diffraction) although significant easterly fetch applies resulting in high exposure category applying.</p>					
	B.1.1	Land Use:	Residential/commercial properties. Coast path and cycle path pleasure boating. Major road route extensive residential hinterland area including Gower beyond.			
	B.1.2	Specific Shoreline Interests:	<p>Walking, Cycling, boating, RNLI, boat/yacht club, launching ramp, sea/shore angling, sub -aqua diving, water and jet skiing.</p> <p>CPA funding for coast paths may not be readily justified although coast path/cycleway is a major asset.</p>			
B.2	<p>SHORELINE EVOLUTION (Refer to Context Report)</p> <p>Geology - Swansea Bay has been formed by the erosion of the less resistant (less resistant than Limestone) Lower Coal Measures and Millstone Grit. These form the southern boundary of the plateau of sediments infilling the synclinal structure (trough) formed by the folded Carboniferous rocks. At the Mumbles Millstone Grit dominates and works its way through the Lower and Middle Coal Measures into the Pennant Sandstones at Swansea. On the surface the Limestone extends to Black Pill where glacial sand and gravel cover the surface around to Swansea.</p> <p>Shoreline Movement/Historic Maps - Although the long term trend of erosion has been referred to above, recent movements are not conclusive. Most recent surveys show the foreshore in the south of the bay becoming shallower and steeper towards the docks</p> <p>Development/Industry - Swansea to Oystermouth railway opened in 1804 and electrified in 1929; Mumble pier built in 1898 and life boat stations built in 1920 and 1963. The area is dominated by residential and small commercial concerns and linked by the road and cycleway.</p> <p>Gains/Losses - Refer to Shoreline Movement above</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Cycle/footpath, marine facilities including slipway, RNLI station, pier, infrastructure including highway and part of water treatment network.	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment Losses	U
			Land Flooding			
			Transport disruption	U		
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess.			
			Condition and maintenance of existing defences.			
		<u>Preliminary Value of Assets at Risk:</u>	More than £10m			

Management Unit 2/1

	B.3.2	Cost Implications: Subject to condition of existing defences and form of eventual replacement defences. Cost likely to be more than £3m.
	B.3.3	Economic Viability: Viable.

Management Unit 2/1

PART C Strategic Policy Appraisal	Mumbles
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C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No known change	No known change	Likely impacts in near shore zone - depends upon extent and form	Local effects in upper foreshore
EFFECTS ON NATURAL ENVIRONMENT	No known effects	Little potential impact - would be influenced by form.	Possible impacts dependant upon extent and form of works	No significant change
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of coastal assets having significant effect.	Secure existing built environment.	Secure existing built environment. Possible impacts on coast path	Major impacts on all aspects of human and built environment on and adjacent to coastline.
EFFECTS ON DEVELOPMENT & LAND USE	Restrict development and change current land use with the loss of many coastal facilities over time.	Secure existing hinterland for development where appropriate and maintain current land use	Increase development potential and extend coastal facilities	Restrict development and change current land use with the loss of many coastal facilities
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would continued to deteriorate and eventually collapse	Programme of repair and renewal would be required	Large scale civil engineering works would probably be required	Existing 'life expired' defence may be removed
EFFECTS ON ADJACENT M.U'S	Little change from present	little anticipated change dependant upon form of defence adopted	Effect would be related to form and extent of works	Effects not clear and would be influenced by extent of retreated line
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Deterioration of existing defences would accelerate and land use would change	Crest levels may need to be higher and the form of the defence would need to take account of these factors	Works and local impacts would need to be considered in detail commensurate with the proposed scale and extent of advance.	Retreat rate would increase
CONCORDANCE WITH OBJECTIVES	Does not accord with objectives generally	Generally accords with objectives	Would not accord with objectives unless applied in a very limited scale.	Does not accord with the objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT	(A) - None known	(A) - No change anticipated	(A) - None known - likely detrimental effect depending upon scale of any proposed advance	(A) - Limited scope of enhancement
(B) - BIODIVERSITY ISSUES	(B) - Not clear	(B) - Present squeeze continues - Roosting	(B) - Squeeze increases	(B) - Potential increase in biodiversity
ECONOMIC VIABILITY	Not viable	Viable	Possibly selectively viable - limited	Not viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable	Not likely to be suitable	Not suitable
RELATIVE SUSTAINABILITY				
Social	- Ve	Baseline	Not Clear	- Ve
Economic	- Ve	Baseline	Unknown	- Ve
Environmental	Unclear in short/medium	Baseline	- Ve	+ Ve

Management Unit 2/1

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Mumbles
C.2.1	Existing Coastal Defence Policy:	Hold line with reactive maintenance	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line Anticipated Long Term: Hold Line	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; condition of existing defences	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M10, M11, M12, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Review condition of existing defences and determine a costed programme of works to enable policy to shift from reactive to pro-active intervention.	
C.2.7	Reasons for change:	To enable Coast Protection Authority to more effectively manage the shoreline.	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Mumbles
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 5, 9, 10	CP 7, 8, 11, 12
C.3.1.2	Natural Environment:	NE 1. 2	NE3
C.3.1.3	Human and Built Environment:	HB 2, 3, 5, 11, 12, 15, 16	HB 1, 6, 8, 9
C.3.1.4	Coastal Defence:	CD 2, 3, 4, 9	CD1, 8
C.3.1.5	Development:	D1, 2	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Bathing and other marine activities. Conflict between cycling and walking along coast.	
C.3.2.2	Access:	Generally Good	
C.3.2.3	Industrial Activities:	Not relevant	
C.3.2.4	Human Pressures:	Road congestion	
C.3.2.5	Tourism/Recreation:	Importance to local economy	

Management Unit 2/1

C.4	OBJECTIVES RECONCILIATION		Mumbles
	The preferred policy accords with the following objectives for this management unit	All stated	Includes non specific or neutral objectives
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 2/2

MANAGEMENT UNIT No. 2/2**Oystermouth to Black Pill**

From	Oystermouth	261650E	188200N
To	Black Pill	262050E	190750N
Approximate Length	2.5Km		

PART A Objectives, Issues and Statutory Details**West Cross**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		West Cross
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles throughout
CP3	Coincidence of high tides and storms	Wide intertidal zone is effective defence that will reduce in influence as tide level increases
CP4	Dune toe behaviour - erosion/regeneration	Dune at Black Pill - unstable in places - trend/cyclic behaviour needs to be analysed
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Minor outlet from Clyne Wood adjacent to boating lake discharges on foreshore and influences/is influenced by drift.
CP7	Siltation of estuaries and ports;	Impact of navigation dredging east of this MU may have an impact here.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Major concern.
CP9	Sea level rise and increased storminess	Significant impacts upon dune area and potential low lying hinterland near Clyne.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Exposure changes will influence drift within and in/out of MU.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern about marine aggregate extraction and navigation dredging to Swansea docks.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local issue

NATURAL ENVIRONMENT		West Cross
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Black Pill SSSI extends over most of the intertidal zone - over 1Km wide,

Management Unit 2/2

NATURAL ENVIRONMENT		West Cross
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	Not applicable - no information.
NE3	Water Quality	Important local issue.
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Treatment works east of Swansea now operational. No other known issues

HUMAN & BUILT ENVIRONMENT		West Cross
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Possible concerns in vicinity of boating lake and adjacent foreshore where beach usage would be potentially higher than other areas.
HB2	Public access to the foreshore	Reasonably good although possible local damage to dunes where access between coast path and beach has been forged.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Potential loss of right of way applying to footpath and cycle path.
HB4	Fisheries interests	No significant known interest
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Possible conflict if more robust defences are required in future and also impacts for dune area. Area of foreshore reduced significantly at High Water.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No known historic assets
HB8	Vehicular access/parking/road congestion	Parking facilities at Clyne Park - traffic congestion regularly noted along coast road.
HB9	Importance of beach quality to tourism	Upper foreshore is particularly important
HB10	Balance between traditional and green tourism	SSSI is very large - conflict most likely over high water periods when space becomes limited for roosting birds.
HB11	Importance of recreational use of foreshore and contribution to local economies	Foreshore and hinterland is important with particular reference to coast path.
HB12	Marine access - Port/harbour/launching facilities	No information
HB13	Human pressure on natural assets such as dunes	Trampling access-ways through dunes and human activity at high water placing pressure on natural environment
HB14	Beach texture - sand/silt	Intertidal zone comprises sand and mud,
HB15	Access for emergency services (including life boat)	Access is reasonably good.
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Commercial shoreline enterprises apply - Industrial frontages are located to the east

Management Unit 2/2

HUMAN & BUILT ENVIRONMENT		West Cross
REF	ISSUE DESCRIPTION	Specific to MU
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major concern

COASTAL DEFENCE		West Cross
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Very limited
CD3	Adequacy/condition of existing defences	Mixture of defences in varying condition. Likely to require regular maintenance.
CD4	Maintenance of existing defences	Likely to become and increasing burden on the Authority.
CD5	Dune erosion	Concern in east of management unit
CD6	Condition of flood banks/sea defences	Possible low lying hinterland vulnerable to flooding
CD7	Private sea defences	None Known
CD8	CPA funding of Coast Protection	Defences would need to be replaced/upgraded over time. CPA criteria may not allow account to be taken of important local issues such as aesthetics.
CD9	The role of the foreshore/beach as a defence	Wide intertidal zone performs important defence role.

DEVELOPMENT		West Cross
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Would be important for planning and conservation interests to agree upon any development proposals
D2	Sustainability	Development would need to acknowledge coast protection requirements.
D3	Preservation/enhancement of landscape value	Landscape value would need to be considered.
D4	Future of large industrial frontages	Not applicable
D5	Impacts of coastal development..	Would depend upon form, scale & position
D6	Integration and conflict with other management plans	Unknown

A.2	STATUTORY PLANNING POLICIES (Appendix A)	West Cross
	<p>Policies NE2 & TRS25 apply throughout "Swansea Bay" and is referred to as an <u>Urban Greenscape</u>: NE2 - Within the defined Landscape protection areas, the existing landscape, wildlife, and geological features will be conserved. Development will only be permitted in exceptional circumstances in service of agriculture, landscape improvements, woodland planting, management measures for landscape and nature conservation, appropriate sustainable recreation and essential operational development by statutory undertakers.</p> <p>TRS25 - The landscaping around Swansea Bay will be extended and enhanced through sensitive and imaginative improvements. Leisure development opportunities are identified at Black Pill and within the maritime quarter. Other than environmental improvement works, development will be restricted to these areas. Measures to improve the amenity and the safety of the Swansea Bay cycle route will be implemented.</p>	

Management Unit 2/2

A.3	<u>CONSERVATION DESIGNATIONS</u> (Context Report)	West Cross
	Statutory: SSSI - Black Pill Non-Statutory - Urban Greenscape	

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	West Cross
	Believed to be a mixture of private and public ownership	

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report)	
	The following coastal defences presently exist within this management unit :	
	W.84: 5247 - Oystermouth Castle area; 0.4Km; Revetment; High Exposure 5250 - West Cross to Black Pill; 1.2Km; Revetment; High Exposure 5255 - Black Pill area; 0.8Km; Sea Wall; High Exposure	

A.6	<u>OBJECTIVES</u>								
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 2/2

PART B Intervention Appraisal		West Cross				
Ref	Topic					
B.1	<p>Shoreline Description (Refer to Context Report)</p> <p>Coast Edge Type - Material - Revetment defended and relic dune frontage to east</p> <p>Foreshore Type - Material - Sand on upper foreshore and sand/mud across majority of intertidal zone</p> <p>Developed/Undeveloped - mixture of developed and green open spaces in hinterland. Coast edge mostly developed sensitively with coast path/cycleway</p> <p>Defended/undefended - mostly defended - exception - dune frontage</p> <p>Orientation/exposure - east to south east. Exposure increases in easterly direction.</p>					
	B.1.1	Land Use:	Residential and commercial with highway, cycleway and foot path.			
	B.1.2	Specific Shoreline Interests:	Walking, cycling, sun bathing, café/park facilities, Black Pill Burrows mini golf course.			
B.2	<p>SHORELINE EVOLUTION (Refer to Context Report)</p> <p>Geology - Swansea Bay has been formed by the erosion of the less resistant (less resistant than Limestone) Lower Coal Measures and Millstone Grit. These form the southern boundary of the plateau of sediments infilling the synclinal structure (trough) formed by the folded Carboniferous rocks. At the Mumbles Millstone Grit dominates and works its way through the Lower and Middle Coal Measures into the Pennant Sandstones at Swansea. On the surface the Limestone extends to Black Pill where glacial sand and gravel cover the surface around to Swansea.</p> <p>Shoreline Movement/Historic Maps - No special historic information. Insufficient time base to draw conclusions from recent monitoring.</p> <p>Development/Industry - Industry is located to east at Swansea Docks.</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Coast path, cycleway properties and highway	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment	
			Land Flooding	U	Losses	
			Transport disruption	U		
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess			
			Funding eligibility			
			Condition of existing defences			
		<u>Preliminary Value of Assets at Risk:</u>	Likely to be over £3m		Note - CPA funding may not be available for the protection of coast paths	
	B.3.2	Cost Implications: Likely to be a schedule of works ranging from maintenance to capital works that could cost up to £3m				
	B.3.3	Economic Viability: Viable when considering intangible benefits.				

Management Unit 2/2

PART C Strategic Policy Appraisal**West Cross**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No known change	No known change	Likely impacts in near shore zone - depends upon extent and form	Local effects on upper foreshore
EFFECTS ON NATURAL ENVIRONMENT	No known effects	Little potential impact - would be influenced by form.	Possible impacts dependant upon extent and form of works	No significant change
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of coastal assets having significant effect.	Secure existing built environment.	Secure existing built environment. Possible impacts on coast path	Major impacts on all aspects of human and built environment on and adjacent to coastline.
EFFECTS ON DEVELOPMENT & LAND USE	Restrict development and change current land use with the loss of many coastal facilities over time.	Secure existing hinterland for development where appropriate and maintain current land use	Increase development potential and extend coastal facilities	Restrict development and change current land use with the loss of many coastal facilities
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would continue to deteriorate and eventually collapse	Programme of repair and renewal would be required	Large scale civil engineering works would probably be required	Existing 'life expired' defence may be removed
EFFECTS ON ADJACENT M.U'S	Little change from present	little anticipated change dependant upon form of defence adopted	Effect would be related to form and extent of works	Effects not clear and would be influenced by extent of retreated line
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Deterioration of existing defences would accelerate and land use would change	Crest levels may need to be higher and the form of the defence would need to take account of these factors	Works and local impacts would need to be considered in detail commensurate with the proposed scale and extent of advance.	Retreat rate would increase
CONCORDANCE WITH OBJECTIVES	Does not accord with objectives generally	Generally accords with objectives	Would not accord with objectives unless applied in a very limited scale.	Does not accord with the objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - Not clear in short/medium term	(A) - No change anticipated (B) - None Known	(A) - None known - likely detrimental effect depending upon scale of any proposed advance (B) - Potential losses	(A) - Limited scope of enhancement (B) - Potential longer term gains
ECONOMIC VIABILITY	Not viable	Viable	Possibly selectively viable - limited	Not viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable	Not likely to be suitable	Not suitable
RELATIVE SUSTAINABILITY				
Social	- Ve	Baseline	Possible + Ve	- Ve
Economic	- Ve	Baseline	Unknown	- Ve
Environmental	Not clear in short term	Baseline	Likely - Ve	+ Ve

Management Unit 2/2

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		West Cross
C.2.1	Existing Coastal Defence Policy:	Reactive maintenance to hold Line	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line Anticipated Long Term: Hold Line	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess Condition of existing defences & Grant aid funding	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M8, M11, M12, M15, M16, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Review existing defences and prepare a managed approach to maintenance and re-newal	
C.2.7	Reason for Change:	Gain control of coastal defence management	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		West Cross
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 5, 6, 9, 10	CP 7, 8, 11, 12
C.3.1.2	Natural Environment:	NE 1, 2	NE 3, 4
C.3.1.3	Human and Built Environment:	HB 2, 3, 5, 11, 12, 15, 16	HB 1, 6, 8, 9, 17
C.3.1.4	Coastal Defence:	CD 3, 4, 9	CD 1, 8
C.3.1.5	Development:	D 1, 2	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Bathing and play area adjacent to cyclepath and footpath	
C.3.2.2	Access:	Generally good	
C.3.2.3	Industrial Activities:	None known	
C.3.2.4	Human Pressures:	Traffic	
C.3.2.5	Tourism/Recreation:	Importance of joined-up coast path throughout bay	

Management Unit 2/2

C.4	OBJECTIVES RECONCILIATION		West Cross
	The preferred policy accords with the following objectives for this management unit	All stated A6	Including neutral Objectives
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 2/3

MANAGEMENT UNIT No. 2/3**Black Pill (East) to Swansea Docks**

From	Black Pill (East)	262050E	190750N
To	Swansea Docks	266500E	192250N
Approximate Length	5.5Km		

PART A Objectives, Issues and Statutory Details**Swansea**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Swansea
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles throughout
CP3	Coincidence of high tides and storms	Potentially significant impact upon defences and overtopping - note vertical sea wall sections and steep revetments
CP4	Dune toe behaviour - erosion/regeneration	Dune creation in eastern corner as a result of drift towards training walls.(dune area also to west at Black Pill)
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Potential impacts resulting from training walls and navigation dredging to Tawe/Swansea Docks
CP7	Siltation of estuaries and ports;	Maintenance dredging and training works
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern - strategic
CP9	Sea level rise and increased storminess	Significant possible impacts upon shoreline.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Shoreline orientation is generally constant throughout this MU facing south to south east direction. Drift is generally east.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant impact although dredging and river training has been underway for many years.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local issue

NATURAL ENVIRONMENT		Swansea
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Adjacent to Black Pill, Swansea SSSI.
NE2	Protection of areas designated under international conventions.	None known

Management Unit 2/3

NATURAL ENVIRONMENT		Swansea
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	Local concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Treatment works operational to east of Tawe

HUMAN & BUILT ENVIRONMENT		Swansea
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	No known major safety issue - possible hazard along top of concrete revetment
HB2	Public access to the foreshore	Good
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Important asset extending between Tawe and Mumbles.
HB4	Fisheries interests	Possible shore based angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	None known
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	None known
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Assets are generally sited in hinterland.
HB8	Vehicular access/parking/road congestion	Generally good because of marina facility and other car parks servicing Swansea city
HB9	Importance of beach quality to tourism	Important along much of shoreline
HB10	Balance between traditional and green tourism	Limited reference to green tourism.
HB11	Importance of recreational use of foreshore and contribution to local economies	Important as part of a number elements including the marina and other leisure facilities.
HB12	Marine access - Port/harbour/launching facilities	None known
HB13	Human pressure on natural assets such as dunes	Dune area adjacent to breakwater in eastern corner of MU
HB14	Beach texture - sand/silt	Generally sand - particularly in east and upper foreshore
HB15	Access for emergency services (including life boat)	Good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Industrial facility adjacent to marina in east of MU
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Maintenance navigation dredging adjacent to this MU - Tawe.

COASTAL DEFENCE		Swansea
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Unlikely to be a general option because of proximity of the highway and footpath - Ref CPA funding - Paths
CD2	Cliff erosion	

Management Unit 2/3

COASTAL DEFENCE		Swansea
REF	ISSUE DESCRIPTION	Specific to MU
CD3	Adequacy/condition of existing defences	General condition appears to be reasonable and foreshore levels are higher in east.
CD4	Maintenance of existing defences	Review of condition along specific length is required
CD5	Dune erosion	Problem adjacent to mini golf and UCS (universal)
CD6	Condition of flood banks/sea defences	Flood risk and hinterland levels should be checked
CD7	Private sea defences	No information apart from NAW coastal survey
CD8	CPA funding of Coast Protection	Eligibility of CPA funding for foot path and cycleway
CD9	The role of the foreshore/beach as a defence	Wide intertidal zone and sand accretion near high water mark perform coast protection function - note wind blown sand

DEVELOPMENT		Swansea
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Refer to Local Plan Policies - Maritime quarter
D2	Sustainability	Would need to be sustainable.
D3	Preservation/enhancement of landscape value	Heritage associated with maritime quarter - Post Modern of regional importance.
D4	Future of large industrial frontages	Industry located in eastern corner adjacent to docks
D5	Impacts of coastal development..	Dependant upon scale - most coastal areas are developed
D6	Integration and conflict with other management plans	No information

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Swansea
	<p>Policies NE2 & TRS25 apply throughout "Swansea Bay" and is referred to as an <u>Urban Greenscape</u>: NE2 - Within the defined Landscape protection areas, the existing landscape, wildlife, and geological features will be conserved. Development will only be permitted in exceptional circumstances in service of agriculture, landscape improvements, woodland planting, management measures for landscape and nature conservation, appropriate sustainable recreation and essential operational development by statutory undertakers.</p> <p>TRS25 - The landscaping around Swansea Bay will be extended and enhanced through sensitive and imaginative improvements. Leisure development opportunities are identified at Black Pill and within the maritime quarter. Other than environmental improvement works, development will be restricted to these areas. Measures to improve the amenity and the safety of the Swansea Bay cycle route will be implemented.</p>	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Swansea
	<p>Statutory: Blackpill SSSI (eastern limit at recreation ground/Brynmill) Non-Statutory: No further information</p>	

Management Unit 2/3

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Swansea
	Believed to be a mixture of private and public ownership - no specific information	

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :	
	<p>W.84: 5875 - Black Pill area Mumbles; 0.59Km; Revetment/Floodwall; Medium exposure 5260 - Sketty Golf Course; 1.28Km; Dunes; High exposure 5262 - Singleton Park access ramp; 15m Sea Wall; High Exposure 5264 - Brynmill; 1.05Km; Sea Wall; High Exposure 5270 - Uplands (1) ; 0.5Km; Sea Wall; High Exposure 5271 - Uplands (2) ; 0.3Km Revetment; High Exposure 5273 - Swansea County Hall; 0.7Km Revetment/Sea Wall; High Exposure 5275 - South Dock Marina; 0.24Km; High Exposure 5277 - South Dock Dunes; 0.5Km; High Exposure</p>	

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 2/3

PART B Intervention Appraisal		Swansea			
Ref	Topic				
B.1	<p>Shoreline Description (Refer to Context Report)</p> <p>Coast Edge Type - Mixture of relic dunes and defended shoreline</p> <p>Foreshore Type - Generally sand along upper foreshore with sand/mud lower in the intertidal zone</p> <p>Developed/Undeveloped - Developed with some green open space such as golf course. Note "Built" coast path along edge.</p> <p>Defended/undefended - Mostly defended with exception of dune frontage. Defended areas are either sea wall, revetment or both</p> <p>Orientation/exposure - South to South East and open to prevailing weather.</p>				
	B.1.1	Land Use:	Coast Path/Cycle way and hinterland built environment including major highway.		
	B.1.2	Specific Shoreline Interests:	Environmental/landscape; recreation use of coast edge - walking & cycling.		
B.2	<p>SHORELINE EVOLUTION (Refer to Context Report)</p> <p>Geology - Swansea Bay has been formed by the erosion of the less resistant (less resistant than Limestone) Lower Coal Measures and Millstone Grit. These form the southern boundary of the plateau of sediments infilling the synclinal structure (trough) formed by the folded Carboniferous rocks. At the Mumbles Millstone Grit dominates and works its way through the Lower and Middle Coal Measures into the Pennant Sandstones at Swansea. On the surface the Limestone extends to Black Pill where glacial sand and gravel cover the surface around to Swansea.</p> <p>Shoreline Movement/Historic Maps - Although the long term trend of erosion has been referred to above, recent movements are not conclusive. Most recent survey show the foreshore in the south of the bay becoming shallower and steeper towards the docks</p> <p>Shoreline Movement/Historic Maps - varies along coast edge with some sections eroding and other accreting. Accretion at eastern end adjacent to west pier wall to Swansea Docks. Note wind blown sand between County Hall and Victoria Park.</p> <p>Development/Industry - Most of shoreline is developed with highway and major buildings such as County Hall, Hotel and residential medium rise buildings.</p> <p>Gains/Losses - No significant change or trend documented although anecdotal evidence presented to indicate erosion along certain sections.</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Cycle way/coast path, golf course and long term - highway and major buildings	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses U U U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess (event lead damage to dunes)		

Management Unit 2/3

		<u>Preliminary Value of Assets at Risk:</u>	Over £10 million.
	B.3.2	Cost Implications:	To renew defences the cost is likely to be in excess of £5m
	B.3.3	Economic Viability:	Viable

Management Unit 2/3

PART C Strategic Policy Appraisal**Swansea**

C.1 MATRIX ASSESSMENT		Coastal Managers : CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No known change	No known change	Likely impacts in near shore zone - depends upon extent and form	Local effects on upper foreshore
EFFECTS ON NATURAL ENVIRONMENT	No known effects	Little potential impact - would be influenced by form.	Possible impacts dependant upon extent and form of works	No significant change
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of coastal assets having significant effect.	Secure existing built environment.	Secure existing built environment. Possible impacts on coast path	Major impacts on all aspects of human and built environment on and adjacent to coastline.
EFFECTS ON DEVELOPMENT & LAND USE	Restrict development and change current land use with the loss of many coastal facilities over time.	Secure existing hinterland for development where appropriate and maintain current land use	Increase development potential and extend coastal facilities	Restrict development and change current land use with the loss of many coastal facilities
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would continue to deteriorate and eventually collapse	Programme of repair and renewal would be required	Large scale civil engineering works would probably be required	Existing 'life expired' defence may be removed
EFFECTS ON ADJACENT M.U'S	Little change from present	little anticipated change dependant upon form of defence adopted	Effect would be related to form and extent of works	Effects not clear and would be influenced by extent of retreated line
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Deterioration of existing defences would accelerate and land use would change	Crest levels may need to be higher and the form of the defence would need to take account of these factors	Works and local impacts would need to be considered in detail commensurate with the proposed scale and extent of advance.	Retreat rate would increase
CONCORDANCE WITH OBJECTIVES	Does not accord with objectives generally	Generally accords with objectives	Would not accord with objectives unless applied in a very limited scale.	Does not accord with the objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - Short term neutral	(A) - No change anticipated (B) - Not known change	(A) - Potential detrimental effect depending upon scale of any proposed advance (B) - Likely Loss	(A) - Limited scope of enhancement (B) - Possible gains
ECONOMIC VIABILITY	Not viable	Viable	Possibly selectively viable - limited	Not viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable	Not likely to be suitable	Not suitable
RELATIVE SUSTAINABILITY				
Social	- Ve	Baseline	Possible + Ve	- Ve
Economic	- Ve	Baseline	Unknown	- Ve
Environmental	Possible + Ve Long term	Baseline	Possible - Ve	Possible + Ve

Management Unit 2/3

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Swansea
C.2.1	Existing Coastal Defence Policy:	Hold Line - Reactive maintenance	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line Anticipated Long Term: Hold Line	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess Erosion rates resulting from event damage to dunes Funding of protection for cycle way	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L1, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M8, M11, M12, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Prepare programme of works to manage maintenance. Consider works to hold dune frontage - Study	
C.2.7	Reason for Change:	Move towards informed approach of planned maintenance and renewal.	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Swansea
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Objectives STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 3, 4, 9, 10	CP 7, 8, 11, 12
C.3.1.2	Natural Environment:	NE 1, 2	NE 3, 4
C.3.1.3	Human and Built Environment:	HB 3, 13	HB 8, 9, 17
C.3.1.4	Coastal Defence:	CD 3, 4, 5, 9	CD8
C.3.1.5	Development:	D1	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Bathing	
C.3.2.2	Access:	Busy road - distance to authorised access points along coast	
C.3.2.3	Industrial Activities:	No specific information	
C.3.2.4	Human Pressures:	Traffic congestion	
C.3.2.5	Tourism/Recreation:	Wind blown sand	

Management Unit 2/3

C.4	OBJECTIVES RECONCILIATION		Swansea
	The preferred policy accords with the following objectives for this management unit	All stated in A6	including neutral objectives
	The preferred policy does not accord with the following objectives for this management unit		

Management Unit 3/1

MANAGEMENT UNIT No. 3/1		Swansea Docks and Channel	
From	West Breakwater	266600E	292000N
To	East Breakwater	266600E	292000N
Approximate Length	Approx. 500m along coast		

PART A Objectives, Issues and Statutory Details	Swansea Docks
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A.1	ISSUES (For further detail on this section refer to the Consultation Responses Report) The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :
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COASTAL PROCESSES		Swansea Docks
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic profiles either side of dock channel and it is believed that ABP monitor approach channel to docks.
CP3	Coincidence of high tides and storms	Possible impacts upon access to port as near shore wave heights increase.
CP4	Dune toe behaviour - erosion/regeneration	West breakwater effects adjacent MU dune frontage.
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Impact upon coastal processes of barrage, approach channel dredging and training walls will be significant
CP7	Siltation of estuaries and ports;	Drift & fluvial sediment in fills channel and is removed by dredging.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Major issue - concern regarding impacts of human intervention such as dredging
CP9	Sea level rise and increased storminess	Impacts are likely to effect operation of port.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Impacts of navigation channel and training walls on adjacent shoreline.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant impact on processes within Tawe and shoreline to either side
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major concern in respect of dredging of both navigation to Swansea and aggregate extraction.

NATURAL ENVIRONMENT		Swansea Docks
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	Important within Tawe
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Recently constructed treatment works to east.

Management Unit 3/1

HUMAN & BUILT ENVIRONMENT		Swansea Docks
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Water activities comprise both commercial and leisure boating - Above Schedule 4 boundary
HB2	Public access to the foreshore	No foreshore access
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Access around breakwaters and above Schedule 4 boundaries
HB4	Fisheries interests	Significant fisheries interest as docks are used by many commercial and leisure fishing craft
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Issues are complex and involve other MU's
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Possible conflict between leisure and large commercial craft.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No known historic assets
HB8	Vehicular access/parking/road congestion	No specific access within MU
HB9	Importance of beach quality to tourism	Not applicable within strict MU boundaries
HB10	Balance between traditional and green tourism	Traditional tourism in form of water based leisure activities including car ferry.
HB11	Importance of recreational use of foreshore and contribution to local economies	Applies to marina facilities and very important
HB12	Marine access - Port/harbour/launching facilities	Major function and asset within MU
HB13	Human pressure on natural assets such as dunes	Impacts of dredging on near shore processes
HB14	Beach texture - sand/silt	Not applicable
HB15	Access for emergency services (including life boat)	Access is generally good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Major contribution to local economy provided by Swansea Docks. Major import and export including car ferry terminal (Cork).
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Fundamental to port operation and general concern regarding impacts upon adjacent shorelines. Sand wharves within docks.

COASTAL DEFENCE		Swansea Docks
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Not likely unless docks close.
CD3	Adequacy/condition of existing defences	Not clear.
CD4	Maintenance of existing defences	Maintenance of breakwaters believed to be ABP. Breakwater perform coast protection role.
CD6	Condition of flood banks/sea defences	Tawe Barrage is above Schedule 4 boundary
CD7	Private sea defences	ABP harbour defences
CD8	CPA funding of Coast Protection	No specific issue

Management Unit 3/1

COASTAL DEFENCE		Swansea Docks
REF	ISSUE DESCRIPTION	Specific to MU
CD9	The role of the foreshore/beach as a defence	Dredged channel will have an impact

DEVELOPMENT		Swansea Docks
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Ongoing commercial viability of docks and part of docks - future of tank farm and deliveries to BP - Baglan and Llandarcy
D2	Sustainability	Linked to long term viability of port
D3	Preservation/enhancement of landscape value	No known interest
D4	Future of large industrial frontages	Important associated industrial frontage
D5	Impacts of coastal development..	Dependent upon form, use and scale
D6	Integration and conflict with other management plans	No information - ref Tawe River

A.2	<u>STATUTORY PLANNING POLICIES (Appendix A)</u>	Swansea Docks
	<p>TRS25 (CCS) refers to leisure development opportunities within the maritime quarter of Swansea Docks. Other development potential - The eastern side of Swansea Docks provides the facilities for the significant commercial port at Swansea and ABP are likely to have long term interests in port as a major facility for both import and export.</p>	

A.3	<u>CONSERVATION DESIGNATIONS (Context Report)</u>	Swansea Docks
	<p>Statutory: None Non-Statutory - The location of the docks within the Swansea Bay area should be noted and with particular reference to local environmental works associated with the Tawe Barrage.</p>	

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Swansea Docks
	<p>Understood to be private - ABP with some Local Authority interests in the Marine and waterside development. Swansea Yacht club based in Tawe upstream of river and understood to have an interest in the north eastern cell of the marina.</p>	

A.5	<u>COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)</u>	Swansea Docks
	<p>The following coastal defences presently exist within this management unit :</p> <p>W.84.5280 Swansea West Pier 0.56Km with adjacent dunes W.84.5266 Swansea East Breakwater 0.4Km W.84.5290 Swansea Queens Dock 2.4Km Sea wall & revetment (MU3/2)</p>	

Management Unit 3/1

A.6	<u>OBJECTIVES</u>								
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17	

Management Unit 3/1

PART B Intervention Appraisal		Swansea Docks			
Ref	Topic				
B.1	<p>Shoreline Description - Refer to Context Report</p> <p>Coast Edge Type - Material - Hard engineering - breakwaters, piers etc</p> <p>Foreshore Type - Material - Navigation channel with sand/silt shore to either side</p> <p>Developed/Undeveloped - Developed - The Docks complex can be divided between the west and east side of the river Tawe. On the western side of the river there is a dedicated marina for leisure and small commercial craft. On the eastern side of the river the large commercial/industrial basins exist. The upper reaches of the river are mainly leisure and the adjacent to the barrage there is a commercial fishing quay. Downstream of the barrage there a ferry terminal (Swansea - Cork).</p> <p>Defended/undefended - Defended</p> <p>Orientation/exposure - orientation of breakwaters and access to port varies. Exposure would also vary with position although the outer section of the training breakwaters would be subject to high wave exposure.</p>				
	B.1.1	Land Use:	Major Port		
	B.1.2	Specific Shoreline Interests:	Commercial and leisure marine traffic		
B.2	<p>SHORELINE EVOLUTION - Refer to Context Report</p> <p>Geology - Intertidal and sub tidal zone adjacent to docks generally comprise muddy sand. The hinterland is Glacial (sand and gravel).</p> <p>Shoreline Movement/Historic Maps - Not specific data. Generally fixed shoreline with approach channel maintained by dredging. Clearly there are significant movements of sediment in the area. Silt would also be deposited from the River Tawe although there is no available information in respect of the Barrage.</p> <p>Development/Industry - Taff Vale railway to Swansea docks opened 1850. Between 1700 - 1740 16No collieries at Swansea Tawe barrage completed 1992</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Port of Swansea including commercial and leisure marine traffic. Ferry terminal.	Property Loss	U	Environmental Losses
			Infrastructure Loss	U	Tourism
			Land Loss	U	Social Effects
			Property Flooding		Historic Environment Losses
			Land Flooding		
			Transport disruption	U	
			Recreation Losses	U	
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. Future viability of the Port.		
		<u>Preliminary Value of Assets at Risk:</u>	Very High and likely to be measured in 'tens' of millions		CPA funding is not certain.
	B.3.2	Cost Implications: Maintenance cost of associated protection works could be in excess of £1m per annum			
	B.3.3	Economic Viability: Viable			

Management Unit 3/1

PART C Strategic Policy Appraisal**Swansea Docks**

C.1 MATRIX ASSESSMENT					Coastal Managers : ABP/CCS				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT					
EFFECTS ON COASTAL PROCESSES	Significant change as natural processes would begin to dominate	No change in current trends and effects	Increase in impacts over and above present intervention	Significant change as natural processes would begin to dominate					
EFFECTS ON NATURAL ENVIRONMENT	Natural environment would evolve without human intervention.	No change from current impacts	Effect unknown and would depend upon the extent and scale of advance	Removal of the present built environment may result in benefit to the natural environment					
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Major effects on port and surrounding facilities	Would maintain status quo	Would secure existing built environment	Significant effect as coast edge built environment would be lost					
EFFECTS ON DEVELOPMENT & LAND USE	Land use would eventually change and removal of development potential	Present land use could continue and opportunities for development would increase	Likely to increase development potential and secure current land use	Land use would change and development potential would be removed					
IMPLICATIONS FOR COASTAL DEFENCES	Breakwaters/pier walls would deteriorate over time.	Increased expenditure as existing defences age.	Significant civil engineering works would be required	Coastal defences would be removed or allowed to fall over time					
EFFECTS ON ADJACENT M.U'S	Major impacts on adjacent management units. Likely accelerated recession to west.	Little change from current impacts on adjacent MU's	Effects are likely to be significant and would be determined by the scale of works	Significant effects likely as existing coastal protrusions are removed					
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Loss of coastal structures and sediment movement (in fill channel) would increase	Cost of maintaining existing structures will increase. Also, changes in sediment regime likely to effect dredging operations	Civil engineering works would need to take account of increased threat.	Retreat would accelerate or occur earlier.					
CONCORDANCE WITH OBJECTIVES	Does not accord with objectives	General concordance with objectives apart from	Does not accord with objectives	Does not generally concord with objectives					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Potential medium to long term opportunities (B) - Potential Gains	(A) - None (B) - No Change	(A) - None known (B) - No Information	(A) - Potential for environmental enhancement depending on form and extent of retreat. (B) - Gains					
ECONOMIC VIABILITY	Not likely to be viable	Likely to be viable	Not likely to be viable	Not likely to be viable					
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable for most criteria	Not suitable	Not suitable					
RELATIVE SUSTAINABILITY									
Social	- Ve	Baseline	- Ve	- Ve					
Economic	- Ve	Baseline	- Ve	- Ve					
Environmental	+ Ve	Baseline	- Ve	+ Ve					

Management Unit 3/1

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		
C.2.1	Existing Coastal Defence Policy:	Hold line, maintain navigation channel	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line Anticipated Long Term: Hold Line - subject to long term future/development of Swansea Docks.	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess, commercial prosperity of Swansea docks and potential for impacts upon other marine traffic currently benefiting from navigation access.	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M7, M13, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Maintenance/monitoring strategy	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 6, 7, 8, 9, 11	CP 12
C.3.1.2	Natural Environment:		
C.3.1.3	Human and Built Environment:	HB 4, 6, 12, 15, 17, 17	HB 5
C.3.1.4	Coastal Defence:	CD 4, 6, 7, 9	CD 8
C.3.1.5	Development:	D2	D4
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Navigation in and out of port facilities; high walls and walkways	
C.3.2.2	Access:	Marine access through locking systems - Summer peak periods.	
C.3.2.3	Industrial Activities:	Major commercial area around docks - not all associated with port operations	
C.3.2.4	Human Pressures:	Impacts of dredging on near shore sediment supply	
C.3.2.5	Tourism/Recreation:	Marina and associated tourism activity	

Management Unit 3/1

C.4	OBJECTIVES RECONCILIATION		Swansea Docks
	The preferred policy accords with the following objectives for this management unit	OB 2, 3, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	OB1, OB4, OB8	
	OB 1 - To be compatible with natural coastal processes and avoid effects elsewhere on the shoreline		
	OB 4 - To maintain, manage and encourage where appropriate the utilisation and development of natural coastal defences.		
	OB 8 - To minimise and mitigate against adverse effects on the natural shoreline environment and where possible enhance it.		

Management Unit 3/2

MANAGEMENT UNIT No. 3/2 Swansea Docks (Dock Wall) & BP Tank Farm

From	Swansea Docks (east side of entrance)	266900E 191800N
To	BP Tank Farm (SSSI boundary)	270300E 193000N
Approximate Length	4Km	(Refer also to MU 3/1)

PART A Objectives, Issues and Statutory Details Dock Wall & BP Tank Farm

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Dock Wall & BP Tank Farm
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles
CP3	Coincidence of high tides and storms	Impacts on defences, overtopping
CP4	Dune toe behaviour - erosion/regeneration	Possible impacts on adjacent MU Note channel
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Site is located between two river and harbour entrances
CP7	Siltation of estuaries and ports;	Not directly relevant
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Form of coast is important - link to strategic Neath element possible
CP9	Sea level rise and increased storminess	Overtopping and increase in damage to defences - narrow intertidal zone/deep water
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Effect on configuration of near shore zone including low water channel
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major general concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Impacts of dredging and Neath training walls in forming reclaimed area extending Crymlyn Burrows and SSSI

NATURAL ENVIRONMENT		Dock Wall & BP Tank Farm
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Proximity of SSSI to be taken into account
NE3	Water Quality	General importance
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	New outfall with associated treatment works at east end of dock.

Management Unit 3/2

HUMAN & BUILT ENVIRONMENT		Dock Wall & BP Tank Farm
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	No significant issue - no permitted access for public.
HB2	Public access to the foreshore	No general access apart from path at eastern limit of tank farm through burrows.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	No paths parallel to shoreline
HB4	Fisheries interests	Possible beach casting an fishing from dock walls.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Potential conflict at boundary with SSSI
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known issue
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Pillboxes around dock perimeter
HB8	Vehicular access/parking/road congestion	No general access/no parking
HB9	Importance of beach quality to tourism	General importance and potential knock-on to adjacent MU's
HB10	Balance between traditional and green tourism	
HB11	Importance of recreational use of foreshore and contribution to local economies	No specific issue
HB13	Human pressure on natural assets such as dunes	Impacts on path adjacent to BP tank farm fence line
HB14	Beach texture - sand/silt	Varies sand and sand/silt
HB15	Access for emergency services (including life boat)	Limited access to foreshore - steps in dock area
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Dock facility outer coast protection wall for Queen's Dock
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Potential impacts from outside MU boundaries - Swansea/Neath

COASTAL DEFENCE		Dock Wall & BP Tank Farm
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Depends upon future of Swansea dock and BP Tank Farm (note new outfall arrangement could be affected)
CD3	Adequacy/condition of existing defences	Little data. Recent sea wall with steep rock armour - exposure is high.
CD4	Maintenance of existing defences	No information - maintenance is likely to be high
CD5	Dune erosion	Effecting adjacent MU
CD7	Private sea defences	YES - ABP and BP
CD8	CPA funding of Coast Protection	Not applicable
CD9	The role of the foreshore/beach as a defence	Greater role in easterly areas

Management Unit 3/2

DEVELOPMENT		Dock Wall & BP Tank Farm
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Possible development demand/change of use. No known conservation within MU
D2	Sustainability	Development would need to consider condition and sustainability of existing defences
D3	Preservation/enhancement of landscape value	Note pillboxes
D4	Future of large industrial frontages	Uncertain in respect of BP installation
D5	Impacts of coastal development.	Limited and shoreline is already developed
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Dock Wall & BP Tank Farm
	No specific reference found in LG Plan regarding docks and BP Tank Farm. Future of BP Tank farm in doubt (Note - associated pipelines to east) and potential impacts upon part of dock operation.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Dock Wall & BP Tank Farm
	Statutory: Immediately adjacent to SSSI Crymlyn Burrows	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Dock Wall & BP Tank Farm
	ABP & BP. Welsh Water treatment works and outfall location along Jersey Marine and therefore incorporated into dock area. Sea outfall through outer dock defences and across (below) intertidal zone.	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)	
	The following coastal defences presently exist within this management unit :	
	W.84.5290 2.4Km - Revetment with high exposure (ABP)	
	W.84.BP Tank Farm - Seawall and revetment with high exposure (ABP/BP)	

A.6	OBJECTIVES								
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 3/2

PART B Intervention Appraisal		Dock Wall & BP Tank Farm			
Ref	Topic				
B.1	<p>Shoreline Description - Refer to Context report</p> <p>Coast Edge Type - Material - Defended with linear protection with Queen's dock to west and BP tank farm in east of MU. Access and the port facility generally has been considered in MU 3/1.</p> <p>Foreshore Type - Material - Sand and Sand/Silt. Intertidal channels draining from Crymlyn Burrows along MU frontage</p> <p>Developed/Undeveloped - Developed with industry</p> <p>Defended/undefended - Defended as stated above</p> <p>Orientation/exposure - South east to south with high exposure</p>				
	B.1.1	Land Use:	Heavy industry - Oil storage and commercial marine traffic into port (MU 3/1)		
	B.1.2	Specific Shoreline Interests:	Ditto		
B.2	<p>SHORELINE EVOLUTION - Refer to Context Report</p> <p>Geology - Glacial</p> <p>Shoreline Movement/Historic Maps - No data</p> <p>Development/Industry - Development of the port in the 1850's involved advancing the shoreline to accommodate the docks and wharfing facilities. Coincided with the establishment of the Taff Vale railway.</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Swansea Queen's dock and BP tank farm	Property Loss		Environmental Losses
			Infrastructure Loss	U	Tourism
			Land Loss	U	Social Effects
			Property Flooding		Historic Environment Losses
			Land Flooding		
			Transport disruption	U	
			Recreation Losses		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. Future of established industries.		
		<u>Preliminary Value of Assets at Risk:</u>	Potentially over £10m		
	B.3.2	Cost Implications: Not clear, however maintenance would be more expensive in the west of the MU as exposure is higher and defences are therefore more exposed. Condition of defences should be checked			
	B.3.3	Economic Viability: Subject to future economic viability of existing industries			

Management Unit 3/2

PART C Strategic Policy Appraisal**Dock Wall & BP Tank Farm**

C.1 MATRIX ASSESSMENT		Coastal Managers : ABP/BP/CCS		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little change in current trends	No significant change	Significant impacts likely in MU and adjacent MU's	Significant changes although unlikely to occur unless matched in MU to east.
EFFECTS ON NATURAL ENVIRONMENT	Little change although impact of low water channel on adjacent MU should be investigated	Impacts likely to be limited	Changes in adjacent MU - Crymlyn Burrows	Possible negative impacts upon adjacent MU SSSI
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Loss of Queen's dock and BP tank farm	Secure existing built environment.	Security for existing built environment	Significant effects with land and infrastructure losses
EFFECTS ON DEVELOPMENT & LAND USE	Removal of development potential	Increased development potential and may result in a change in specific land use	Increased development potential	Land use would change and development potential would be removed
IMPLICATIONS FOR COASTAL DEFENCES	Defences would deteriorate and fail	Significant civil engineering works are likely to be required in the medium term	Very significant	Existing defences would be lost and recession would probably be rapid - geology
EFFECTS ON ADJACENT M.U'S	Significant impacts on adjacent MU's - Access to Industrial port in west and SSSI to east	Little change anticipated from current trends	Significant effect will occur and would need to be carefully assessed	Significant effects upon dock entrance and adjacent Burrows/SSSI
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Losses would occur sooner	Scale and therefore cost of defences would increase.	Increase scale and cost of coast protection elements	Rate of recession would increase
CONCORDANCE WITH OBJECTIVES	Does not accord with main body of objectives	Generally accords with objectives	Does not accord with objectives	Does generally accord with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT	(A) - None known in short term	(A) - None known	(A) - None	(A) - None known in short to medium term
(B) - BIODIVERSITY ISSUES	(B) - Potential gains within MU	(B) - Status Quo	(B) - Probable losses	(B) - Long term gains - impacts on adjacent MU
ECONOMIC VIABILITY	Not likely to be viable	Not clear with present information	Not viable	Not likely to be economic
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable - at present	Possibly suitable	Not suitable	Not likely to be suitable
RELATIVE SUSTAINABILITY				
Social	- Ve	Baseline	- Ve	- Ve
Economic	- Ve	Baseline	- Ve	- Ve
Environmental	Not presently clear	Baseline	- Ve	Short Term - Ve Long term unknown - SSSI

Management Unit 3/2

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Dock Wall & BP Tank Farm
C.2.1	Existing Coastal Defence Policy:	Hold line	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold line Anticipated Long Term: Unsure	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess, future land use	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L4	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M11, M12, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Review condition of existing defences and determine policy in light of future of local industry	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Dock Wall & BP Tank Farm
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 8, 9, 11	CP 12
C.3.1.2	Natural Environment:	NE1, 3, 4	
C.3.1.3	Human and Built Environment:	HB 16, 17	HB 5
C.3.1.4	Coastal Defence:	CD 3, 4, 5, 7	CD 8, 9
C.3.1.5	Development:		D 4
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Potential hazards along existing defences and intertidal zone	
C.3.2.2	Access:	Access is restricted along this management unit	
C.3.2.3	Industrial Activities:	Future of present industrial activity	
C.3.2.4	Human Pressures:	No specific issue	
C.3.2.5	Tourism/Recreation:	Limited along this MU	

Management Unit 3/2

C.4	OBJECTIVES RECONCILIATION		Dock Wall & BP Tank Farm
	The preferred policy accords with the following objectives for this management unit	General accordance with Objectives identified in A6 above	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 3/3

MANAGEMENT UNIT No. 3/3**Neath Estuary Area**

From BP Tank Farm 270300E 193000N
 To Whiteford Point 273000E 191000N
 Approximate Length 3400m (As crow flies)

PART A Objectives, Issues and Statutory Details**Neath Estuary**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Neath Estuary
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles and channel surveys.
CP3	Coincidence of high tides and storms	Greatest sediment movement including dune erosion
CP4	Dune toe behaviour -	Relic dune - vertical cut face & drift when CP3
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Likely to be of strategic importance in Swansea Bay Area.
CP7	Siltation of estuaries and ports;	Major issue - works to training walls/dredging
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Potential importance of Neath estuary and shoreline either side within Swansea bay context
CP9	Sea level rise and increased storminess	Potential trend changes in processes & impacts on near shore and estuary environment. Vulnerability of training wall as exposure increases.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Shoreline orientation - drift direction fluctuations/trend behaviour
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Local impacts and broader dredging issues including navigation dredging to Swansea & Port Talbot.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Important local issue concerning marine dredged aggregate and navigation dredging

NATURAL ENVIRONMENT		Neath Estuary
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Crymlyn Burrows SSSI abuts the western training wall (3km common frontage). Special Landscape Area. The dunes are a biodiversity habitat
NE3	Water Quality	Potential issue as use of estuary may change over time. A number of small discharges present.

Management Unit 3/3

HUMAN & BUILT ENVIRONMENT		Neath Estuary
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (water activities)	Water activities - Monkstone yacht club
HB2	Public access to the foreshore	Likely to increase over time - development
HB4	Fisheries interests	Limited fishing boat interests
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Navigation requirements - sustainability and impacts on adjacent SSSI
HB7	Preservation of the historic environment -	Possible historic value of training walls
HB11	Importance of recreational use of foreshore and contribution to local economies	Limited at present - significant potential development.
HB12	Marine access - Port/harbour/launching facilities	Commercial goods port with wharf, marina and slipway facilities
HB13	Human pressure on natural assets such as dunes	Possible impacts in vicinity of main approach to SSSI
HB15	Access for emergency services (including life boat)	Possible future issue.
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Harbour - future changes resulting from closure of BP sites and also Energy Park development.
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Important local issue

COASTAL DEFENCE		Neath Estuary
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Subject to result of local development plans, potential impacts on Aberavon sea wall.
CD3	Adequacy/condition of existing defences	Review of function and adequacy
CD4	Maintenance of existing defences	Defences mainly comprise training walls, maintenance/development/impact on local processes.
CD5	Dune erosion	Extensive dune system at Crymlyn, eroding relic dune east of Aberavon sea wall.
CD6	Condition of flood banks/sea defences	Works at upstream end to training walls to manage ebb flows.
CD7	Private sea defences	Training walls
CD8	CPA funding of Coast Protection	Eligibility criteria. Determination and apportionment of benefits
CD9	The role of the foreshore/beach as a defence	Significant - shallow sloping foreshore with, wide breaker zone

Management Unit 3/3

DEVELOPMENT		Neath Estuary
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Appropriate balance - conservation areas with development of former industrial areas.
D2	Sustainability	Long term future of navigation to Neath harbour.
D3	Preservation/enhancement of landscape value	Opportunities to improve landscape value with current development and removal of chemical plant. Special Landscape Area.
D5	Impacts of coastal development.	May increase viability of port.
D6	Integration and conflict with other management plans	Proximity of SSSI to training walls

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Neath Estuary
	The development of an Energy Park including a Power Station is underway - Plans or policy for the waterside area and the estuary are not known.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Neath Estuary
	Statutory: SSSI Crymlyn Burrows Non-Statutory: Second tier sites under consideration by Unitary Authorities - SINC/CMP & LEAPS (EA)	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Neath Estuary
	Mostly private ownership (BP). Interests ranging from environmental, leisure and industrial.	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)					
	The following coastal defences presently exist within this management unit :					
Defence Code	LOCATION	Length Km	Asset Type - Ownership	Crest Level m (AOD)	Deg. of Exp.	Min Res Life (yrs)
W.83.4101	Jersey Marine	1.07	Revetment P		High	
W.83.4103	Jersey Marine Beach	2.05	Dunes P		High	
W.83.4105	Monkstone Sailing Club1	0.17	Sea Wall P		Low	
W.83.4108	Monkstone Sailing Club 2	0.76	Other Art/clay shore/cliff		Low	
W.8314115	E/wood to Sch 4 Boundary	0.6			Low	
W.83.4119	Britton Ferry Giants Grave	0.8				
W.83.4125	Old Dock Entrance	0.1	Breakwater P			
W.83.4130	BP Jetty	0.6	Breakwater P			
W.81.4001	BP Jetty	0.4	Dunes CPA		Low	
W.81.4005	Little Warren	1.0	Revetment P		High	
W.81.4010	Baglan Burrows	1.26	Revetment CPA			
Note - Training walls do not appear to be included in the coastal survey. The training walls are major controlling features in this management unit (MU) and have relevance beyond this MU. The training walls and modifications to the training walls have significant impact upon near shore coastal processes.						

Management Unit 3/3

A.6	<u>OBJECTIVES</u>								Neath Estuary
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	X	X	OB 13	X	OB 15	OB 16	OB 17	

Management Unit 3/3

PART B Intervention Appraisal		Neath Estuary
Ref.	Topic	
B.1	<p>SHORELINE DESCRIPTION:</p> <p>Coast Edge : The coast edge changes from a stable dune system as the shoreline turns into the Neath estuary which is dominated by the two training walls. The training walls abut the dune/burrows which also includes an area of marshland. East of the training walls there is a further area of marsh and dune/burrows. The eastern area of the management unit has an eroding dune. The Neath estuary has a number of wharfs and minor defences.</p> <p>Foreshore Type: Wide sandy foreshore..</p> <p>Developed/undeveloped: Mostly developed around estuary or earmarked for development. Western area undeveloped or leisure interest (golf) with inland area comprising major road and industry.</p> <p>Defended/undefended: Mostly undefended either-side of estuary with training walls and various defences with river mainly concerned with port operations.</p> <p>Orientation/exposure: Orientation and exposure varies across the unit. In east dune/burrow face generally south to south east with moderate exposure. In western part of MU shore position varies with Baglan Burrows set-back and well protected and the dunes system to east more prominently exposed and eroding.</p>	
	B.1.1	<p>Land Use:</p> <p>Harbour/port for commercial goods and some leisure interest at Monkstone yacht club. Dune/burrows area to west has a BP pipeline. Land to east currently occupied by BP Chemicals. Due to close with redevelopment planned in due course.</p>
	B.1.2	<p>Specific Shoreline Interests:</p> <p>Shipping (Sand and goods wharfs including BP Jetty facility) Boating, and environmental interests to west at Crymlyn Burrows.</p>
B.2	<p>SHORELINE EVOLUTION (Refer to Context Report Section 3)</p> <p>Geology: The coastline mostly comprises sand with a muddy sand near shore zone. The hinterland is generally Alluvium at the river Neath and to the east. Sandstone is located to either side of a large area of peat bog - Crymlyn Bog.</p> <p>Shoreline Movement/Historic Maps: Although the shoreline has generally advanced (exception dune frontage west of Aberavon sea wall) beach profiling data suggests a beach gradient trending steeper with the exception of the Baglan Bay/Burrows area east of the training walls.</p> <p>Development/Industry: Former major coal port with seven working collieries located at Britton Ferry in the early 1700's. First recorded tidal cut in estuary at about the same time and therefore one of the earliest coal ports along the south Wales coast. The hinterland is currently undergoing significant changes with the immanent closure of BP Baglan and the development of the energy park.</p> <p>Gains/Losses - Sand drift accumulating on south east side of training walls and regular dredging of navigation channel. Significant survey information within the channel and very little outside. Processes and movement likely to change as a result of changing intervention policy from maintenance dredging to modifications to east wall. Impacts unknown.</p>	

Management Unit 3/3

B.3	PRELIMINARY ECONOMIC APPRAISAL				
B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
	<p>Short/Medium Term: increase in deposits in estuary following departure of BP with consequent reduction in navigable access. Deterioration of training wall and possible changes to SSSI. Dune erosion at Aberavon will eventually threaten sea wall as foreshore levels reduce.</p> <p>Long Term: Viability of the Neath Harbour uncertain, potential loss of commercial marine access and development potential.</p>	<p>Property Loss</p> <p>Infrastructure Loss</p> <p>Land Loss</p> <p>Property Flooding</p> <p>Land Flooding</p> <p>Transport disruption</p> <p>Recreation Losses</p>	<p>U</p> <p>U</p> <p>U</p> <p>U</p>	<p>Environmental Losses</p> <p>Tourism</p> <p>Social Effects</p> <p>Historic Environment Losses</p>	<p>U</p> <p>U</p> <p>U</p>
	<p>Factors influencing the evaluation of benefits in this MU: Sea level rise and increased storminess; condition of existing defences; commercial changes in use of estuary and approach to maintenance of navigation.</p>				
	<p>Preliminary Value of Assets at Risk: Tangible benefits apply to the eventual loss of the port facility which would be valued in £millions. Valuation of intangible benefits are not readily available. CPA funding of any works to training walls is unlikely to be straightforward. However, as a strategic feature in the sub-cell, the area requires monitoring and study and this work is more appropriately funded as a strategic study.</p>				
B.3.2	<p>Cost Implications: The determination of a sustainable approach to the management of the estuary taking into account the various issues is required. The options in achieving this may vary in method and cost and it would be appropriate to examine all options including the consideration of environmentally sympathetic approaches to maintaining the navigable channel.</p>				
B.3.3	<p>Economic Viability: Although most of the shoreline is privately owned, the effects of significant changes of policy in the Neath estuary are likely to affect other interests. The economic viability is not readily addressed as the approach to maintenance works are likely to change. In addition the revenue and expenditure are not known. There is however likely to be a case for maintaining some navigable access in the estuary.</p>				

Management Unit 3/3

PART C Intervention Appraisal	Neath Estuary
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C.1 MATRIX ASSESSMENT		Coastal Managers : NPTCBC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Changes likely as a result of increased sand encroachment between walls.	Reduce sediment drift supply from current dune erosion. Not likely to be only source	Significant effects if line were to be artificially advanced.	Significant changes in near shore and intertidal environment
EFFECTS ON NATURAL ENVIRONMENT	Changes to SSSI will occur in medium term as west wall deteriorates and is overrun	Little anticipated change	If generally applied then effects would be very significant	Loss of part of SSSI - extent would need to be assessed and would depend upon details
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Possible long term effect dependant upon channel behaviour.	Little change	little effect apart from securing current land use.	Potential effect on A483 and surrounding hinterland. Impact in estuary and to east anticipated.
EFFECTS ON DEVELOPMENT & LAND USE	Impact upon use of Neath harbour as part of/adjacent to energy park development.	Increase development potential and land available for development - would only be reasonable on east side of estuary.	Further enhance development potential	Significant impact upon proposed development and current land use in respect of port facilities and other local interests
IMPLICATIONS FOR COASTAL DEFENCES	Limited impact in short term. Dune recession in east of MU will effect MU 3/4	Significant if artificial defences were adopted throughout	subject to extent however implications would be for major civil engineering works	limited impacts within MU
EFFECTS ON ADJACENT M.U'S	Impact likely MU 3/4	impacts unknown	Effects would be anticipated and would need to be carefully examined.	Would effect MU's to either side as adjacent shorelines would become more exposed - dependant upon adjacent adopted policies.
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Will change intertidal zone and effect Crymlyn Burrows and marsh areas	Hold line becomes more costly and use of natural methods along dunes becomes less sustainable	Increase design in criteria and capital works	increase rate of recession and form of intertidal zone.
CONCORDANCE WITH OBJECTIVES				
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Unknown (B) - Evolution - Gains/Losses	(A) - Would depend upon form protection along environmentally sensitive frontages. (B) - Unknown	(A) - Limited or none (B) - Unknown	(A) - None known (B) - Losses likely
ECONOMIC VIABILITY	Dependant upon port economics - generally likely to be viable	Not likely to be viable in general - selectively this policy may be viable	not likely to be viable	Not likely to be viable
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to suitable	Selectively viable subject to the further study - justification	Generally not suitable. Specifics sections may need to be studied	Not suitable
RELATIVE SUSTAINABILITY				
Social	1 Baseline Dune	2 Baseline Training Walls	- ve	- ve
Economic	1 Baseline Dune	2 Baseline Training Walls	- ve	- ve
Environmental	1 Baseline Dune	2 Baseline Training Walls	- ve	- ve

Management Unit 3/3

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Neath Estuary
C.2.1	Existing Coastal Defence Policy:	Do Nothing apart from Neath estuary management where hold line applies. Construction works/modification to the eastern training wall is carried-out for navigation purposes and is likely to have an impact on coastal processes.	
C.2.2	Future Coastal Defence Policy:	<p>Short Term: Do nothing apart from Neath estuary and possibly eastern dune system (Aberavon). Strategy study required to examine full range of management options throughout MU set against proposals for hinterland development, port economics, environmental assets and effects on adjacent MU's.</p> <p>Anticipated Long Term: Subject to outcome of local study.</p>	0 - 5 years
C.2.3	Uncertainties/Dependencies:	Grant aid priorities/qualification/economics/private funding; sea level rise and increased storminess; strategic littoral drift climate; changes in management of port & training walls and consequent unknown impacts on coastal processes resulting from current construction works to change crest levels on eastern sea wall.	
C.2.4	Further Studies:	S1, S2, S3, S5, S6, S7, S9, S10, S11, L1, L3, L5	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M5, M7, M8, M10, M11, M12, M14, M15, M16, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority :	Maintenance dredging in short term and maintenance of training walls.	
C.2.7	Reasons for Change:	The need to adopt an informed approach to intervention	

Management Unit 3/3

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC			Neath Estuary
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)			
	Concordance with Short Term Policy STP		OK with STP/Neutral (assume local strategy is commissioned)	Not OK with STP
C.3.1.1	Coastal Processes:		CP's 1,4,6,7,8,10,11	CP 3, 9, 12
C.3.1.2	Natural Environment :		NE's 1	NE3
C.3.1.3	Human and Built Environment:		HB's 1, 4, 12, 17	HB 2, 5, 16
C.3.1.4	Coastal Defence:		CD's 6, 9	CD 3, 4, 5, 8
C.3.1.5	Development:		D's 1, 2	D 3, 5
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)			
C.3.2.1	Safety:		Navigation; Possible public safety issue during spring tide cycles - wide intertidal zone.	
C.3.2.2	Access:		Navigation; access to SSSI.	
C.3.2.3	Industrial Activities:		Dredging and port activities; adjacent industrial areas and development	
C.3.2.4	Human Pressures:		Possible impact on SSSI	
C.3.2.5	Tourism/Recreation:		Real or perceived link with Aberavon beach. Significant potential of Neath Estuary.	

C.4	OBJECTIVES RECONCILIATION		Neath Estuary
	The preferred policy accords with the following objectives for this management unit		All stated in A6.
	The <u>Current</u> policy <u>does not</u> accord with the following objectives for this management unit		OB 1, 2, 3, 4.
	OB 1 - To be compatible with natural coastal processes and avoid effects elsewhere on the shoreline		
	OB 2 - To continue and enhance present coastal process monitoring to provide further data from which the scale and magnitude of policy actions can be defined together with their effect on the historic and natural environment throughout the life of the SMP.		
	OB 3 - To be adaptable to predicted changes in sea level rise		
	OB 4 - To maintain, manage and encourage where appropriate the utilisation and development of natural coastal defences.		

Management Unit 3/4

MANAGEMENT UNIT No. 3/4**Aberavon Beach**

From	Whiteford Point	272700E 191400N
To	Port Talbot Docks (Afon Afan)	274600E 188800N
Approximate Length	3200m	

PART A Objectives, Issues and Statutory Details**Aberavon Beach**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Aberavon Beach
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles are taken along Aberavon Beach
CP3	Coincidence of high tides and storms	Potential impacts along sea wall - overtopping/damage/beach draw down
CP4	Dune toe behaviour - erosion/regeneration	Dune erosion east of sea wall.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Applies to dune stability and drift inputs
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Potential links between Neath estuary and Aberavon and Port Talbot Harbour and Aberavon
CP7	Siltation of estuaries and ports;	Consideration of adjacent MU's required in management of Aberavon beach
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern in respect of beach levels
CP9	Sea level rise and increased storminess	Potentially significant impacts on coast protection and foreshore levels
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Orientation of shoreline likely to be influenced by modest changes wave approach direction.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Potential links between adjacent marine dredging operations.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major general concern

Management Unit 3/4

NATURAL ENVIRONMENT		Aberavon Beach
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	No immediate designated area - SSSI other side of Neath. Intertidal zone and dunes have environmental significance. Dunes are important biodiversity habitat.
NE3	Water Quality	General concern for beach users
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern throughout

HUMAN & BUILT ENVIRONMENT		Aberavon Beach
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	General safety issue regarding beach use
HB2	Public access to the foreshore	Good
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Promenade extends over much of the MU (East)
HB4	Fisheries interests	Beach casting
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Potential conflicts exist and conflict have been recorded in past (surfers/breakwater construction)
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential conflict between bathers and surfers - Surfers general in east.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No recorded sites
HB8	Vehicular access/parking/road congestion	Access generally good - congestion occasionally in east of MU.
HB9	Importance of beach quality to tourism	Very important
HB10	Balance between traditional and green tourism	Mainly traditional tourism although there is significant landscape interest in the foreshore
HB11	Importance of recreational use of foreshore and contribution to local economies	Not as significant as 20 years past...Plans to increase importance as part of coastal development package.
HB12	Marine access - Port/harbour/launching facilities	Launching slipway only
HB13	Human pressure on natural assets such as dunes	Dune to west are in poor condition. This is mainly because of coastal erosion, although dune trampling has been noted
HB14	Beach texture - sand/silt	Mostly sand (coal issue historically)
HB15	Access for emergency services (including life boat)	RNLI station with access slipway to foreshore for launching
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Eastern breakwater forms part of the protection for industrial activities in adjacent MU
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Navigation dredging either side of Aberavon beach. General concern regarding aggregate extraction

Management Unit 3/4

COASTAL DEFENCE		Aberavon Beach
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Western end of MU this may be feasible. Not likely along main promenade section in medium term
CD3	Adequacy/condition of existing defences	Condition varies and new works recently completed at eastern end.
CD4	Maintenance of existing defences	Concrete revetment/seawall structures will be expensive to maintain
CD5	Dune erosion	Significant issue in west of MU. Potential knock-on effect at Burrows and training walls.
CD6	Condition of flood banks/sea defences	General accretion at Baglan Burrows
CD7	Private sea defences	Not applicable
CD8	CPA funding of Coast Protection	Potential issue for future
CD9	The role of the foreshore/beach as a defence	Wide intertidal zone perform coast protection function. Note link with MU 3/3

DEVELOPMENT		Aberavon Beach
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Comprehensive coastal re-development is planned across the MU
D2	Sustainability	Design life of development would need to accord with commitment for coastal defence
D3	Preservation/enhancement of landscape value	No known sites
D4	Future of large industrial frontages	Impacts from adjacent MU's at Baglan and Port Talbot
D5	Impacts of coastal development..	Impacts in west end of MU or any development immediately adjacent to defences would require careful consideration.
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Aberavon Beach
	Extensive development plans for Aberavon including (from west to east): I10/12 - Business use/Light industry; AS5b - Tourism: car, boat, trailer park & golf course; AS3a - housing; AS5c Tourism/car park; AS4a + b Retail and associated uses; AS7/5a car parking, tourism, coast protection; RT15/16 Sea and freshwater angling.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Aberavon Beach
	None - note SSSI in adjacent MU at Crymlyn Burrows	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Aberavon Beach
	Believed to be Neath Port Talbot CBC	

Management Unit 3/4

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.81.4010 1.26Km Revetment (CPA), high exposure W.83.4700 2.4Km Revetment (CPA), high exposure

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 3/4

PART B Intervention Appraisal		Aberavon Beach																																	
Ref	Topic																																		
B.1	<p>Shoreline Description (Refer to Context report Section 3)</p> <p>Coast Edge Type - Material - Dunes/burrows in west and concrete revetment with sea wall in middle and eastern area</p> <p>Foreshore Type - Material - sand</p> <p>Developed/Undeveloped - Hinterland generally developed or planned for development, coast edge in west is undeveloped. Note treatment works behind dune system.</p> <p>Defended/undefended - Undefended in west and defended in middle and east.</p> <p>Orientation/exposure - South west and high exposure</p> <p>Gains/Losses - Dunes to west are eroding and foreshore to east eroding (note recent coast protection works to remedy) central section frequent gains resulting in wind blown sand through hinterland area.</p>																																		
	B.1.1	Land Use:	Recreation, promenade, highway																																
	B.1.2	Specific Shoreline Interests:	Sea bathing, surfing, jet skiing, sea angling, wind surfing, surf life saving.																																
B.2	<p>SHORELINE EVOLUTION (Refer to Context report Section 3)</p> <p>Geology - Sand with glacial hinterland.</p> <p>Shoreline Movement/Historic Maps - Beach appears to trending steeper</p> <p>Development/Industry - Aberavon was a traditional sea side resort with fun fair. Traditional beach holidays have declined in this area during the last twenty years. Significant development is planned along the coast strip and hinterland and reference should be made to the context report for details.</p> <p>Gains/Losses - General losses with beach draw down in front of sea wall. Apparent movement of low water mark to landward.</p>																																		
B.3	PRELIMINARY ECONOMIC APPRAISAL																																		
	B.3.1	ASSETS AT RISK	<table border="1"> <thead> <tr> <th colspan="2">TANGIBLE BENEFITS</th> <th colspan="2">INTANGIBLE BENEFITS</th> </tr> </thead> <tbody> <tr> <td>Promenade, highway, coast guard/RNLI station.</td> <td>Property Loss</td> <td></td> <td>Environmental Losses</td> </tr> <tr> <td>Hinterland properties in longer term subject to on going maintenance and upgrading of defences. Note development plans.</td> <td>Infrastructure Loss</td> <td>U</td> <td>Tourism</td> </tr> <tr> <td></td> <td>Land Loss</td> <td>U</td> <td>Social Effects</td> </tr> <tr> <td></td> <td>Property Flooding</td> <td></td> <td>Historic Environment Losses</td> </tr> <tr> <td></td> <td>Land Flooding</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Transport disruption</td> <td>U</td> <td></td> </tr> <tr> <td></td> <td>Recreation Losses</td> <td>U</td> <td></td> </tr> </tbody> </table>	TANGIBLE BENEFITS		INTANGIBLE BENEFITS		Promenade, highway, coast guard/RNLI station.	Property Loss		Environmental Losses	Hinterland properties in longer term subject to on going maintenance and upgrading of defences. Note development plans.	Infrastructure Loss	U	Tourism		Land Loss	U	Social Effects		Property Flooding		Historic Environment Losses		Land Flooding				Transport disruption	U			Recreation Losses	U	
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	Recreation Losses	U																																	
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess																																
		<u>Preliminary Value of Assets at Risk:</u>	Likely to be linked to development plans																																
			Grant funding of coast protection needs to considered in the light of development plans and likely recession lines.																																
	B.3.2	Cost Implications: Medium to long term maintenance of sea wall and revetment is likely to increase significantly																																	
	B.3.3	Economic Viability: Viability would need to be tested against appropriate criteria including CPA rules. Also development plan funds.																																	

Management Unit 3/4

PART C Strategic Policy Appraisal	Aberavon Beach
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C.1 MATRIX ASSESSMENT		Coastal Managers : NPTCBC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little change from current trend	Little change in current trends/cyclic behaviour	Effects likely and would depend upon form and scale of works	Would increase sediment supply and reduce beach steepness
EFFECTS ON NATURAL ENVIRONMENT	Little change anticipated with exception of west end dunes/burrows areas	No significant change some gains/losses in west of MU	Potentially detrimental effects	Possible losses to west as shoreline recedes
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual impacts upon built environment.	Secure existing built environment including promenade	Secure built environment	Major impacts as shoreline assets would be lost
EFFECTS ON DEVELOPMENT & LAND USE	Would put current development plan on hold	Enable proposed development to be guaranteed	Secure development potential and increase available land area	Land use would change and development potential removed
IMPLICATIONS FOR COASTAL DEFENCES	Defences would deteriorate and fail over time - concern for potential development of voids	Not significant in short term. More significant in medium term	Significant civil engineering works would be required	Defences could be removed or assets relocated to landward.
EFFECTS ON ADJACENT M.U'S	Possible impacts regarding sediment movement	Subject to western extent of hold the line - potential reduction in sediment inputs from dune erosion	Possible impacts would need to be assessed - subject to scale of proposed works	Likely changes with potentially significant impact to west of MU
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Beach draw down adjacent to coast protection would accelerate - defence will fail earlier.	Form of existing defences may become less appropriate.	Increased scale and cost of civil engineering works	Rate of retreat from natural recession would increase
CONCORDANCE WITH OBJECTIVES	Does not generally accord with objectives	Generally accords with objectives	Does not generally accord with objectives	Does not generally accord with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Not clear although potential at Burrows (B) - No information	(A) - Depends upon form of hold line in west - potential for enhancement (B) - Potential for Gains	(A) - None known (B) - Likely losses	(A) - Limited in short to medium term. Potential opportunities in long term depending upon policies of adjacent MU's (B) - Gains
ECONOMIC VIABILITY	Not likely to be economic and does not accord with development plans	Likely to be viable	Not likely to be viable if applied throughout MU	Not viable across whole MU
GENERAL COMMENT ON POLICY SUITABILITY	Not Suitable	Suitable	Not suitable	Not suitable unless applied locally in west of MU
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline	Detail Required	- ve
Economic	- ve	Baseline	- ve	- ve
Environmental	- ve	Baseline	- ve	- ve

Management Unit 3/4

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Aberavon Beach
C.2.1	Existing Coastal Defence Policy:	Hold line along defended section and do nothing in west of MU (Note recent works in eastern corner advanced line locally to smooth transition to breakwater.	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold line through defended shoreline and review policy in west Anticipated Long Term: Hold line	0 to 5 years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; future of adjacent port facilities - Neath & Port Talbot	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L1, L6	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M8, M9, M11, M12, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Maintain existing defences. Potential for voids under concrete revetments should be notes	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Aberavon Beach
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 4, 10	CP 3, 11
C.3.1.2	Natural Environment:	NE 1	NE 4 (coal)
C.3.1.3	Human and Built Environment:	HB 1, 2, 3, 15	HB 9, 11, 12, 13, 14, 17
C.3.1.4	Coastal Defence:	CD 3, 4, 5, 9	CD 8
C.3.1.5	Development:	D 1, 5?	D 2
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Beach activity including water sports	
C.3.2.2	Access:		
C.3.2.3	Industrial Activities:	Future of Neath and Port Talbot and knock-on effects within this MU	
C.3.2.4	Human Pressures:		
C.3.2.5	Tourism/Recreation:	Balance between tourism and adjacent industries	

Management Unit 3/4

C.4	OBJECTIVES RECONCILIATION Aberavon Beach	
	The preferred policy accords with the following objectives for this management unit	All (Further details regarding future development proposal in relation to proximity to recession line forecast. Reliance of development on CPA funding hold line policy).
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 4/1

MANAGEMENT UNIT No. 4/1**Port Talbot Docks**

From Port Talbot Docks (including River Afan)
 To
 Approximate Length 2000m

PART A Objectives, Issues and Statutory Details**Port Talbot Docks**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Port Talbot Docks
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile on beach inside harbour.
CP3	Coincidence of high tides and storms	Damage to breakwater during storms - Consequent maintenance cost
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Sediment regime in Afan is effected by breakwaters and navigation dredging operations
CP7	Siltation of estuaries and ports;	Comprehensive programme if maintenance dredging to provide deep water access for iron ore ships
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Sediment movement in Swansea bay is effected by the harbour structure and dredging operations to maintain marine access.
CP9	Sea level rise and increased storminess	Potential impact upon near shore processes and maintenance of breakwaters
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Possible impacts upon sediment regime, dredging operations and nearshore zone.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant impacts upon process are likely from nearby navigation dredging operations
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major concern applying to marine aggregate and navigation dredging operations.

NATURAL ENVIRONMENT		Port Talbot Docks
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Impacts unknown upon designated areas. Historic extraction of building sand from foreshore noted at Margam.
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concerns associated with heavy industry. Outfalls/discharges

Management Unit 4/1

HUMAN & BUILT ENVIRONMENT		Port Talbot Docks
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Navigation of small craft to river harbour.
HB2	Public access to the foreshore	No public access
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	No known rights of way (Corrus/ABP)
HB4	Fisheries interests	Fishing craft based in river mooring facilities and land based angling from breakwaters and banks.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Effects on adjacent MU (Aberavon) unknown. Boating club in river Afan and inner dock used for water based recreation.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	None known apart from possible navigation conflict between commercial and leisure craft
HB8	Vehicular access/parking/road congestion	No general access apart from access to river and inner dock.
HB9	Importance of beach quality to tourism	Not applicable
HB10	Balance between traditional and green tourism	Not relevant apart from possible impacts outside MU (Aberavon)
HB11	Importance of recreational use of foreshore and contribution to local economies	Not relevant
HB12	Marine access - Port/harbour/launching facilities	Port Talbot deep water harbour and river Afan jetty and mooring facilities.
HB15	Access for emergency services (including life boat)	Access is good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Major industry on very large hinterland site. The site also has an industrial estate that supports other industries. Deep water port is important to viability of steel making although long term future of steel making is not guaranteed
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Significant marine navigation dredging carried out to maintain deep water access

COASTAL DEFENCE		Port Talbot Docks
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Unlikely unless there is a major change in land use. Retreat unlikely even if port was no longer used for steel making.
CD3	Adequacy/condition of existing defences	Should be confirmed - damage noted during storms
CD4	Maintenance of existing defences	Significant regular maintenance carried out on breakwaters
CD7	Private sea defences	Harbour defences are private. North pier (Aberavon) CPA
CD8	CPA funding of Coast Protection	Not applicable to Port
CD9	The role of the foreshore/beach as a defence	Minor role within harbour - spending beach

Management Unit 4/1

DEVELOPMENT		Port Talbot Docks
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Strategic conservation interest regarding dredging for marine access
D2	Sustainability	Development or changes in use of existing facilities would need to be sustainable
D3	Preservation/enhancement of landscape value	Industrial landscape
D4	Future of large industrial frontages	Future of steel making at Port Talbot is not certain. The recent change in ownership and withdrawal of Corrus from membership of the coastal group should be noted.
D5	Impacts of coastal development..	Coastal development potential exists and impacts would need to be assessed if serious proposals were to be made.
D6	Integration and conflict with other management plans	Harbour activities are of bay wide interest

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Port Talbot Docks
	<p>Neath Port Talbot County Borough Council - Local Development Plan: RT15/16 Facilities for fresh water angling in the River Afan and Eglwys Nunydd Reservoir and sea angling from the Aberavon Beach would be permitted. The expansion of water sports facilities at both Eglwys Nunydd Reservoir and Aberavon Beach will be permitted.</p> <p>Policy I 13 - 88 Hectares of land at the Port Talbot Docks and Port Talbot industrial estate is available for redevelopment for residential, recreational, commercial and industrial uses, subject to proposals being part of a comprehensive scheme encompassing the whole of the area. Proposals relating to existing and new uses will be considered against the impact on the aim of this policy for redevelopment.</p> <p>Policy I 31 - Land is allocated for a water treatment works at Port Talbot Docks</p> <p>Policy T1 - Peripheral road - no development that would prejudice land for the construction of the road.</p>	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Port Talbot Docks
	<p>Statutory: None (Nearest is Kenfig and Margam)</p> <p>Non-Statutory: None</p>	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Port Talbot Docks
	<p>Mainly Corrus and ABP. It is noted that the Afan river harbour is above the Schedule 4 boundary. Hinterland area supports many smaller industries and commercial operations. Corrus (formerly British Steel) have significant coastal interests and until recently were active members of the Swansea Bay Coastal Engineering Group. Corrus have now withdrawn their membership of the Coastal Group. ABP remain members of the Coastal Group.</p>	

Management Unit 4/1

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.81.4028 Port Talbot Tidal Harbour - 2.9Km Revetment with high degree of exposure - Deep water navigation channel

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 4/1

PART B Intervention Appraisal		Port Talbot Docks			
Ref	Topic				
B.1	<p>Shoreline Description - Refer to Context Report</p> <p>Coast Edge Type - Material - Hard engineering forming breakwaters to deep water tidal harbour</p> <p>Foreshore Type - Material - Spending beaches within harbour generally sand and also beach adjacent to River Afan</p> <p>Developed/Undeveloped - Developed</p> <p>Defended/undefended - Defended apart from northerly spending beach inside harbour.</p> <p>Orientation/exposure - Orientation and exposure varies</p>				
	B.1.1	Land Use:	Industrial with other small commercial and leisure craft in river		
	B.1.2	Specific Shoreline Interests:	Steel making - bulk iron ore import		
B.2	<p>SHORELINE EVOLUTION - Refer to Context Report</p> <p>Geology - Interrupted by port development in the 60's (Iron ore terminal) - Note impacts on dune area through Kenfig when a haul road was driven through the dunes along the shoreline to connect the harbour development with Cornelly quarries. Note also slag tip adjacent to Kenfig dunes and also slag deposition on foreshore to the east - refer to MU 4/2.</p> <p>Shoreline Movement/Historic Maps - Links directly to development of port facility in the 60's. General trend of erosion to either side (next MU).</p> <p>Development/Industry - See Above</p> <p>Gains/Losses - Probable erosion along shoreline overall</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Breakwater and harbour wharf facility	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U	Environmental Losses Tourism Social Effects Historic Environment Losses U
		Factors influencing the evaluation of benefits in this MU:	Sea Level rise and increased storminess and confirmation of long term future of steel making at Port Talbot		
		<u>Preliminary Value of Assets at Risk:</u>	Over £5m		
	B.3.2	<p>Cost Implications: Costs need to consider the maintenance of the breakwaters and deep water navigation or dredging requirements for current land use.</p> <p>Corrus have an interest in over 4Km of coastal frontage and have recently withdrawn from membership of the coastal group promoting shoreline management plans. Therefore, information applying to this MU is limited. ABP remain members of the Swansea Bay coastal engineering group.</p>			
	B.3.3	<p>Economic Viability: Understood to be viable as there appears to be no immediate plans to close the steel making facilities. This would need to be reviewed over time.</p>			

Management Unit 4/1

PART C Strategic Policy Appraisal	Port Talbot Docks
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C.1 MATRIX ASSESSMENT		Coastal Managers : NPTCBC		
	DO-NOTHING - Assumes continuation of dredging operations	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Effect on coastal processes will remain unchanged.	No change from present impacts	Impacts would increase	Major change as sediment currently extracted remains within the near shore sediment regime
EFFECTS ON NATURAL ENVIRONMENT	No change	No change anticipated	Possible effects upon adjacent land and marine environment - would be subject to an EIA	Potentially significant and likely to be beneficial
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Damage to breakwater will occur and harbour will deteriorate over time	Works to maintain breakwaters would continue	Possible impacts for other marine traffic. Current built environment would change within harbour area	Significant impacts upon built environment and local economy
EFFECTS ON DEVELOPMENT & LAND USE	Little short term impact. Long term impact upon serviceability of the port	Secure marine access for current land use and future development	No significant effect known at this time - further study would be required	Land use would change - development may be possible landward - remediation issues.
IMPLICATIONS FOR COASTAL DEFENCES	Defences would deteriorate over time	On going maintenance would be required	Significant - scale would be governed by the form and extent of advanced line	Harbour breakwater would deteriorate but would not disappear unless physically removed - unlikely
EFFECTS ON ADJACENT M.U'S	Effects in the long term	Effect would continue as existing	Effects would occur and the scale would be governed by the extent of advance	Significant effects and these effects may be beneficial in terms of beach volumes
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Deterioration of breakwaters will be rapid with event lead damage	Repair and maintenance work commitment would need to increase	Civil engineering works would increase in scale and cost	Retreat rate would increase and demise of breakwaters would occur sooner.
CONCORDANCE WITH OBJECTIVES	Does not generally accord with Objectives	Generally accords with objectives with certain exceptions see C4	Does not generally accord with objectives	Accords with some objectives - unlikely to apply.
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known in short to medium term (B) - Gains	(A) - None (B) - No anticipated change from present	(A) - None (B) - Losses	(A) - Yes (B) - Gains
ECONOMIC VIABILITY	Not likely to viable assuming the port is to remain open	Believed to be viable at present - subject to external (national and international) economic factors	Not likely to be viable	Dependant upon national and international market for steel in medium and long term.
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable at present	Suitable at present	Not suitable	Not suitable at present
RELATIVE SUSTAINABILITY				
Social	+ ve	Baseline	-ve	-ve - with potential conflict
Economic	- ve	Baseline	-ve	-ve
Environmental	Neutral	Baseline	-ve	+ve

Management Unit 4/1

Ref	TOPIC	DESCRIPTION
C.2	PREFERRED POLICY DEFINITION	Port Talbot Docks
C.2.1	Existing Coastal Defence Policy:	Hold Line, continue marine navigation dredging and maintenance of breakwaters
C.2.2	Future Coastal Defence Policy:	Short Term: Continue with existing. Re-consider dumping policy by examination of more appropriate drop zones within near shore system. Anticipated Long Term: Entirely dependant upon the future of steel making in the UK/Wales
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess, The economics of steel making in the longer term
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L7
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M12, M13, M15, M16
C.2.6	Intervention Priority:	Re-consider beneficial use of dredge spoil in near shore zone. (Previous analysis shows dredged material to be 85% silt and 15% sand and therefore unsuitable for beach nourishment)
C.2.7	Reason for Change:	Potential beneficial use of dredged material.

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC	Port Talbot Docks
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)	
	Concordance with Short Term Policy STP	OK with STP/Neutral
	Not OK with STP	
C.3.1.1	Coastal Processes:	CP 1, 2, 6, 7
C.3.1.2	Natural Environment:	
C.3.1.3	Human and Built Environment:	HB 12, 15, 16, 17
C.3.1.4	Coastal Defence:	CD 3, 7
C.3.1.5	Development:	D1
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)	
C.3.2.1	Safety:	Marine traffic
C.3.2.2	Access:	Navigation
C.3.2.3	Industrial Activities:	Large steel making facility
C.3.2.4	Human Pressures:	Public perception of potential for damage to environment from dredging activities. Possibility of further research seeking beneficial uses.
C.3.2.5	Tourism/Recreation:	Balance between heavy industry and landscape/environmental improvement to promote tourism and recreation.

Management Unit 4/1

C.4	OBJECTIVES RECONCILIATION Port Talbot Docks	
	The preferred policy accords with the following objectives for this management unit	All those stated in A6 with the exception of those state below
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	OB 1, 4, 8
	OB 1 To be compatible with natural coastal processes and avoid effects elsewhere on the shoreline	
	OB 4 To maintain, manage and encourage where appropriate the utilisation and development of natural coastal defences.	
	OB 8 To minimise and mitigate against adverse effects on the natural shoreline environment and where possible enhance it.	

Management Unit 4/2

MANAGEMENT UNIT No. 4/2 Port Talbot Dock to Afon Cynfig (Margam)

From Port Talbot Docks (East) 275900E 187300N
 To Afon Cynfig 278000E 183300N
 Approximate Length 4.5Km

PART A Objectives, Issues and Statutory Details**Margam**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Margam
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles
CP3	Coincidence of high tides and storms	
CP4	Dune toe behaviour - erosion/regeneration	Relevant at south eastern end of MU (nr River). Differential recession will have medium to long term impacts
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Afon Cynfig has local effect upon sediment and shoreline geometry
CP7	Siltation of estuaries and ports;	Effects of dredging operations a Port Talbot on beaches
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern and specific interest in impacts of marine dredging for navigation at Port Talbot
CP9	Sea level rise and increased storminess	Knock-on effects from dredging harbour approaches
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Impacts on general sand level and drift direction
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant impact upon coastal process from navigation dredging at Port Talbot. More general impact from marine aggregate extraction possible
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major concern

NATURAL ENVIRONMENT		Margam
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Important designated areas in hinterland of this MU and adjacent MU - Kenfig Burrows (includes intertidal zone)
NE2	Protection of areas designated under international conventions.	Not applicable at present although note should be taken of Kenfig cSAC, NNR & SSSI

Management Unit 4/2

NATURAL ENVIRONMENT		Margam
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	General issue
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concerns although debris does accumulate in south eastern areas of MU

HUMAN & BUILT ENVIRONMENT		Margam
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	No specific issue
HB2	Public access to the foreshore	Restricted vehicular access. Footpath access from Margam
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Access is usually along the foreshore
HB4	Fisheries interests	Shore based angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No significant conflict. Potential conflict between industrial use, conservation and recreation
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Sites present on foreshore - wreck, peat shelf & other finds
HB8	Vehicular access/parking/road congestion	No public vehicular access
HB9	Importance of beach quality to tourism	Important in south eastern section of MU
HB10	Balance between traditional and green tourism	Access restriction ensures no significant conflict.
HB11	Importance of recreational use of foreshore and contribution to local economies	No significant economic contribution
HB12	Marine access - Port/harbour/launching facilities	None - note adjacent major port
HB13	Human pressure on natural assets such as dunes	Some trampling noted - limited
HB14	Beach texture - sand/silt	Sandy in south east. Silt believed to increase towards harbour associated with fall in beach levels
HB15	Access for emergency services (including life boat)	No known restrictions
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Coastal facilities would apply to defences and outfalls protecting steel works
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major general concerns

Management Unit 4/2

COASTAL DEFENCE		Margam
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Long term potential although comprehensive contamination study would be required along industrial frontage where waste material has been dumped along the foreshore. Responsibility for this shoreline should be clarified
CD3	Adequacy/condition of existing defences	Various existing defences/varying standards - in places defences are inadequate and inappropriate
CD4	Maintenance of existing defences	Defence strategy should be reviewed/determined
CD5	Dune erosion	Erosion to south east is increasing exposure along remainder of defended coastline
CD7	Private sea defences	Defence are all private and comprise rock armour, concrete and waste material from the steel making process - slag, skulls etc.
CD8	CPA funding of Coast Protection	Not applicable - responsibility for long term remediation of shoreline should be determined.
CD9	The role of the foreshore/beach as a defence	Wide intertidal zone has significant defence role

DEVELOPMENT		Margam
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Future development would not be permitted unless the shoreline and hinterland was reclaimed from industrial contamination from tipping waste along and adjacent to the foreshore
D2	Sustainability	Development would need to be sustainable in terms of coastal defence.
D3	Preservation/enhancement of landscape value	Several historic features
D4	Future of large industrial frontages	Future of steel making will be influenced by national and international economic considerations. In the event of a change of land use, then large scale demolition and site remediation works would be required
D5	Impacts of coastal development.	Dependent upon form, scale and use.
D6	Integration and conflict with other management plans	Conflict with adjacent conservation interests

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Margam
	<p>Associated policies identified around Port Talbot Iron Ore Port in MU 4/1 with particular reference to peripheral road TP1.</p> <p>Policy is likely to be driven largely by the future of steel making in South Wales and the scale of the Port Talbot operation. Development opportunities for the Steel Works site are likely to be limited as much of the site is likely to be contaminated to various degrees. This also applies to the shoreline and Planning Policy should address the long term impacts of recession along a potentially contaminated coast - Further examination would be required to determine to extent of any risk.</p>	

Management Unit 4/2

A.3	<u>CONSERVATION DESIGNATIONS (Context Report)</u>	Margam
Statutory: SSSI Hinterland - Margam Moors. (Adjacent MU has Kenfig NNR, SSSI, cSAC) Non-Statutory:		

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Margam
Private - Corrus, Foreshore believed to be Penrhys estate. Corrus (formally British Steel) have significant coastal interests and until recently were active members of the Swansea Bay Coastal Engineering Group. Corrus has recently decided to withdraw from membership of Coastal Group.		

A.5	<u>COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)</u>	
The following coastal defences presently exist within this management unit :		
W.81.4033	Steel Works Slag Tip Revetment - Including armourstone sections - 3Km High exposure	
W.81.4034	Margam Burrows Dunes - 1.3Km with high exposure	

A.6	Objectives							
The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	OB 9
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 4/2

PART B Intervention Appraisal		Margam			
Ref	Topic				
B.1	Shoreline Description - Refer to Context Report Coast Edge Type - Material - Rock armour, concrete and industrial waist including slag and old ingots/'skulls' . The material composition of the hinterland within the predicted recession line should be examined to assess any potential contamination risk to the environment. Foreshore Type - Material - Sand Developed/Undeveloped - Mostly heavy industry with large slag tip to south east. Defended/undefended - Mixture of formal defences and ad-hoc defences comprising tipped material Orientation/exposure - South west with high exposure				
	B.1.1	Land Use:	Heavy industry - steel making		
	B.1.2	Specific Shoreline Interests:	Walking, bathing,		
B.2	SHORELINE EVOLUTION - Refer to Context report Geology - Alluvial fans extend along the eastern side of Port Talbot to the Afon Cynfig. Mercia Mudstone covered by blown sand. Shoreline Movement/Historic Maps - general recession although the tipping of slag would have reclaimed some land. Development/Industry - Steel making at Port Talbot has been developed on the site and in the 1960's a major expansion occurred with the new iron ore deep water port constructed, in part, with rock quarried from the Cornelly area and hauled along a purpose made road cutting through the dunes. The road included a river bridge at the Afon Cynfig and traces of the road remain in the form of a track running parallel to the shoreline. Sand winning from the beach occurred and Margam and Sker and the material was used in the building and construction industry. The use of waste material to reclaim land or mitigate against coastal erosion along the shoreline was a common practice in many heavy industries. The material used was often tipped in an ad hoc manner with no regard to chemical composition and contamination risk. It is likely if contaminated material was placed along the shoreline that the immediate coast edge would have been washed by tidal and wave action. This pollution would have already occurred and attention should be focussed upon the risk of any contamination becoming influenced by coastal processes as erosion progresses over time. A programme of trial/bore holes, sampling and testing should be undertaken if such an exercise has not already been completed to assess whether or not contamination is present within the predicted recession zone. Responsibility for this shoreline should be clarified. Gains/Losses - Erosion of shoreline overall.				
	PRELIMINARY ECONOMIC APPRAISAL				
B.3	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Haul road to tip in medium term although there appears to be sufficient room to set back the haul road. Environmental issues should be examined in the event of significant erosion as the material immediately adjacent to the foreshore has the potential to be contaminated.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U	Environmental Losses Tourism Social Effects Historic Environment Losses

Management Unit 4/2

	Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess, question regarding possible contamination of coast edged and immediate hinterland
	<u>Preliminary Value of Assets at Risk:</u>	Not significant in short term apart from possible contamination risk assessment.
B.3.2	Cost Implications: Consideration should be focussed upon two elements for justification purposes. Firstly straight forward coast protection and secondly potential contamination. Initial enquiries should be made in respect of the material tipped along the foreshore the extent on- off shore and across-shore.	
B.3.3	Economic Viability: Viability subject to long term future of steel making and also dealing with the aftermath of any contamination.	

Management Unit 4/2

PART C Strategic Policy Appraisal	Margam
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C.1 MATRIX ASSESSMENT		Coastal Managers : CORRUS/NPTCBC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Effects from differential rates of recession between the dunes and defended coast.	As Do Nothing if dunes are not included in hold the line policy	Effects will be governed by the extent and form of advance proposal	Effects likely and would need to be considered in more detail - ie form and extent of retreat, natural progressing or forced
EFFECTS ON NATURAL ENVIRONMENT	Little change from current situation in short term. Medium to long term impact of an eroding industrial frontage should be examined.	Various options possible ie hold dunes option - impacts would be effected by the form . Hold remainder - refer to potential need to hold to prevent damage to environment	Impacts likely and determination of form and extent would critically effect the impact.	Balance of benefits and dis-benefits would need to be assessed in some detail
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Medium to long term effect on steel works	Secure land used for steel making	Secure land used for steel making	Loss of private coast road servicing steel indust.
EFFECTS ON DEVELOPMENT & LAND USE	Long term changes would occur. Development associated with steel making and requiring a coast edge location is unlikely	Current land use would be secured.	Current land use would be secured	Most likely option to relocate/set-back landward
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would deteriorate and collapse over time.	Significant investment would be required to upgrade existing defences works to an adequate standard.	Scale of civil engineering would increase	Existing defences would either be removed or lost over time.
EFFECTS ON ADJACENT M.U'S	Limited impact subject to ground investigation for contamination	Effects would be governed by form and scale of defences	Effects would be governed by form and scale of defences	Impacts likely as shoreline in this MU moves landward thereby increasing the exposure of adjacent MU's
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Deterioration of defences and dune erosion would occur more rapidly	Scale of works would need to increase to take account of greater wave impacts	Scale of works would need to increase to take account of greater wave impacts	Erosion rates would increase.
CONCORDANCE WITH OBJECTIVES	Does Not Accord with OB1, 2, 3, 7, 8, 9, 10, 15	Does Not Accord with OB 4. OB 1 subject to form	dependant upon form & scale.	Dependant upon results of material tests
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Limited (B) - Potential gains	(A) - Improvement along industrial foreshore and dune frontage would be possible (B) - No known change	(A) - Limited scope for improvement as impacts are likely within intertidal zone. (B) - Losses	(A) - None in the short to medium term unless a comprehensive programme of improvements is funded (B) - Potential long term gains
ECONOMIC VIABILITY	Possibly viable	Possibly Viable	Not likely to be viable	Not likely to be viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable	Not suitable	Possibly suitable subject to findings of contamination risk assessment
RELATIVELY SUSTAINABILITY				
Social	- ve	Baseline	Not Clear	- ve
Economic	- ve	Baseline	Not Clear	- ve
Environmental	- ve	Baseline	Not Clear	- ve (subject to material tests)

Management Unit 4/2

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Margam
C.2.1	Existing Coastal Defence Policy:	Ad-hoc defences along industrial frontage, do nothing along dune frontage. Actual policy is not clear.	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold line along industrial frontage until the composition of the hinterland is understood. Dunes - monitor Anticipated Long Term: Hold or retreat	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess, Potential contamination of coast edge	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L1, L3, L7	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M8, M9, M11, M15, M16, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Maintain existing defence with minimum intervention until any contamination risk is fully assessed against predicted recession rates	
C.2.7	Reason for change:	Prepare considered policy that takes account of coast protection and material legacy.	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Margam
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP		OK with STP/Neutral
	Not OK with STP		
C.3.1.1	Coastal Processes:	CP 1, 3, 4	CP 4
C.3.1.2	Natural Environment:	NE 1, 3, 4	
C.3.1.3	Human and Built Environment:	HB 4, 9, 16	HB 17
C.3.1.4	Coastal Defence:	CD 3, 4	CD 5
C.3.1.5	Development:	D 1	D 4
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Remoteness of site	
C.3.2.2	Access:	Restricted	
C.3.2.3	Industrial Activities:	Major steel making facility, potential contamination risk as a result of erosion - more information required	
C.3.2.4	Human Pressures:		
C.3.2.5	Tourism/Recreation:		

Management Unit 4/2

C.4	OBJECTIVES RECONCILIATION		Margam
	The preferred policy accords with the following objectives for this management unit	General accordance with preferred policy as listed in A6 with exception OB4	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	OB4 - To maintain, manage and encourage where appropriate the utilisation and development of natural coastal defences.	

Management Unit 4/3

MANAGEMENT UNIT No. 4/3			Sker
From	Afon Cynfig	278000E 183300N	
To	Sker Point	278800E 179800N	
Approximate Length	3.8 Km		

PART A Objectives, Issues and Statutory Details	Sker
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A.1	<p>ISSUES (For further detail on this section refer to the Consultation Responses Report)</p> <p>The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :</p>
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COASTAL PROCESSES			Sker
REF.	ISSUE DESCRIPTION	Specific to MU	
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles throughout MU	
CP2	Shingle Storm Beach Behaviour	Not surveyed, but important feature in along most of the MU. Shingle beach not present in central area where dune erosion is most active.	
CP3	Coincidence of high tides and storms	Potential impacts upon dunes and storm beach. Also effects general sand volume on foreshore.	
CP4	Dune toe behaviour - erosion/regeneration	Erosion rates are relatively high. Some sections receive increased level of protection from storm beaches.	
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	No cliffs, however coastal processes effect sand deposition and movement across intertidal zone.	
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Limited impacts from Afon Cynfig. River channel geometry is effected by drift rates across the intertidal zone.	
CP7	Siltation of estuaries and ports;	Sediment regime in this MU has probably been effected by Port Talbot Harbour construction and maintenance of the navigation channel.	
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Wave induced drift brings material onto the foreshore and the extent of any linkage with sand banks is not clear	
CP9	Sea level rise and increased storminess	Significant potential impacts for dune system.	
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Important process that requires further study to understand how beach draw down may expose and liberate buried glacial material.	
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant historic damage resulting from sand extraction from the foreshore. Effect of offshore dredging unknown	
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local political concern	

Management Unit 4/3

NATURAL ENVIRONMENT		Sker
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Major area of national and international designation includes both hinterland and foreshore. Unlikely that damage resulting from natural processes could be avoided. Note - Extent of cSAC is to be modified subject to further survey work in 2001.
NE2	Protection of areas designated under international conventions.	Ditto
NE3	Water Quality	Impacts of industry are unknown.
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Significant accumulations of debris and pollution along foreshore and strandline detracts from exceptional landscape and area of important conservation.

HUMAN & BUILT ENVIRONMENT		Sker
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Uncommercialised, and unspoilt foreshore with no direct rescue 'safety net' for water users.
HB2	Public access to the foreshore	Good access by foot. No public vehicular access
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Footpaths are generally set-back and not formal. Potential impacts if footpaths are eroded in adjacent MU (Rest Bay golf course area)
HB4	Fisheries interests	Local interest in fishing from foreshore. Local vessels also fish the near shore and offshore area - not believed to be commercial
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Conflict between recreation and conservation would increase if access were to be improved or made available to vehicles. This is not planned or believed to be appropriate.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict - beach is very large. Surfing and bathing occur.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Natural peat shelf and wreck.
HB8	Vehicular access/parking/road congestion	Parking at Kenfig Nature Centre or Rest Bay. Peak Summer congestion noted on main road adjacent to paths to Sker (+Pink Bay).
HB9	Importance of beach quality to tourism	
HB10	Balance between traditional and green tourism	Refer to HB5
HB11	Importance of recreational use of foreshore and contribution to local economies	Not believed to contribute significantly at present although possible increases resulting from Objective 1 funding and proposals for Green Tourism projects. Not defined as a tourist beach. Nature conservation and general wildlife interest (bird watching)
HB12	Marine access - Port/harbour/launching facilities	Not applicable

Management Unit 4/3

HUMAN & BUILT ENVIRONMENT		Sker
REF	ISSUE DESCRIPTION	Specific to MU
HB13	Human pressure on natural assets such as dunes	Limited damage resulting from track through dunes. Minor in relation to coastal erosion.
HB14	Beach texture - sand/silt	Sand with occasional surface deposits of silt/foam
HB15	Access for emergency services (including life boat)	Generally good. Coastguard is believed to have a key to gate across track.
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Not applicable
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Significant local issue. Note BP sand trial to deposit material on the foreshore at Sker - beneficial use

COASTAL DEFENCE		Sker
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Retreat is most likely management option and new routes for informal footpaths may be required.
CD2	Cliff erosion	Not applicable
CD3	Adequacy/condition of existing defences	Current natural defences are eroding although there is a mechanism present in respect of shingle bank behaviour across significant lengths of the foreshore
CD4	Maintenance of existing defences	Potential for developing sand re-cycling initiative.
CD5	Dune erosion	Varies along length and significant in places. Long term monitoring in place - analysis required.
CD6	Condition of flood banks/sea defences	Not applicable although medium to long term concerns regarding potential impacts resulting from loss of the foredune and tidal inundation effecting designated area
CD7	Private sea defences	Not applicable - Note: foreshore is privately owned
CD8	CPA funding of Coast Protection	Unlikely that this MU would qualify for grant aid. Some potential for sand re-cycling as part of cell wide initiative.
CD9	The role of the foreshore/beach as a defence	Foreshore plays an important role although the effectiveness reduces during storm surge events.

DEVELOPMENT		Sker
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Development is likely to be sensitive to high conservation value within MU eg footpaths, signage etc. Development on adjoining land is less likely to be sensitive to conservation value eg slag tip adjacent to Afon Cyfig.
D2	Sustainability	No development likely
D3	Preservation/enhancement of landscape value	Monitor and record only

Management Unit 4/3

DEVELOPMENT		Sker
REF	ISSUE DESCRIPTION	Specific to MU
D4	Future of large industrial frontages	Impacts on conservation area resulting from potential development or closure of major industrial facilities.
D5	Impacts of coastal development..	No development likely
D6	Integration and conflict with other management plans	Note link with Merthyr Mawr conservation area, also Bridgend County Borough Council coastal zone management strategy

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Sker
	<p>Policies applying to Kenfig Pool and Dunes indicated below (note link with Merthyr Mawr Warren)</p> <p>EV8 - Development that would adversely affect, or visually impinge upon the following areas and/or their settings will not be permitted.</p> <p>SSSI Site for which Policy EV15 & EV16 applies:</p> <p>EV15 - Development that would destroy or adversely effect, either directly or indirectly, sites and/or settings recognised as being nationally, regionally or locally important for nature conservation will not be permitted.</p> <p>EV16 - Where development proposals are acceptable in terms of EV15, the applicant will still be required to demonstrate that the decrease in the nature conservation value of the site has been kept to a minimum and wherever possible any loss is compensated for by appropriate habitat creation/local enhancement elsewhere within the site or borough.</p>	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Sker
	<p>Statutory: NNR, cSAC and SSSI with important wildlife interest including bird watching. Kenfig cSAC comprises Kenfig Pool and Dunes SSSI and Merthyr Mawr Warren SSSI. These areas contain habitats and species which are threatened in a European context. There is a nature centre with wardens from the County Borough of Bridgend Council working in close co-operation with CCW. The boundary of the cSAC is currently under review.</p> <p>Non-Statutory: LNR</p>	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Sker
	Mixture of public and private. Foreshore is privately owned.	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)
	<p>The following coastal defences presently exist within this management unit :</p> <p>W.53.4001 Kenfig Dunes; 3.6Km Dunes with high exposure</p> <p>W.53.4003 Sker Rocks form southern boundary of MU</p>

A.6	OBJECTIVES																		
	<p>The following objectives as defined in Section 2 of the Plan are relevant to this management unit :</p> <table border="1"> <tr> <td>OB 1</td> <td>OB 2</td> <td>OB 3</td> <td>OB 4</td> <td>OB 5</td> <td>OB 6</td> <td>OB 7</td> <td>OB 8</td> <td></td> </tr> <tr> <td>OB 9</td> <td>OB 10</td> <td>OB 11</td> <td>OB 12</td> <td></td> <td>OB 14</td> <td>OB 15</td> <td>OB 16</td> <td></td> </tr> </table>	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8		OB 9	OB 10	OB 11	OB 12		OB 14	OB 15	OB 16	
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8												
OB 9	OB 10	OB 11	OB 12		OB 14	OB 15	OB 16												

Management Unit 4/3

PART B Intervention Appraisal				Sker		
Ref	Topic					
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - eroding dune system with some sections receiving temporary protection from the development of storm shingle beached</p> <p>Foreshore Type - Sand overlayer with evidence of submerged glacial deposits. One rock outcrop noted on foreshore towards Sker Point.</p> <p>Developed/Undeveloped - coastline is undeveloped although a hinterland scar is visible from the 60's when a wide haul road was driven through the dunes to enable construction materials to be supplied to Port Talbot Harbour.</p> <p>Defended/undefended - Undefended coastline in man made terms - some natural protection provided by shingle storm beach.</p> <p>Orientation/exposure - South west orientation with high exposure</p>					
	B.1.1	Land Use:	Conservation and recreational use for those prepared to make the effort to walk to Sker.			
	B.1.2	Specific Shoreline Interests:	Sun bathing, fishing, surfing, wildlife interests			
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Blown sand over steeply dipping non conformity between Carboniferous and Keuper Marls - Red Marl Facies of the Upper Triassic. Mercia Mudstone become more prevalent towards Rest Bay.</p> <p>Shoreline Movement/Historic Maps - Established trend of shoreline erosion from Local Authority records.</p> <p>Development/Industry - No development or industry although impacts from outside this MU are possible.</p> <p>Gains/Losses - Current phase of shoreline erosion and losses.</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	<p>ASSETS AT RISK</p> <p>Natural environment along coast edge as a result of dune erosion. Some informal footpaths.</p>	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
			Property Loss		Environmental Losses	U
			Infrastructure Loss		Tourism	
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment	U
			Land Flooding	U	Losses	
			Transport disruption			
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; Future of land surrounding MU with particular reference to heavy industry to the North west			
		<u>Preliminary Value of Assets at Risk:</u>	Valuation of conservation area is difficult to assess in economic terms		CPA funding unlikely.	
	B.3.2	Cost Implications: Limited cost apart from management and set-back of footpaths.				
	B.3.3	Economic Viability: Intervention to protect shoreline would not be viable although recent sand recycling could form part of a wider strategy.				

Management Unit 4/3

PART C Strategic Policy Appraisal	Sker
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C.1 MATRIX ASSESSMENT		Coastal Managers : BCBC	
	DO-NOTHING/RETREAT	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE
EFFECTS ON COASTAL PROCESSES	Present trends continue although further examination of the sediment exchanges in the near shore and intertidal zone should be considered		
EFFECTS ON NATURAL ENVIRONMENT	Progressive erosion of dune face and this erosion is not likely to be uniform across the MU because of the presences of shingle storm beaches. It should be noted that the shingle bank features may be severely effected by storm events.		
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Not relevant apart from modifications to human access and possibly beach texture.		
EFFECTS ON DEVELOPMENT & LAND USE	Development is not likely to be an option. Land use may change and would be dependant upon beach texture. Hinterland use may be effected in the long term.		
IMPLICATIONS FOR COASTAL DEFENCES	Natural dune defences will progressively erode.	Refer to notes below	Refer to notes below
EFFECTS ON ADJACENT M.U'S	Impacts upon dunes and defended area in MU 4/2. As Sker recedes, the adjacent shoreline will become more exposed. This is already happening locally in MU4/2.		
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion would increase with greater risk of disruption to the storm shingle beach. Vertical eroding cut faces will become more common.		
CONCORDANCE WITH OBJECTIVES	Generally accords with Objectives identified in A6		
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None likely as natural evolution progressively reduces land area. (B) - Change will occur over time and this may effect significant areas of the hinterland		
ECONOMIC VIABILITY	Viable		
GENERAL COMMENT ON POLICY SUITABILITY	A base policy of Do- nothing with local management and monitoring is the only realistic policy currently available for this shoreline		
RELATIVE SUSTAINABILITY			
Social	Baseline		
Economic	Baseline		
Environmental	Baseline		

NOTES

It is not considered necessary to offer serious consideration of the impacts of HOLD and ADVANCE the line policy options in this Management Unit. These policy options would clearly not be appropriate environmentally, socially or economically. Consideration is therefore only given to the combined DO-NOTHING/RETREAT policy options. Retreat, for the purposes of this management unit should be understood to apply to limited assets such as informal coast paths and not intervention to retreat the existing coast edge. The policy is therefore essentially one of Do-Nothing.



Management Unit 4/3

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Sker
C.2.1	Existing Coastal Defence Policy :	Do Nothing, monitor	
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing, monitor Anticipated Long Term: Retreat	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea Level rise and increased storminess; potential changes in nearby port activity.	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L1	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Record and monitor. Follow-up sand trial initiative	
C.2.7	Reason for Change:	Change would be guided by events and monitoring should be enhanced	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Sker
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 10	CP 3, 4, 9, 11, 12
C.3.1.2	Natural Environment:	NE 1, 2	NE 3, 4
C.3.1.3	Human and Built Environment:		HB 17
C.3.1.4	Coastal Defence:	CD 1, 5, 9	
C.3.1.5	Development:		D 1, 4
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	No specific issue although there may be representation to offer the public life saving facilities - Impact assessment on potential changes to local environment should be investigated	
C.3.2.2	Access:	No specific issue. Local policy to maintain current access arrangements - by foot only.	
C.3.2.3	Industrial Activities:	Impact potential from surrounding industry (outside this MU)	
C.3.2.4	Human Pressures:	No specific issues apart from parking remote from the site	
C.3.2.5	Tourism/Recreation:	Green tourism and low volume of visitors is believed to be most appropriate	

Management Unit 4/3

C.4	OBJECTIVES RECONCILIATION		Sker
	The preferred policy accords with the following objectives for this management unit	The policy generally accords with the objectives although it is accepted that some environmental damage or change is likely from natural coastal processes.	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 4/4

MANAGEMENT UNIT No. 4/4**Rest Bay**

From	Sker Point	278800E	179800N
To	Hutchwns Point	280700E	177000N
Approximate Length	3.5Km		

PART A Objectives, Issues and Statutory Details**Rest Bay**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Rest Bay
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile monitoring
CP2	Shingle Storm Beach Behaviour	Storm shingle beach surveys - Three storm beaches along golf course area
CP3	Coincidence of high tides and storms	Most significant impact between Sker Point and Rest Bay as low lying land may become overtopped
CP4	Dune toe behaviour - erosion/regeneration	Not applicable
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Coarse sediment yield from adjoining promontories supplies storm shingle beach material.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Potential link between off shore sand banks and beaches. Sand banks provide some protection against waves.
CP9	Sea level rise and increased storminess	Significant potential impact on footpath, golf course, beach levels and life savers building.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Foreshore levels through MU fluctuate between seasons and has been observed for many decades. Observation evidence of sand cover to foreshore features along upper foreshore and intertidal zone.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant local concern - difficulty in differentiating between natural events, trends and impacts as a result of human intervention such as dredging (CP12).
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local political issue

NATURAL ENVIRONMENT		Rest Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Greenscape SINC's and pLNR - high landscape value

Management Unit 4/4

NATURAL ENVIRONMENT		Rest Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	Not applicable.
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern

HUMAN & BUILT ENVIRONMENT		Rest Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Cliff edge and gullies around Lock's Common coastline. Strong cross currents effecting bathers are surfers.
HB2	Public access to the foreshore	Generally good from Rest Bay car park
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Paths have been, and continue to erode - path in north of MU is squeezed between foreshore and golf course. Inappropriate attempts to renew foot path in front of golf club.
HB4	Fisheries interests	Rod fishing from shore and local craft fish in near zone/offshore banks.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Potential for conflict exists
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential for conflict increases significantly as high water mark approaches - Particularly on a warm summer day when the surf is up.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No significant interest apart from local field boundaries towards Sker point
HB8	Vehicular access/parking/road congestion	Peak summer road congestion at junction to Rest Bay and illegal parking at "Half Moon" area adjacent to steps. Large hinterland car park.
HB9	Importance of beach quality to tourism	Very important
HB10	Balance between traditional and green tourism	Rest bay provides a gateway to Sker where green tourism would apply.
HB11	Importance of recreational use of foreshore and contribution to local economies	Major beach in the Porthcawl tourism "Product"
HB12	Marine access - Port/harbour/launching facilities	No public launching facility. Slipway adjacent to life savers building
HB13	Human pressure on natural assets such as dunes	Not applicable although some relic sand areas around golf course
HB14	Beach texture - sand/silt	Generally "good" sand
HB15	Access for emergency services (including life boat)	Generally good although Rest Bay often has a wide breaker zone mostly onto rocks at high water

Management Unit 4/4

HUMAN & BUILT ENVIRONMENT		Rest Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Facilities such as car parks and other facilities within Porthcawl providing alternatives to the beach - part of tourism package
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local political issue

COASTAL DEFENCE		Rest Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Possible set-back of foot path to Sker subject to land acquisition.
CD2	Cliff erosion	Slow erosion rates
CD3	Adequacy/condition of existing defences	Defence supporting recently constructed life savers building is inadequate and promoting localised erosion. Some sections of coastline have been protected using "River Training Wall" techniques and are also not appropriate in the long term.. Defences considered inadequate fronting golf links to Pink Bay. Encroachment of sea flooding onto green and fairways.
CD4	Maintenance of existing defences	Mixture of private and public responsibility - works are usually reactive
CD5	Dune erosion	No relevant
CD6	Condition of flood banks/sea defences	Some embankment work has recently been undertaken by the Blundell estate
CD7	Private sea defences	Applies along golf course
CD8	CPA funding of Coast Protection	Funding for footpath is unlikely.
CD9	The role of the foreshore/beach as a defence	Foreshore plays important coast defence role

DEVELOPMENT		Rest Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	No known development demand apart from desire to establish life saving facilities around the coast
D2	Sustainability	Royal Porthcawl Golf Club course. Long term remodelling to address loss of land to sea.
D3	Preservation/enhancement of landscape value	
D4	Future of large industrial frontages	
D5	Impacts of coastal development..	
D6	Integration and conflict with other management plans	

Management Unit 4/4

A.2	<u>STATUTORY PLANNING POLICIES (Appendix A)</u>	Rest Bay
<p>The following general policies have re-produced form the relevant Local Government Plan: EV8 - Development that would adversely affect, or visually impinge upon the following areas and/or their settings will not be permitted. SSSI Site for which Policy EV15 & EV16 applies: EV15 - Development that would destroy or adversely effect, either directly or indirectly, sites and/or settings recognised as being nationally, regionally or locally important for nature conservation will not be permitted. EV16 - Where development proposals are acceptable in terms of EV15, the applicant will still be required to demonstrate that the decrease in the nature conservation value of the site has been kept to a minimum and wherever possible any loss is compensated for by appropriate habitat creation/local enhancement elsewhere within the site or borough. RC 9 - The Borough Council will promote the provision of amenity open space where suitable opportunities arise.</p>		

A.3	<u>CONSERVATION DESIGNATIONS (Context Report)</u>	Rest Bay
<p>Statutory: None Non-Statutory: SINC and recreation open space along with pLNR at Lock's Common</p>		

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Rest Bay
<p>Mixture of private and public- much of the land is believed to be leased to Authority and owned by the Blundell Estate.</p>		

A.5	<u>COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)</u>	
<p>The following coastal defences presently exist within this management unit :</p>		
<p>W.53: 4003 - Sker Rocks; 2.2Km; Hard Rock Shore; Private ownership with high exposure 4005 - Pink Bay Golf Course; 0.58Km; Embankment/clay/silt short; CPA with high exposure 4007 - Rest Bay; 2.0Km; Hard Rock Shore; Private with high exposure</p>		

A.6	<u>OBJECTIVES</u>							
<p>The following objectives as defined in Section 2 of the Plan are relevant to this management unit :</p>								
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	OB 9
OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17	OB 18

Management Unit 4/4

PART B Intervention Appraisal		Rest Bay			
Ref	Topic				
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - Varies from rock to clay/silt. Mostly rock shore</p> <p>Foreshore Type - Sand with small embayments with storm shingle beaches</p> <p>Developed/Undeveloped - Mostly undeveloped with the exception of the life savers building at Rest Bay. Also close proximity of coast path and boundary walls/greens of golf course.</p> <p>Defended/undefended - mostly undefended with the exception of a sea wall and steps at the life savers building and rock armour protection works in along some sections of the golf course.</p> <p>Orientation/exposure - South west orientation with high exposure.</p>				
	B.1.1	Land Use:	Walking, golf, recreation open space.		
	B.1.2	Specific Shoreline Interests:	Sea and sun bathing, surfing and surf life saving.		
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Mercia Mudstone Group outcropping at Sker with hinterland Alluvium towards Kenfig Pool. Unconformity as lithology changes and an outcrop of Carboniferous forming the rock cliffs south of Rest Bay and continuing to Porthcawl Point.</p> <p>Shoreline Movement/Historic Maps - Historic coast edge erosion with recent evidence of retreating low water mark resulting in beach steepening.</p> <p>Development/Industry - No significant development</p> <p>Gains/Losses - Neutral to possible loss.</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Life savers building in medium term. Sections of coast path towards Sker. Golf course in medium to long term.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses U U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess		
		<u>Preliminary Value of Assets at Risk:</u>	A review of coastal asset values should be undertaken. Assets are may not qualify for grant aid	CPA funding for private defences, footpaths and recently constructed life savers building is unlikely.	
	B.3.2	Cost Implications: Estimates are difficult determine. Significant intangible value			
	B.3.3	Economic Viability: Viability is not clear.			

Management Unit 4/4

PART C Strategic Policy Appraisal	Rest Bay
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C.1 MATRIX ASSESSMENT		Coastal Managers : BCBC + Private		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little anticipated change	Significant if applies over whole unit. Little or no impact if applied selectively.	Significant impacts likely	Little anticipated change
EFFECTS ON NATURAL ENVIRONMENT	Potential changes towards Sker point in environment and landscape	Dependant upon form and extent - possible use of natural materials	Potentially significant	Subject to extent of retreat if forced (intervention)
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of life savers building and boundary wall to golf club	Secure existing coastal assets	Would secure existing built environment and coastal assets	Locally significant at Rest Bay
EFFECTS ON DEVELOPMENT & LAND USE	Footpath and golf course would be eventually effected	Would increase development potential along shoreline	Would increase development potential	Land use would change in middle and northern part of MU as foot path and sections of golf course are lost
IMPLICATIONS FOR COASTAL DEFENCES	Armourstone defences and sea wall at Rest Bay would eventually be lost in long term.	Potentially very significant if applied throughout MU. Do minimum could apply to Rest Bay area only - Note coast Path	Significant construction would be required - dependant upon form and scale - this is unlikely to be serious option MU wide	Existing defences would be lost or removed
EFFECTS ON ADJACENT M.U'S	No known effects	No significant effects if do minimum options adopted	Potentially significant impacts	Little known impact apart from very modest increase in sediment supply
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Early loss of coast path, sections of golf course and life savers building	Civil engineering works would need to take account of increased pressures	Scale of civil engineering works would significantly increase	Rate of loss would accelerate
CONCORDANCE WITH OBJECTIVES	Does not accord with OB7 in respect of life savers building	Would not accord with general objectives if applied throughout MU	Does not generally accord with objectives	Does not generally accord with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - Long term losses anticipated	(A) - None known (B) - Gains/losses would be dependant upon scale & form	(A) -None (B) - Losses	(A) - Unknown (B) - Probable losses
ECONOMIC VIABILITY	Generally viable	Not viable across whole MU - selectively viable	Not viable	Not viable throughout MU
GENERAL COMMENT ON POLICY SUITABILITY	View required regarding importance of coast path to Sker	Suitable at Rest Bay - questionable through remainder	Not suitable	Not suitable throughout MU
RELATIVE SUSTAINABILITY				
Social	Baseline	MU wide -ve Selectively +ve	-ve	-ve
Economic	Baseline	MU wide -ve Selectively +ve	-ve	-ve
Environmental	Baseline	MU wide -ve Selectively +ve	-ve	-ve

Management Unit 4/4

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		
C.2.1	Existing Coastal Defence Policy:	Ad-hoc intervention and maintenance by private and CPA	
C.2.2	Future Coastal Defence Policy:	Short Term: Selective Hold Line (do nothing along limestone cliff area to south) - further consultation. Protect coastal path. Anticipated Long Term: Selective hold line with retreat. Reroute coastal path	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; Responsibility and funding (economic assessment)	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M8, M11, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Design energy dissipating structure in front of life savers building.	
C.2.7	Reason for Change:	Move towards managed approach to include all local interests (private owners)	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2	CP 3, 5, 8, 11, 12
C.3.1.2	Natural Environment:		
C.3.1.3	Human and Built Environment:	HB 3, 11, 14	HB 2, 6, 17
C.3.1.4	Coastal Defence:	CD 1, 4, 9	CD 3, 7, 8
C.3.1.5	Development:		
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	The establishment of satellite part time life saving facilities along dangerous sections of coast should be examined.	
C.3.2.2	Access:	Generally good although traffic congestion near beach is common.	
C.3.2.3	Industrial Activities:	Not applicable	
C.3.2.4	Human Pressures	Conflict between bathers and surfers at high water (particularly spring tides)	
C.3.2.5	Tourism/Recreation	Important to visitors and residents.	

Management Unit 4/4

C.4	OBJECTIVES RECONCILIATION	
	<p>The preferred policy accords with the following objectives for this management unit</p>	<p>The preferred policy generally accord with the objectives provided selective hold line is considered at Rest Bay (life saver and access steps, possibly other limited locations). The consequences of losing the foot path to Sker should be examined</p>
	<p>The preferred policy <u>does not</u> accord with the following objectives for this management unit</p>	

Management Unit 4/5

MANAGEMENT UNIT No. 4/5**Hutchwns to Porthcawl Point**

From Hutchwns Point 280700E 177000N
 To Porthcawl Point 281900E 176300N
 Approximate Length 1400m

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Porthcawl
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles
CP2	Shingle Storm Beach Behaviour	Storm beach survey
CP3	Coincidence of high tides and storms	Overtopping at West Drive, debris on road and flood risk
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Durable limestone results in very slow erosion rates
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General issue concerning links between beach levels and dredging
CP9	Sea level rise and increased storminess	Built-up area with high assets values under increasing threat.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Generally rock shore with modest fluctuation although impacts likely in small bays - Town and West Drive
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major general issue - concern regarding impact upon beach levels
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major general issue around coast

NATURAL ENVIRONMENT		Porthcawl
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Adjacent to Locks Common pLNR, ref to recreation and open spaces.
NE3	Water Quality	General local importance.
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Combined emergency storm discharges

Management Unit 4/5

HUMAN & BUILT ENVIRONMENT		Porthcawl
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Rocks can be hazardous, bathing is dangerous, surfing is common off rock points
HB2	Public access to the foreshore	Generally good with exception of parts of rock shore.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Formal and informal footpaths relatively secure (mostly adjacent to highway)
HB4	Fisheries interests	Rod angling and boat fishing
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Potential conflicts dependant upon form and scale of future coastal defence works
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No significant issues - sea bathing is discouraged
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No vulnerability in short to medium term subject to future defence policy
HB8	Vehicular access/parking/road congestion	Congestion on peak summer days and weekends.
HB9	Importance of beach quality to tourism	More important at Town beach adjacent to revetement
HB10	Balance between traditional and green tourism	Generally traditional tourism
HB11	Importance of recreational use of foreshore and contribution to local economies	Significant importance of general shoreline/coast edge infrastructure - promenade/coast path/common.
HB14	Beach texture - sand/silt	Varies between fine sand in low part of intertidal zone to coarse sand and gravels in pocket beaches
HB15	Access for emergency services (including life boat)	Generally good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	No industrial activity
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Significant local issue

COASTAL DEFENCE		Porthcawl
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Limited scope - highway/coast path & general infrastructure built environment.
CD2	Cliff erosion	Durable limestone erosion would be very slow
CD3	Adequacy/condition of existing defences	Varies along shoreline - poor in places - extremes west and east
CD4	Maintenance of existing defences	Important issue for CPA at both Town beach and West drive.
CD6	Condition of flood banks/sea defences	Flood defence/coast protection along West Drive, promenade and also condition of sea wall and beach revetment.
CD7	Private sea defences	None
CD8	CPA funding of Coast Protection	Potential issue regarding intangible assets

Management Unit 4/5

COASTAL DEFENCE		Porthcawl
REF	ISSUE DESCRIPTION	Specific to MU
CD9	The role of the foreshore/beach as a defence	Rock shore and headlands perform significant defence role

DEVELOPMENT		Porthcawl
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Little scope for future development. Significant landscape interest along rock shore
D2	Sustainability	Sustainability of existing defences. Defences for development unlikely
D3	Preservation/enhancement of landscape value	No known proposal that may effect landscape. Careful consideration of defences along West Drive required
D5	Impacts of coastal development..	Potential development in adjacent MU
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Porthcawl
	Landscape conservation and amenity/open space ENV8(4), ENV20 - 23 (T7 & T16) & RC9 - Refer to Context report and Local Plan.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Porthcawl
	General landscape interest - Locks common pLNR	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Porthcawl
	Bridgend CBC/Blundell and crown appear to have main interest	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
W.53.4015	0.42Km Revetment, sea wall CPA responsibility with high exposure
W.53.4017	0.28Km Irongate point hard rock shore (private) with high exposure
W.53.4020	0.6Km sea wall (part revetment) CPA responsibility with high exposure

A.6	OBJECTIVES							
The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 4/5

PART B Intervention Appraisal		Porthcawl				
Ref	Topic					
B.1	Shoreline Description Refer to Context report Section 3 Coast Edge Type - Material - Hard rock shore Foreshore Type - Material - rock and sand lower foreshore Developed/Undeveloped - Mixture of developed (east and west) and undeveloped (Irongate Point) Defended/undefended - Mixture of defended (east and west) and undefended (irongate point) Orientation/exposure - Generally south west orientation with high exposure					
	B.1.1	Land Use:	Recreation, tourism, transport			
	B.1.2	Specific Shoreline Interests:	Walking (promenades), sun bathing, sea views, café/eating establishments.			
B.2	SHORELINE EVOLUTION Refer to Context report Section 3 Geology - Limestone Shoreline Movement/Historic Maps - Little change apart from Town Beach area (upper beach level/sea defences) Development/Industry - Development of sea side/tourism adjacent to Porthcawl at Town Beach and residential to the west Gains/Losses - Mostly neutral with balance slightly towards losses on coarse gravel and sand upper beaches.					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Coast road, common, promenades, property, outfalls and consequential intangible assets.	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding	U	Historic Environment Losses	U
			Land Flooding	U		
			Transport disruption	U		
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; method of benefit evaluation			
		<u>Preliminary Value of Assets at Risk:</u>	Over £10m		Assessment of assets may be influenced by the rules applying to eligibility of grant aid for footpaths.	
	B.3.2	Cost Implications: Up to £4m				
	B.3.3	Economic Viability: Viable to hold line				

Management Unit 4/5

PART C Strategic Policy Appraisal**Porthcawl**

C.1 MATRIX ASSESSMENT					Coastal Managers : BCBC				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT					
EFFECTS ON COASTAL PROCESSES	No change	Little anticipated change	Effect would be commensurate with scale of advance	Effects would be likely and restricted to near shore zone because of hard rock shore					
EFFECTS ON NATURAL ENVIRONMENT	No anticipated change	Significant effect on landscape value if applied throughout MU	Significant effect on landscape value if applied throughout MU	Significant effect if applied to shoreline with intervention - limited impact if applied to coastal assets					
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Increases rate of flooding through West Drive area. Section of promenade would eventually collapse	Secure existing built environment	Secure existing built environment	Significant impacts on human and built environment extending beyond the coastal area of MU					
EFFECTS ON DEVELOPMENT & LAND USE	Medium to long term effects resulting in change to current land use as infrastructure is lost and shoreline becomes more informal	Present land use is maintained. Limited scope for further development. Note development plans to east	Present land use may be maintained. Likely change in landscape and increase in coastal development potential	Current land use will change and development will not be permitted as existing built environment is lost in long term					
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would be lost	Existing defences would be maintained, removed and improved where appropriate	New defences required at significant cost. Scale dependant upon extent of advance	Existing defences would be lost/removed.					
EFFECTS ON ADJACENT M.U'S	No effects known apart from access to pier would be lost as part of promenade collapses	No known effects (excludes works to hold hard rock shore)	Effects likely and determined by extent of advanced line	Impacts likely in medium to long term. Depends upon extent of retreat and whether or not forced					
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Loss of defences would accelerate. Property flooding would occur more frequently	Defences would need to be sufficiently robust with high enough threshold level to prevent hinterland flooding	Civil engineering works would increase in scale and cost	Retreat would occur more quickly associated with significant event lead flooding.					
CONCORDANCE WITH OBJECTIVES	Does not generally accord with objectives	Accords with general objectives	Does not generally accord with objectives	Does not accord with objectives					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - Little known change	(A) - Possible opportunities in terms of landscaping (B) - Little known change	(A) - None likely (B) - Losses probable	(A) - None known (B) - Likely gains					
ECONOMIC VIABILITY	Not viable	Viable	Not likely to be viable	Not viable					
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Suitable	Not likely to be suitable	Not suitable					
RELATIVE SUSTAINABILITY									
Social	-ve	Baseline	-ve	-ve					
Economic	-ve	Baseline	-ve	-ve					
Environmental	-ve	Baseline (existing defences/upper foreshore only)	-ve	-ve					

Management Unit 4/5

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Porthcawl
C.2.1	Existing Coastal Defence Policy:	Hold line	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line Anticipated Long Term: Hold Line	No change
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M8, M11, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	West Drive sea wall, Town beach revetment and vertical sea wall in east of MU (adjacent to Porthcawl Point)	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 9	
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human & Built Environment:	HB 3, 16	HB5, 17
C.3.1.4	Coastal Defence:	CD 2, 3, 4, 9	CD8
C.3.1.5	Development:		
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public use of rock shore	
C.3.2.2	Access:	Generally good	
C.3.2.3	Industrial Activities:	Not applicable	
C.3.2.4	Human Pressures:	Traffic congestion	
C.3.2.5	Tourism/Recreation:	Balance between different forms of tourism between west and east (Trecco Bay)	

Management Unit 4/5

C.4	OBJECTIVES RECONCILIATION		Porthcawl
	The preferred policy accords with the following objectives for this management unit	All not hatched-out in A6 above	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 4/6

MANAGEMENT UNIT No. 4/6**Porthcawl Point to Newton**

From	PORTHCAWL POINT	282000E 176300N
To	NEWTON (Slipway)	283700E 176900N
Approximate Length	1400m	

PART A Objectives, Issues and Statutory Details**Harbour, Sandy & Trecco Bay**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Harbour, Sandy & Trecco Bay
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles and local topo surveys.
CP2	Shingle Storm Beach Behaviour	Isolated locations at Sandy & Trecco Bay
CP3	Coincidence of high tides and storms	Principle cause of erosion and risk to breakwater structure
CP4	Dune toe behaviour - erosion/regeneration	Relic dune - vertical cut face when CP3
CP7	Siltation of estuaries and ports;	Processes in lee of breakwater and harbour
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	
CP9	Sea level rise and increased storminess	Vulnerability of breakwater and eroding coast edge Sand & Trecco bays
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Requires further updating as knowledge increases.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Important local issue.

NATURAL ENVIRONMENT		Harbour, Sandy & Trecco Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Adjacent to Merthyr Mawr which is part of the Kenfig cSAC in the adjacent MU
NE3	Water Quality	Silt in suspension vs pollution
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Update required in respect of local combined discharges (Ogmore link).

Management Unit 4/6

HUMAN & BUILT ENVIRONMENT		Harbour, Sandy & Trecco Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Breakwater & local water activities SLS club
HB2	Public access to the foreshore	Generally good private and public
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Mostly private frontage
HB4	Fisheries interests	Land based rod and boat interests - commercial vessels based in harbour
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Coast protection would need to take account of tourism
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Fishing from breakwater and navigation; bathing/surfing/boating (Harbour & Newton)
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Breakwater is listed
HB8	Vehicular access/parking/road congestion	General issues in Porthcawl (Peak summer days)
HB9	Importance of beach quality to tourism	Very important at Sandy, Trecco & Newton.
HB10	Balance between traditional and green tourism	All traditional however Newton is adjacent to Merthyr Mawr.
HB11	Importance of recreational use of foreshore and contribution to local economies	Very Important throughout MU for Private & public frontage.
HB12	Marine access - Port/harbour/launching facilities	Important Launch site at harbour (inc RNLI) and Newton - NB "Paddle Steamer" including ship quay
HB13	Human pressure on natural assets such as dunes	Relic dune at Sandy Bay
HB14	Beach texture - sand/silt	Newton & Sandy bay low water silt
HB15	Access for emergency services (including life boat)	Harbour and foreshore (low water)
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Harbour, Coney Beach, Trecco Bay etc
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Important local issue

COASTAL DEFENCE		Harbour, Sandy & Trecco Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Subject to result of local development plans. Note built environment at harbour, eastern promenade and breakwater
CD3	Adequacy/condition of existing defences	Most of the defences within this MU are not adequate.
CD4	Maintenance of existing defences	Private/public/development issues
CD5	Dune erosion	Relic dune including section east of Rhych Point - Private residential properties.
CD6	Condition of flood banks/sea defences	Newton flood defence scheme including groynes, sea wall and embankment
CD7	Private sea defences	Trecco & Sandy Bay west

Management Unit 4/6

COASTAL DEFENCE		Harbour, Sandy & Trecco Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD8	CPA funding of Coast Protection	Eligibility criteria. Determination and apportionment of benefits
CD9	The role of the foreshore/beach as a defence	Shallow sloping, wide breaker zones

DEVELOPMENT		Harbour, Sandy & Trecco Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Breakwater - landscape
D2	Sustainability	Sustainability of existing defences
D3	Preservation/enhancement of landscape value	Consideration of breakwater/harbour defences subject of local development plans for foreshore
D5	Impacts of coastal development.	Feasibility
D6	Integration and conflict with other management plans	Porthcawl regeneration strategy

A.2	<u>STATUTORY PLANNING POLICIES</u> (Appendix A)	Harbour, Sandy & Trecco Bay
	The development of appropriately located tourist facilities in the borough will be favoured (TM4(4)). Development plans are currently being progressed in Porthcawl Sandy Bay , harbour & 'Salt Lake' area.	

A.3	<u>CONSERVATION DESIGNATIONS</u> (Context Report)	Harbour, Sandy & Trecco Bay
	Statutory: None Non-Statutory: Second tier sites under consideration by Unitary Authorities - SINC's/ CMP & LEAPS (EA) Note - which is part of the Kenfig cSAC in the adjacent MU	

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Harbour, Sandy & Trecco Bay
	Mixture of private and public ownership. Generally private (or long lease) with exception of the harbour (Cosey Corner) extending along eastern promenade and including eastern half of Sandy Bay and Rhych Point.	

Management Unit 4/6

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :						
Defence Code	LOCATION	Length Km	Asset Type - Ownership	Crest Level m (AOD)	Deg. of Exp.	Min Res Life (yrs)	
W.53.4022	Porthcawl Breakwater	0.11	Breakwater CPA				
W.53.4025	East Pier Harbour, Porthcawl	0.26	B/W Sea Wall CPA				
W.53.4028	Sandy Bay Sea Wall	0.35	Revet/Seawall P				
W.53.4030	Sandy Bay	0.6	Dunes CPA				
W.53.4035	Rhych Point	0.4	HRS P				
W.53.4038	Trecco Bay (1)	0.2	Apron P				
W.53.4039	Trecco Bay (2)	0.3	Embankment P				
W.53.4040	Newton Point	0.9	HRS P				
W.53.4000	Newton Village	0.18	S/wall Revet EA				

Notes - Check length of East Pier Sea Wall; Trecco Bay (1 & 2) Asset type; Rhych Point ownership; Length of EA S/wall

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4		OB 6	OB 7	OB 8	
	OB 10		OB 12	OB 13		OB 15	OB 16	OB 17

Management Unit 4/6

PART B Intervention Appraisal	Harbour, Sandy & Trecco Bay
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Ref.	Topic					
B.1	<p>SHORELINE DESCRIPTION Refer to Context Report Section 3</p> <p>Coast Edge : various protection works to various standards with sections of undefended shore ranging from soft sediment to rock shore.</p> <p>Foreshore Type: rock bed outcropping and extending points and headlands with generally sandy foreshore.</p> <p>Developed/undeveloped: Mostly developed or earmarked for development.</p> <p>Defended/undefended: Defended to varying standards. Defence standard poorest at breakwater and withing two main embayments.</p> <p>Orientation/exposure: generally south to south west in main embayments with east or south eastern facing flanks at Sandy bay and Newton.</p>					
	B.1.1	<p>Land Use:</p> <p>Harbour, lifeboat and launching facilities; tourist beach; parking; amusement ground including gambling arcades and public houses; caravan sites; highway; residential properties; flee market; Wharf for paddle steamer.</p>				
	B.1.2	<p>Specific Shoreline Interests:</p> <p>Boating, sea & sun bathing, surfing, fishing, tourism general including fun fair and caravan sites.</p>				
B.2	<p>SHORELINE EVOLUTION Refer to Context report Section 3</p> <p>Geology: Limestone Points/headlands with soft sediment embayments.</p> <p>Shoreline Movement/Historic Maps: general shoreline recession along undefended sections of coast.</p> <p>Development/Industry: Former major coal port adapted to tourism that has been in general decline in recent history (last 20 years).</p> <p>Proposals for new development of coastal and adjacent areas.</p> <p>Gains/Losses - Erosion across Sandy Bay and increased exposure of breakwater.</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		<p>Short/Medium Term: Breakwater; soft overburden at Rhych Point; parts of Sandy bay; access track and defences at Trecco bay; residential properties adjacent to Rhych Point</p> <p>Long Term: Harbour/RNLI launching facility; general loss of hinterland assets.</p>	<p>Property Loss</p> <p>Infrastructure Loss</p> <p>Land Loss</p> <p>Property Flooding</p> <p>Land Flooding</p> <p>Transport disruption</p> <p>Recreation Losses</p>	<p>U</p> <p>U</p> <p>U</p> <p>U</p> <p>U</p> <p>U</p>	<p>Environmental Losses</p> <p>Tourism</p> <p>Social Effects</p> <p>Historic Environment</p> <p>Losses</p>	<p>U</p> <p>U</p> <p>U</p>
		<p>Factors influencing the evaluation of benefits in this MU: Sea level rise and increased storminess; condition of existing defences</p>				
		<p>Preliminary Value of Assets at Risk:</p> <p>Valuation of intangible benefits are not readily available and would be subject to further study and clarification from NAW in respect of eligibility for . Tangible assets likely to be £15 million.</p>				

Management Unit 4/6

	B.3.2	<p>Cost Implications: Coast protection works would be required to maintain the status quo. The potential for development and possible apportionment of benefits and cost between CPA and development would need to be confirmed. The breakwater is a strategic element in the MU and would cost more than £2.5m to secure.</p>
	B.3.3	<p>Economic Viability: Sections of coast that are entirely private and in single ownership are unlikely to qualify for grant aid and works would therefore need to be justified commercially by respective owners. The same approach applies to public/private development initiatives although justification for grant aid based upon the protection of existing eligible assets may be acceptable.</p>

Management Unit 4/6

PART C Intervention Appraisal**Harbour, Sandy & Trecco Bay**

C.1 MATRIX ASSESSMENT		Coastal Managers : BCBC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Local changes resulting from collapse of breakwater in medium term. Long term general changes resulting from recession	No significant change - subject to form of protection installed to hold line	Effect would be dependant upon the form and specific location of works within the MU. A general advance would effect CP's	Effects resulting from the removal of breakwater and other hard engineering and general shoreline recession
EFFECTS ON NATURAL ENVIRONMENT	Little anticipated change	Little anticipated change	Effect/changes would be subject to extent of reclamation	Effect likely balance of favourable and non-favourable would need to be confirmed
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Significant effects on human and built environment	Maintains current activities and safeguards hinterland buildings	Significant changes to built environment likely with knock-on effect on human environment.	Significant changes to built environment likely with knock-on effect on human environment.
EFFECTS ON DEVELOPMENT & LAND USE	Present land use would be lost. Development potential would cease.	Increase development potential with consequent changes in land use.	Increase development potential and area of land for potential development with consequent changes in land use.	Present land use would be lost. Significant loss of development potential.
IMPLICATIONS FOR COASTAL DEFENCES	Coastal defences would be progressively lost with breakwater likely to be first casualty.	Coast protection works would be required along most of the shoreline with significant engineering works at the breakwater.	Coast protection works would be required along most of the shoreline with significant engineering works at the breakwater and along the area of advanced line.	Removal of existing defences including breakwater.
EFFECTS ON ADJACENT M.U'S	No short term impact and limited medium to long term effects	No anticipated change	Limited effects subject to extent of advance.	Changes likely resulting from removal of breakwater
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Assets loss would commence at an earlier date.	Increase defence standard of coast protection works.	Increase defence standard of coast protection works including scale of works and costs.	Assets loss would commence at an earlier date - accelerated loss of assets.
CONCORDANCE WITH OBJECTIVES	Not 3, 7, 10, 12, 13, 16, 17.	All	All	Not 3, 4, 7, 12, 13, 16, 17.
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known - potential limited benefits (B) - Long term gains	(A) - Local enhancement of relic dunes and upper foreshore possible (B) - Neutral	(A) - Local enhancement of relic dunes and upper foreshore possible (B) - Losses	(A) - Possible opportunities (B) - Gains
ECONOMIC VIABILITY	Viability presently unclear from CP Act 1949 perspective. Not viable for harbour/ breakwater.	Viability presently unclear from CP Act 1949 perspective. Viable.	Viability presently unclear from CP Act 1949 perspective. Viable subject to development proposals.	Viability presently unclear from CP Act 1949 perspective. Not viable for breakwater/ harbour section.
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be socially or economically acceptable	Suitable	Potentially suitable	Un-suitable
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline 1	Baseline 2	- ve
Economic	- ve	Baseline 1	Baseline 2	- ve
Environmental	+ ve	Baseline 1	Baseline 2	+ ve

Management Unit 4/6

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION	Harbour, Sandy & Trecco Bay	
	C.2.1 Existing Coastal Defence Policy:	Hold line with reactive maintenance repairs	
	C.2.2 Future Coastal Defence Policy:	Short Term: Hold or possibly advance subject to development proposals. Anticipated Long Term: Hold or advance.	0 - 5 years 5+
	C.2.3 Uncertainties/Dependencies:	Grant aid priorities/qualification/economics; sea level rise and increased storminess; strategic littoral drift climate.	
	C.2.4 Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L3	(Ref. Sect 5.3)
	C.2.5 Future Monitoring:	M1, M2, M3, M4, M7, M8, M10, M11, M12, M13, M15, M16, M17	(Ref. Sect 5.2)
	C.2.6 Intervention Priority:	Attempt to hold onto breakwater structure to keep options open until medium and long term policy strategy has been determined.	
	C.2.7 Reasons for Change:	To progress to a management approach that is not event lead.	

Management Unit 4/6

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Harbour, Sandy & Trecco Bay
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1, 3, 9	CP7, 12
C.3.1.2	Natural Environment:	NE3, 4	
C.3.1.3	Human and Built Environment:	HB1, 2, 3, 4, 5, 6, 11, 12, 14, 15	HB8, 16
C.3.1.4	Coastal Defence:	CD3, 4, 6, 7, 8, 9	
C.3.1.5	Development:	D1, 2, 3, 5	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public access to breakwater and adjacent to high walls; lifeguard station at Rhych Point	
C.3.2.2	Access:	RNLI; Other craft including paddle steamer; access to Rhych Point; pedestrian/maintenance access along promenades/coastal walkways.	
C.3.2.3	Industrial Activities:	Effects of maintenance and commercial dredging.	
C.3.2.4	Human Pressures:	Congestion on peak summer days and also balance between tourism/residents and development.	
C.3.2.5	Tourism/Recreation:	Importance of tourism to local economy and recreational use of sea side by residents.	

C.4	OBJECTIVES RECONCILIATION	Harbour, Sandy & Trecco Bay
	The preferred policy accords with the following objectives for this management unit	All stated in A6.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 4/7

MANAGEMENT UNIT No. 4/7**Merthyr Mawr**

From Newton 283700E 176900N
 To Ogmore River 286100E 175600N
 Approximate Length 3.2Km

PART A Objectives, Issues and Statutory Details**Merthyr Mawr**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)
 The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Merthyr Mawr
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles
CP2	Shingle Storm Beach Behaviour	Modest storm shingle beach along some sections of foreshore.
CP3	Coincidence of high tides and storms	Potential impacts upon dunes area where storm beach is present. Storm direction would be important and function of Black Rocks should be considered.
CP4	Dune toe behaviour - erosion/regeneration	Erosion rates can be relatively high. Some sections receive increased level of protection from storm beaches and Black Rocks.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	No cliffs, however coastal processes effect sand deposition and movement across intertidal zone.
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Impacts of River Ogmore may have some impact at eastern end of MU although drift direction is generally east and wave induced. Channel meander has been recorded extending in a westerly direction in the past.
CP7	Siltation of estuaries and ports;	Some impacts from River Ogmore possible but restricted to local effects immediately west of the river.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Wave induced drift brings material onto the foreshore and the extent of any linked with sand banks is not clear - major local concern. Note potential influence of Tusker Rocks.
CP9	Sea level rise and increased storminess	Significant potential impacts for dune system.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Important process that requires further study to understand how beaches and offshore banks may interact.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant historic damage resulting from sand extraction from the foreshore. Effect of offshore dredging unknown. However, significant local concern.

Management Unit 4/7

COASTAL PROCESSES		Merthyr Mawr
REF.	ISSUE DESCRIPTION	Specific to MU
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local political concern

NATURAL ENVIRONMENT		Merthyr Mawr
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Major area of national and international designation includes both hinterland and foreshore. Unlikely that damage resulting from natural processes could be avoided.
NE2	Protection of areas designated under international conventions.	Ditto
NE3	Water Quality	Major sewage treatment works at Ogmore and pipeline infrastructure through Merthyr Mawr Dunes and Burrows areas. - Location of pipeline relative to predicted recession line should be investigated
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Significant accumulations of debris and pollution along foreshore and strandline detracts from exceptional landscape and area of important conservation.

HUMAN & BUILT ENVIRONMENT		Merthyr Mawr
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Uncommercialised, and unspoilt foreshore in the east. Tourist beach in west at Newton. Summer surf life saving believed to be based in porta cabin . Note local rip currents
HB2	Public access to the foreshore	Good access by foot across MU with private car park at Newton. No vehicular access across Burrows apart from Maintenance vehicles - Pipeline
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Footpaths are generally set-back and not formal. Limited impacts if current footpaths are eroded.
HB4	Fisheries interests	Local interest in fishing from foreshore and note launch site at Newton referred to in MU 4/6. Small craft fish near shore and offshore zone.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Conflict between recreation and conservation possible because of proximity of Porthcawl.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Significant potential conflict between a range of water users including boating, jet-ski and bathing. Attempts have been made to zone parts of western beach at Newton.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Rabbit warren, pillow mound and hillfort.
HB8	Vehicular access/parking/road congestion	Parking at Newton, Ogmore and Merthyr Mawr.

Management Unit 4/7

HUMAN & BUILT ENVIRONMENT		Merthyr Mawr
REF	ISSUE DESCRIPTION	Specific to MU
HB9	Importance of beach quality to tourism	Important along whole MU with specific interest at Newton (west)
HB10	Balance between traditional and green tourism	Refer to HB5
HB11	Importance of recreational use of foreshore and contribution to local economies	Important in terms of holiday businesses at Porthcawl/Trecco Bay.
HB12	Marine access - Port/harbour/launching facilities	Note Porthcawl power boat club slipway referred to in MU 4/6. Note local concerns regarding condition of lower foreshore - increase in silt effecting launching
HB13	Human pressure on natural assets such as dunes	Damage to dune system more pronounced in west adjacent to Newton and centre of population.
HB14	Beach texture - sand/silt	Sand with outcropping rock.
HB15	Access for emergency services (including life boat)	Generally good. Coastguard is believed to have access across the foreshore.
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Applies mainly to car parks and beach café at Newton
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Significant local issue - Nash Bank

COASTAL DEFENCE		Merthyr Mawr
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Retreat is most likely management option along most of the coast with the exception of the flood defences at Newton.
CD2	Cliff erosion	Not applicable
CD3	Adequacy/condition of existing defences	Current natural defences are eroding at a rate unknown. Flood defences at Newton will require periodic maintenance and upgrading.
CD4	Maintenance of existing defences	EA - Newton. Natural dunes unlikely to receive intervention. Position of sewer should be checked - Welsh Water.
CD5	Dune erosion	Varies along length. Long term monitoring in place - analysis required. Likely to be effected by storm events
CD6	Condition of flood banks/sea defences	EA Flood defences at Newton - monitor recession to east for potential run-round
CD7	Private sea defences	Not applicable
CD8	CPA funding of Coast Protection	Funding arrangements at Newton under flood defence.
CD9	The role of the foreshore/beach as a defence	Foreshore plays an important role although the effectiveness reduces during storm surge events. Note Tusker Rock and south easterly vulnerability

Management Unit 4/7

DEVELOPMENT		Merthyr Mawr
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Development is likely to be sensitive to high conservation value within MU eg footpaths, signage etc. Development on adjoining land is less likely to be as sensitive to conservation value - Newton..
D2	Sustainability	No development likely along shoreline.
D3	Preservation/enhancement of landscape value	Monitor and record only
D4	Future of large industrial frontages	No specific interests
D5	Impacts of coastal development.	No development likely
D6	Integration and conflict with other management plans	Note link with Kenfig conservation area

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Merthyr Mawr
	<p>Policies applying to Kenfig Pool and Dunes are repeated here because of the established administrative link with Merthyr Mawr Warren:</p> <p>EV8 - Development that would adversely affect, or visually impinge upon the following areas and/or their settings will not be permitted.</p> <p>SSSI Site for which Policy EV15 & EV16 applies:</p> <p>EV15 - Development that would destroy or adversely effect, either directly or indirectly, sites and/or settings recognised as being nationally, regionally or locally important for nature conservation will not be permitted.</p> <p>EV16 - Where development proposals are acceptable in terms of EV15, the applicant will still be required to demonstrate that the decrease in the nature conservation value of the site has been kept to a minimum and wherever possible any loss is compensated for by appropriate habitat creation/local enhancement elsewhere within the site or borough.</p>	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Merthyr Mawr
	<p>Statutory: cSAC and SSSI with important wildlife interest including bird watching. Kenfig cSAC comprises Kenfig Pool and Dunes SSSI and Merthyr Mawr Warren SSSI. These areas contain habitats and species which are threatened in a European context. The boundaries of the cSAC are currently under review.</p> <p>Non-Statutory: pLNR</p>	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Merthyr Mawr
	Believed to be a mixture of public and private.	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)
	<p>The following coastal defences presently exist within this management unit :</p> <p>W.53.4010 - Newton Burrows; 0.18Km; embankment, groynes; medium exposure.</p> <p>W.53.4050 - Black Rocks; 1.8Km; HRS</p>

Management Unit 4/7

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16

Management Unit 4/7

PART B Intervention Appraisal		Merthyr Mawr		
Ref	Topic			
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - eroding dune system with some sections receiving temporary protection from the development of storm shingle beached</p> <p>Foreshore Type - Sand overlayer with evidence of submerged glacial deposits. One rock outcrop noted on foreshore towards Sker Point.</p> <p>Developed/Undeveloped - coastline is undeveloped although a hinterland scar is visible from the 60's when a wide haul road was driven through the dunes to enable construction materials to be supplies to Port Talbot Harbour.</p> <p>Defended/undefended - Undefended coastline in man made terms - some natural protection provided by shingle storm beach.</p> <p>Orientation/exposure - South west orientation with high exposure</p>			
	B.1.1	Land Use:	Conservation and recreational use for those prepared to make the effort to walk.	
	B.1.2	Specific Shoreline Interests:	Sun bathing, fishing, surfing, wildlife interests	
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Blown sand over steeply dipping non conformity between Carboniferous and Keuper Marls - Red Marl Facies of the Upper Triassic. Mercia Mudstone become more prevalent towards Rest Bay.</p> <p>Shoreline Movement/Historic Maps - Established trend of shoreline erosion from LA records.</p> <p>Development/Industry - No development or industry although impacts from outside this MU are possible.</p> <p>Gains/Losses - Current phase of shoreline erosion and losses.</p>			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Natural environment along coast edge as a result of dune erosion. Some informal footpaths.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; Future of land surrounding MU with particular reference to heavy industry to the North west	
		<u>Preliminary Value of Assets at Risk:</u>	Valuation of conservation area is difficult to assess in economic terms	CPA funding unlikely.
	B.3.2	Cost Implications: Limited cost apart from management and set-back of footpaths.		
	B.3.3	Economic Viability: Intervention to protect shoreline would not be viable although recent sand recycling could from part of a wider strategy.		

Management Unit 4/7

PART C Strategic Policy Appraisal	Merthyr Mawr
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C.1 MATRIX ASSESSMENT		Coastal Managers : BCBC	
	DO-NOTHING/RETREAT	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE
EFFECTS ON COASTAL PROCESSES	Present trends continue. Further examination of sediment drift would be desirable.		
EFFECTS ON NATURAL ENVIRONMENT	Progressive erosion of dune faces which is not likely to be uniform across the MU because of the presence of shingle storm beaches and black rocks.		
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Impact at Newton where hold line policy is recommended. Note - details of sewer required.		
EFFECTS ON DEVELOPMENT & LAND USE	Development is not likely to be an option. Land use may change and would be dependant upon beach texture. Hinterland use may be effected in the long term.		
IMPLICATIONS FOR COASTAL DEFENCES	Natural dune defences will progressively erode.	Refer to notes below	Refer to notes below
EFFECTS ON ADJACENT M.U'S	Impacts upon dunes in the eastern part of the frontage are likely to be linked to the Ogmore river.		
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion would increase with greater risk of disruption to the dunes and storm shingle beach. Vertical eroding cut faces will become more common.		
CONCORDANCE WITH OBJECTIVES	Generally accords with Objectives identified in A6 although application will not be universal because of Newton.		
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None likely as natural evolution progressively reduces land area. (B) - Change will occur over time and this may effect areas of the hinterland		
ECONOMIC VIABILITY	Do nothing is likely to be the viable option with possible long term set-back of the sewer pipe (subject to confirmation of position)		
GENERAL COMMENT ON POLICY SUITABILITY	A base policy of Do- nothing with local management and monitoring is the only realistic policy currently available for this shoreline		
RELATIVE SUSTAINABILITY			
Social	Baseline		
Economic	Baseline		
Environmental	Baseline		

NOTES

It is not considered necessary to offer serious consideration of the impacts of HOLD and ADVANCE the line policy options in this Management Unit with the exception of the small section at the western end of Newton. Hold and Advance the line would clearly not be appropriate environmentally, socially or economically along the dune shore (check position of sewer line). Consideration is therefore only given to the combined DO-NOTHING/RETREAT policy options. Retreat, for the purposes of this management unit should be understood to apply to limited assets such as informal coast paths and not intervention to retreat the existing coast edge. The policy is therefore essentially one of Do-Nothing.

The exception at Newton, where flood defences are located, requires maintenance and will eventually need to be upgraded to prevent flooding along part of Beach Road.

Management Unit 4/7

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Merthyr Mawr
C.2.1	Existing Coastal Defence Policy:	Do Nothing, monitor	
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing, monitor Anticipated Long Term: Retreat	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea Level rise and increased storminess; potential changes at river Ogmore.	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L1	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M7, M12, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Record and monitor.	
C.2.7	Reason for Change:	Change would be guided by events and monitoring should be enhanced.	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Merthyr Mawr
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 10	CP 3, 4, 9, 11, 12
C.3.1.2	Natural Environment:	NE1, 2	NE 4
C.3.1.3	Human and Built Environment:	HB 1, 2, 4, 8, 9, 11, 12, 15, 16	HB 17
C.3.1.4	Coastal Defence:	CD 1, 5, 9	CD 17
C.3.1.5	Development:	D 1	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	No specific issue through dune area. Safety issues concerning conflicting recreation use of the foreshore and near shore zones in the west	
C.3.2.2	Access:	No specific issue.	
C.3.2.3	Industrial Activities:	Impact potential from dredging activities is a major concern	
C.3.2.4	Human Pressures:	No specific issues apart those referred in safety. Also some traffic congestion in Summer	
C.3.2.5	Tourism/Recreation:	Green tourism and low volume of visitors is believed to be most appropriate throughout dune frontage and more traditional activities to the west.	

Management Unit 4/7

C.4	OBJECTIVES RECONCILIATION		Merthyr Mawr
	The preferred policy accords with the following objectives for this management unit	The policy generally accords with the objectives although it is accepted that some environmental damage or change is likely as a result of natural coastal processes.	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 5/1

MANAGEMENT UNIT No. 5/1**Ogmore-by-Sea**

From	Ogmore River	286100E	175700N
To	Dunraven Bay (West side)	288200E	173300N
Approximate Length	3.3Km		

PART A Objectives, Issues and Statutory Details**Ogmore-by-Sea**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Ogmore-by-Sea
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach monitoring surveys
CP2	Shingle Storm Beach Behaviour	None
CP3	Coincidence of high tides and storms	Potential impacts within River Ogmore
CP4	Dune toe behaviour - erosion/regeneration	No Dunes
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Eroding rock shore
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Mouth of river Ogmore - geometry of flow across foreshore varies
CP7	Siltation of estuaries and ports;	No specific issue
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concerns - proximity of sand banks
CP9	Sea level rise and increased storminess	Impacts upon rate of erosion
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Potential changes in direction of drift.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major general concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local issue

NATURAL ENVIRONMENT		Ogmore-by-Sea
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI (geomorph. Bot & GCR) Heritage Coast

Management Unit 5/1

NATURAL ENVIRONMENT		Ogmore-by-Sea
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	
NE3	Water Quality	Large sewage treatment works in Ogmore river - Outfalls
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern regarding debris on foreshore

HUMAN & BUILT ENVIRONMENT		Ogmore-by-Sea
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Safety for water users in river mouth area and surrounding foreshore. Also coast path near edge and fishing from rock cliffs
HB2	Public access to the foreshore	Good at Ogmore
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Long term potential loss
HB4	Fisheries interests	Shore fishing and small boat fishing near shore
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No significant conflict - some potential at Ogmore
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known issue - beach is patrolled - surf life saving club
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No specific site on coast edge
HB8	Vehicular access/parking/road congestion	Good at Ogmore and parking available on common east of Ogmore
HB9	Importance of beach quality to tourism	Beach is popular in summer - note peak summer days
HB10	Balance between traditional and green tourism	Traditional tourism is focussed at Ogmore (in vicinity of car park/river)
HB11	Importance of recreational use of foreshore and contribution to local economies	Important to local shops/ice cream vans etc
HB12	Marine access - Port/harbour/launching facilities	Slipway launching facility. Ogmore River historically used to moor small craft - Now ceased
HB13	Human pressure on natural assets such as dunes	No dunes
HB14	Beach texture - sand/silt	Mixture - sand intertidal zone and shingle upper beach
HB15	Access for emergency services (including life boat)	Good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	None apart from Sewage treatment works
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local concern

Management Unit 5/1

COASTAL DEFENCE		Ogmore-by-Sea
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Possible retreat of coast path
CD2	Cliff erosion	Needs to be monitored
CD3	Adequacy/condition of existing defences	Natural cliff defence will continue to erode over time
CD4	Maintenance of existing defences	Natural defences - maintenance would apply to foot path signing
CD5	Dune erosion	No dunes
CD6	Condition of flood banks/sea defences	Natural rock cliff shore
CD7	Private sea defences	No information
CD8	CPA funding of Coast Protection	Not likely to be relevant
CD9	The role of the foreshore/beach as a defence	Important - varies along shoreline

DEVELOPMENT		Ogmore-by-Sea
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Small area of hinterland recently built on. Development should not be permitted seaward of existing building line.
D2	Sustainability	
D3	Preservation/enhancement of landscape value	
D4	Future of large industrial frontages	
D5	Impacts of coastal development.	Presumption against coastal development should be adopted.
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Ogmore-by-Sea
	Conserve and manage the special environmental qualities of the Heritage Coast. ENV4 refers to the special landscape qualities of the Heritage Coast and states that this assets will be conserved and enhanced. Priority in these areas will be given to agriculture, landscape and conservation. Tourism interest at Ogmore by Sea	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Ogmore-by-Sea
	Statutory: SSSI - Sutton Flats and Southerndown Coast. GCR. Southerndown Coast SSSI was re-notified and extended in 1998/99 to include the former Sutton Flats SSSI. The SSSI is important for geological and biological interests. Non-Statutory: Heritage Coast	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Ogmore-by-Sea
	Not specific information - Local Authority understood to have coastal interest	

Management Unit 5/1

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.72.4060 - Ogmore to Dunraven; 3.4Km Hard Rock Shore with high exposure

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 5/1

PART B Intervention Appraisal	Ogmore-by-Sea
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Ref	Topic			
B.1	Shoreline Description - Refer to Context report Section 3 Coast Edge Type - Rock cliff shore with small bays between minor rock promontories. Foreshore Type - Sand low water area with rock at high water. Shingle storm beaches in places Developed/Undeveloped - Undeveloped - note coast path Defended/undefended - Natural rock cliff shore - undefended Orientation/exposure - Generally south west with high exposure			
	B.1.1	Land Use:	Recreation - traditional beach at Ogmore and walking along coast path to east.	
	B.1.2	Specific Shoreline Interests:	Surf life saving, sun/sea bathing, Surfing, Fishing	
B.2	SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - Rock cliff shoreline includes Carboniferous Limestone, Breccia and Facied Lias. Shoreline Movement/Historic Maps - Slowly eroding natural coast. Recent evidence of foreshore trending steeper Development/Industry - No industry or coastal development. Note sewage treatment works Gains/Losses - Possible sand foreshore loss to be confirmed through further monitoring. Coast edge slowly receding			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Coast Path and longer term - slipway and life savers building. Vulnerability of outfall across foreshore to be checked.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess	
		<u>Preliminary Value of Assets at Risk:</u>	Not possible to set a value to coast path. Threat is not immediate	CPA funding coast paths is unlikely
	B.3.2	Cost Implications: It is unlikely that protection works across this MU would be desirable. Set back may involve some land purchase - to be checked for first plan review.		
	B.3.3	Economic Viability: Protection would not be viable or desirable - set back may be viable.		

Management Unit 5/1

PART C Strategic Policy Appraisal	Ogmore-by-Sea
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	++ RETREAT
EFFECTS ON COASTAL PROCESSES	No anticipated change in current trends			No anticipated change in current trends
EFFECTS ON NATURAL ENVIRONMENT	Progressive erosion over time will damage existing assets and possibly reveal new areas of interest			Progressive erosion over time will damage existing assets and possibly reveal new areas of interest
EFFECTS ON HUMAN & BUILT ENVIRONMENT	No impact in short term. Possible impacts on slipways in medium/long term			No impact in short term. Possible impacts on slipways in medium/long term
EFFECTS ON DEVELOPMENT & LAND USE	Development is unlikely near coast edge and not recommended			Development is unlikely near coast edge and not recommended
IMPLICATIONS FOR COASTAL DEFENCES	None - natural defences will erode slowly	Refer to notes below	Refer to notes below	None - natural defences will erode slowly
EFFECTS ON ADJACENT M.U'S	No known impacts			No known impacts
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion will increase			Rate of erosion will increase
CONCORDANCE WITH OBJECTIVES	Accords, in general, with objectives.			Accords, in general, with objectives.
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None (B) - No Anticipated change			(A) - None (B) - No Anticipated change
ECONOMIC VIABILITY	Viable			Potentially viable subject to availability of land at pinch points
GENERAL COMMENT ON POLICY SUITABILITY	Suitable in short term - potential loss of coast path eventually			Suitable
RELATIVE SUSTAINABILITY				
Social	Baseline 1	Not Clear - likely - ve	- ve	Baseline 2
Economic	Baseline 1	- ve	- ve	Baseline 2
Environmental	Baseline 1	- ve	- ve	Baseline 2

NOTES

The Hold and advance the line policy options are not considered to be realistic policy options for review in the matrix assessment because of the natural rock cliff shore, environmental assets and lack of tangible assets.

++ The retreat options applies only to the coast edge assets such as the coast path and should not be taken to mean the natural rock shoreline.

Management Unit 5/1

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Ogmore-by-Sea
C.2.1	Existing Coastal Defence Policy:	Do Nothing	
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing/Monitor for long term set back Anticipated Long Term: Set Back	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; Local geology - Differential erosion rates	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Public safety consideration in respect of coast path, monitoring to enable programme of retreat to be established	
C.2.7	Reason for Change:	Promotion of informed approach and public safety	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1	CP 3, 6, 8, 11, 12
C.3.1.2	Natural Environment:	NE 1	NE 4
C.3.1.3	Human and Built Environment:		HB 1, 3, 17
C.3.1.4	Coastal Defence:	CD 1, 2	
C.3.1.5	Development:		
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety relating to access around coast, fishing from rock outcrops and water activities in mouth of river	
C.3.2.2	Access:	No specific issue	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Peak summer congestion to Ogmore by Sea	
C.3.2.5	Tourism/Recreation:	Road congestion	

Management Unit 5/1

C.4	OBJECTIVES RECONCILIATION	Ogmore-by-Sea
	The preferred policy accords with the following objectives for this management unit	General accordance with objectives set-out in A6
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 5/2

MANAGEMENT UNIT No. 5/2		Dunraven Bay	
From	Dunraven Bay (West)	288100E	173300N
To	Trwyn y Witch	288500E	172600N
Approximate Length	800m		

PART A Objectives, Issues and Statutory Details	Dunraven Bay
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A.1	ISSUES (For further detail on this section refer to the Consultation Responses Report) The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :
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COASTAL PROCESSES			Dunraven Bay
REF.	ISSUE DESCRIPTION	Specific to MU	
CP1	Monitoring Foreshore Behaviour	Strategic beach profile	
CP2	Shingle Storm Beach Behaviour	Topographic survey monitoring	
CP3	Coincidence of high tides and storms	Effects cobble beach and access along slipway - impact at cliff also.	
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Eroding lias limestone cliffs are undercut by wave action.	
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Proximity to Nash - local concern regarding potential interactions between beach and banks	
CP9	Sea level rise and increased storminess	Impacts on cobble beach, car park and cliff erosion - access road.	
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Movement of cobble beach.	
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Significant local concern	
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Significant local concern	

NATURAL ENVIRONMENT			Dunraven Bay
REF	ISSUE DESCRIPTION	Specific to MU	
NE1	Avoid adverse impacts of designated and non-designated areas.	Heritage Coast/SSSI/landscape value	
NE2	Protection of areas designated under international conventions.	Dunraven Bay is a cSAC for Shore Dock. Habitats will be threatened as a result of coastal erosion.	
NE3	Water Quality	Possible concern for beach users	
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern for beach users	

Management Unit 5/2

HUMAN & BUILT ENVIRONMENT		Dunraven Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Heritage Coast Path near cliff top. Public sunbathing under cliff - signage is provided.
HB2	Public access to the foreshore	Only in centre of Dunraven Bay.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Concern in other MU's along heritage coast.
HB4	Fisheries interests	Sea Angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Management of cobble beach and emergency access to foreshore
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Bathing/surfing
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Dunraven estate coast edge interest Trwyn y Witch.
HB8	Vehicular access/parking/road congestion	Road access is near cliff edge - action required, significant congestion on peak summer days and adjoining fields are opened as overflow car parks
HB9	Importance of beach quality to tourism	Important to tourism and used by residents of nearby townships.
HB10	Balance between traditional and green tourism	Dunraven bay is a traditional tourist bay and gateway to heritage coast - note heritage coast centre.
HB11	Importance of recreational use of foreshore and contribution to local economies	Important
HB12	Marine access - Port/harbour/launching facilities	Possible launching facility - not commonly used.
HB14	Beach texture - sand/silt	Generally sand - note stream effecting beach texture
HB15	Access for emergency services (including life boat)	Surf life saving
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local issue

COASTAL DEFENCE		Dunraven Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Coast path and main access road
CD2	Cliff erosion	Major issue - lias Limestone eroding relatively rapidly - weak joints interbedded with shale
CD3	Adequacy/condition of existing defences	Normally effective storm cobble/boulder beach but effected by storm events and therefore inadequate in long term
CD4	Maintenance of existing defences	Maintenance required following storm events
CD5	Dune erosion	No applicable
CD6	Condition of flood banks/sea defences	Not applicable
CD7	Private sea defences	Believed to be CPA

Management Unit 5/2

COASTAL DEFENCE		Dunraven Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD8	CPA funding of Coast Protection	Funding unlikely unless justified on intangible benefits
CD9	The role of the foreshore/beach as a defence	Foreshore and storm cobble beach forms the defence

DEVELOPMENT		Dunraven Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Development unlikely and would be subject to normal planning process & D6.
D2	Sustainability	Would need to be sustainable
D3	Preservation/enhancement of landscape value	Most important issue. Priority given to landscape
D4	Future of large industrial frontages	Not relevant
D5	Impacts of coastal development..	Dependant upon form
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Dunraven Bay
	Conserve and manage the special environmental qualities of the Heritage Coast. Acknowledge limited informal recreation facilities at Dunraven Bay but priority given to landscape, nature conservation and agriculture.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Dunraven Bay
	Statutory: SSSI - Southerndown Coast. Dunraven Bay is a cSAC for Shore Dock. Habitats will be threatened as a result of coastal erosion. Non-Statutory: - Heritage Coast.	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Dunraven Bay
	Dunraven estate with Heritage Coast Centre and Local Authority management	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)	Dunraven Bay
	<p>The following coastal defences presently exist within this management unit :</p> <p>Part of W.72.4060 Ogmore to Dunraven HRS with high exposure W.72.4070 - Dunraven Bay; Shingle/Cobble Ridge; 0.4Km (Coastal Survey NAW value); high exposure Part of W.72.4075 - Dunraven to Traeth Mawr Soft Rock Shore with high exposure. It may be appropriate to consider a review of the definitions describing the asset type.</p>	

Management Unit 5/2

A.6	<u>OBJECTIVES</u>								
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 5/2

PART B Intervention Appraisal		Dunraven Bay				
Ref	Topic					
B.1	<p>Shoreline Description - Refer to Context Report Section 3</p> <p>Coast Edge Type - Vertical eroding cliffs either side of valley where large storm cobble/boulder beach located in front of small car park.</p> <p>Foreshore Type - Upper foreshore is predominantly rock with large sand intertidal zone.</p> <p>Developed/Undeveloped - The area is mostly undeveloped and the exception applies to the small car park, access road, toilet block and gatehouse.</p> <p>Defended/undefended - The centre of bay is defended by a large natural cobble/boulder embankment. The embankment is managed in the vicinity of the access ramp to the beach.</p> <p>Orientation/exposure - South westerly orientation with high exposure.</p>					
	B.1.1	Land Use:	Recreation, environmental and landscape with significant historic interest around the former Dunraven House and walled garden			
	B.1.2	Specific Shoreline Interests:	Surfing, sun and sea bathing, surf life saving, SSSI, historic environment walking.			
B.2	<p>SHORELINE EVOLUTION - Refer to Context Report Section 3</p> <p>Geology - Porthkerry formation of the Lower Jurassic including Lower Lias with marginal facies</p> <p>Shoreline Movement/Historic Maps - Erosion rates appear to vary although are considered to be generally high - ranging between 0.15 and 0.6m per year. The form of the erosion is of specific interest as wave induced undercutting produces collapses (talas cone type).</p> <p>Development/Industry - Mostly undeveloped with no industry</p> <p>Gains/Losses - General erosion of cliff and slow recession (relatively high for rock shore)</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Car park and access road to Dunraven Bay.	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment Losses	U
			Land Flooding			
			Transport disruption	U		
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. Mechanism of failure at cliff face/toe.			
		<u>Preliminary Value of Assets at Risk:</u>	Value of assets relies heavily upon intangible benefits. Total value is likely to be high and would justify alternative access arrangements where road is threatened by cliff erosion.			
	B.3.2	Cost Implications: Likely to be several hundred thousand pounds				
	B.3.3	Economic Viability: Viable				

Management Unit 5/2

PART C Strategic Policy Appraisal	Dunraven Bay
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	** RETREAT
EFFECTS ON COASTAL PROCESSES	Increase in sediment input from collapsing cliffs	Major impact on local coarse sediment regime	Major impact on local coarse sediment regime	Progressive increase in sediment input - current trend continues
EFFECTS ON NATURAL ENVIRONMENT	Continuation of current trends in term of cliff erosion and impacts on landscape/geology	Likely detrimental impact depending upon form and extent	Likely detrimental impact depending upon form and extent	Current trend continues as cliff erodes and landscape is slowly modified.
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Access road and car park will be lost	May not secure road in long term unless whole cliff face was "held"	May not secure road in long term unless whole cliff face was "held"	Existing coastal facilities & services will eventually be lost - new road will be required in set-back position
EFFECTS ON DEVELOPMENT & LAND USE	No vehicular access - probably in short term	Would increase development potential depending upon form & extent	Would increase development potential depending upon form & extent	Little significant change - Gatehouse and toilet block will eventually be lost (long term)
IMPLICATIONS FOR COASTAL DEFENCES	Existing natural defences will be modified - cliff and storm beach will recede	Major civil engineering works would be required	Major civil engineering works would be required	No intervention as storm beach rolls back to landward and cliff erodes.
EFFECTS ON ADJACENT M.U'S	Little or no impact	Impacts on sediment drift in to adjacent MU likely	Impacts on sediment drift in to adjacent MU likely	No change from current trends
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of change will increase and events described above will occur sooner	Increase in capital works required to hold the line	Increase in capital works required to hold the line	Rate of recession will increase and losses described over will occur earlier
CONCORDANCE WITH OBJECTIVES	Does not accord with important objectives	Does not accord with Objectives	Does not accord with Objectives	Generally accords with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Little or none - gradual changes likely over time (B) - As 1	(A) - None (B) - Losses	(A) - None (B) - Losses	(A) - No information (B) - Impacts of alternative access should be examined environmentally
ECONOMIC VIABILITY	Not viable	Not viable	Not viable	Viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable	Not suitable (possible exception for small wall at top of storm beach)	Not suitable	Suitable
RELATIVE SUSTAINABILITY				
Social	- ve	- ve		Baseline
Economic	- ve	- ve		Baseline
Environmental	Neutral	- ve		Baseline

**** RETREAT - Assumes no intervention in respect of cliff face and applies only to coastal assets**

Management Unit 5/2

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Dunraven Bay
C.2.1	Existing Coastal Defence Policy:	Do nothing apart from observational monitoring and occasional movement of cobble beach	
C.2.2	Future Coastal Defence Policy:	Short Term: Retreat (managed by maintenance of cobble beach until this becomes uneconomic, re-route access road) Anticipated Long Term: Retreat	0 - 5 years 5 +
C.2.3	Uncertainties/Dependencies:	Sea Level rise and increased storminess. Rate and type of cliff failure.	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	To construct an alternative access to Dunraven Bay. Note - careful consideration required because of the environmentally sensitive location (cSAC, SSSI, Heritage Coast)	
C.2.7	Reason for Change:	To avoid crises management	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Dunraven Bay
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 3, 5, 9	CP 11, 12
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human and Built Environment:	HB 2, 8, 9, 11	HB 1, 3, 6, 17
C.3.1.4	Coastal Defence:	CD 1, 2	CD 8
C.3.1.5	Development:		
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety at cliff top and cliff bottom. Safety of water users	
C.3.2.2	Access:	Vehicular access will be lost. The timing of the loss is not clear and should be further researched - anticipated to be short to medium term	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Peak Summer congestion	
C.3.2.5	Tourism/Recreation:	Major importance	

Management Unit 5/2

C.4	OBJECTIVES RECONCILIATION	Dunraven Bay
	The preferred policy accords with the following objectives for this management unit	Generally accords with objectives listed in A6 above.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 5/3

MANAGEMENT UNIT No. 5/3**Nash Point West**

From	Trwyn y Witch	288500E	172600N
To	Nash Point	291600E	168100N
Approximate Length	2.2Km		

PART A Objectives, Issues and Statutory Details**Nash Point West**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Nash Point West
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	A strategic beach profile is taken west of Nash Point (Marcross) - sand overlay. Observations
CP2	Shingle Storm Beach Behaviour	Accumulations of shingle are often transient as coarse wave induced sediment drift trundles east.
CP3	Coincidence of high tides and storms	Impacts upon cliff stability - undercutting - note other influencing factors on cliff stability non coastal - rain, freeze/thaw soft interbedding.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Ditto CP3 - undercutting and easterly drift
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Proximity of Nash Bank - sand inclusion in generally rocky foreshore severely influenced by waves on this exposed coast. Sandy foreshore is barometer of recent wave trends not long term beach levels.
CP9	Sea level rise and increased storminess	Potential increase in cliff erosion rates. Impacts at toe of cliff as water depth increases and coarse sediment becomes more mobile.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Sand cover will vary significantly as indicated above (CP8) - usually seasonal. Coarse sediment accumulation will vary as cliff tends to erode by large collapse events.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Nash Bank is near shoreline. Dredging operations further west. Potential impacts/changes in shoreline exposure.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local concern

NATURAL ENVIRONMENT		Nash Point West
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI's - most of the coast, Heritage Coast - whole MU.

Management Unit 5/3

NATURAL ENVIRONMENT		Nash Point West
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	General issue
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General issue - Works at Nash Point

HUMAN & BUILT ENVIRONMENT		Nash Point West
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Major concern for heritage coast - localised slumping of talas cones effecting path - Set back by agreement with farmers. Public safety issues on upper foreshore - rock falls on public
HB2	Public access to the foreshore	Specific gateways to coast path and coast through several river valleys. Car park at New Mill Farm (Monknash) Otherwise Dunraven and Nash Point.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Heritage Coast Path is an important asset that is being effected by cliff erosion - set-back is the only feasible policy.
HB4	Fisheries interests	Shore and Sea
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Current managed approach unlikely to result in major conflict
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential problems with jet skies. Access control.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	A number of coastal sites - proximity to eroding cliff edge should be confirmed
HB8	Vehicular access/parking/road congestion	Not a major problem within MU. Narrow road to New Mill Farm and cars occasionally block road at Cwm Nash. Problems noted outside MU 5-2 & 5-4
HB9	Importance of beach quality to tourism	Beach is important but not for mass tourism activity.
HB10	Balance between traditional and green tourism	Access effort required usually favours users more sympathetic to the environment.
HB11	Importance of recreational use of foreshore and contribution to local economies	Benefits are present and spread throughout the area - coast forms major part of the general attraction of the area.
HB14	Beach texture - sand/silt	Rock/sand fluctuations are more important - large rock wave cut platforms
HB15	Access for emergency services (including life boat)	Access from land is poor. From sea, access is generally good.
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Dredging at Nash.

Management Unit 5/3

COASTAL DEFENCE		Nash Point West
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Managed retreat has been in place along coast path for many years.
CD2	Cliff erosion	Relatively high because of lias limestone formations interbedded with soft material on exposed coast.
CD3	Adequacy/condition of existing defences	There are no known defences apart from the natural cliff - Soft Rock Shore (actually unstable - limestone element forming cliff is hard).
CD6	Condition of flood banks/sea defences	Rock falls monitored in respect of effects on coast path.
CD7	Private sea defences	None known.
CD8	CPA funding of Coast Protection	Qualification for grant aid of coast path set-back.
CD9	The role of the foreshore/beach as a defence	Major role - mainly rock.

DEVELOPMENT		Nash Point West
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	No real prospect of development
D2	Sustainability	
D3	Preservation/enhancement of landscape value	Major assets - Heritage Coast - important for landscape value
D5	Impacts of coastal development.	Not likely to be an issues
D6	Integration and conflict with other management plans	No conflict anticipated

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Nash Point West
	ENV4 refers to the special landscape qualities of the Heritage Coast and states that this asset will be conserved and enhanced. Priority in these areas will be given to agriculture, landscape and conservation.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Nash Point West
	Statutory: Southerndown Coast and Monknash Coast SSSI Non-Statutory: Heritage Coast with exceptional landscape value	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Nash Point West
	Understood to be Private with coast edge/path managed by Heritage Coast Rangers based at Dunraven Bay.	

Management Unit 5/3

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.72.4075. Dunraven to Traeth Mawr - 5.4Km of Soft Rock Shore with high exposure

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	X	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 5/3

PART B Intervention Appraisal	Nash Point West
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Ref	Topic			
B.1	Shoreline Description - Refer to Context Report Section 3 Coast Edge Type - Material -Mostly high eroding cliffs. Foreshore Type - Material - Generally rock shore with wave cut platforms and sand inclusions Developed/Undeveloped - Undeveloped apart from hinterland areas at valley outlet (Cwm Nash, Marcross) Defended/undefended - Undefended Orientation/exposure - South West and high exposure.			
	B.1.1	Land Use:	Agricultural hinterland, coast edge path,	
	B.1.2	Specific Shoreline Interests:	Walking, sea view and landscape interest, environmental interest. Recreational use of foreshore.	
B.2	SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - Mudstones/shales of Lower Jurassic. Porthkerry formation. Shoreline Movement/Historic Maps - Eroding cliff Development/Industry - Undeveloped mainly agricultural, environmental and tourism Gains/Losses - coast edge erosion			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Coast path and geological assets associated with SSSI	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
			U	U
			U	U
			U	U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; Availability and cost of coast path set back	
		<u>Preliminary Value of Assets at Risk:</u>	Intangible and therefore difficult to evaluate - Coast Path	CPA funding of coast path retreat may not be available
	B.3.2	Cost Implications: Land purchase for set-back of coast path/setting-up agreements with land owners for re-routing and signage		
	B.3.3	Economic Viability: Likely to be viable - probably not in strict CPA terms		

Management Unit 5/3

PART C Strategic Policy Appraisal**Nash Point West**

C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No change	Significant change to near shore and on shore processes	Significant change to near shore and on shore processes	Increase in drift supply and land loss if achieved by intervention. Eg exploding cliff
EFFECTS ON NATURAL ENVIRONMENT	Natural modification of designated areas over time	Significant detrimental impacts upon SSSI's and Heritage Coast.	Significant detrimental impacts upon SSSI's and Heritage Coast.	Damage to SSSI's and Heritage Coast would be likely if applied to cliff coast. Same as do nothing if applied to path only
EFFECTS ON HUMAN & BUILT ENVIRONMENT	No general impacts - possible safety issues concerning coast path and rock falls	Would effect public enjoyment of area and secure coast path	Would effect public enjoyment of area and secure coast path	Would depend upon specific policy ie applied to cliff shore of just footpath.
EFFECTS ON DEVELOPMENT & LAND USE	No change in current trend unless footpath retreat is prevented	Development would be possible (but unlikely). Land use would change	Development would be possible (but unlikely). Land use would change	No change in current trend unless footpath retreat is prevented
IMPLICATIONS FOR COASTAL DEFENCES	Slow erosion of natural defence and continuation of drift supply for storm beaches.	Significant civil engineering works would be required	Large scale civil engineering works would be required	Erosion rate would increase in the short term as shoreline was re-located. Little impact if applied only to coast path.
EFFECTS ON ADJACENT M.U'S	No Known change	Loss of drift supply	Loss of drift supply	Change in exposure and possible increase in drift supply
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion will increase	Civil engineering works would need to be more robust	Civil engineering works would need to be more robust	Rate of retreat may increase, depends upon exact nature of retreat policy
CONCORDANCE WITH OBJECTIVES	General accord with objectives with exception of desire to retain footpath - retreat	Does not accord with relevant objectives	Does not accord with relevant objective	In general accordance with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	None known	None	None	None Known
ECONOMIC VIABILITY	Viable	Not Viable	Not Viable	Only viable if applied to coast path
GENERAL COMMENT ON POLICY SUITABILITY	Generally suitable - not suitable for sustainable coast path	Not Suitable	Not Suitable	Suitable is applied only to coast path
RELATIVE SUSTAINABILITY				
Social	Baseline 2 (No - ref path)	- ve	- ve	Baseline 1 (path only)
Economic	Baseline 2	- ve	- ve	Baseline 1 (Path Only)
Environmental	Baseline 2	- ve	- ve	Baseline 1 (Path Only)

Management Unit 5/3

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Nash Point West
C.2.1	Existing Coastal Defence Policy:	Monitor/Do nothing - set back coast path as safety assessment dictates	
C.2.2	Future Coastal Defence Policy:	Short Term: Do nothing/Set -back coast path Anticipated Long Term: Do nothing/set-back coast path.	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increase storminess, land acquisition	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, S12, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M13, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Set Back footpath, public safety	
C.2.7	Reason for Change:	No significant change	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 5, 9	
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human and Built Environment:	HB 1, 2, 3	
C.3.1.4	Coastal Defence:	CD 1, 2	CD 8
C.3.1.5	Development:		
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Coast path and unstable rock face	
C.3.2.2	Access:	Maintain existing access	
C.3.2.3	Industrial Activities:	None apart from dredging - further understanding of impacts required	
C.3.2.4	Human Pressures:	Potentially from increased numbers	
C.3.2.5	Tourism/Recreation:	Important to balance access to enable sustainable use	

Management Unit 5/3

C.4	OBJECTIVES RECONCILIATION	Nash Point West
	The preferred policy accords with the following objectives for this management unit	Accords with relevant policies in A6 above.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 6/1

MANAGEMENT UNIT No. 6/1**Nash Point East**

From	Nash Point	291600E	168100N
To	Cwm Col Huw	295600E	167500N
Approximate Length	3Km		

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Nash Point East
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles at Atlantic College and Tresillian.
CP2	Shingle Storm Beach Behaviour	Accumulation of shingle are often transient as coarse wave induced sediment drift trundles east. A storm shingle beach is present at Tresillian.
CP3	Coincidence of high tides and storms	Impacts upon cliff stability - undercutting - note other influencing factors on cliff stability Non coastal - rain, freeze/thaw soft interbedding., Overtopping/damage potential increases at Atlantic College and Tresillian
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Ditto CP3 - undercutting and easterly drift
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Proximity of Nash Bank - Generally rocky foreshore severely influenced by waves on this coast.
CP9	Sea level rise and increased storminess	Potential increase in cliff erosion rates. Impacts at toe of cliff as water depth increases and coarse sediment becomes more mobile.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Sand cover and coarse sediment drift will vary significantly seasonally and as a result of changing storm directions.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Nash Bank is west of the MU shoreline and dredged for marine aggregates. Potential impacts/changes in shoreline exposure.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local concern

Management Unit 6/1

NATURAL ENVIRONMENT		Nash Point East
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI's - Monkash Coast extends around Nash Point & Heritage Coast - whole MU.
NE3	Water Quality	General issue
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General issue - Works at Nash Point

HUMAN & BUILT ENVIRONMENT		Nash Point East
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Major concern for heritage coast - localised slumping of talas cones effecting path - Set back by agreement with farmers. Public safety issues on upper foreshore - rock falls on public
HB2	Public access to the foreshore	No specific gateways to coast path apart from Nash Point . Coast path extends around most of coastline with foreshore access at Atlantic College and Tresillian.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Heritage Coast Path is an important asset that is being effected by cliff erosion - set-back is the only feasible policy. Issues at Atlantic College and Tresillian
HB4	Fisheries interests	Shore and Sea
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Current managed approach unlikely to result in major conflict
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential problems with jet skies. Access control.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	A number of coastal sites - proximity to eroding cliff edge should be confirmed. Atlantic College has many recorded sites.
HB8	Vehicular access/parking/road congestion	No available access apart from occasional right of way across agricultural land. Main access from either end at Nash and Cwm Col Huw.
HB9	Importance of beach quality to tourism	Beach is important but not for mass tourism activity. The rocky foreshore is an important feature.
HB10	Balance between traditional and green tourism	Access effort usually favours users more sympathetic to the environment.
HB11	Importance of recreational use of foreshore and contribution to local economies	Benefits are present and spread throughout the area - coast forms major part of the general attraction of the area. Economic benefits at Nash and Cwm Col Huw.
HB14	Beach texture - sand/silt	Coarse sediment/sand fluctuations are more important - large rock wave cut platforms
HB15	Access for emergency services (including life boat)	From land access is poor. From sea access is generally good. Note Lifeboat station at Atlantic College.
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Dredging at Nash.

Management Unit 6/1

COASTAL DEFENCE		Nash Point East
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Managed retreat has been in place along coast path for many years. Defences at Atlantic College likely to be maintained
CD2	Cliff erosion	Relatively high because of lias limestone formations interbedded with soft material on exposed coast.
CD3	Adequacy/condition of existing defences	Mainly Soft Rock Shore (actually unstable - limestone element forming cliff is hard) with defences at Atlantic College - condition should be confirmed - possibly not in good condition.
CD4	Maintenance of existing defences	Lighthouse and Atlantic College (Tresillian)
CD6	Condition of flood banks/sea defences	Rock falls monitored in respect of effects on coast path.
CD7	Private sea defences	As CD4
CD8	CPA funding of Coast Protection	Qualification for grant aid of coast path set-back. Remaining defences are private.
CD9	The role of the foreshore/beach as a defence	Major role - mainly rock

DEVELOPMENT		Nash Point East
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	No real prospect of development. With possible exception at Atlantic College.
D2	Sustainability	Sustainability of existing defences at Atlantic College should be examined.
D3	Preservation/enhancement of landscape value	Major assets - Heritage Coast - important for landscape value
D5	Impacts of coastal development.	Not likely to be an issue along cliff coast.
D6	Integration and conflict with other management plans	No conflict anticipated

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Nash Point East
	ENV4 refers to the special landscape qualities of the Heritage Coast and states that this asset will be conserved and enhanced. Priority in these areas will be given to agriculture, landscape and conservation.	
A.3	CONSERVATION DESIGNATIONS (Context Report)	Nash Point East
	Statutory: SSSI - Monkash at Nash Point. Nash Lighthouse Meadow SSSI is under threat from coastal erosion. Non-Statutory: - Heritage Coast	
A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Nash Point East
	Agricultural, education residential, Environmental	

Management Unit 6/1

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.72.4041 Monknash to St Donats - Soft Rock Shore - low exposure. W.72.4105 St Donats (Atlantic College) 0.11Km Private sea wall - Low exposure.

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	X	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 6/1

PART B Intervention Appraisal	Nash Point East
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Ref	Topic			
B.1	<p>Shoreline Description - Refer to Context Report Section 3</p> <p>Coast Edge Type - Material -Mostly high cliffs of Lias limestone interbedded with softer erodible material. Sea defences and slipway at St Donats, storm shingle beach at Tresillian. Some toe protection noted at Nash (Lighthouse)</p> <p>Foreshore Type - Material - Generally rock shore with wave cut platforms and occasional sand inclusions</p> <p>Developed/Undeveloped - Undeveloped apart from Atlantic College</p> <p>Defended/undefended - Mostly undefended</p> <p>Orientation/exposure - South and medium exposure.</p>			
	B.1.1	Land Use:	Agricultural hinterland, coast edge path walking, sea rescue and sea based leisure and education, residential	
	B.1.2	Specific Shoreline Interests:	Walking, sea view and landscape interest, environmental interest. Recreational use of foreshore and education.	
B.2	<p>SHORELINE EVOLUTION - Refer to Context Report Section 3</p> <p>Geology - Lias limestone.</p> <p>Shoreline Movement/Historic Maps - General cliff erosion varies between 150mm to 600mm per year.</p> <p>Development/Industry - none.</p> <p>Gains/Losses - General loss but at a slow rate.</p>			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Possibly lighthouse at Nash. Also coast edge part of Atlantic College and Gardens at Tresillian.	Property Loss U Infrastructure Loss U Land Loss U Property Flooding Land Flooding Transport disruption Recreation Losses U	Environmental Losses U Tourism Social Effects U Historic Environment Losses U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess, Condition of existing defences.	
		<u>Preliminary Value of Assets at Risk:</u>	Between £1m - £2m	CPA funding is not necessarily available for coast paths.
	B.3.2	Cost Implications: Up to £500,000.		
	B.3.3	Economic Viability: Viable.		

Management Unit 6/1

PART C Strategic Policy Appraisal	Nash Point East
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No change	Significant change to near shore and on shore processes	Significant change to near shore and on shore processes	Increase in drift supply and land loss if achieved by intervention. Eg exploding cliff
EFFECTS ON NATURAL ENVIRONMENT	Natural modification of designated areas over time	Significant detrimental impacts upon SSSI's and Heritage Coast.	Significant detrimental impacts upon SSSI's and Heritage Coast.	Damage to SSSI's and Heritage Coast would be likely if applied to cliff coast. Same as do nothing if applied to path only
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual loss of defences at Atlantic College. Possible safety issues concerning coast path and rock falls. Impacts at Tresillian and Nash Point	Would effect public enjoyment of area and secure coast path and Atlantic College	Would effect public enjoyment of area and secure coast path	Would depend upon specific policy ie applied to cliff shore or just footpath.
EFFECTS ON DEVELOPMENT & LAND USE	Potential impacts at Atlantic College. Footpath effected if retreat is prevented.	Development would be possible (but unlikely). Land use would change	Development would be possible (but unlikely). Land use would change	No change in current trend unless footpath retreat is prevented
IMPLICATIONS FOR COASTAL DEFENCES	Slow erosion of natural defence and continuation of drift supply for storm beaches. Loss of defence at Atlantic College.	Significant civil engineering works would be required if generally applied.	Large scale civil engineering works would be required	Erosion rate would increase in the short term as shoreline was re-located. Little impact if applied only to coast path.
EFFECTS ON ADJACENT M.U'S	No Known change	Loss of drift supply	Loss of drift supply	Change in exposure and possible increase in drift supply
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion will increase	Civil engineering works would need to be more robust	Civil engineering works would need to be more robust	Rate of retreat may increase, depends upon exact nature of retreat policy
CONCORDANCE WITH OBJECTIVES	Varies along MU	Varies along MU	Varies along MU	Varies along MU
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - No known change	(A) - None (B) - Losses	(A) - None (B) - Losses	(A) - None Known (B) - No information
ECONOMIC VIABILITY	Generally Viable (exception at Atlantic College)	Generally not Viable	Not Viable	Only viable if applied to coast path
GENERAL COMMENT ON POLICY SUITABILITY	Generally suitable with specific exclusions - coast path and Atlantic College	Generally not Suitable - Exceptions Atlantic College.	Not likely to be suitable	Suitable is applied only to coast path
RELATIVE SUSTAINABILITY				
Social	Baseline 2	Atlantic College	- Ve	Baseline 1 (path only)
Economic	Baseline 2	Atlantic College	- Ve	Baseline 1 (Path Only)
Environmental	Baseline 2	Atlantic College	- Ve	Baseline 1(Path Only)

Management Unit 6/1

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Nash Point East
C.2.1	Existing Coastal Defence Policy:	Generally do nothing - set back coast path	
C.2.2	Future Coastal Defence Policy:	Short Term: Set back (land acquisition), monitor built areas Atlantic College and Tressilian Anticipated Long Term: As short term with possible set back throughout	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increase storminess, land acquisition	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, S12, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Set Back footpath, public safety	
C.2.7	Reason for Change:	Assess long term policy at Atlantic College and Tressilian	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1	
C.3.1.2	Natural Environment:		
C.3.1.3	Human and Built Environment:	HB 3	
C.3.1.4	Coastal Defence:	CD 1, 2, 3, 4, 7	CD 8
C.3.1.5	Development:		
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Coast path and unstable rock face	
C.3.2.2	Access:	Maintain existing access	
C.3.2.3	Industrial Activities:	None apart from dredging - further understanding of impacts required	
C.3.2.4	Human Pressures:	Potentially from increased numbers	
C.3.2.5	Tourism/Recreation:	Important to balance access to enable sustainable use	

Management Unit 6/1

C.4	OBJECTIVES RECONCILIATION	Nash Point East
	The preferred policy accords with the following objectives for this management unit	Varies in accordance with location along MU - general accordance with possible hold at Atlantic College.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 6/2

MANAGEMENT UNIT No. 6/2**Cwm Col Huw**

From CWM COL HUW - Llantwit Major 295600E 167500N
 To
 Approximate Length 200m

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Cwm Col Huw
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic Beach Profile, impact on approaching waves of the form of the intertidal zone
CP2	Shingle Storm Beach Behaviour	Surveys and Inspections both east and west
CP3	Coincidence of high tides and storms	Impact on Life savers building and café west of river and car park recession in east/potential impact on culvert/access between east and west.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Very important in respect of coarse sediment supply.
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Limited impact on processes - impact on hinterland flooding.
CP9	Sea level rise and increased storminess	
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Specifically in respect of cliff falls and sudden sediment inputs along upper foreshore
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Proximity of Nash
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern regarding dredging operations

NATURAL ENVIRONMENT		Cwm Col Huw
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Heritage coast
NE3	Water Quality	Recently constructed water treatment works
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Beach debris would be local concern. Also material landing on car park.

Management Unit 6/2

HUMAN & BUILT ENVIRONMENT		Cwm Col Huw
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Important gateway to coastal path, some sections very close to cliff edge.
HB2	Public access to the foreshore	Car parking close to beach and walking over shingle and cobble.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Would have knock-on impact at Cwm Col Huw as a major gateway to coast path.
HB4	Fisheries interests	Limited angling
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Significant local issue.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Potential conflict between bathers and surfers.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Archaeological site set-back on eastern side of MU.
HB8	Vehicular access/parking/road congestion	Managed retreat on east side car park. Hinterland flooding in Winter and road congestion backing-up to Llantwit Major.
HB9	Importance of beach quality to tourism	Sand beach not available at high water.
HB10	Balance between traditional and green tourism	Site is located in middle of Heritage Coast.
HB11	Importance of recreational use of foreshore and contribution to local economies	Café business located at shoreline.
HB12	Marine access - Port/harbour/launching facilities	Used by surf life savers - skiers/canoes etc
HB14	Beach texture - sand/silt	Promontory within intertidal zone of Alluvium with cobble cladding surrounded by sand incursions
HB15	Access for emergency services (including life boat)	

COASTAL DEFENCE		Cwm Col Huw
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Ref study recommending managed retreat in eastern part of frontage.
CD2	Cliff erosion	Cliff recession either side of site increases exposure of site
CD3	Adequacy/condition of existing defences	Defences in front of life savers building are not adequate but do perform a coast defence function.
CD4	Maintenance of existing defences	Funding of re-working & modification of existing defence
CD6	Condition of flood banks/sea defences	EA maintain river and outfall structure/culvert.
CD8	CPA funding of Coast Protection	History of development
CD9	The role of the foreshore/beach as a defence	Foreshore performs defence role but at certain times can focus energy increasing erosion.

Management Unit 6/2

DEVELOPMENT		Cwm Col Huw
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Avoid development along coast edge.
D2	Sustainability	Not sustainable when position adjacent to coast edge.
D3	Preservation/enhancement of landscape value	Opportunities for division of MU at river with enhanced protection to west and retreat to west.
D5	Impacts of coastal development..	No new development likely unless associated with upgrading existing defences.
D6	Integration and conflict with other management plans	Conflict with Heritage Coast.

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Cwm Col Huw
	The Special environmental qualities of the Glamorgan Heritage Coast will be conserved and enhanced with the exception of limited in formal recreational facilities at Cwm Col Huw (ENV4). The Authority acknowledge recommendations to protect the western half of the MU and allow the eastern area to retreat naturally.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Cwm Col Huw
	Statutory: Non-Statutory: Heritage Coast; Glamorgan Wildlife Trust Reserve adjacent to Cwm Col Huw (Leased)	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Cwm Col Huw
	Mixture of private and LA owned. Generally private through hinterland on west side and LA on East side. Car parking; Café; Life savers building.	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)					
	The following coastal defences presently exist within this management unit :					
Defence Code	LOCATION	Length Km	Asset Type - Ownership	Crest Level m (AOD)	Deg. of Exp.	Min Res Life (yrs)
W.72.4705	Cwm Col Huw	0.23	Revetment CPA		Med	2-5
Notes: Defences may be divided between the west and east side with west side comprising a rock revetment and the eastern defences collapsed and now comprising a storm shingle beach.						

A.6	OBJECTIVES							
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	X	OB 15	OB 16	X

Management Unit 6/2

PART B Intervention Appraisal**Cwm Col Huw**

Ref.	Topic				
B.1	<p>SHORELINE DESCRIPTION - Refer to Context report Section 3</p> <p>Coast Edge : A valley through which the Afon Cwm Col Huw flows to sea with elevated land boundaries outcropping at the coastline as eroding cliffs of nodular limestone and shale. The shoreline can be divided between west and east with a rock armour revetment in the west and a storm shingle beach in the east. The western half of the MU comprises development in the form of a café and life savers building. The eastern half of the MU is a car park fronted by a shingle storm beach.</p> <p>Foreshore Type: mixture of wave induced coarse long shore drift and sandy lower foreshore with a large glacial rock promontory.</p> <p>Developed/undeveloped: Developed in west; undeveloped (formal car park now eroded) in east. Important gateway to Heritage Coast Path.</p> <p>Defended/undefended: Defended in West, undefended in east</p> <p>Orientation/exposure: Orientation south south west and exposed to prevailing weather. Approaches generally oblique and effected by geometry of intertidal zone.</p>				
	<table border="1"> <tr> <td>B.1.1</td> <td> <p>Land Use:</p> <p>Local visitor attraction and some tourist interest. Important "pit-stop" along coast path. Surf life saving club and café. Car parking</p> </td> </tr> <tr> <td>B.1.2</td> <td> <p>Specific Shoreline Interests:</p> <p>Viewing the sea, surfing, beach activities, walking</p> </td> </tr> </table>	B.1.1	<p>Land Use:</p> <p>Local visitor attraction and some tourist interest. Important "pit-stop" along coast path. Surf life saving club and café. Car parking</p>	B.1.2	<p>Specific Shoreline Interests:</p> <p>Viewing the sea, surfing, beach activities, walking</p>
B.1.1	<p>Land Use:</p> <p>Local visitor attraction and some tourist interest. Important "pit-stop" along coast path. Surf life saving club and café. Car parking</p>				
B.1.2	<p>Specific Shoreline Interests:</p> <p>Viewing the sea, surfing, beach activities, walking</p>				
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - River valley with Afon Cum Col-Huw flowing to sea between outcropping lias Limestone. The limestone to either side is nodular and interbedded with soft shale.</p> <p>Shoreline Type - Foreshore promontory comprising clay with overlying boulders. Foreshore generally rock with sand inclusions.</p> <p>Shoreline Movement - The shoreline is receding slowly as the outcropping Limestone either side of the MU erodes. Erosion rates are relatively high for Limestone cliff because of the mechanical form or joint pattern. Wave action causes undercutting over time resulting (typically) in the formation of Talas cones and slumping onto the foreshore. This erosion sets the shoreline back increasing the exposure of the frontage which has been eroding at a similar rate to the adjacent limestone outcrops.</p> <p>Developed/Undeveloped - The shoreline is development and can be divided into two sections with a café and life savers building on the west side and car park to the east.</p> <p>Gains/Losses - The car park has been progressively eroding and most of the formal parking area has disappeared. The defences in front of the western built area are not adequate and occasional damage to property results.</p>				

Management Unit 6/2

B.3		PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Surf life saving and café premises not adequately protected by existing coast protection works. Increased damage and flooding likely. Access to assets under medium term threat and car park will erode over time.	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
		Property Flooding	U	Historic Environment Losses		
		Land Flooding	U			
		Transport disruption	U			
		Recreation Losses	U			
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; condition of existing defences including outflanking and loss of access to the west side of MU.			
		<u>Preliminary Value of Assets at Risk:</u>	Tangible benefits apply to the eventual loss of the café and surf life savers building circa £0.5m.			
	B.3.2	Cost Implications: Following a recent study a split policy has been determined at a cost of approximately £300K. Retreat in east and hold/advance to west				
	B.3.3	Economic Viability: The proposed policy is viable although insufficient funding is presently available and therefore a short term policy of storm damage management is in place.				

Management Unit 6/2

PART C Intervention Appraisal**Cwm Col Huw**

MATRIX ASSESSMENT		Coastal Managers : VOGC			
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT	
EFFECTS ON COASTAL PROCESSES	Little anticipated change; current drift trend and slow cliff erosion will continue	Little anticipated change.	Limited long term impacts; scale and form would significantly influence impact.	Little short term impact; foreshore exposure would eventually increase.	
EFFECTS ON NATURAL ENVIRONMENT	Little change in short to medium term	Limited impact in west; more significant impact in east	Dependant upon extent.	Long term improvement	
EFFECTS ON HUMAN & BUILT ENVIRONMENT	car park will continue to be rolled back; access to café and life savers building will be lost - building will eventually be lost	Secure existing assets. Defences would need to be adaptable to cliff line recession	Secure existing assets. Defences would need to be adaptable to cliff line recession	all coastal assets will be lost	
EFFECTS ON DEVELOPMENT & LAND USE	No development would be allowed and car parking area will reduce over time.	May enable some development. Land use would be largely unaffected.	Potential for further use of coast edge eg promenade. Coast edge parking	No development and land use will be changed	
IMPLICATIONS FOR COASTAL DEFENCES	Coastal defences will become even less effective over time	Improvement would be required to defences in western half. New defences would be required in east	Significant if applied to whole frontage	Defences on west side would be removed.	
EFFECTS ON ADJACENT M.U'S	little change apart from very minor take of shingle into recessed inlet.	Limited effects up or down drift	Effect would directly related to scale.	Little impact in short to medium term. Possible long term impact adjacent to site	
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	increase recession rate and early loss of built assets	Defences would need to be more robust.	Defences would need to be more robust.	Recession rates would increase and foreshore promontory would probably be effected.	
CONCORDANCE WITH OBJECTIVES					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Natural inlet will eventually form. (B) - Gains as hinterland reverts to more natural condition	(A) - Limited if applied to whole frontage. Potential improvements if applied only in west. (B) - Neutral	(A) - None known (B) - Neutral or losses	(A) - In medium to long term (B) - Gains	
ECONOMIC VIABILITY	Not likely to be viable.	Viable if applied in west.	Not likely to be viable.	Not likely to be viable.	
GENERAL COMMENT ON POLICY SUITABILITY	Not sustainable long term without significant loss but close to present policy	* Suitable is applied in west only	Suitable dependant upon scale and if applied to the protection of existing assets on west side only.	Not suitable in west. Suitable in east provided access to west is maintained or re-routed and car park is rolled back	
RELATIVE SUSTAINABILITY					
Social	- ve	Baseline	- ve	- ve	
Economic	- ve	Baseline	- ve	- ve	
Environmental	- ve	Baseline	- ve	- ve	

Management Unit 6/2

Ref.	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Cwm Col Huw
C.2.1	Existing Coastal Defence Policy:	Short term storm maintenance with hold/advance in west and retreat in east.	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold or advance in west and managed retreat in east. Establish new access across valley floor to built assets and provide formal parking behind life savers building (Ref Study). Concern expressed regarding proposed re-development of café - Possible set-back option. Anticipated Long Term: Allow east to retreat and eventually shoreline assets will need to be abandoned as cliff recession progresses	0 - 3 years
C.2.3	Uncertainties/Dependencies:	Funding/storm events. Sea level rise and increased storminess.	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Maintain building and access.	
C.2.7	Reasons for Change:	Appropriate policy adopted subject to funding	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Cwm Col Huw
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 3, 5, 6, 9	CP 11, 12
C.3.1.2	Natural Environment:	NE 1	NE 3, 4
C.3.1.3	Human and Built Environment:	HB 2, 5, 8, 9, 11, 15	HB 6, 10
C.3.1.4	Coastal Defence:	CD 1, 2, 3, 4, 9	CD 6, 8
C.3.1.5	Development:	D 1, 2, 3	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety issues relating to rock armour revetment and unstable cliffs. Strong tidal currents	
C.3.2.2	Access:	Beach access and access to coast path	
C.3.2.3	Industrial Activities:	Dredging at Nash (remote)	
C.3.2.4	Human Pressures:	Parking space, congestion	
C.3.2.5	Tourism/Recreation:	Marketing the proposed shift in how the shoreline will be managed in the future.	

Management Unit 6/2

C.4	OBJECTIVES RECONCILIATION	Cwm Col Huw
	The preferred policy accords with the following objectives for this management unit	All stated in A6.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 6/3

MANAGEMENT UNIT No. 6/3 Cwm Col Huw to Limpert Bay (St. Athan)

From	Cwm Col Huw	295600E	167500N
To	Limpert Bay	300850E	166300N
Approximate Length	5.1Km		

PART A Objectives, Issues and Statutory Details**St. Athan**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		St. Athan
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Inspections relating to cliff coast path
CP3	Coincidence of high tides and storms	Impacts upon cliff erosion
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Waves are main cause of cliff erosion and bring coarse sediment into drift supply
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General issue through sub cell
CP9	Sea level rise and increased storminess	Potentially significant impact upon coast path and loss of agricultural land
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Drift direction may vary seasonally although trend is well established - wave induced easterly
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	No specific information but major issue
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local issue

NATURAL ENVIRONMENT		St. Athan
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Heritage coast
NE2	Protection of areas designated under international conventions.	
NE3	Water Quality	
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	

Management Unit 6/3

HUMAN & BUILT ENVIRONMENT		St. Athan
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Major concern
HB2	Public access to the foreshore	Limited and available mainly at the ends of the MU
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Significant issue - land acquisition for retreat of coast path
HB4	Fisheries interests	No information
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Access is restricted and therefore conservation tends to win out
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No specific issue
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Iron age hillfort
HB8	Vehicular access/parking/road congestion	Parking at either end of MU unless walking some distance from hinterland
HB9	Importance of beach quality to tourism	Not regarded as a traditional tourism area
HB10	Balance between traditional and green tourism	Generally green tourism
HB11	Importance of recreational use of foreshore and contribution to local economies	Not important apart from possible visitors using local hinterland pubs and guest houses - limited volumes
HB14	Beach texture - sand/silt	Rock shore
HB15	Access for emergency services (including life boat)	OK from sea - access from land is not good
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern

COASTAL DEFENCE		St. Athan
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Most important for coast path
CD2	Cliff erosion	Rates vary but believed to be high for a rock shore
CD3	Adequacy/condition of existing defences	Natural rock cliff shore
CD4	Maintenance of existing defences	Not feasible
CD8	CPA funding of Coast Protection	CPA funding for set back of coast path is unlikely
CD9	The role of the foreshore/beach as a defence	Rock foreshore does play a role

Management Unit 6/3

DEVELOPMENT		St. Athan
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Hinterland is agricultural
D2	Sustainability	Agricultural land will be slowly be lost over time
D3	Preservation/enhancement of landscape value	Important natural asset - landscape
D5	Impacts of coastal development..	
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	St. Athan
	ENV4 refers to the special landscape qualities of the Heritage Coast and states that this assets will be conserved and enhanced. Priority in these areas will be given to agriculture, landscape and conservation.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	St. Athan
	Statutory: Non-Statutory: Heritage Coast - High landscape value	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	St. Athan
	Understood to be private agricultural - Authority/heritage coast interest in coast path	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)
	The following coastal defences presently exist within this management unit :
	W.72.4122 Llantwit major to Summer House Point; 5.6Km Soft Rock Shore with medium exposure

A.6	OBJECTIVES																		
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :																		
	<table border="1"> <tr> <td>OB 1</td> <td>OB 2</td> <td>OB 3</td> <td>OB 4</td> <td>OB 5</td> <td>OB 6</td> <td>OB 7</td> <td>OB 8</td> <td></td> </tr> <tr> <td>OB 9</td> <td>OB 10</td> <td>OB 11</td> <td>OB 12</td> <td>OB 13</td> <td>OB 14</td> <td>OB 15</td> <td>OB 16</td> <td>OB 17</td> </tr> </table>	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8		OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8												
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17											

Management Unit 6/3

PART B Intervention Appraisal		St. Athan																																			
Ref	Topic																																				
B.1	Shoreline Description - Refer to Context report Section 3 Coast Edge Type - Soft rock cliff Foreshore Type - Rock shore with shingle drift upper foreshore Developed/Undeveloped - Undeveloped Defended/undefended - Undefended Orientation/exposure - South with medium exposure																																				
	B.1.1	Land Use:	Agricultural, coast path																																		
	B.1.2	Specific Shoreline Interests:	Farming, Walking, high landscape interest																																		
B.2	SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - Porthkerry formation of the Lower Jurassic - Mudstone/shales Shoreline Movement/Historic Maps -No specific recent information although cliff is known to be receding Development/Industry - None Gains/Losses - General cliff erosion along whole frontage																																				
B.3	PRELIMINARY ECONOMIC APPRAISAL																																				
	B.3.1	ASSETS AT RISK	<table border="1"> <thead> <tr> <th colspan="2">TANGIBLE BENEFITS</th> <th colspan="2">INTANGIBLE BENEFITS</th> </tr> </thead> <tbody> <tr> <td>Coast path and agricultural land</td> <td>Property Loss</td> <td rowspan="6">U</td> <td>Environmental Losses</td> <td>U</td> </tr> <tr> <td></td> <td>Infrastructure Loss</td> <td>Tourism</td> <td>U</td> </tr> <tr> <td></td> <td>Land Loss</td> <td>Social Effects</td> <td></td> </tr> <tr> <td></td> <td>Property Flooding</td> <td>Historic Environment Losses</td> <td>U</td> </tr> <tr> <td></td> <td>Land Flooding</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Transport disruption</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Recreation Losses</td> <td>U</td> <td></td> <td></td> </tr> </tbody> </table>	TANGIBLE BENEFITS		INTANGIBLE BENEFITS		Coast path and agricultural land	Property Loss	U	Environmental Losses	U		Infrastructure Loss	Tourism	U		Land Loss	Social Effects			Property Flooding	Historic Environment Losses	U		Land Flooding				Transport disruption				Recreation Losses	U		
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	Transport disruption																																				
	Recreation Losses	U																																			
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess																																		
		<u>Preliminary Value of Assets at Risk:</u>	Value of coast path is not readily determined - intangible	CPA funding of set back of coast path is unlikely																																	
	B.3.2	Cost Implications: Cost of set back will be influenced by co-operation of land owners																																			
	B.3.3	Economic Viability: Not clear at present time																																			

Management Unit 6/3

PART C Strategic Policy Appraisal	St. Athan
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	++ RETREAT
EFFECTS ON COASTAL PROCESSES	Current trend will continue with periodic cliff falls and sediment inputs to system.			Current trend will continue with periodic cliff falls and sediment inputs to system.
EFFECTS ON NATURAL ENVIRONMENT	Evolutionary changes			Evolutionary changes
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Impacts on coast path			Impacts on coast path
EFFECTS ON DEVELOPMENT & LAND USE	Development is most unlikely - land use will change in time as coast path is lost			Development is most unlikely - land use will change in time as coast path is lost
IMPLICATIONS FOR COASTAL DEFENCES	Natural cliff shore will continue to erode	Refer to notes below	Refer to notes below	Natural cliff shore will continue to erode
EFFECTS ON ADJACENT M.U.'S	No change in current drift trend			No change in current drift trend
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of cliff erosion will increase and coast path losses will occur earlier			Rate of cliff erosion will increase and set-back programme will need to be accelerated
CONCORDANCE WITH OBJECTIVES	General accordance with exception of desire to maintain public access			Generally accords with objectives.
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - No Change			(A) - None Known (B) - No Change
ECONOMIC VIABILITY	Viable			Subject to acquisition of land to allow coast path to be set-back
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable as public access along shoreline will be lost			Suitable
RELATIVE SUSTAINABILITY				
Social	- ve	- ve	- ve	Baseline
Economic	+ ve	- ve	- ve	Baseline
Environmental	Neutral	- ve	- ve	Baseline

NOTES

Hold the line and advance the line are not considered to be worthy of serious consideration in this matrix appraisal.

++ Retreat should be assumed to apply only to the coast path and no intervention on the cliff face is anticipated. It is not proposed to set explosive charges along any section of the Heritage Coast as has previously been the case.

Management Unit 6/3

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		St. Athan
C.2.1	Existing Coastal Defence Policy:	Do nothing with set-back at pinch points	
C.2.2	Future Coastal Defence Policy:	Short Term: Monitor for pinch points and localised set back guided by public safety Anticipated Long Term: Retreat	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess - rate of erosion and erosion mechanism. Vulnerability needs to be assessed from both top and bottom of cliff face	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M6, M7, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Increased monitoring of erosion adjacent to coast path	
C.2.7	Reason for Change:	Development of managed/informed approach	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1, CP9	CP12
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human and Built Environment:	HB1	HB2, HB17
C.3.1.4	Coastal Defence:	CD1	CD8
C.3.1.5	Development:	D3	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety on coast path adjacent top cliff edge.	
C.3.2.2	Access:	Good along coast from access point at end of MU, access is more restricted from hinterland.	
C.3.2.3	Industrial Activities:	None.	
C.3.2.4	Human Pressures:	No specific issue.	
C.3.2.5	Tourism/Recreation:	Important to maintain coast path access throughout Heritage Coast.	

Management Unit 6/3

C.4	OBJECTIVES RECONCILIATION		St. Athan
	The preferred policy accords with the following objectives for this management unit	The Policy generally accords with the objectives set-out in A6	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 6/4

MANAGEMENT UNIT No. 6/4**Limpert Bay to Leys Beach (Aberthaw)**

From	Limpert Bay	300850E	166300N
To	Leys Beach	304000E	166000N
Approximate Length	3.2Km		

PART A Objectives, Issues and Statutory Details**Aberthaw**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Aberthaw
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles taken (3No)
CP2	Shingle Storm Beach Behaviour	Storm beach behaviour is important - not suited for current monitoring package
CP3	Coincidence of high tides and storms	Potential overtopping - crest level and sea wall survey should assess future risk
CP4	Dune toe behaviour - erosion/regeneration	Not applicable although historic area of blown sand
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Very important but not within this MU. Wave induced drift supply from west provides storm beach material for Aberthaw protection
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	River Thaw issues through MU and has been trained through power station area
CP7	Siltation of estuaries and ports;	Not relevant
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	Generally coarse sediment resulting from long shore drift exists although some sand inclusions are noted (Limpert Bay)
CP9	Sea level rise and increased storminess	Present coast protection was probably not designed to take account of CP9
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Effects upon shingle beach behaviour and knock-on impacts upon defence.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern.

NATURAL ENVIRONMENT		Aberthaw
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Note SSSI extends into power station frontage areas.

Management Unit 6/4

NATURAL ENVIRONMENT		Aberthaw
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	
NE3	Water Quality	Sewage outfalls and caisson.
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	

HUMAN & BUILT ENVIRONMENT		Aberthaw
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Not known issue
HB2	Public access to the foreshore	Access track from Gileston - Car park
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Limited information - numerous rights of way shown/footpaths shown through power station site.
HB4	Fisheries interests	No information
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No significant conflict known
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Historic port at Aberthaw and other noted sites.
HB8	Vehicular access/parking/road congestion	Vehicular access along track and parking facility at Limpert Beach
HB9	Importance of beach quality to tourism	Shingle beach is important feature
HB10	Balance between traditional and green tourism	MU forms interface between traditional and green tourism with industrial centre. Caravan site to east and Heritage Coast to west.
HB11	Importance of recreational use of foreshore and contribution to local economies	No information
HB12	Marine access - Port/harbour/launching facilities	No known facility (historic port)
HB13	Human pressure on natural assets such as dunes	No known impacts
HB14	Beach texture - sand/silt	
HB15	Access for emergency services (including life boat)	
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Power station is clearly a major contributor to the regional electricity needs and important as part of the national grid
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	

Management Unit 6/4

COASTAL DEFENCE		Aberthaw
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Not likely during service life of power station
CD2	Cliff erosion	Eastern border of MU adjacent to Railway line
CD3	Adequacy/condition of existing defences	Should be reviewed in the light of sea level rise and increased storminess and age of defences
CD4	Maintenance of existing defences	No information - probably maintained
CD5	Dune erosion	
CD6	Condition of flood banks/sea defences	
CD7	Private sea defences	Power station defences would be described as private
CD8	CPA funding of Coast Protection	
CD9	The role of the foreshore/beach as a defence	

DEVELOPMENT		Aberthaw
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	
D2	Sustainability	
D3	Preservation/enhancement of landscape value	
D4	Future of large industrial frontages	Long term future of coal fired power stations.
D5	Impacts of coastal development..	
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Aberthaw
	Heritage coast and East Aberthaw Coast have important landscape value which are cover by separate policies - ENV4 & ENV5 - ENV4 - Special environmental qualities of Heritage Coast will be conserved and enhanced. Priority given to agriculture, landscape and nature conservation. ENV 5 - Development should have regard for the coastal location - list of mitigation and conditions.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Aberthaw
	Statutory: Eastern Area of MU (Stock pile area) East Aberthaw Coast SSSI. Non-Statutory: Heritage coast ends at western boundary of Power Station.	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Aberthaw
	Private and mostly belonging to National Power but much of the Aberthaw SSSI area is leased to, and managed by Glamorgan Wildlife Trust (nature reserve).	

Management Unit 6/4

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.72.4123 The Walls, Gilston 1.0Km Shingle Beach with medium exposure W.72.4710 Aberthaw Power Station; 2.5Km Private Wave Wall & Groynes with medium exposure

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 6/4

PART B Intervention Appraisal		Aberthaw																														
Ref	Topic																															
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - Varies from Natural shingle and natural shingle fronting a sea wall and groyne field through the Walls and Limpert Bay. Sea wall with groyne field holding shingle extends around Leys Beach before soft rock cliff shore behind apparent marsh area adjacent to railway line.</p> <p>Foreshore Type - Outcropping Porthkerry Formation through sections of the intertidal zone and marine deposits.</p> <p>Developed/Undeveloped - Developed apart from the western section known as the Walls.</p> <p>Defended/undefended - Mostly defended apart from the western section through the Walls.</p> <p>Orientation/exposure - Orientation varies however coastline is generally south facing with medium exposure.</p>																															
	B.1.1	Land Use:	Mainly power generation with some environmental and landscape interest along undeveloped section																													
	B.1.2	Specific Shoreline Interests:	Power generation - note caisson intake/outflow SSSI in eastern part of MU																													
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Generally Alluvium with blown sand and patches of outcropping Mercia Mudstone of the Lower Jurassic on the foreshore. Large areas of made ground adjacent (east) of the Power station.</p> <p>Shoreline Movement/Historic Maps - Recent surveys suggest beach steepening to the west and gradient becoming more shallow to the east.. No firm conclusion can be drawn from this as the data set extends over a limited period.</p> <p>Development/Industry - Power generation has been located on the site for many years and two stations have been constructed over time (Aberthaw A & B). The Power station site has been protected with a sea wall and groyne field.</p> <p>Gains/Losses No specific information although losses along the eastern marsh would have been likely.</p>																															
B.3	PRELIMINARY ECONOMIC APPRAISAL																															
	B.3.1	ASSETS AT RISK	<table border="1"> <thead> <tr> <th colspan="2">TANGIBLE BENEFITS</th> <th colspan="2">INTANGIBLE BENEFITS</th> </tr> </thead> <tbody> <tr> <td rowspan="6">Power station and railway on eastern border of MU - Consider only power station</td> <td>Property Loss</td> <td></td> <td>Environmental Losses</td> <td>U</td> </tr> <tr> <td>Infrastructure Loss</td> <td>U</td> <td>Tourism</td> <td></td> </tr> <tr> <td>Land Loss</td> <td>U</td> <td>Social Effects</td> <td>U</td> </tr> <tr> <td>Property Flooding</td> <td></td> <td>Historic Environment Losses</td> <td>U</td> </tr> <tr> <td>Land Flooding</td> <td>U</td> <td></td> <td></td> </tr> <tr> <td>Transport disruption Recreation Losses</td> <td>U</td> <td></td> <td></td> </tr> </tbody> </table>	TANGIBLE BENEFITS		INTANGIBLE BENEFITS		Power station and railway on eastern border of MU - Consider only power station	Property Loss		Environmental Losses	U	Infrastructure Loss	U	Tourism		Land Loss	U	Social Effects	U	Property Flooding		Historic Environment Losses	U	Land Flooding	U			Transport disruption Recreation Losses	U		
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	Property Flooding		Historic Environment Losses	U																												
	Land Flooding	U																														
	Transport disruption Recreation Losses	U																														
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess and future of power generation at Aberthaw.																													
		<u>Preliminary Value of Assets at Risk:</u>	Over £10m protected by existing defences CPA funding unlikely for industry frontage																													
	B.3.2	Cost Implications: To maintain and enhance existing defences could cost between £1m & £3m.																														
	B.3.3	Economic Viability: Viable.																														

Management Unit 6/4

PART C Strategic Policy Appraisal	Aberthaw
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little change in current trends	No anticipated change from current trends	Depend upon form and extent	Would release material into system
EFFECTS ON NATURAL ENVIRONMENT	Little known change	No known change	Potentially significant	Unknown - would need to be studied
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Eventual impacts upon power station complex - risk is currently unknown	Existing built environment would be secured	Would secure existing built environment	Existing built environment would be lost
EFFECTS ON DEVELOPMENT & LAND USE	Potential medium to long term impacts on current land use	Current land use would be secured	Would increase development potential	Current land use would change and development would not be feasible
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would eventually deteriorate and be at increased risk from storms.	Condition of existing defences should be assessed in the light of latest environmental data **	Potentially significant	Existing defences would be lost over time or removed
EFFECTS ON ADJACENT M.U.'S	Potential release of shingle presently contained along this MU - Groynes		Impacts are likely and severity would be dependant upon form and extent	Impact would need to be assessed as part of serious consideration of policy
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Damage to existing assets would occur sooner	** Impacts upon defences will occur earlier	Civil engineering works would need to be sufficiently robust to cope with increased wave heights	Losses would occur early
CONCORDANCE WITH OBJECTIVES	Does not accord with most relevant objectives	Generally Accords with objectives	Does not generally accord with objectives	Does not generally accord with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT 2 - BIODIVERSITY ISSUES	(A) - None likely as erosion may effect made ground (B) - No information	(A) - No information (B) - No anticipated change	(A) - None (B) - Potential losses	(A) - Unclear at present (B) - Potential gains
ECONOMIC VIABILITY	Not viable	Viable	Not viable	Not likely to viable whilst power station is in service
GENERAL COMMENT ON POLICY SUITABILITY	Not Suitable	Suitable	Not suitable	Not suitable - significant work would be required to site before retreat option could be permitted
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline	Unknown - probably - ve	- ve
Economic	- ve	Baseline	Probably - ve	- ve
Environmental	+ ve (subject to site remediation)	Baseline	- ve	+ ve

Management Unit 6/4

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Aberthaw
C.2.1	Existing Coastal Defence Policy:	Hold line (power station)	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold line Anticipated Long Term: Hold line unless power station closes	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increase storminess; long term future of coal fired power stations. Possible re-working or ash tips which cover the existing river course - potential impacts upon coastal defence.	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, L8	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M10, M11, M13, M15, M16, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Conform condition of existing defences and assess storm event risk	
C.2.7	Reason for Change:	No significant change proposed	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1	CP 2, 3, 9
C.3.1.2	Natural Environment:		
C.3.1.3	Human and Built Environment:	HB 16	
C.3.1.4	Coastal Defence:	CD 4, 7	CD 3
C.3.1.5	Development:		D 2, 4
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Potential safety issue - public use of the Walls - Limpert Bay	
C.3.2.2	Access:	Limited by narrow track from Gileston	
C.3.2.3	Industrial Activities:	Power Station; Note hinterland cement works and railway	
C.3.2.4	Human Pressures:	No specific local issue	
C.3.2.5	Tourism/Recreation:	No specific issue	

Management Unit 6/4

C.4	OBJECTIVES RECONCILIATION	Aberthaw
	The preferred policy accords with the following objectives for this management unit	Generally accord with objectives outlined in A6 above.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 6/5

MANAGEMENT UNIT No. 6/5**Fontygary to Bullcliff Rocks (Rhoose)**

From	Fontygary	304000E	166000N
To	Bullcliff Rocks	309200E	166700N
Approximate Length	5.5Km		

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Rhoose
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile - Fontygary
CP2	Shingle Storm Beach Behaviour	No monitoring at present
CP3	Coincidence of high tides and storms	Impacts upon shingle drift and erosion at the base of cliff
CP4	Dune toe behaviour - erosion/regeneration	No applicable
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Very important - impacts at caravan sites and Rhoose Point development
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	No specific Issue
CP7	Siltation of estuaries and ports;	No specific Issue
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern although most near shore movement is wave induced
CP9	Sea level rise and increased storminess	Potential major concern in respect of cliff line erosion rates.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Effects upon drift movement and cliff exposure
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major general concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major issue

NATURAL ENVIRONMENT		Rhoose
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	High landscape value although little is designated apart from Porthkerry Country Park & East Aberthaw
NE2	Protection of areas designated under international conventions.	Not applicable

Management Unit 6/5

NATURAL ENVIRONMENT		Rhoose
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	No known discharges

HUMAN & BUILT ENVIRONMENT		Rhoose
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Public safety concerns along cliff coast path
HB2	Public access to the foreshore	Limited because of cliff coast - access points present at specific locations
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Coast path under threat in a number of places - pressure from coastal erosion and, in places, from quarrying activities (Rhoose Point)
HB4	Fisheries interests	General interest around coast
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No significant conflict
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known issue
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	No specific issue - Some hinterland sites at Bullcliff Rocks
HB8	Vehicular access/parking/road congestion	No known designated parking along coast apart from caravan sites.
HB9	Importance of beach quality to tourism	Most important for landscape value
HB10	Balance between traditional and green tourism	Mixture of both although best suited to environmental along general coast - exception - The Leys.
HB11	Importance of recreational use of foreshore and contribution to local economies	Caravan site at Fontygary and Porthkerry
HB12	Marine access - Port/harbour/launching facilities	None Known
HB13	Human pressure on natural assets such as dunes	No dunes present
HB14	Beach texture - sand/silt	Generally coarse sediment such as shingle
HB15	Access for emergency services (including life boat)	
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	No known facilities - Quarry now being re-developed
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern along whole coast

COASTAL DEFENCE		Rhoose
REF	ISSUE DESCRIPTION	Specific to MU

Management Unit 6/5

COASTAL DEFENCE		Rhosee
CD1	Identification of opportunities for managed retreat	Retreat is likely to be only economic long term option - exception - long term management plan for Rhosee Point development is unknown
CD2	Major cliff erosion	Issue with most significant impact human environment
CD3	Adequacy/condition of existing defences	Rhosee Point defences should be reviewed
CD4	Maintenance of existing defences	Responsibility for Rhosee Point coastal management should be confirmed
CD5	Dune erosion	No dunes
CD6	Condition of flood banks/sea defences	No known issue
CD7	Private sea defences	Ownership of Rhosee Point defences should be confirmed
CD8	CPA funding of Coast Protection	Coastal defence unlikely to be permitted or assisted by central funding
CD9	The role of the foreshore/beach as a defence	Rock shore plays an important role in dissipating wave energy and has a diminishing effect as tide height increases.

DEVELOPMENT		Rhosee
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Status of foreshore ownership and responsibility throughout development area at Rhosee Point should be clarified
D2	Sustainability	Sustainability of coastal development at Rhosee Point should be reviewed
D3	Preservation/enhancement of landscape value	Future of natural cliff landscape around Rhosee Point was ruined by ill-informed past quarrying activity.
D4	Future of large industrial frontages	Derelict quarry at Rhosee Point is being re-developed - this will inevitable involve changes to the 'hard' quarried landscape.
D5	Impacts of coastal development.	Potential increase in safety issues as development will generate more human activity around unstable cliff coast - information/education pgm required. Monitoring required
D6	Integration and conflict with other management plans	Need to require future coastal developments to consider the aims of shoreline management plans in advance.

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Rhosee
	ENV 5 - Development should have regard for the coastal location - list of mitigation and conditions.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Rhosee
	Statutory: Porthkerry SSSI - Cliff Wood & Golden Stairs - Country Park, East Aberthaw SSSI Non-Statutory: No designation but general landscape importance	

Management Unit 6/5

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Rhose
Understood to be private - Should be reviewed. Note proximity of railway to coast edge adjacent to the Leys		

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :	
W.72.4140 - Aberthaw to Cold Knap 7.8Km of soft rock shore with medium exposure		

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 6/5

PART B Intervention Appraisal	Rhoose
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Ref	Topic																																		
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - Rock cliff shore of eroding Lias</p> <p>Foreshore Type - Generally rock with mobile storm shingle beaches.</p> <p>Developed/Undeveloped Mixture of developed and undeveloped with developed section at Fontygary and Porthkerry caravan parks and the Rhoose Point development - note railway adjacent to coast edge at the Leys</p> <p>Defended/undefended - undefended with the exception of two small plugs along Rhoose Point where the cliff has broken through to the hinterland (disused quarry)</p> <p>Orientation/exposure Varies south to south east with medium exposure.</p>																																		
	B.1.1	Land Use:	Holiday caravan sites, residential development, landscape interests																																
	B.1.2	Specific Shoreline Interests:	Walking and enjoyment of landscape, sun bathing, fishing																																
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Part of Porthkerry formation of Lower Jurassic, Lower Lias with intertidal wave cut platforms</p> <p>Shoreline Movement/Historic Maps - General erosion of soft rock shore coast edge with recent evidence of foreshore steepening</p> <p>Development/Industry - Rhoose Point development on site of former quarry.</p> <p>Gains/Losses - Soft rock shore erosion resulting in a receding shoreline</p>																																		
B.3	PRELIMINARY ECONOMIC APPRAISAL																																		
	B.3.1	ASSETS AT RISK	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: left;">TANGIBLE BENEFITS</th> <th colspan="2" style="text-align: left;">INTANGIBLE BENEFITS</th> </tr> </thead> <tbody> <tr> <td style="width: 30%;">Caravan sites, railway line, review of Rhoose Point development, coast paths.</td> <td style="width: 15%;">Property Loss</td> <td style="width: 10%; text-align: center;">U</td> <td style="width: 45%;">Environmental Losses</td> </tr> <tr> <td></td> <td>Infrastructure Loss</td> <td style="text-align: center;">U</td> <td>Tourism</td> </tr> <tr> <td></td> <td>Land Loss</td> <td style="text-align: center;">U</td> <td>Social Effects</td> </tr> <tr> <td></td> <td>Property Flooding</td> <td></td> <td>Historic Environment Losses</td> </tr> <tr> <td></td> <td>Land Flooding</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Transport disruption</td> <td style="text-align: center;">U</td> <td></td> </tr> <tr> <td></td> <td>Recreation Losses</td> <td style="text-align: center;">U</td> <td></td> </tr> </tbody> </table>	TANGIBLE BENEFITS		INTANGIBLE BENEFITS		Caravan sites, railway line, review of Rhoose Point development, coast paths.	Property Loss	U	Environmental Losses		Infrastructure Loss	U	Tourism		Land Loss	U	Social Effects		Property Flooding		Historic Environment Losses		Land Flooding				Transport disruption	U			Recreation Losses	U	
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	Property Flooding		Historic Environment Losses																																
	Land Flooding																																		
	Transport disruption	U																																	
	Recreation Losses	U																																	
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess, Programme of development at Rhoose Point.																																
		<u>Preliminary Value of Assets at Risk:</u>	Further research is required to assess the risks to coastal assets. Includes risk to railway and caravan sites.																																
			CPA funding - of coast paths is unlikely																																
	B.3.2	Cost Implications: Selective protection may be required.																																	
	B.3.3	Economic Viability: Subject to further economic assessment but likely to viable in respect of railway line (subject to risk)																																	

Management Unit 6/5

PART C Strategic Policy Appraisal	Rhoose
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	++ RETREAT
EFFECTS ON COASTAL PROCESSES	Current trend continue			Little change in current trend
EFFECTS ON NATURAL ENVIRONMENT	Little anticipated change			Gradual/natural change
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Impacts at caravan sites and Rhoose Point development in long term			Potential impacts on built assets including coast paths, caravan sites and Rhoose Point development.
EFFECTS ON DEVELOPMENT & LAND USE	Impacts upon Rhoose Point development in long term			Potential impacts upon development and land use - an assessment of long term sustainability should be undertaken
IMPLICATIONS FOR COASTAL DEFENCES	Recently installed defences at Rhoose will eventually be stranded on foreshore as cliff line recedes to either side - long term	Refer to notes below	Refer to notes below	Existing defences would eventually be lost or abandoned
EFFECTS ON ADJACENT M.U'S	No anticipated impacts			No significant change in current trend
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of recession would increase and effect coastal assets earlier			Rate of recession would increase
CONCORDANCE WITH OBJECTIVES	Generally accords with objectives. Information regarding issues at Rhoose Point will be required			Generally accords with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - No significant change (B) - No information			(A) - No significant change (B) - No information
ECONOMIC VIABILITY	Viable			Potentially viable
GENERAL COMMENT ON POLICY SUITABILITY	Suitable with possible exception at Rhoose Point development			Potentially suitable
RELATIVE SUSTAINABILITY				
Social	Baseline 1	+ ve (selectively)	- ve	Baseline 2
Economic	Baseline 1	- ve	- ve	Baseline 2
Environmental	Baseline 1	- ve	- ve	Baseline 2

NOTES

Hold and/or advance the line along the whole of this MU is not realistic or desirable. Such a policy would result in major changes to the near shore and wave induced upper shore sediment regime with consequent effect down drift at the Knap.

It may be necessary to apply selective hold the line policies, however proposals for such works should be reviewed in the light of the Shoreline Management Plan which requires particular attention to be paid to impact on adjoining coasts. It will be important to carefully assess any works that may change the long shore drift regime.

++ RETREAT - Retreat assumes no physical removal of the shoreline but does assume the setting back of assets such as coast paths.

Management Unit 6/5

Ref	TOPIC	DESCRIPTION		
C.2	PREFERRED POLICY DEFINITION			Rhoose
C.2.1	Existing Coastal Defence Policy:	Do nothing apart from those areas associated with Rhoose Point development where limited defence work has been undertaken.		
C.2.2	Future Coastal Defence Policy:	Short Term: Hold line along railway frontage, retreat along remainder - policy at Rhoose point to determined following further investigation Anticipated Long Term: Hold along railway - retreat along remainder.		0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; predicting rate of erosion along sections of coast with assets.		
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, L9		(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15, M16		(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Confirm rights and responsibilities		
C.2.7	Reason for Change:	To prepare a more informed approach for decision making and management.		

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 9	
C.3.1.2	Natural Environment:		
C.3.1.3	Human and Built Environment:	HB 1	
C.3.1.4	Coastal Defence:	CD 1, 2, 3, 4, 7	
C.3.1.5	Development:	D 1, 2, 5	
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Coast path and beach users - eroding cliff hazard	
C.3.2.2	Access:	No specific issues apart from consequences of increasing access and development at Rhoose Point	
C.3.2.3	Industrial Activities:	Associated with railway line.	
C.3.2.4	Human Pressures:	Associated with safety	
C.3.2.5	Tourism/Recreation:	Caravan parks and Rhoose Point developments	

Management Unit 6/5

C.4	OBJECTIVES RECONCILIATION		Rhoose
	The preferred policy accords with the following objectives for this management unit	Accords with all Objectives apart from those stated below	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	OB5, OB6 - Subject to confirmation following further review of development plans at Rhoose Point	
	OB5 - To guide future development requiring a shoreline position to locations that are not under threat from flooding or coastal erosion, or which can be defended appropriately		
	OB6 - To discourage future development and upgrading of existing development in areas that can not be appropriately defended.		

Management Unit 6/6

MANAGEMENT UNIT No. 6/6**Bull Cliff Rock to Cold Knap Point (The Knap)**

From	Bullcliff Rock	309200E	166700N
To	Cold Knap Point	310400E	166000N
Approximate Length	1.4Km		

PART A Objectives, Issues and Statutory Details**The Knap**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		The Knap
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile monitoring at either end of MU.
CP2	Shingle Storm Beach Behaviour	Covered, only in part, within beach profile data
CP3	Coincidence of high tides and storms	Potential impacts upon large storm shingle beach
CP4	Dune toe behaviour - erosion/regeneration	Not applicable
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Major issues effecting cliffed shoreline outside this MU - Knap protection relies upon cliff erosion to the west and wave induced long shore drift.
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Cold Knap Point and entrance to Barry Harbour outside MU should be noted.
CP7	Siltation of estuaries and ports;	No specific issue
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General issue
CP9	Sea level rise and increased storminess	Potentially significant impact upon foreshore, natural defences and therefore hinterland assets.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Potentially significant if current drift trend is disrupted
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local concern

NATURAL ENVIRONMENT		The Knap
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Nearby Cliff Wood SSSI - general landscape value around The Knap

Management Unit 6/6

NATURAL ENVIRONMENT		The Knap
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern

HUMAN & BUILT ENVIRONMENT		The Knap
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Cliff shoreline to west, water activities
HB2	Public access to the foreshore	Good with promenade extending across most of the MU
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Coast path across top of Bull Cliff in west of MU before built area
HB4	Fisheries interests	Beach casting likely - no specific information
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Dependant upon coastal policy adopted
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Hillfort and buildings on sea front
HB8	Vehicular access/parking/road congestion	Good access, peak summer congestion
HB9	Importance of beach quality to tourism	Important and popular shingle beach feature. Hinterland lake and swimming pool.
HB10	Balance between traditional and green tourism	Generally traditional and concentrated in east of MU)
HB11	Importance of recreational use of foreshore and contribution to local economies	Important
HB12	Marine access - Port/harbour/launching facilities	Old Barry Harbour in adjacent MU.
HB13	Human pressure on natural assets such as dunes	Not applicable
HB14	Beach texture - sand/silt	Upper foreshore is shingle, lower foreshore is sand (silty) - bull cliff rocks to west.
HB15	Access for emergency services (including life boat)	Good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Commercial relating to tourism - no industry
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern

Management Unit 6/6

COASTAL DEFENCE		The Knap
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Retreat would result in the loss of the promenade.
CD2	Cliff erosion	Erosion to the west - impacts to west end car park and access, coast path and property in long term .
CD3	Adequacy/condition of existing defences	Review of maintenance/movement of shingle required - general profile appears to be healthy at present time - vulnerable to extreme events
CD4	Maintenance of existing defences	Data required to assess future policy
CD5	Dune erosion	No applicable
CD6	Condition of flood banks/sea defences	Hinterland flood risk should be confirmed
CD7	Private sea defences	Promenade understood to be VOGC.
CD8	CPA funding of Coast Protection	Economic benefits would need to be assessed - possible wave wall along sea ward edge of road.
CD9	The role of the foreshore/beach as a defence	The foreshore and shingle beach is the defence

DEVELOPMENT		The Knap
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Development should be restricted and steered away from shoreline
D2	Sustainability	
D3	Preservation/enhancement of landscape value	Risk of erosion should be assessed over time - Monitoring
D4	Future of large industrial frontages	Not applicable
D5	Impacts of coastal development.	Potential impacts of any further development or works along Rhoose Point should be carefully examined for impacts within this MU.
D6	Integration and conflict with other management plans	

A.2	<u>STATUTORY PLANNING POLICIES (Appendix A)</u>	The Knap
	ENV 5 - Development should have regard for the coastal location - list of mitigation and conditions.	
A.3	<u>CONSERVATION DESIGNATIONS (Context Report)</u>	The Knap
	Statutory: Cliff Wood - Golden Stairs SSSI - mixed woodland. Non-Statutory: General landscape interest	
A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	The Knap
	No specific information - believed to be mostly private.	

Management Unit 6/6

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.72.4140 - Aberthaw to Cold Knap; 7.8Km of soft rock shore with medium exposure

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

PART B Intervention Appraisal**The Knap**

Ref	Topic				
B.1	Shoreline Description - Refer to Context report Section 3 Coast Edge Type - Material - Varies from west to east with high cliff soft rock shore in west (Bull Cliff) leading into a low valley/plane before the Cold Knap Point rock outcrop. The coast edge is dominated by an asphalt road/promenade with adjacent shingle beach. Foreshore Type - Material - Two components with shingle upper beach on top of sandy lower foreshore. Developed/Undeveloped - Mostly developed along coast edge - promenade, road, car park. Hinterland development varies from west to east with housing set back from high cliff to the west, properties (including flats) near the coast edge in centre of the MU and recreation lakes and swimming pool to the east adjacent to Cold Knap Point. Defended/undefended - undefended - Note importance of shingle bank/beach to defences Orientation/exposure - south west orientation with medium exposure				
	B.1.1	Land Use:	Residential housing and recreation. Good vehicular access and parking along coast edge - tourism		
	B.1.2	Specific Shoreline Interests:	Surf life saving, tourist beach, sea/sun bathing and water skiing (no information on launch site for trailer mounted boats)		
B.2	SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - General hinterland comprises the Porthkerry Formation with a band of Lavernock Shales extending across the western area and Bull Cliff. Storm Gravel Beach Deposits form a distinctive pebble ridge (Friars Point Limestone) across the whole MU west of Cold Knap Point. Shoreline Movement/Historic Maps - No specific data - long term/time series data required and being gathered as part of Coastal Group monitoring programme Development/Industry - None Gains/Losses - Long term losses will occur as shingle beach is influenced by storm events.				
	PRELIMINARY ECONOMIC APPRAISAL				
B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
	Promenade, access road, coast path and hinterland assets and infrastructure.	Property Loss	U	Environmental Losses	U
		Infrastructure Loss	U	Tourism	U
		Land Loss	U	Social Effects	U
Property Flooding		U	Historic Environment	U	
Land Flooding		U	Losses		
Transport disruption		U			
Recreation Losses	U				
Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. Long term movement of coarse drift material from eroding Vale coast.				
<u>Preliminary Value of Assets at Risk:</u>	The extent of land and therefore assets at risk is not clear and will be governed by the severity of future events - value likely to be over £2m		CPA funding coast paths is unlikely		
B.3.2	Cost Implications: Will be subject to further review of suitability of work eg wave wall along sea ward edge of highway may be appropriate unless significant draw down of the shingle beach was predicted..				
B.3.3	Economic Viability: Likely to be viable if a degree of coast protection provided by the storm shingle beach is maintained.				

Management Unit 6/6

PART C Strategic Policy Appraisal**The Knap**

C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	No anticipated change to current trends.	Provided linear protection is adopted, impacts are likely to be minimal	Significant impacts likely - subject to form and extent	Little short term change with longer term impacts possible as shoreline recedes
EFFECTS ON NATURAL ENVIRONMENT	No short term change. Medium to long term erosion expected to effect environment	Little change anticipated	Detrimental impacts possible although holding the cliff to the west may be environmentally positive	The knap would eventually return to a more natural recessed valley bounded by bull cliff and Cold Knap Point
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Impacts on promenade/roadway as shingle beach is wash over road - progressively increasing over time wider impacts expected	Would secure built environment although extent of works may need to consider a revised design life to accord with future erosion risks	Would secure existing built environment	Much of built environment would be lost with consequent change in human activity
EFFECTS ON DEVELOPMENT & LAND USE	Restrict future development and modify present land use over time	Development potential may increase but not recommended	Maintenance of current land use and increase development potential	No development feasible
IMPLICATIONS FOR COASTAL DEFENCES	Natural shingle bank will over run highway over time	Further study would be required to determine most appropriate form of works	Significant	Natural defences would evolve and roll back in landward direction
EFFECTS ON ADJACENT M.U'S	No significant impacts anticipated	Defences would need to minimise effects on adjacent MU's. Any effects would need to be considered/assessed	Impacts would need to be assessed.	No anticipated effects
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of shingle incursion will increase and effect built environment sooner.	Scale of civil engineering works would need to increase to accommodate greater wave energy inputs to shoreline	Scale of works would increase	Rate of change/recession will increase
CONCORDANCE WITH OBJECTIVES	Does not accord with all objectives - potential impacts on built environment	Generally accords with objectives	Does not accord with general objectives	Does not generally accord with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	Possible improvement as whole frontage reverts to a natural condition	(A) - None (B) - No change	(A) - None (B) - Losses	(A) - Yes (B) - Gains
ECONOMIC VIABILITY	Probably not viable	potentially viable	Not likely to be viable	Not likely to be viable
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be suitable	Suitable	Not suitable	Not likely to be suitable
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline	- ve	- ve
Economic	Not known	Baseline	- ve	??
Environmental	+ ve	Baseline	- ve	+ ve

Management Unit 6/6

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		The Knap
C.2.1	Existing Coastal Defence Policy:	Essential maintenance linked to highway	
C.2.2	Future Coastal Defence Policy:	Short Term: Review feasibility of hold line Anticipated Long Term: Hold or Retreat	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Speed at which present line will become uneconomic to sustain. Sea level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M9, M11, M15, M16, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Local study to review options, maintain highway	
C.2.7	Reason for Change:	Prepare informed approach	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		The Knap
C.3.1	1 - GENERIC		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1	CP 2, 3, 5, 9
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human and Built Environment:	HB 2, 9, 11	HB 1, 2, 5, 7, 8
C.3.1.4	Coastal Defence:	CD 1, 2, 4, 9	CD 3, 8
C.3.1.5	Development:		D 1, 5
C.3.2	2 - SPECIFIC		
C.3.2.1	Safety:	Safety associated with water activities	
C.3.2.2	Access:	Peak Summer congestion	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Peak Summer numbers	
C.3.2.5	Tourism/Recreation:	Importance to local economy - assessment of socio-economic issues	

Management Unit 6/6

C.4	OBJECTIVES RECONCILIATION The Knap	
	The preferred policy accords with the following objectives for this management unit	The policy needs to be confirmed for this MU although an initial assumption for short term hold followed by long term retreat form the outline policy proposed. These policies will not accord with some of the objectives listed in A6.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	Will be dependant upon adopted policy.

Management Unit 6/7

MANAGEMENT UNIT No. 6/7 Cold Knap Point to Friars Point (Barry Harbour)

From	Cold Knap Point	310400E	166000N
To	Friars Point	311100E	165900N
Approximate Length	2.4Km		

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Barry Harbour
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile
CP3	Coincidence of high tides and storms	Potential impacts around coast edge within harbour - Possible resonance
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Modest drift supply yield from soft rock shore within MU
CP7	Siltation of estuaries and ports;	Much of Barry harbour has silted-up and tidal access windows for craft have therefore been reduced. Access for paddle steamer to outer breakwater is understood to be reasonably good
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern
CP9	Sea level rise and increased storminess	Potential significant impacts for property and carpark
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	No specific issue identified
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Monitoring low water mark will be important - note general siltation within harbour

NATURAL ENVIRONMENT		Barry Harbour
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Barry Island SSSI - Friars Point
NE2	Protection of areas designated under international conventions.	

Management Unit 6/7

NATURAL ENVIRONMENT		Barry Harbour
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	Important to local tourism, Barry west major works and outfall
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern. Barry West coastal discharge - major works

HUMAN & BUILT ENVIRONMENT		Barry Harbour
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Coast edge walk and breakwater
HB2	Public access to the foreshore	Good to coast edge - limited scope for public use of foreshore other than low water & Watch House
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	No specific information - no public access on west side
HB4	Fisheries interests	fishing activities from breakwater and Friars Point
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No known conflict
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Sites noted on Friar's Point
HB8	Vehicular access/parking/road congestion	Car parking is good - peak summer congestion across to Barry Island
HB9	Importance of beach quality to tourism	Not as important as bays to either side
HB10	Balance between traditional and green tourism	SSSI in close proximity to traditional tourism area - Barry Island/Whitmore Bay
HB11	Importance of recreational use of foreshore and contribution to local economies	Part of overall tourism package
HB12	Marine access - Port/harbour/launching facilities	Harbour is not busy
HB14	Beach texture - sand/silt	Varies from sand to mud in some parts of harbour
HB15	Access for emergency services (including life boat)	Generally good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Not applicable
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern

COASTAL DEFENCE		Barry Harbour
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Potentially controversial
CD2	Cliff erosion	Soft rock cliff eroding in front of private houses on west side of harbour.

Management Unit 6/7

COASTAL DEFENCE		Barry Harbour
REF	ISSUE DESCRIPTION	Specific to MU
CD3	Adequacy/condition of existing defences	No formal defences - coast edge (riprap) is eroding along car park area.
CD4	Maintenance of existing defences	Car park - reactive repairs - West side should be monitored
CD6	Condition of flood banks/sea defences	Inner harbour area - generally poor condition
CD7	Private sea defences	Rock shore may be private. Built defences are CPA
CD8	CPA funding of Coast Protection	Potential issue
CD9	The role of the foreshore/beach as a defence	Foreshore plays an important but limiting role - reduces with water depth

DEVELOPMENT		Barry Harbour
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Possible conflict at Friars Point - development unlikely on SSSI
D2	Sustainability	Development on west side of harbour should be examined
D3	Preservation/enhancement of landscape value	Applies to Friars Point area
D4	Future of large industrial frontages	Not applicable
D5	Impacts of coastal development..	Future protection for such development
D6	Integration and conflict with other management plans	

A.2	<u>STATUTORY PLANNING POLICIES (Appendix A)</u>	Barry Harbour
	To maintain existing rights of way and develop recreation routes around coast (including bridle ways) - REC 12 Significant waterside development is underway within Barry/Barry docks area and the extent to which the development will effect Barry Harbour is not presently clear.	

A.3	<u>CONSERVATION DESIGNATIONS (Context Report)</u>	Barry Harbour
	Statutory: SSSI Friars Point Non-Statutory:	

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Barry Harbour
	Mixture of public and private ownership	

Management Unit 6/7

A.5	<p><u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report)</p> <p>The following coastal defences presently exist within this management unit :</p> <p>W.72.4715 Watch House Bay; 0.2Km ; Sea Wall (CPA) with low exposure W.72.4146 Old Harbour, Barry ; 1.3Km ; Soft Rock Shore with low exposure W.72.4148 Storehouse Point ; 0.03Km ; Sea Wall (CPA) with low exposure W.72.4155 Old Harbour, Barry 2 ; 0.9Km ; Revetment (CPA) with low exposure W.72.4160 Breakwater, Barry 0.125Km ; Sea Wall/Breakwater (CPA) with low exposure (medium on sea ward face) W.72.4162 Friars Point 1.29Km ; Soft Rock Shore with low exposure (possibly medium)</p>
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A.6	<p><u>OBJECTIVES</u></p> <p>The following objectives as defined in Section 2 of the Plan are relevant to this management unit :</p>								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 6/7

PART B Intervention Appraisal		Barry Harbour				
Ref	Topic					
B.1	Shoreline Description - Refer to Context report Section 3 Coast Edge Type - natural soft rock shore which has received protection works along a number of sections (refer to A5) Foreshore Type - Sand and mud Developed/Undeveloped - Mostly developed with the exception of Friars Point. Proximity of housing on west side to eroding soft rock shore should be measured/monitored. Defended/undefended - Varies - see A5 above Orientation/exposure - Varies within harbour and harbour entrance faces south					
	B.1.1	Land Use:	Road, housing, car parking, pleasure boating, environmental interest			
	B.1.2	Specific Shoreline Interests:	Boating including paddle steamer pick-up/drop-off point. Sea bathing.			
B.2	SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - Soft rock shore (Mercia Mudstone) around Barry Harbour of Porthkerry formation with Friars Point Limestone outcrops on Friars and Cold Knap point. Barry Landslip area. Hinterland is mostly made ground associated with the construction of Barry Docks. - Shoreline Movement/Historic Maps - Recent trend of beach steepening (note - data set is limited) Development/Industry - Barry inner docks development (dock 1 & 2) 1884 - 1898 Gains/Losses - Coast edge losses, siltation of Barry harbour and further examination of low water mark is required					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Car park, residential housing, Road (long term), Breakwater	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment Losses	U
			Land Flooding			
			Transport disruption	U		
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	The point in the future that the assets referred to above are likely to come under serious threat. Sea level rise and increased storminess			
		<u>Preliminary Value of Assets at Risk:</u>	Potentially several million pounds.		CPA funding rules should be clarified following closer examination of assets under threat.	
	B.3.2	Cost Implications: Subject to further examination to assess cost - likely to be up to one million				
	B.3.3	Economic Viability: Potentially viable				

Management Unit 6/7

PART C Strategic Policy Appraisal**Barry Harbour**

C.1 MATRIX ASSESSMENT					Coastal Managers : VOGC				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT					
EFFECTS ON COASTAL PROCESSES	Little anticipated change	No significant change if applied only within harbour area	Possible impacts and dependant upon scale and form of reclamation	No short to medium term change.					
EFFECTS ON NATURAL ENVIRONMENT	No change	Some loss of natural soft rock shore in harbour	Possible effect - would need to be examined at time of any serious proposal	No immediate impact.					
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Significant losses over time to public and private assets	Would secure existing built environment	Would secure existing built environment.	Significant medium term loss of coastal assets.					
EFFECTS ON DEVELOPMENT & LAND USE	No future development would be permitted (incl. coast paths) and would change present land use	Would increase development potential and allow coast path/bridal ways to be established	Would significantly increase local development potential and modify current land use	No future development would be permitted (incl. coast paths) and would change present land use.					
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would continue to deteriorate - soft rock shore will erode	Significant new works would be required - justification etc	Defences would be required	Defences/infrastructure would deteriorate and would be removed.					
EFFECTS ON ADJACENT M.U'S	No known impacts	No known significant impact	Potential impacts would need to be assessed	Impacts would apply to human and built environment in medium term.					
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion will increase and assets will be lost earlier	Defences would be required at an earlier date and would need to take account of issue	Protection works are likely to be greater in scale to cope with increased wave energies	Rate of retreat would increase.					
CONCORDANCE WITH OBJECTIVES	Does not accord with range of objectives	General concordance with objectives	Not clear - subject to examination of a firm proposal	Does not accord with broad range of objectives.					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Yes (B) - Likely Gains over time	(A) - None known (B) - Possible loss on balance	(A) - None known - more details would be required (B) - No information	(A) - Yes (B) - Likely gains over time					
ECONOMIC VIABILITY	Not likely to be viable	Potentially viable - subject to study	Subject to further analysis regarding form and extent	Not viable.					
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be suitable in medium to long term	Potentially suitable	Potentially suitable	Not suitable.					
RELATIVE SUSTAINABILITY									
Social	- ve	Baseline 1 (ex SSSI)	-/+ ve (subject to proposal)	- ve					
Economic	To be confirmed	Baseline 1 (ex SSSI)	-/+ ve (subject to proposal)	To be confirmed (likely - ve)					
Environmental	To be confirmed	Baseline 1 (es SSSI)	-/+ ve (subject to proposal)	+ ve					

Management Unit 6/7

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Barry Harbour
C.2.1	Existing Coastal Defence Policy:	Do nothing apart from minimal reactive repairs to revetment	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line along built sections - excluding headlands (review erosion along soft rock shore on west side of MU - potential do nothing policy) Anticipated Long Term: Hold Line	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; responsibility for undertaking works	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Hold edge of car park and review remaining frontage	
C.2.7	Reason for Change:	Prepare informed approach	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP1, 3, 9	CP 7, 8, 11, 12
C.3.1.2	Natural Environment:	NE1	
C.3.1.3	Human and Built Environment:		HB 1, 17
C.3.1.4	Coastal Defence:	CD 3, 6	CD 1, 2, 7, 8
C.3.1.5	Development:		D2
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety around breakwater	
C.3.2.2	Access:	No specific issue	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Possible peak summer congestion	
C.3.2.5	Tourism/Recreation:	Important	

Management Unit 6/7

C.4	OBJECTIVES RECONCILIATION Barry Harbour	
	The preferred policy accords with the following objectives for this management unit	General accordance with objectives in A6 although further examination of west side of MU is required. Insufficient information regarding advance/development options
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 7/1

MANAGEMENT UNIT No. 7/1**Friars Point to Nell's Point (Whitmore Bay)**

From	Friars Point	311100E	165900N
To	Nell's Point	312000E	166100N
Approximate Length	1.4Km		

PART A Objectives, Issues and Statutory Details**Whitmore Bay**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Whitmore Bay
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile monitoring
CP3	Coincidence of high tides and storms	Potential impacts around coast edge and beach draw down resulting from increase wave energy inputs
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Slowly eroding cliff of outcropping Limestone - some drift material generated but unlikely to be accessible to shoreline
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Down-drift barrier at Barry Dock entrance
CP7	Siltation of estuaries and ports;	Barry docks are down drift in separate MU
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern regarding potential links and impacts upon beaches
CP9	Sea level rise and increased storminess	Long term change in near shore regime.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Potential movement across embayment resulting in localised draw down
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Major public concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major issue

NATURAL ENVIRONMENT		Whitmore Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI on Friars and Nell's Point and proximity to development should be noted.
NE2	Protection of areas designated under international conventions.	
NE3	Water Quality	General concern in respect of tourist beach

Management Unit 7/1

NATURAL ENVIRONMENT		Whitmore Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern - tourist beach

HUMAN & BUILT ENVIRONMENT		Whitmore Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Cliff path around Nell's Point and into adjacent MU at Jackson's Bay
HB2	Public access to the foreshore	Good - no specific issue
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Coast path around Nell's Point will become under increasing threat
HB4	Fisheries interests	General interest
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	All three factors apply in this MU and potential for conflict does exist
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Trailer boating and sea/sun bathing - potential conflict exists
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Confirm risks to Well and Chapel
HB8	Vehicular access/parking/road congestion	Parking available around Barry Island with additional hinterland parking available
HB9	Importance of beach quality to tourism	Very important part of tourist package
HB10	Balance between traditional and green tourism	The traditional tourist area is bounded by areas of environmental importance and a sympathetic balance is required - Potential issues in respect of coast path repairs
HB11	Importance of recreational use of foreshore and contribution to local economies	Major contributor to local economy
HB12	Marine access - Port/harbour/launching facilities	Launching facilities for trailer mounted boats
HB14	Beach texture - sand/silt	Sand
HB15	Access for emergency services (including life boat)	Good
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local issue

COASTAL DEFENCE		Whitmore Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Possible retreat of coastal path - study required to assess retreat option for remainder of the bay.
CD2	Cliff erosion	Cliff erosion whilst being slow, is likely to effect coast path in short to medium term
CD3	Adequacy/condition of existing defences	No specific information - inspection required

Management Unit 7/1

COASTAL DEFENCE		Whitmore Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD4	Maintenance of existing defences	CPA responsibility
CD7	Private sea defences	Land ownership of Nell's point should be confirmed and set-back options for coast path should be examined.
CD8	CPA funding of Coast Protection	Assets will include intangible benefits.
CD9	The role of the foreshore/beach as a defence	Foreshore provides a significant contribution to coast protection

DEVELOPMENT		Whitmore Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Development plans throughout former holiday camp.
D2	Sustainability	Development should have regard for long term coastal defence
D3	Preservation/enhancement of landscape value	Proximity and form of development will be important
D5	Impacts of coastal development..	Dependant upon proposals and form of works
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Whitmore Bay
	Development area at Barry Island on former holiday camp - refer to Context report and or Appendix A (includes REC12).	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Whitmore Bay
	Statutory: SSSI Barry Island - Nell's Point - geological interest showing relationship between Mercia Mudstones Group and Carboniferous Limestone Non-Statutory: - General landscape interest	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Whitmore Bay
	Mixture of public and private ownership and responsibilities with CPA responsible for defences in Whitmore Bay. Note coast path around Nell's Point	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)	
	The following coastal defences presently exist within this management unit :	
	W.72.4162 ; Friars Point ; 1.29Km Soft Rock Shore with low exposure W.72.4720 ; Whitmore Bay Esplanade ; 0.4Km Sea Wall with low exposure (CPA) W.72.4164 ; Barry Island ; 0.26Km Sea Wall with low exposure (CPA) W.72.4170 ; Jacksons Bay & Nell's Point ; 1.0Km Soft Rock Shore with low exposure.	

Management Unit 7/1

A.6	<u>OBJECTIVES</u>							
	The following objectives as defined in Section 2 of the Plan are relevant to this management unit :							
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 7/1

PART B Intervention Appraisal		Whitmore Bay				
Ref	Topic					
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - Mixture of cliff coast and sea wall forming wide embayment. Sea wall protects esplanade</p> <p>Foreshore Type - Sand tourist beach</p> <p>Developed/Undeveloped - Mostly developed</p> <p>Defended/undefended - Centre part of embayment is protected with sea wall defences under the responsibility of the Coast Protection Authority.</p> <p>Orientation/exposure - Southerly orientation with low exposure</p>					
	B.1.1	Land Use:	Tourism, conservation & development			
	B.1.2	Specific Shoreline Interests:	Sun/sea bathing, trailer boating, adjacent fun fair and seaside attractions.			
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Area described as having marginal facies of the Mercia Mudstones Group adjacent to Carboniferous Limestone at Barry Island Friars Point.</p> <p>Shoreline Movement/Historic Maps - No specific long term information although recent surveys indicate beach steepening</p> <p>Development/Industry - Development at site of former holiday camp.</p> <p>Gains/Losses - Slow erosion causing problems along parts of the coastal path and anecdotal evidence of beach loss within the bay</p>					
B.3	PRELIMINARY ECONOMIC APPRAISAL					
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS	
		Promenade/tourist infrastructure, coast path	Property Loss	U	Environmental Losses	U
			Infrastructure Loss	U	Tourism	U
			Land Loss	U	Social Effects	U
			Property Flooding		Historic Environment Losses	U
			Land Flooding			
			Transport disruption			
			Recreation Losses	U		
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess			
		<u>Preliminary Value of Assets at Risk:</u>	Likely to be many millions including intangible benefits		CPA funding issues concerning coast path and assessment of intangible benefits	
	B.3.2	Cost Implications: Potentially high if traditional promenade with accesses through to sandy beach is to be maintained in the long term. Difficult to estimate as local study is required but approximately up to £3m				
	B.3.3	Economic Viability: Likely to viable if funding mechanism acknowledges intangible benefits.				

Management Unit 7/1

PART C Strategic Policy Appraisal**Whitmore Bay**

C.1 MATRIX ASSESSMENT					Coastal Managers : VOGC				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT					
EFFECTS ON COASTAL PROCESSES	Little anticipated change in current trends	Subject to form and extent	Subject to form, scale and extent	Possible modest increase in sediment supply - little impact anticipated					
EFFECTS ON NATURAL ENVIRONMENT	No change anticipated	Limited if applied in centre of bay only	Not clear but significant if applied throughout the MU	Not clear at present time - subject to details of any proposed retreat policy					
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Coast edge assets will eventually be lost	Would secure existing built environment	Would secure built environment	Significant loss of built environment					
EFFECTS ON DEVELOPMENT & LAND USE	No development without consideration of coast protection. Land use will change	Increase development potential around coast edge	Significantly increase development potential and maintain current land use	No development and changes in current and proposed land use					
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences will eventually fail - review impacts on local foreshore levels	Coast protection works would be required	Significant civil engineering works would be required	Existing defences would be removed					
EFFECTS ON ADJACENT M.U'S	No impacts likely	Limited if applied to centre of MU only	Would need to be confirmed by further works - scale/extent of proposal	limited impact apart from loss of some access routes around coast					
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of loss of assets will increase	Works would need to take account of increased wave energy inputs and impacts on sand beach	Further work required to establish potential impacts	Rate of asset loss would increase					
CONCORDANCE WITH OBJECTIVES	Does not generally accord with objectives	Generally accords with objective if applied to centre of MU only	Does not generally accord with objectives - further review would be required	Does not generally accord with objectives					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Possible (B) - Potential Gains	(A) - None known (B) - No information - subject to form of proposal	(A) - None Known (B) - Possible Losses	(A) - Yes (B) - Gains likely in longer term					
ECONOMIC VIABILITY	Not likely to be viable - to be confirmed by local study	Potentially viable - would need to be tested against usual criteria/alternative funding arrangements	Subject to further study	Not likely to be viable					
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be suitable	Likely to be suitable	Not clear at present time - subject to form and scale	Not suitable					
RELATIVE SUSTAINABILITY									
Social	- ve	Baseline 1 (not SSSI)	Not clear	- ve					
Economic	- ve	Baseline 1 (not SSSI)	Not clear	- ve					
Environmental	Not clear at present	Baseline 1 (not SSSI)	Not clear	- ve					

Management Unit 7/1

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Whitmore Bay
C.2.1	Existing Coastal Defence Policy:	Do Nothing/minimal reactive maintenance	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold Line/prepare local strategy to determine policy (excluding SSSI cliff coast) Anticipated Long Term: Hold or possibly retreat	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; Technical feasibility of holding line and sand beach/intertidal zone	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, L10	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Prepare maintenance programme to hold line and study	
C.2.7	Reason for Change:	Actions to gather information to plan future policy	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 9, 10	CP 8, 11, 12
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human and Built Environment:	HB 5, 9, 11, 12, 14	HB 1, 3, 17
C.3.1.4	Coastal Defence:		CD 1, 2, 3, 8
C.3.1.5	Development:		D1, 2
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	General safety relating to water activities and cliff walk	
C.3.2.2	Access:	Good	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Peak summer days/Bank Holidays etc	
C.3.2.5	Tourism/Recreation:	Importance of tourist beach to local economy	

Management Unit 7/1

C.4	OBJECTIVES RECONCILIATION Whitmore Bay	
	The preferred policy accords with the following objectives for this management unit	General accordance with objectives in A6 although further work is required to confirm proposed short term policy
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 7/2

MANAGEMENT UNIT No. 7/2**Jacksons Bay & Barry Docks**

From	Nell's Point	312600E	166100N
To	Bendrick Rock	313200E	166800N
Approximate Length	2Km		

PART A Objectives, Issues and Statutory Details**Jacksons Bay & Barry Docks**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Jacksons Bay & Barry Docks
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profile in centre of bay
CP2	Shingle Storm Beach Behaviour	No shingle beach however there is an upper 'dry' sandy section
CP3	Coincidence of high tides and storms	Potential impacts upon upper sandy beach and breakwater
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Cliff is generally stable although there is a pinch point in the centre of the bay - road and pedestrian access to beach
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Sediment movement effected by Docks
CP7	Siltation of estuaries and ports;	Approach channel to Barry Docks
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern regarding potential link between sand banks and beaches
CP9	Sea level rise and increased storminess	Potential impacts upon dock breakwaters and upper foreshore in Jacksons Bay
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Little effect apart from increase in risk of damage from storm with south easterly approaches
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Marine dredging operation in nearshore zone effect coastal processes.
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General public concern

NATURAL ENVIRONMENT		Jacksons Bay & Barry Docks
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Barry Island SSSI (Nell's Point) along western part of this MU

Management Unit 7/2

NATURAL ENVIRONMENT		Jacksons Bay & Barry Docks
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern

HUMAN & BUILT ENVIRONMENT		Jacksons Bay & Barry Docks
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Cliff path and vertical cliff face adjacent to sandy beach.
HB2	Public access to the foreshore	From harbour, or pedestrian access around cliff from Whitmore or from steep path from Barry Island.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Public rights of way will become progressively more vulnerable
HB4	Fisheries interests	Associated with outer harbour moorings
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Implications as coast path becomes vulnerable - also funding issue
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	Activities in MU are clearly defined in different areas.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Proximity of Well and chapel to coast edge should be confirmed
HB8	Vehicular access/parking/road congestion	No general vehicular access, parking on highway above bay and at yacht club for members
HB9	Importance of beach quality to tourism	Forms part of "Barry" tourist product along with other bays in adjacent MU's
HB10	Balance between traditional and green tourism	Mainly traditional
HB11	Importance of recreational use of foreshore and contribution to local economies	Important as part of overall package for Barry
HB12	Marine access - Port/harbour/launching facilities	Major commercial port and tidal harbour for private and smaller commercial craft - boat yard and yacht club
HB14	Beach texture - sand/silt	Upper foreshore sand and lower foreshore sand and mud. In tidal section of harbour - mud
HB15	Access for emergency services (including life boat)	Life boat station - permanently moored
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Port facilities provide major contribution to local economy. Industrial base has however reduced in recent years. (Geast etc)
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Maintenance dredging at Barry - not believed to be significant volumes.

Management Unit 7/2

COASTAL DEFENCE		Jacksons Bay & Barry Docks
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Unlikely unless Port becomes uneconomic and significant damage to breakwaters occurs.
CD2	Cliff erosion	In centre of Jacksons Bay - nearby road above
CD3	Adequacy/condition of existing defences	Condition of breakwaters should be reviewed in the light of predicted increases in wave/storm activity
CD4	Maintenance of existing defences	ABP
CD7	Private sea defences	Port/harbour - ABP
CD8	CPA funding of Coast Protection	Potential issue if usage shifts to become more public
CD9	The role of the foreshore/beach as a defence	Some use in Jacksons Bay only

DEVELOPMENT		Jacksons Bay & Barry Docks
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Major development plans now in progress within Barry waterside area. Implication of significant damage to breakwaters should be assessed in overall development plan
D2	Sustainability	Development needs to be sustainable
D3	Preservation/enhancement of landscape value	
D4	Future of large industrial frontages	Industry relies upon supply of goods through the docks
D5	Impacts of coastal development..	Links to large hinterland development - water front
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Jacksons Bay & Barry Docks
	Barry waterfront development - Housing, retail, leisure, industrial & business - Refer to Policies ENV5, HOUS1(16), EMP1 (16), TRANS 3(i), SHOP 3 (i), & 4, COMM 3(iii).	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Jacksons Bay & Barry Docks
	Statutory: None apart from east side of Barry Island SSSI - Nell's Point Non-Statutory: None	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Jacksons Bay & Barry Docks
	Understood to be private - mainly ABP although CPA have interest in development plans.	

Management Unit 7/2

A.5	<p><u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :</p> <p>W.72.4170 Jacksons Bay & Nell's Point ; 1.0Km Soft Rock Shore with low exposure W.72.4174 Barry West Breakwater ; 0.42Km Sea wall/Breakwater - ABP W.72.4176 - Barry Dock entrance W.72.4178 Barry East Breakwater ; 0.83Km ; Sea Wall/Breakwater - ABP</p>
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A.6	<p><u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :</p>								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 7/2

PART B Intervention Appraisal**Jacksons Bay & Barry Docks**

Ref	Topic			
B.1	<p>Shoreline Description - Refer to Context report Section 3</p> <p>Coast Edge Type - Rock cliff in west of unit through Nell's Point and Jacksons Bay with artificial defences at Barry Docks</p> <p>Foreshore Type - Sand & mud with breakwater protruding into deeper water</p> <p>Developed/Undeveloped - Undeveloped in west and developed in east (Docks)</p> <p>Defended/undefended - Undefended in west and defended in east (Docks)</p> <p>Orientation/exposure - Low along shoreline of Jacksons Bay and Medium exposure on sea ward side of breakwaters. Orientation is south east.</p>			
	B.1.1	Land Use:	Recreational beach and cliff walk to west with commercial and recreation port in east.	
	B.1.2	Specific Shoreline Interests:	Sun/sea bathing, walking, commercial shipping of goods, yacht club and boat repairs	
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3</p> <p>Geology - Shoreline is artificial apart from the combination of Mercia Mudstones with Carboniferous Limestone in the west of the MU. Barry docks is largely made ground.</p> <p>Shoreline Movement/Historic Maps - Development of the docks latter part of the 19th Century.</p> <p>Development/Industry - Dock and associated industry - major rail head linking coal production to export point.</p> <p>Gains/Losses - No information apart from slow erosion of cliff coast to the west of the MU.</p>			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Coast path, highway above (in longer term), Barry Docks outer breakwaters and function as a port - linked to port economics as well as coast protection.	Property Loss U Infrastructure Loss U Land Loss U Property Flooding Land Flooding Transport disruption U Recreation Losses U	Environmental Losses U Tourism U Social Effects U Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; Maintenance of Barry Dock breakwaters	
		<u>Preliminary Value of Assets at Risk:</u>	Over £5m	CPA funding may become an issue as land use changes
	B.3.2	Cost Implications: Cost of long term maintenance of breakwaters and deep water navigation is unknown		
	B.3.3	Economic Viability: Potentially viable		

Management Unit 7/2

PART C Strategic Policy Appraisal**Jacksons Bay & Barry Docks**

C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Long term changes in nearshore sediment regime	No significant change in current processes	Significant further impacts likely	Changes would occur and these would need to be assessed.
EFFECTS ON NATURAL ENVIRONMENT	Possible long term improvements	No short term change - potential losses on Nell's Point	Effects may be considerable and would need to be studied	Potential long term improvements
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Significant changes in medium to long term	Maintain existing built environment	Secure present built environment	Major changes and losses to built environment
EFFECTS ON DEVELOPMENT & LAND USE	No development would be advisable and recent development would be affected	Existing land use would be maintained and development of the waterside could continue without significant impact	Increase coast edge development potential and secure present (proposed) hinterland use	Future development would not be possible and recent development plan would also be effected
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences will deteriorate and progressively fail.	Significant maintenance and renewal costs over time - funding issues	Major civil engineering works would be required into deep water	Existing defences would either be removed or allowed to collapse
EFFECTS ON ADJACENT M.U'S	Significant impacts on adjacent MU over time	No significant change anticipated	Significant impacts likely and would need to be assessed	Effect would be significant and would need to be assessed
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of loss will increase - breakwaters will be lost earlier	Cost of maintaining existing coastal structure will increase significantly	Works would need to be more robust	Rate of retreat would increase
CONCORDANCE WITH OBJECTIVES	Does not accord with range of objectives	Generally accords with objectives	Does not accord with objectives	Does not accord with objectives for this MU
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - Yes - long term (B) - Gains - Long term	(A) - None (B) - No Change	(A) - None (B) - Losses	(A) - Yes in long term (B) - Long term gains
ECONOMIC VIABILITY	Unlikely but not certain - further work required	Potentially viable - subject to further examination	Not viable	Not likely to be viable
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be suitable	Suitable	Not suitable	Not suitable
RELATIVE SUSTAINABILITY				
Social	- ve	Baseline 1 (ex SSSI & Cliff)	- ve	- ve
Economic	Possibly - ve	Baseline 1 (ex SSSI & Cliff)	- ve	- ve
Environmental	+ ve	Baseline 1 (ex SSSI & Cliff)	- ve	+ ve

Management Unit 7/2

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Jacksons Bay to Barry Docks
C.2.1	Existing Coastal Defence Policy:	Barry Dock breakwaters - hold line Remainder - do nothing (note cliff path may need to be closed eventually)	
C.2.2	Future Coastal Defence Policy:	Short Term: As existing - Local study required to determine long term future (form) of port, condition of breakwaters, management strategy & funding. Anticipated Long Term: Hold line or possibly retreat.	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; economic viability of maintaining protection for Barry Docks	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, 10	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M12, M13, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Review responsibility/benefits and policy for maintenance of breakwaters	
C.2.7	Reason for Change:	Confirm medium and long term options/policies	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 7, 9	CP 11, 12
C.3.1.2	Natural Environment:	NE 1	
C.3.1.3	Human and Built Environment:	HB 2, 4, 9, 15, 16	HB 1, 3, 5, 17
C.3.1.4	Coastal Defence:	CD 3, 4, 7	CD 2, 8
C.3.1.5	Development:		D 1, 2, 4, 5
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public safety around cliff coast path and under cliffs in Jacksons Bay; safety regarding access to breakwaters.	
C.3.2.2	Access:	Potential loss of pedestrian access.	
C.3.2.3	Industrial Activities:	Future of commercial port.	
C.3.2.4	Human Pressures:	Socio-economic issues relating to current development and impacts of coast protection becoming uneconomic to sustain.	
C.3.2.5	Tourism/Recreation:	Importance of Jacksons Bay and docks. Increasing importance of waterside development.	

Management Unit 7/2

C.4	OBJECTIVES RECONCILIATION Jacksons Bay to Barry Docks	
	The preferred policy accords with the following objectives for this management unit	Generally accords with objectives set-out in A6
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 7/3

MANAGEMENT UNIT No. 7/3**Sully Bay (West)**

From	Bendrick Rock	313200E	166800N
To	East Side of Sully	315200E	167900N
Approximate Length	2.7Km		

PART A Objectives, Issues and Statutory Details**Sully Bay (West)**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Sully Bay (West)
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	No strategic monitoring; shoreline inspections required
CP2	Shingle Storm Beach Behaviour	Shingle drift behaviour is important to shingle beach in centre of the Bay - Sully Bay East
CP3	Coincidence of high tides and storms	Significant potential impact on coast edge erosion - proximity of industrial units to coast edge.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Drift from west of MU to Hayes Point provides important supply into Sully Bay.
CP7	Siltation of estuaries and ports;	Potential impact of dredging operations on sediment supply down drift through this MU
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern regarding potential links
CP9	Sea level rise and increased storminess	Erosion rates will increase and coast path will be lost.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Drift supply along coast will be effected by changes in exposure - note geometry of shoreline varies and long shore drift component will therefore change.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	Potential impacts resulting from dredging at Barry Docks
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major local concern

NATURAL ENVIRONMENT		Sully Bay (West)
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	SSSI Hayes Point to Bendrick Rock - geological
NE2	Protection of areas designated under international conventions.	

Management Unit 7/3

NATURAL ENVIRONMENT		Sully Bay (West)
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	Outfall from Ty-Hafon

HUMAN & BUILT ENVIRONMENT		Sully Bay (West)
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Coast path under threat.
HB2	Public access to the foreshore	Will be significantly effected as coast path is lost
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Public right of way around coast will be lost in short to medium term
HB4	Fisheries interests	No specific information
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Conflict between recreational use of shoreline and conservation as coast path is lost - little apparent room to set-back. Further work required to confirm set-back option
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No specific issue identified
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Historic environment presently set-back from coast edge.
HB8	Vehicular access/parking/road congestion	No parking nearby
HB9	Importance of beach quality to tourism	Not vital to general tourism but important landscape value.(SSSI geological)
HB10	Balance between traditional and green tourism	Mainly 'green'
HB11	Importance of recreational use of foreshore and contribution to local economies	No significant use linked to the support of local economy
HB12	Marine access - Port/harbour/launching facilities	No specific issue
HB13	Human pressure on natural assets such as dunes	Potential minor impacts from coast path
HB14	Beach texture - sand/silt	Rock
HB15	Access for emergency services (including life boat)	Not good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Note industrial estate adjacent to docks
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Potential impacts resulting from dredging activities at Barry

COASTAL DEFENCE		Sully Bay (West)
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Feasibility of land acquisition to set-back coast path
CD2	Cliff erosion	Monitoring around coast required

Management Unit 7/3

COASTAL DEFENCE		Sully Bay (West)
REF	ISSUE DESCRIPTION	Specific to MU
CD3	Adequacy/condition of existing defences	No formal defences
CD4	Maintenance of existing defences	Cliff edge eroding naturally
CD7	Private sea defences	Natural soft rock shore - responsibility likely to be with land owner under most threat of losing assets
CD8	CPA funding of Coast Protection	Unlikely that CPA funding will be available to set-back coast path
CD9	The role of the foreshore/beach as a defence	Rock play important coast protection role

DEVELOPMENT		Sully Bay (West)
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Any future development should have due regard of the aims of the shoreline management plan
D2	Sustainability	See above D1
D3	Preservation/enhancement of landscape value	Section of MU in east, outside MU, lies within an area of landscape value
D4	Future of large industrial frontages	Industrial estate to west, adjacent to docks, is likely to remain
D5	Impacts of coastal development..	Ty-Hafon - coastal squeeze on path and outfall
D6	Integration and conflict with other management plans	

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Sully Bay (West)
	ENV 5 - Development should have regard for the coastal location - list of mitigation and conditions.	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Sully Bay (West)
	Statutory: SSSI Hayes Point to Bendrick Rock - Geological SSSI Non-Statutory: General landscape interest	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Sully Bay (West)
	Understood to be mainly private with CPA interest along coast edge - coast path	

A.5	COASTAL DEFENCES (For further detail on this section refer to the Data Context Report)	
	The following coastal defences presently exist within this management unit :	
	W.72.4185 Bendrick to Hayes ; 2.5Km soft rock shore with medium exposure	
	W.72.4186 Sully Hospital ; 0.4Km Soft Rock Shore with medium exposure	
	W.72.4190 Sully Bay ; 2.2Km Soft Rock Shore with medium exposure	

Management Unit 7/3

A.6	OBJECTIVES The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 7/3

PART B Intervention Appraisal		Sully Bay (West)		
Ref	Topic			
B.1	Shoreline Description - Refer to Context report Section 3 Coast Edge Type - Eroding soft rock shore Foreshore Type - Rock shore Developed/Undeveloped - Mixture of developed and undeveloped Defended/undefended - Undeveloped Orientation/exposure - Varies from South to south east			
	B.1.1	Land Use:	Commercial/industrial, hospital, Ty-hafon (hospice), environmental/landscape and coast edge walks	
	B.1.2	Specific Shoreline Interests:	Environmental and walking	
B.2	SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - Soft rock shore comprising Mercia Mudstones (marginal facies) of Triassic with an outcrop of Carboniferous Limestone at Bendrick Rock. Shoreline Movement/Historic Maps - No specific information but known to be eroding Development/Industry - industry in west with further development along the central section of the MU Gains/Losses - Coast erosion resulting in general losses at coast edge.			
B.3	PRELIMINARY ECONOMIC APPRAISAL			
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS	INTANGIBLE BENEFITS
		Coast path will be lost in short term. Long term losses of hinterland property and development commencing with landscaped grounds	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	Environmental Losses Tourism Social Effects Historic Environment Losses
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess. Erosion rates along coast edge	
		<u>Preliminary Value of Assets at Risk:</u>	Intangible at present or in short term - coast path	CPA funding for coast path set-back is unlikely
	B.3.2	Cost Implications: Set back of coast path cost will be governed by cost of land acquisition		
	B.3.3	Economic Viability: Dependant upon cost of land for set back		

Management Unit 7/3

PART C Strategic Policy Appraisal**Sully Bay (West)**

C.1 MATRIX ASSESSMENT					Coastal Managers : VOGC				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT - Coast path only					
EFFECTS ON COASTAL PROCESSES	No change in current trends	Significant effect on local sediment regime	Significant effect on local sediment regime	Little change in current trend					
EFFECTS ON NATURAL ENVIRONMENT	No change apart from natural erosion and resultant loss	Significant impact on natural environment	Significant impact on natural environment	Natural progression - losses					
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Loss of coast path in short term	Secure coast path and hinterland properties in longer term	Secure coast path and hinterland properties in longer term	Land would be required to set-back coast path					
EFFECTS ON DEVELOPMENT & LAND USE	Land use will change as coast walk is lost	Secure existing land use and recent development	Secure existing land use and recent development	No development would be permitted within recession zone					
IMPLICATIONS FOR COASTAL DEFENCES	None	Not necessarily significant if only applied to eroding coast edge	Potentially significant	None					
EFFECTS ON ADJACENT M.U'S	No impacts anticipated	Significant if applied across whole MU - potential for selective protection	Significant if applied across whole MU	No change in current trends					
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of loss of coast path will accelerate	Works to hold line would increase in scale and cost	Significant civil engineering works would be required	Rate of recession would increase					
CONCORDANCE WITH OBJECTIVES	Accords with general objectives apart from loss of coast path	Would not be acceptable unless applies selectively	Would not be acceptable unless applies selectively	Generally accords with objectives - subject to further examination of recession zone in industrial areas					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - No change (B) - Natural Loss or neutral	(A) - None (B) - Losses	(A) - None (B) - Losses	(A) - Yes (B) - Gains					
ECONOMIC VIABILITY	Viable	Not viable	Not viable	Potentially viable subject to acquisition of land					
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be suitable as coast path will be lost	Not suitable unless applied selectively at pinch point	Not suitable	Suitable - subject to funding					
RELATIVE SUSTAINABILITY									
Social	- ve	Possibly	- ve	Baseline					
Economic	+ ve	- ve	- ve	Baseline					
Environmental	+ ve	- ve	- ve	Baseline					

Management Unit 7/3

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Sully Bay (West)
C.2.1	Existing Coastal Defence Policy:	Do nothing	
C.2.2	Future Coastal Defence Policy:	Short Term: Monitor and examine opportunities for set-back - Coast Path Anticipated Long Term: Set-back	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess; rate of erosion	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15, M17	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Assess present viability of coast path	
C.2.7	Reason for Change:	Prepare for informed approach to coastal management	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 3, 5	CP 11, 12
C.3.1.2	Natural Environment:	NE1	
C.3.1.3	Human and Built Environment:		HB 1, 2, 3, 5
C.3.1.4	Coastal Defence:	CD 1	CD 2, 8
C.3.1.5	Development:		D1, 2
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Coast path	
C.3.2.2	Access:	Access along coast only	
C.3.2.3	Industrial Activities:	Concentrated in west	
C.3.2.4	Human Pressures:	Local pressure to maintain coast path	
C.3.2.5	Tourism/Recreation:	Walking along coast	

Management Unit 7/3

C.4	OBJECTIVES RECONCILIATION		Sully Bay (West)
	The preferred policy accords with the following objectives for this management unit	General accordance with exception of potential loss of access around coast	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 7/4

MANAGEMENT UNIT No. 7/4**Sully Bay East**

From	West Side Sully	315200E	167900N
To	Swanbridge West (causeway)	316500E	167500N
Approximate Length	1.7Km		

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Sully Bay East
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Local monitoring regime required along upper beach and soft rock coast edge.
CP2	Shingle Storm Beach Behaviour	Local monitoring required as shingle provides important coast defence function.
CP3	Coincidence of high tides and storms	Risk of overtopping and movement of beach material effecting gardens of residential properties in short term.
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Important drift regime linked to shoreline orientation and exposure. Links to MU 7/3
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern.
CP9	Sea level rise and increased storminess	Significant potential impact upon coastline assets.
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Important to shingle beach location and volume. Exposure of properties in west of MU as shingle builds in east.
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern - mostly rocky foreshore

NATURAL ENVIRONMENT		Sully Bay East
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Designated areas in upstream and downstream MU's
NE2	Protection of areas designated under international conventions.	Adjacent MU Sully Island
NE3	Water Quality	General concern (note outfalls)

Management Unit 7/4

NATURAL ENVIRONMENT		Sully Bay East
REF	ISSUE DESCRIPTION	Specific to MU
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General concern (not outfalls)

HUMAN & BUILT ENVIRONMENT		Sully Bay East
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Proximity of coast path to the eroding edge and potential safety issues regarding water activities - slipways and sailing club
HB2	Public access to the foreshore	Generally good through public rights of way and along coast path (for short term)
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Coast paths will become increasingly threatened over time and public rights of way will be lost.
HB4	Fisheries interests	No specific interest declared.
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	No specific issue
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No specific issue identified
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	None
HB8	Vehicular access/parking/road congestion	No known issue
HB9	Importance of beach quality to tourism	Beach is generally a rock shore with a seaweed blanket of much of the intertidal zone.
HB10	Balance between traditional and green tourism	Not believed to be a popular area for traditional tourism.
HB11	Importance of recreational use of foreshore and contribution to local economies	Not significant
HB12	Marine access - Port/harbour/launching facilities	Launching facilities across intertidal zone will require maintenance - note sailing club
HB13	Human pressure on natural assets such as dunes	No relevant
HB14	Beach texture - sand/silt	Sand inclusion on foreshore towards west end of MU
HB15	Access for emergency services (including life boat)	Good
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Not relevant
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern

COASTAL DEFENCE		Sully Bay East
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Potentially sensitive local issue because of proximity of residential properties to coast edge.

Management Unit 7/4

COASTAL DEFENCE		Sully Bay East
REF	ISSUE DESCRIPTION	Specific to MU
CD2	Cliff erosion	Not a cliff but steep eroding coast edge of soft rock.
CD3	Adequacy/condition of existing defences	Natural soft rock shore and shingle banks are vulnerable and not adequate as long term coast protection.
CD4	Maintenance of existing defences	Responsibility is not presently clear and some economic tests should be undertaken to examine cost effectiveness of protecting properties under current CPA rules.
CD5	Dune erosion	Not applicable
CD6	Condition of flood banks/sea defences	Low level hinterland adjacent to the school should be checked in relation to the shingle banks and storm events
CD7	Private sea defences	No formal defences are present
CD8	CPA funding of Coast Protection	Potentially significant issue applying to public access and erosion adjacent to coastal properties.
CD9	The role of the foreshore/beach as a defence	Geometry of foreshore and position of controlling features such as Hayes point play a significant and varying role across the frontage

DEVELOPMENT		Sully Bay East
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	No information
D2	Sustainability	Sully coast edge development was probably installed prior to any concerns in respect of coastal erosion. Sea level rise etc.
D3	Preservation/enhancement of landscape value	Natural shingle banks and eroding cliff edge are important and interesting features.
D4	Future of large industrial frontages	Not relevant
D5	Impacts of coastal development.	No further coastal development should be permitted without specific consideration of long term coastal protection.
D6	Integration and conflict with other management plans	No information

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Sully Bay East
	Vale of Glamorgan Policies - ENV 5 Land outside Heritage Coast Area. REC 12 - Public Rights of Way	

A.3	CONSERVATION DESIGNATIONS (Context Report)	Sully Bay East
	Statutory: No statutory designations Non-Statutory: Area is of general landscape interest	

Management Unit 7/4

A.4	<u>LAND OWNERSHIP/OCCUPATION INTERESTS</u>	Sully Bay East
Mixture of private and public ownership - note residential housing adjacent to coast. Note also school and sports ground.		

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report)	
The following coastal defences presently exist within this management unit :		
W.72.4190 - Sully Bay; 2.2Km Soft Rock Shore with medium exposure - Note storm shingle beach fronting properties and sports ground.		

A.6	<u>OBJECTIVES</u>							
The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

Management Unit 7/4

PART B Intervention Appraisal		Sully Bay East																	
Ref	Topic																		
B.1	<p>Shoreline Description</p> <p>Coast Edge Type - Material - Varies between shingle storm beach, shingle bank and eroding (cliffed) soft rock shore.</p> <p>Foreshore Type - Material is generally rock with low areas of intertidal zone being infilled with sand.</p> <p>Developed/Undeveloped - The MU is either developed with residential housing or used for recreation - sports grounds</p> <p>Defended/undefended - Undefended with the exception of some localised bunding of shingle. There is a caravan park at the eastern end of the MU.</p> <p>Orientation/exposure - South south west with medium exposure - vulnerable to storm events.</p>																		
	B.1.1	Land Use:	Residential, recreation/sports use, sailing, foot path																
	B.1.2	Specific Shoreline Interests:	Sailing, walking																
B.2	<p>SHORELINE EVOLUTION:</p> <p>Geology - Soft rock shore with eroding edges up to 4m high. Mercia Mudstone of the Jurassic (note also Penarth group). Outcrops of lower Lias. Some sections are lower with a storm shingle beach along coast edge.</p> <p>Shoreline Movement/Historic Maps - General eroding trend with drift from Hayes Point weakening as bay geometry/orientation changes in an easterly direction. This modification in drift component results in shingle banks forming in the centre of the bay and these features are also influenced by seas generated from the south east. The situation could become volatile during storm events and should be monitored closely.</p> <p>Development/Industry - No significant recent development or industry.</p> <p>Gains/Losses - General loss along coast edge with unknown changes across intertidal zone.</p>																		
B.3	PRELIMINARY ECONOMIC APPRAISAL																		
	B.3.1	ASSETS AT RISK	<table border="1"> <thead> <tr> <th colspan="2">TANGIBLE BENEFITS</th> <th colspan="2">INTANGIBLE BENEFITS</th> </tr> </thead> <tbody> <tr> <td>Up to a dozen residential properties. In the longer term a school and sports fields.</td> <td>Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses</td> <td>U U U U U</td> <td>Environmental Losses Tourism Social Effects Historic Environment Losses</td> </tr> <tr> <td>Factors influencing the evaluation of benefits in this MU:</td> <td colspan="3">Sea level rise and increased storminess; Trend behaviour in respect of storm direction.</td> </tr> <tr> <td><u>Preliminary Value of Assets at Risk:</u></td> <td colspan="3">Likely to be over £1m.</td> </tr> </tbody> </table>	TANGIBLE BENEFITS		INTANGIBLE BENEFITS		Up to a dozen residential properties. In the longer term a school and sports fields.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses	Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; Trend behaviour in respect of storm direction.			<u>Preliminary Value of Assets at Risk:</u>	Likely to be over £1m.		
TANGIBLE BENEFITS		INTANGIBLE BENEFITS																	
Up to a dozen residential properties. In the longer term a school and sports fields.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses																
Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess; Trend behaviour in respect of storm direction.																		
<u>Preliminary Value of Assets at Risk:</u>	Likely to be over £1m.																		
	B.3.2	Cost Implications: Up to £1m.																	
	B.3.3	Economic Viability: Potentially viable.																	

Management Unit 7/4

PART C Strategic Policy Appraisal**Sully Bay East**

C.1 MATRIX ASSESSMENT					Coastal Managers : VOGC				
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT					
EFFECTS ON COASTAL PROCESSES	Changes are presently unclear - interaction with shingle drift is important	Would depend upon the form of defences adopted	Significant impact possible dependant upon extent	Little short to medium term change in current trends					
EFFECTS ON NATURAL ENVIRONMENT	Little known impact	Would depend upon the form of defence adopted	Some impact likely	Long term gains likely					
EFFECTS ON HUMAN & BUILT ENVIRONMENT	It is anticipated that the built environment will be effected in the short to medium term	Would secure existing built environment	Would secure existing built environment	Built environment would be lost with detrimental social impacts					
EFFECTS ON DEVELOPMENT & LAND USE	Land use will change over time and no development would be possible	Secure existing land use although development would need to be examined 'case by case'	secure existing land use and increase development potential	land use would change - no development could occur					
IMPLICATIONS FOR COASTAL DEFENCES	Existing natural defences in the form of shingle banks and eroding cliff will deteriorate and recede.	Potentially significant but study could determine lower cost and appropriate method/arrangement	Significant civil engineering works would probably be needed	existing natural defence line would recede over time					
EFFECTS ON ADJACENT M.U.'S	Little impact anticipated	Impacts if drift supply was completely interrupted	Impacts would need to be assessed - impact likely	No significant short to medium term change					
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of erosion and early loss of coastal assets could be expected	Defences would need to be more robust	Defences would need to be designed to accommodate increase wave climate	Recession rate would be greater and early loss of assets would occur					
CONCORDANCE WITH OBJECTIVES	Does not generally accord with objectives although more work is required to determine most appropriate policy	May accord with objectives subject to further study	Accord with majority of objectives but on balance is not likely to be acceptable or affordable	Does not generally accord with objectives					
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - No change (B) - No anticipated change	(A) - Not likely (B) - Little change	(A) - None (B) - Possible losses	(A) - Yes (B) - Gains					
ECONOMIC VIABILITY	Probably not viable - further works needed to confirm	Potentially viable	Not likely to be viable	Possibly not viable subject to further examination					
GENERAL COMMENT ON POLICY SUITABILITY	Not likely to be suitable	Potentially suitable	Probably not suitable	Not likely to be suitable					
RELATIVE SUSTAINABILITY									
Social	- ve	Baseline	+ ve	- ve					
Economic	- ve	Baseline	- ve	- ve					
Environmental	- ve	Baseline	- ve	+ ve					

Management Unit 7/4

Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Sully Bay East
C.2.1	Existing Coastal Defence Policy:	Do Nothing	
C.2.2	Future Coastal Defence Policy:	Short Term: Assess Vulnerability and economics for medium term hold the line - Set up monitoring package Anticipated Long Term: Retreat.	
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2, L3	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Assess vulnerability of shingle bank/storm beach and reinforce	
C.2.7	Reason for Change:	Adopt informed approach with an assessment of risk	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (Where issues are not referenced they are not considered to have direct relevant to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 3, 5, 9, 10	CP 11, 12
C.3.1.2	Natural Environment:		
C.3.1.3	Human and Built Environment:	HB 1	HB 3, 12
C.3.1.4	Coastal Defence:	CD 2, 3	CD 1, 4, 8
C.3.1.5	Development:	D 5	
C.3.2	2 - SPECIFIC (Where issues are not referenced they are not considered to have direct relevant to the preferred policy)		
C.3.2.1	Safety:	No specific issue related to coast defence	
C.3.2.2	Access:	No specific issue	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Likely to be political	
C.3.2.5	Tourism/Recreation:	Coast path and impacts upon sports grounds in long term	

Management Unit 7/4

C.4	OBJECTIVES RECONCILIATION Sully Bay East	
	The preferred policy accords with the following objectives for this management unit	A clear assessment of concordance with all objectives is not readily available. Viability of hold the line needs to be assessed.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

Management Unit 7/5

MANAGEMENT UNIT No. 7/5**Swanbridge**

From	Swanbridge East	316500E 167500N	(Including Sully Island)
To	Ball Rock	317500E 167500N	
Approximate Length	1000m		

PART A Objectives, Issues and Statutory Details

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		Swanbridge
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Foreshore is un-natural comprising demolition material and rock.
CP2	Shingle Storm Beach Behaviour	Broken concrete and rubble to west with small shingle beach fronting 'farm'
CP3	Coincidence of high tides and storms	important regarding defence integrity, overtopping and flooding
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Varying coast edge form. Erosion rate & drift effected near shore coastal processes.
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General interest regarding sediment movement
CP9	Sea level rise and increased storminess	Potential significant impact on coastal assets and possible flood risk
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Effect on shingle beach in-front of Swanbridge farm
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	General concern
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	General concern - sub-cell wide

NATURAL ENVIRONMENT		Swanbridge
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Sully Island SSSI & SPA, Penarth Coast SSSI (East side of MU)
NE2	Protection of areas designated under international conventions.	SPA

Management Unit 7/5

NATURAL ENVIRONMENT		Swanbridge
REF	ISSUE DESCRIPTION	Specific to MU
NE3	Water Quality	General concern
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	No known outfalls, debris on beaches is a general concern although the condition of the foreshore is unsightly

HUMAN & BUILT ENVIRONMENT		Swanbridge
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Cliff edge adjacent to St Marys Well bay road. Hazardous foreshore - broken concrete and steel protrusions, dangerous near shore currents - causeway to Sully Island.
HB2	Public access to the foreshore	Public Safety issues concerned with condition of private foreshore/crown foreshore.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	Long term concerns for St Mary's Well Bay Road
HB4	Fisheries interests	Possible interest to east of MU
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Dependant upon form of defence. The general foreshore at Swanbridge is unattractive and not suitable for public use.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict.
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Emergency works installed to protect Swanbridge Farm area - relevance to historic interest should be confirmed in the light of recent development
HB8	Vehicular access/parking/road congestion	Road congestion at end of St Mary's Well Bay Road and Beach road. Parking on west side is extensive. Private Captains Wife PH
HB9	Importance of beach quality to tourism	Potentially important - ie re-mediation of concrete rubble would significantly improve beach use.
HB10	Balance between traditional and green tourism	Traditional - mainland and Green for Sully Island. Potential disturbance of green by traditional tourism exporting itself to Sully Island.
HB11	Importance of recreational use of foreshore and contribution to local economies	The coastal location is important to local economies and the foreshore in-front of the Captain Wife PH would be important if it was usable.
HB12	Marine access - Port/harbour/launching facilities	Derelict slipway - historically used by small boats - relic quay.
HB13	Human pressure on natural assets such as dunes	Potentially detrimental impact from an increase in human traffic to Sully Island.
HB14	Beach texture - sand/silt	Stones, silt, rock, concrete, rubble, steel rods & general building debris. (Worst section fronts Captains Wife PH)
HB15	Access for emergency services (including life boat)	Reasonably good

Management Unit 7/5

HUMAN & BUILT ENVIRONMENT		Swanbridge
REF	ISSUE DESCRIPTION	Specific to MU
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	General concern

COASTAL DEFENCE		Swanbridge
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Local study commissioned by CPA . Recent development suggests retreat is unlikely - long term issues concerning access road from east.
CD2	Cliff erosion	Impacts on caravan site on western boundary of MU and eastern access road in long term.
CD3	Adequacy/condition of existing defences	Not adequate/poor condition - recent emergency works to prevent collapse in certain critical section - St Mary's Well Bay Road.
CD4	Maintenance of existing defences	Mixture of private, CPA & Highway
CD6	Condition of flood banks/sea defences	Potential flood risk should be investigated.
CD7	Private sea defences	In poor condition - implementation of 'joined-up' policy may require collaboration.
CD8	CPA funding of Coast Protection	Issue relating specifically to St Marys Well Bay road.
CD9	The role of the foreshore/beach as a defence	Foreshore and Sully Island (including causeway) provides some protection.

DEVELOPMENT		Swanbridge
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	Recent development at Swanbridge Farm does not appear to have taken account of future coast protection needs. Further investigation required - CPA study
D2	Sustainability	There are sustainability issues at Swanbridge.
D3	Preservation/enhancement of landscape value	Important landscape interest to sea ward (Sully Island), the low tide foreshore and along the eastern cliff coast. Swanbridge beach generally demeans the area. Caravan site to west is noted.
D5	Impacts of coastal development..	Swanbridge Farm development has had a significant local impact.
D6	Integration and conflict with other management plans	No Known information at this time

A.2	STATUTORY PLANNING POLICIES (Appendix A)	Swanbridge
	Vale of Glamorgan Policies - ENV 5 Land outside Heritage Coast Area. REC 12 - Public Rights of Way	

Management Unit 7/5

A.3	CONSERVATION DESIGNATIONS (Context Report)	Swanbridge
	Statutory: SSSI's Sully Island, Penarth Coast, SPA Non-Statutory:	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	Swanbridge
	Mostly private ownership with coast protection maintenance and proposals for a scheme being promoted by the coast protection authority. Swanbridge beach (west) & hinterland believed to be owned by Captains Wife PH. High way (St Mary's Well Bay Road) is believed to be owned by local authority (to be confirmed). Beach in-front of Swanbridge Farm may be private.	

A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :	
	W.72. 4725 - Sully Causeway - 0.11km - sea wall/break water Private/CPA - Low exposure 4195 - Swanbridge 1 - 0.14km - Sea wall CPA? - Medium exposure 4200 - Swanbridge 2 - 0.1km - Seawall CPA? - Low exposure 4205 - St Mary's to Penarth - 4.1 km Soft Rock Shore - Medium exposure	

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

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PART B Intervention Appraisal		Swanbridge			
Ref.	Topic				
B.1	<p>Shoreline Description Refer to Context report Section 3</p> <p>Coast Edge Type - Material - Soft rock shore and sea walls (Mercia Mudstones and outcropping limestone)</p> <p>Foreshore Type - mostly rock with areas of gravelly sand near Sully Island. Mudflow deposits in hinterland at St Mary's Well Bay. Trial holes for taken during Swanbridge Farm development show clay and sand deposits with clay commencing typically at depth of more than one metre.</p> <p>Developed/Undeveloped - mixture although through cliff coastline highway is close to the edge. Development along Swanbridge including coast protection works and foreshore in poor condition.</p> <p>Defended/undefended - Cliff section undefended and defences along Swanbridge Farm and Captains Wife areas. Defences are mixture of private and CPA responsibility. Significant issue for Council with emergency measures taken recently to support highway. Defences remain vulnerable.</p> <p>Orientation/exposure Southerly and medium exposure.</p> <p>Gains/Losses - Losses over time due to form of original protection and beach depletion.</p>				
	B.1.1	Land Use:	Residential, leisure, environmentally designated.		
	B.1.2	Specific Shoreline Interests:	Bird watching, sight seeing (Landscape/seascape).		
B.2	<p>SHORELINE EVOLUTION Refer to Context report Section 3</p> <p>Geology - Clifed coastline with central low and soft area at Swanbridge.</p> <p>Shoreline Movement/Historic Maps - Swanbridge once believed to be a recessed valley prior to development of Swanbridge Quay when line was advanced. Erosion along cliff and localised foreshore erosion at Swanbridge has been noted. Influence of Sully Island & Sully Sound is significant.</p> <p>Development/Industry - Recent residential development at Swanbridge Farm allowed on appeal to Welsh Office (now NAW). In 1984, the owner of Captain's Wife Inn illegally deposited demolition material on the foreshore; the Council served an enforcement notice requiring the material to be removed and commenced legal proceedings. Ownership changes and eventually the holding company was dissolved resulting in foreshore ownership being assumed by Crown Estate under law of 'Escheat'. This situation, in law, resulted in no responsibility for the foreshore resting with the Crown. However, statutory duties incumbent upon the Council such as public health and safety has resulted in an economic commitment by the Council to carry out the minimum works to fulfill their statutory duty. It can therefore be concluded that the Council have been placed in a difficult position as a result of illegal activity and the protection, in law, afforded to the Crown.</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Short term access to residential properties. Medium term access to and properties at recent Swanbridge Farm development. Cliff erosion and loss of parts of St Marys Well Bay Road.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U U U U U	Environmental Losses Tourism Social Effects Historic Environment Losses U U
		Factors influencing the evaluation of benefits in this MU:	Condition of existing defences, position of development, sea level rise and increased storminess, responsibility.		
		<u>Preliminary Value of Assets at Risk:</u>	Potentially up to £2m	Grant aid for hold line across whole frontage may be difficult to obtain.	

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	B.3.2	Cost Implications: Between £250K and £1m depending on scheme form and extent
	B.3.3	Economic Viability: Protection works are viable although qualification for straight forward grant support may not easily be justified.

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PART C Strategic Policy Appraisal**Swanbridge****C.1 MATRIX ASSESSMENT** (Excludes Sully Island as Do Nothing in Coast Protection term is appropriate policy) **Coastal Managers : VOGC**

	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT
EFFECTS ON COASTAL PROCESSES	Little or no known change	Potential local effects - dependant upon form of hold the line	Effects likely - dependent upon form of works	Effects likely.
EFFECTS ON NATURAL ENVIRONMENT	Slow change as rock shore erodes	Significant effect if applied to whole MU. No change if applied to shoreline with works already present	Significant effect if applied to whole MU. Effect if applied to Swanbridge would depend upon scale and form of works	Likely positive effect if applied in the extreme with removal of all built environment. Would need to be managed - not realistic.
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Loss of access to properties. Significant effect	Secure existing assets including road and properties.	Secure existing assets including road and properties	Loss of access to properties. Significant effect
EFFECTS ON DEVELOPMENT & LAND USE	Land use would change. No further development would be practical	Present land use would continue - possible remediation of foreshore. Further development would be possible but subject to review.	Present land use would continue - possible remediation of foreshore	Present land use would change - existing/recent development would be lost
IMPLICATIONS FOR COASTAL DEFENCES	Existing defences would be lost	Coastal work would be required. Limited space to install works sympathetic with near shore environment	Coastal works would be required - possible opportunities to tidy-up existing foreshore	Existing defences would be removed.
EFFECTS ON ADJACENT M.U'S	Little or none	Possible impact dependant upon linear extent	Possible impacts dependant upon form and extent.	Little or none
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Early loss of coastal defences and hinterland assets.	Form of works would need to consider effects of and increase in water depth and wave heights .	Form of works would need to consider effects of and increase in water depth and wave heights .	Retreat would occur more rapidly
CONCORDANCE WITH OBJECTIVES	NOT OB3, OB7, OB10, OB12, OB13	Generally accords with OB's subject to form	Generally Accords with OB's subject to form.	NOT OB 7, OB12, OB13
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - None known (B) - No short/medium term gains.	(A) - Possible benefits if clean-up applied to foreshore in-front of Captains Wife PH (B) - Potential gains	(A) - Possible benefits if clean-up applied to foreshore in-front of Captains Wife PH (B) - Potential gains	(A) - Potential improvement in longer term (B) - Longer term gains
ECONOMIC VIABILITY	Not viable in built areas	likely to be viable in built areas only	likely to be viable in built areas only	Not viable
GENERAL COMMENT ON POLICY SUITABILITY	Not suitable in built areas	Suitable in built areas provided no detrimental impact on coastal processes	Potentially viable	Not viable
RELATIVE SUSTAINABILITY - Built sections only				
Social	- ve	Baseline 1	Baseline 2	- ve
Economic	- ve	Baseline 1	Baseline 2	- ve
Environmental	- ve	Baseline 1	Baseline 2	Varies over time

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Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		Swanbridge
C.2.1	Existing Coastal Defence Policy:	Do nothing along cliff coastline; Maintain or defend in Swanbridge depends upon outcome of study. Do nothing Sully Island	
C.2.2	Future Coastal Defence Policy:	Short Term: Hold or Advance along present defended section with retreat along cliff coast (Ex Sully Island) Anticipated Long Term: Hold or advance (Ex Sully Island)	0 - 1 year 1 + year
C.2.3	Uncertainties/Dependencies:	Sea level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M15, M16	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	Keep options open by reactive maintenance until scheme is installed	
C.2.7	Reason for Change:	Act upon recommendation to provide long term scheme when NAW are able to approve proposals	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		Swanbridge
C.3.1	1 - GENERIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 2, 3, 5, 9	CP 8, 11, 12
C.3.1.2	Natural Environment:	NE 1, 2	NE 3, 4
C.3.1.3	Human & Built Environment:	HB 1, 2, 3, 4, 5, 7	HB 6, 8, 12, 17
C.3.1.4	Coastal Defence:	CD 1, 2, 3, 4, 7	CD 6, 8
C.3.1.5	Development:	D 1, 2, 3, 5	D 6
C.3.2	2 - SPECIFIC (where issues are not referenced they are not considered to have direct relevance to the preferred policy)		
C.3.2.1	Safety:	Public health and safety hazard on foreshore fronting Captain's Wife Inn; Causeway to Sully Island and public mis-reading tide resulting in people becoming stranded.	
C.3.2.2	Access:	Loss of access/highway at the end of St Mary's Well Bay Road	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Visitor numbers/congestion - end of St Mary's Well Bay Road at peak periods	
C.3.2.5	Tourism/Recreation:	Loss of foreshore to recreation & tourism	

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C.4	OBJECTIVES RECONCILIATION		Swanbridge
	The preferred policy accords with the following objectives for this management unit	All OB's List in A6	
	The preferred policy <u>does not</u> accord with the following objectives for this management unit		

Management Unit 7/6

MANAGEMENT UNIT No. 7/6**St Mary's Well Bay**

From	Ball Rock	317500E	167500N
To	Lavernock Point	318800E	168100N
Approximate Length	1.5Km		

PART A Objectives, Issues and Statutory Details**St. Mary's Well Bay**

A.1

ISSUES (For further detail on this section refer to the Consultation Responses Report)

The following specific issues were raised during Consultation with regard to the on-going provision of coastal defence within this management unit :

COASTAL PROCESSES		St. Mary's Well Bay
REF.	ISSUE DESCRIPTION	Specific to MU
CP1	Monitoring Foreshore Behaviour	Strategic beach profiles (from cliff)
CP2	Shingle Storm Beach Behaviour	Not applicable
CP3	Coincidence of high tides and storms	Effects upon cliff toe and coarse sediment drift - wave induced
CP4	Dune toe behaviour - erosion/regeneration	Not applicable
CP5	Effect of coastal processes on cliff stability & the supply of drift material (coarse & fine)	Major local coastal process effects coastal environment
CP6	Sediment movement at the mouths of rivers & estuaries & their impact upon processes	Not applicable
CP7	Siltation of estuaries and ports;	Not Applicable
CP8	Sediment movement in Swansea Bay and associated interactions including potential links between sand banks & beaches.	General concern - sand deposits tend to occur in sheltered areas between rock outcrops or in the shelter of ball rock - generally coarse sand
CP9	Sea level rise and increased storminess	Potential major impact upon rates of cliff erosion
CP10	Cyclic behaviour of beaches and intertidal zone associated shoreline exposure fluctuations along open shore and within bays & estuaries.	Effects upon coarse sediment accumulations along foreshore
CP11	Sediment movement resulting from marine dredging operations and the impact upon processes.	No known impacts but significant issue
CP12	Real & perceived reduction in beach levels and the understanding/measurement of impacts resulting from natural processes and human intervention such as dredging.	Major issue

NATURAL ENVIRONMENT		St. Mary's Well Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE1	Avoid adverse impacts of designated and non-designated areas.	Penarth Coast SSSI extends across whole MU

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NATURAL ENVIRONMENT		St. Mary's Well Bay
REF	ISSUE DESCRIPTION	Specific to MU
NE2	Protection of areas designated under international conventions.	Nearby cSAC & SPA Ramsar
NE3	Water Quality	General importance
NE4	Concerns regarding pollution including sewage treatment and debris landing on beaches.	General Importance

HUMAN & BUILT ENVIRONMENT		St. Mary's Well Bay
REF	ISSUE DESCRIPTION	Specific to MU
HB1	Public safety (Incl. cliff top paths/beaches & water activities)	Safety concerns regarding footpaths and proximity to cliff edge.
HB2	Public access to the foreshore	Local concern at St Mary's Well Bay which is believed to be private and public access is therefore understood to be restricted. Recent application by landowner to construct a new beach access has been rejected. Landowner has appealed.
HB3	Sustainability of coastal paths/pedestrian access around the shoreline - Potential loss of public rights of way.	General concern around cliff coast
HB4	Fisheries interests	No specific interest recorded although some fishing interest from shore is likely
HB5	Potential conflicts between Coastal defence/Recreation/Conservation	Potential conflict between recreation/tourism and conservation because of close proximity of caravan sites to SSSI.
HB6	Conflicts regarding recreational use of foreshore and nearshore zones eg water sports potential zoning	No known conflict
HB7	Preservation of the historic environment - Vulnerability resulting from coastal erosion.	Site recorded along coast include searchlight batteries and pillbox. Note Church set back at Lavernock Point. Need to fully record and document these assets
HB8	Vehicular access/parking/road congestion	Narrow road to both caravan/holiday camps.
HB9	Importance of beach quality to tourism	General importance
HB10	Balance between traditional and green tourism	Potentially sensitive issue.
HB11	Importance of recreational use of foreshore and contribution to local economies	Access is not straight forward from holiday sites and may not be sustainable
HB12	Marine access - Port/harbour/launching facilities	Not relevant
HB13	Human pressure on natural assets such as dunes	Not relevant
HB14	Beach texture - sand/silt	Coarse sand and shingle
HB15	Access for emergency services (including life boat)	generally good from sea - no 'easy' access from landward side
HB16	Maintenance of coastal facilities that support industrial activities and contribute to local and national economy.	Caravan sites at St Mary's Well Bay Road and adjacent to Lavernock
HB17	Marine Aggregate Extraction and Navigation maintenance dredging	Major local concern

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COASTAL DEFENCE		St. Mary's Well Bay
REF	ISSUE DESCRIPTION	Specific to MU
CD1	Identification of opportunities for managed retreat	Need to consider retreat when appropriate along whole coast.
CD2	Cliff erosion	Probably most important concern in respect of human and built environment
CD3	Adequacy/condition of existing defences	undefended
CD4	Maintenance of existing defences	Not applicable apart from access steps from Caravan Park
CD5	Dune erosion	Not relevant
CD6	Condition of flood banks/sea defences	Not relevant
CD7	Private sea defences	No information - none believed to be present
CD8	CPA funding of Coast Protection	Unlikely to be available to protect private holiday sites
CD9	The role of the foreshore/beach as a defence	Rock outcrops play important role in defences

DEVELOPMENT		St. Mary's Well Bay
REF	ISSUE DESCRIPTION	Specific to MU
D1	Management of demand for development with conservation and landscape interests	No significant information regarding future of holiday area and derelict houses in vicinity of Ball Bay.
D2	Sustainability	Development should only be approved if proposals are shown to be sustainable in terms of coastal defence.
D3	Preservation/enhancement of landscape value	Important to SSSI which is noted for its geological features
D4	Future of large industrial frontages	No industrial frontage in this MU
D5	Impacts of coastal development..	Any proposed development should be referred in the normal planning process to consider long term coastal defence implications
D6	Integration and conflict with other management plans	No specific information

A.2	STATUTORY PLANNING POLICIES (Appendix A)	St. Mary's Well Bay
	East Vale Coastal Zone ENV 5 - Outside the Heritage Coast, development or change within the developed coastal zone should have regard for the coastal location.	

A.3	Conservation Designations (Context Report)	St. Mary's Well Bay
	Statutory: SSSI - Penarth Coast - Note nearby cSAC, SPA Ramsar Non-Statutory: - None known	

A.4	LAND OWNERSHIP/OCCUPATION INTERESTS	St. Mary's Well Bay
	Understood to be mostly in private ownership. Details of foreshore and nature reserve are not clear.	

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A.5	<u>COASTAL DEFENCES</u> (For further detail on this section refer to the Data Context Report) The following coastal defences presently exist within this management unit :
	W.72.4205 St Mary's to Penarth 4.1Km Soft Rock Shore with medium exposure

A.6	<u>OBJECTIVES</u> The following objectives as defined in Section 2 of the Plan are relevant to this management unit :								
	OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	
	OB 9	OB 10	OB 11	OB 12	OB 13	OB 14	OB 15	OB 16	OB 17

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PART B Intervention Appraisal**St. Mary's Well Bay**

Ref	Topic				
B.1	<p>Shoreline Description - Refer to Context report Section 3 Coast Edge Type - Eroding cliff of Limestone/Mudstone Foreshore Type - Rock outcrops steeply dipping with large incursions of sand sediment Developed/Undeveloped - Mixture of both with large holiday site at each end of the MU Defended/undefended - The shoreline is undefended Orientation/exposure Generally south east with medium exposure</p>				
	B.1.1	Land Use:	Environmental and tourism		
	B.1.2	Specific Shoreline Interests:	Sea bathing and walking		
B.2	<p>SHORELINE EVOLUTION - Refer to Context report Section 3 Geology - St Mary's Well Bay Formation with section of Porthkerry and the Penarth Group all of which are of the Lower Jurassic. Shoreline Movement/Historic Maps - Recent evidence of steepening foreshore. Development/Industry - No industry although holiday and caravan sites are present Gains/Losses - Little information although trend appears to be clearly one of coast edge erosion</p>				
B.3	PRELIMINARY ECONOMIC APPRAISAL				
	B.3.1	ASSETS AT RISK	TANGIBLE BENEFITS		INTANGIBLE BENEFITS
		Caravans and holiday chalets. Derelict building at Ball Bay.	Property Loss Infrastructure Loss Land Loss Property Flooding Land Flooding Transport disruption Recreation Losses	U U U	Environmental Losses Tourism Social Effects Historic Environment Losses U
		Factors influencing the evaluation of benefits in this MU:	Sea level rise and increased storminess		
		<u>Preliminary Value of Assets at Risk:</u>	Less than £1m	CPA funding	
	B.3.2	Cost Implications: Cliff protection would be very expensive and probably unacceptable environmentally			
	B.3.3	Economic Viability: Not viable			

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PART C Strategic Policy Appraisal	St. Mary's Well Bay
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C.1 MATRIX ASSESSMENT		Coastal Managers : VOGC		
	DO-NOTHING	HOLD THE EXISTING LINE	ADVANCE THE EXISTING LINE	RETREAT ++ Applies to hinterland assets only
EFFECTS ON COASTAL PROCESSES	Little anticipated change in current trends			Little anticipated change in current trends
EFFECTS ON NATURAL ENVIRONMENT	Gradual loss of cliff section of SSSI and small sections of nature reserve. (Geological)			Gradual loss of cliff section of SSSI and small sections of nature reserve.
EFFECTS ON HUMAN & BUILT ENVIRONMENT	Built environment adjacent to the coast edge will eventually be lost - present access will be lost			Built environment adjacent to the coast edge may be removed possibly replaced inland - subject to availability of land
EFFECTS ON DEVELOPMENT & LAND USE	Land use and access will change over time - development to be resisted	Refer to notes below	Refer to notes below	Land use and access will change over time - Development to be resisted
IMPLICATIONS FOR COASTAL DEFENCES	None - Natural cliff defence will recede			None - Natural cliff defence will recede
EFFECTS ON ADJACENT M.U'S	No known impacts			No known impacts
EFFECTS OF SEA LEVEL RISE & INCREASED STORMINESS	Rate of loss will increase			Rate of loss will increase
CONCORDANCE WITH OBJECTIVES	Generally accord with objectives			Generally accords with objectives
(A) - OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT (B) - BIODIVERSITY ISSUES	(A) - No clear picture as present (B) - Possible long term gains			(A) - Potential long term loss of traditional holiday areas may improve natural environment. (B) - Gains
ECONOMIC VIABILITY	Viable			Not likely to be viable unless land is available
GENERAL COMMENT ON POLICY SUITABILITY	Suitable			Probably not suitable
RELATIVE SUSTAINABILITY				
Social	Baseline 1	- ve	- ve	Baseline 2
Economic	Baseline 1	- ve	- ve	Baseline 2
Environmental	Baseline 1	- ve	- ve	Baseline 2

NOTES

Although sections of the hinterland are developed and adjacent to the cliff coast, it is not considered appropriate to contemplate either hold or advance the line policies across the whole management unit. It may however be appropriate to carry out minor works to maintain access to the beach.

These policies have not been considered in detail because of the nature conservation value and likely cost of carrying out protection works. This policy may be reviewed in the future if circumstances change significantly.

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Ref	TOPIC	DESCRIPTION	
C.2	PREFERRED POLICY DEFINITION		St. Mary's Well Bay
C.2.1	Existing Coastal Defence Policy:	Do Nothing	
C.2.2	Future Coastal Defence Policy:	Short Term: Do Nothing/Retreat Assets Anticipated Long Term: Retreat	0 - 5 years 5+ years
C.2.3	Uncertainties/Dependencies:	Sea Level rise and increased storminess	
C.2.4	Further Studies:	S1, S2, S5, S6, S7, S9, S10, S11, L2	(Ref. Sect 5.3)
C.2.5	Future Monitoring:	M1, M2, M3, M4, M6, M7, M8, M11, M13, M15	(Ref. Sect 5.2)
C.2.6	Intervention Priority:	None - apart from communicate with land owners to inform/confirm policy - <u>avoid ad-hoc private intervention.</u>	
C.2.7	Reason for Change:	No significant change	

C.3	PREFERRED POLICY ISSUES: 1 - GENERIC & 2 - SPECIFIC		
C.3.1	1 - GENERIC (Where issues are not referenced they are not considered to have direct relevant to the preferred policy)		
	Concordance with Short Term Policy STP	OK with STP/Neutral	Not OK with STP
C.3.1.1	Coastal Processes:	CP 1, 5, 9	
C.3.1.2	Natural Environment :	NE 1	
C.3.1.3	Human and Built Environment :	HB 1, 2, 3, 7	HB 11
C.3.1.4	Coastal Defence :	CD 1, 2	
C.3.1.5	Development :	D 1, 3	
C.3.2	2 - SPECIFIC (Where issues are not referenced they are not considered to have direct relevant to the preferred policy)		
C.3.2.1	Safety:	Dangers associated with cliff edge and potentially unstable access	
C.3.2.2	Access:	Sustainability of access is unlikely	
C.3.2.3	Industrial Activities:	None	
C.3.2.4	Human Pressures:	Resulting from holiday area adjacent to SSSI possible	
C.3.2.5	Tourism/Recreation:	Holiday sites - caravan and chalets	

Management Unit 7/6

C.4	OBJECTIVES RECONCILIATION St. Mary's Well Bay	
	The preferred policy accords with the following objectives for this management unit	Generally accords with objectives set-out in A6.
	The preferred policy <u>does not</u> accord with the following objectives for this management unit	

5.0 PLAN USE & DEVELOPMENT

Introduction

This Shoreline Management Plan document represents the initial definition of preferred coastal defence policies for each of the 39 management units that make up the coastline of sub-cell 8b between Worms Head and Lavernock Point. The document is subject to periodic review and updating as new and previously undiscovered information becomes available. The effect of feeding additional information into the plan is likely to have a bearing upon, and may change, plan policies. Shoreline Management Plans are intended to be living documents which evolve as new information is assimilated into the plan.

The procedure for reviewing and up-dating the plan is also set-out in this section and a practical mechanism for amending the coastal defence strategy is considered. Although the mechanism allows for recommendations to be made for policy changes which are based upon the acquisition of new information or data, a maximum period of 5 years before a first review of the plan is proposed.

The preparation of a Shoreline Management Plan involves the collection of available relevant data which also enables gaps in knowledge to be identified. Improvements in understanding through acquiring more knowledge is achieved by gathering relevant data through monitoring and undertaking studies. This section lists the present monitoring activity and also proposes future monitoring around the sub-cell. A list of proposed technical studies is also included in this section to fill specific gaps in baseline data. The proposed studies are categorised as strategic or local depending upon geographic extent of influence.

Budget estimates are provided alongside the list of possible studies and monitoring activities. The funding of recommended works to improve understanding and inform the management process is likely to be an issue for the coastal group and National Assembly for Wales. The shoreline management plan will make recommendations in respect of studies and monitoring relevant to each management unit. Whilst it is acknowledged that budget restrictions are likely to result in a degree of prioritisation, the shoreline management plan will not achieve best value for investments made unless reasonable funds are allocated to make early progress on the recommended works.

In undertaking a Shoreline Management Plan study, future intervention works are considered under the headings of maintenance and capital works. The financing of these works is different and it is important to distinguish between new works funding from capital expenditure and works of maintenance which are funded from revenue.

The section concludes with a summary of specific recommendations from which sustainable coastal defence can be achieved.

5.1 PLAN USAGE

Coastal monitoring and studies are important to both future plan development and on-going usage. Monitoring and studies have been introduced above and are considered in detail in sections 5.2 and 5.3 below. Other aims, relevant to plan usage include the following:

- “ To facilitate on-going consultation between those bodies with an interest in the shoreline.
- “ To inform the statutory planning process.

The Shoreline Management Plan relies heavily upon consultation for its preparation and it is therefore appropriate that modifications that might be proposed are discussed with interested parties. Principal users of the plans include public authority coastal managers, Planning Authorities, private owners of the shoreline, Central Government administrators, statutory conservation bodies (CCW) and other non-statutory environmental (and historic environment/ landscape)

groups (RSPB, WWT, GGAT etc.). It is desirable to bring about modifications by consensus and on-going consultation is intended to allow reasoned debate to influence policy modifications.

Other bodies with an interest in some or all of the facets of the shoreline e.g. sailing clubs, walking groups, RNLI etc. will be able to use all or parts of the Plan document for reference. Feedback from Stage 1 Consultation suggests this is already happening.

Although Shoreline Management Plans are non-statutory documents, it is intended that the objectives, proposed management strategies and recommendations are adopted by Planning Authorities and that the policies they provide are fed into the statutory planning process at the earliest opportunity.

If coastal defence works of a public or private nature are proposed for any section of the shoreline within sub-cell 8b then they will need to accord with the recommendations contained in the SMP.

The existence of the SMP should facilitate closer links between the above bodies / organisations and particularly where management units span administrative boundaries and coastal defence operations become a matter for more than one coastal manager.

5.2 MONITORING

Monitoring of the coastline is fundamental to planning the management of the shoreline. Monitoring should include measurements of the physical shoreline and also the natural processes that influence it. Traditionally monitoring has been carried out on an ad-hoc basis without a monitoring strategy in place. However, in the recent past the need for structured monitoring programmes has been recognised and the basis of such programmes have in many areas now been put in place.

Strategic monitoring programmes need to address a number of issues, including :

- Common formats for data collection, analysis and presentation;
- Cell wide co-operation.

The agreement of a common format at the outset of a monitoring programme even if different bodies are carrying out data collection individually, provides for ease of analysis and more cost-effective use of resources. Cell wide co-operation between members is clearly more cost-effective, particularly with regard to the collection of strategic data sets e.g large scale hydrographic surveys.

The evaluation and solution of problems faced by coastal managers will utilise various monitoring techniques which will incorporate the use of up to date computer technology allied with the experience and judgment of specialist personnel. Standard techniques available include :

- " Data Basing
- " Digital Mapping and GIS
- " Local Knowledge Gathering
- " Digital Ground Modelling
- " Numerical Modelling - Water/Sediment Movement/Beach Behaviour
- " Annual Aerial Inspection of the intertidal zone;
- " Annual Ground Shoreline and Structure Inspections;
- " Sediment Sampling at specific locations and various tidal contours;
- " Beach Profile and Topographic Surveys (open coast shoreline);
- " Marsh Area Surveys (estuaries and sheltered shorelines);
- " Inshore Wave Monitoring;
- " Vertical Aerial Photography and 'LIDAR' measurements;
- " Littoral Drift Measurements;
- " Hydrographic Beach Profile Extensions;
- " Tide/Water Level recording;
- " Storm typicality and shoreline energy assessments;
- " Hydrographic Surveys of estuary and approaches;
- " Biological Surveys (Bird counts intertidal zone and invertebrate studies).

A Shoreline Management Plan is not a vehicle for extensive numerical and /or physical modelling of particular sections of shoreline. The above techniques may be more appropriately employed once the plan has been prepared and specific needs and gaps in knowledge have been identified. Existing data requires analysis and specialist skills are needed in the interpretation of collected data which provide the basis of determination of future coastline behaviour and impacts to be expected from existing and prospective coastal defence interventions.

Data analysis should focus on the need to provide sufficient definition of coastal process behaviour to allow satisfactory prediction of future coastline behaviour, and would generally employ the following methods:

- S Time series analysis of wave, water level, beach profile data etc.
- S Basic inshore wave climate definition
- S Storm typicality definition

The relatively small costs of undertaking monitoring will be offset in the longer term, allowing better informed decisions on coastal defence to be made and enabling more cost effective design of appropriate defence works. The funding of monitoring should be recognised as an investment as its value increases with the extent of times series data sets. The information obtained from regular monitoring also provides for thresholds to be defined for actions.

In addition, standard and purpose developed software packages e.g. SANDS, KEYSHORE etc. can be readily customised to take specific data sets, containing information on a variety of parameters, and provide the basis for analysis of shoreline behaviour from which future recommendations can be made.

There are a number of elements to be considered in any monitoring programme, based upon what needs to be known and how it can be established. The basic needs relate to the condition of defences, the behaviour and condition of foreshore in front of them, the behaviour of process forcing parameters and the changes that result from these processes. In addition where changes in coastal process behaviour and/or modification to coastal defences impact upon environmental behaviour then collection of specific environmental data should form an integral part of any monitoring system proposed.

5.2.1 EXISTING MONITORING

The absence of coherent time-series monitoring data on coastal processes has provided a serious constraint upon the development of understanding shoreline behaviour. Whilst the introduction of computers has allowed the development of numerical models and improved data management there has been little progress made on advancing the basic physics of coastal processes. There is a need to compile coherent time-series monitoring data both for medium-term gain (5-15 yrs) and long-term (> 15 yrs) so that process trends can be more accurately determined thereby improving the timing and extent of any intervention works. In order for returns on monitoring investments to be optimised it is essential that the accuracy of any measurement matches its intended use. Although studies can contribute to definition of design criteria, they too can be subject to significant error by extrapolating in time over the relatively large periods of scheme service life from a short period data base.

The following is a summary of those activities currently being carried out :

- S Annual report to Swansea Bay Coastal Engineering Group which includes an Aerial Inspection of the sub-cell 8b shoreline.
- S Beach profiling sections at strategic locations throughout the sub-cell along with relevant storm beach surveys. Historic ad-hoc monitoring associated with CPA's and in support of dredging licence applications.
- S Ad-hoc shoreline inspections.

5.2.3 FUTURE MONITORING

The existing arrangements within sub-cell 8b will provide useful strategic monitoring data although the existing system falls significantly short of a strategic monitoring system for the sub-cell as a whole. The present arrangements require both extension, expansion and additions if the correct data is to be collected to confirm / amend presently proposed policies and actions. Table 5.1 provides a list of elements forming an integral part of an overall system :

TABLE 5.1 PROPOSED FUTURE MONITORING ELEMENTS	
REF. KEY	DESCRIPTION
M 1	Annual aerial inspection of the intertidal zone
M 2	Annual ground shoreline and structure inspections
M 3	Sediment sampling (Grading) at specific locations and various tidal contours
M 4	Beach profiles and topographic surveys (open coast shoreline and spits)
M 5	Marsh/Burrows area surveys (estuaries and sheltered shorelines)
M 6	Cliff Recession Surveys
M 7	Vertical aerial photography including 'LIDAR' measurements where feasible
M 8	Littoral drift measurements
M 9	Hydrographic beach profile extensions
M 10	Tide/Water Level recording
M 11	Storm typicality and shoreline energy assessments
M 12	Hydrographic surveys including estuary and approaches
M 13	Environmental monitoring data collection
M 14	Low water channel surveys
M 15	Fixed aspect still photography
M 16	Periodic structural inspections - particularly masonry structures
M 17	Inshore wave monitoring (building upon local studies)
M 18	Biological Monitoring - intertidal bird counts
M 19	Biological Monitoring - invertebrate surveys
NOTE Ref. Keys refer to abbreviations used in Part C.2 of Management Unit Policy Appraisal (Section 4.2)	

Monitoring task frequencies will need regular review with a view to relaxation if the measured data show little change between successive surveys and the system elements will need to be phased-in to smooth-out cash-flow requirements in this regard.

The ground and aerial inspections (**M1 & M2**) of the shoreline and intertidal zone provide a contextual setting for the quantitative monitoring data. The aerial inspection provides an insight to the major bank and channel dispositions and the cover and exposure of the various rocky formations around the Bay shoreline. These aspects cannot be qualitatively assessed from the ground. The ground inspection allows detailed examination of interaction between coastal defences and the intertidal zone and pinpoints problem areas for more quantitative examination from other monitoring data. This inspection also provides early warning of changes where attention can be focussed from the more spatially discrete measurements such as inshore wave monitoring.

The beach profiles (**M4**) provide level definition of beach form for the generally two dimensional sections of shoreline. Local contour surveys are taken where a more three dimensional behaviour is evident (e.g. in the vicinity of structures or on storm shingle beaches). Sections of shoreline that support saltmarsh across their frontage would be monitored by marsh-edge perimeter surveys (**M5**) since level differences in these areas are small. The results are stored as digital and hard copy data displaying profiles graphically with surface material identified together with tabulated data on contour offsets from fixed profile origins to identify temporal trends. As such this survey work defines quantitatively the response of the intertidal zone to the forcing agents of wind, water level, waves, currents and freshwater inputs.

The sediment particle-size analyses (**M3**) are required to complete coherence of the beach profile data, since level and gradient fluctuations may be linked to particle-size. The estuary hydrographic surveys (**M12**) are needed to monitor their tidal capacity for detecting trend changes due to sea level rise and increased storminess. The offshore extension of selected beach profiles (**M9**) is required to monitor approach depths for inshore wave field propagation and the availability of offshore sediments for shoreline nourishment from natural processes. The estuary marsh-edge surveys (**M5**) monitor changes linked with water level and storm climate - these surveys will link with vertical aerial photography which will also allow channel centre-line mapping with major sandbank movement.

The transfer of storm typicality (**M11**) inshore and its filtering to apply to higher water level ranges (derived from tide gauge(s) data) provides a more coherent link between forcing processes and shoreline response (profiles, surveys etc.). This development leads to the calculation of time series data on overtopping risk along the Plan shoreline to give improved prediction of extremes.

Such a system requires a suitable software analysis system preferably with a number of facilities 'bolted-on' such as ground modelling package for 3-D volumetric analyses of beach changes.

Inshore wave monitoring (**M17**) is carried out using video-records of a three pole array located typically 200 metres from the shoreline. One of the poles is graduated so that the system provides data on :

- S wave height, period, direction, breaker type;
- S balance of incident and reflected wave energies;
- S wave grouping.

This information is used to establish design criteria for coastal defences and to refine offshore/inshore wave transformation co-efficients to improve calculations of storm typicality, on-offshore and longshore energies against tide level bands etc.

Numerical model prediction of inshore wave climate becomes inaccurate in shallow water where non-linear effects dominate wave behaviour making the linear model simulation inappropriate. The inshore wave monitoring provides direct measurements in the area of most relevance for coastal defence design.

A monitoring proposal was prepared and submitted, in draft form, to the City and County of Swansea and provides a useful insight into the form and budgets of a typical monitoring scheme. The draft proposal has been appended to this document for information - Appendix B. This appendix also includes a more comprehensive monitoring system more closely based on the above to be implemented by the Liverpool Bay Coastal Group for their Shoreline Management Plan area.

National Assembly for Wales and marine dredging companies sponsor monitoring work in the Bristol Channel and Swansea Bay area. Beach profiles are taken around Gower and Vale of Glamorgan and hydrographic surveys are taken at Helwick Bank. An investigation into additional/alternative sources of marine aggregate has been undertaken and was published at the time this Shoreline Management Plan was completed (Oct 2000) - Bristol Channel Marine Aggregate Study (August 2000). Some relevant further studies relating to the BCMAS have been included in the strategic study list in 5.3.1 below.

5.3 FUTURE STUDIES

The collection, collation and analysis of presently available data carried out during preparation of the Shoreline Management Plan has identified specific areas where there are gaps in existing knowledge of the shoreline that require filling if on-going plan update and review is to be progressed satisfactorily in the future.

Whilst much data will come from the proposed strategic monitoring system that is recommended to be set up (as detailed in Section 5.2), specific one-off studies will also be required to provide information that does not necessarily require regular updating. Such studies will either be strategic to the whole or parts of the sub-cell, in which case cell-wide funding by all members of the Plan Partnership including National Assembly will need to be considered, or specific to certain locations or smaller sections of the shoreline in which case single Authority funding is more likely to be appropriate.

To assist in prioritising future studies and to provide a guide as to the anticipated levels of expenditure likely for each of the studies, cost estimates for each element have been identified within one of four bands as indicated below:

"	< £10,000
S	£10-50,000
S	£50-100,000
S	> £100,000

A cost range has been included following the initial estimate band in a limited number of cases where a more refined estimate has been possible eg < £10,000 (£3 - £5,000)

The above costs assume that relevant monitoring data recommended in Section 5.2 is available without charge to assist carrying out of the studies. The following specific studies are proposed in this respect :

5.3.1 STRATEGIC STUDIES

CCW have stressed the importance of strategic studies and policy development carried out by the National Assembly for Wales should take account of the findings and recommendations of the Shoreline Management Plans and vice-versa.

S1 Wave/Water Level Joint Probability : To transfer offshore data to the nearshore wave climate prediction locations to improve definition of design criteria for shoreline management of coastal defences and to establish a system for assessing annual occurrences against a typical baseline.

Estimated Cost : £10-50,000

S2 Sediment Tracers : To investigate nearshore and shoreline movement of sand-sized sediments at specific locations around the Bay:

S	South Gower
S	Mumbles/Swansea Docks
S	Neath Estuary
S	Port Talbot
S	Sker
S	Porthcawl
S	Lavernock Point

Estimated Cost : £10-50,000 per location

S3 Neath Estuary : To define coastal processes applying in the estuary and its approaches and to assess the relative sustainability of different management approaches with regard to shoreline integrity.

Estimated Cost : £10-50,000

- S4 South Gower : To examine the form and structure of beaches and nearshore zone including necessary field survey work to provide a baseline for use in future monitoring and beach bulk volume changes and to establish a suitable analysis package for such monitoring data.

Estimated Cost : £10-50,000

- S5 Geomorphology Study: It is recommended that a sub-cell wide desk study of geomorphological evolution of the shoreline is undertaken to bring together existing information and identify gaps in knowledge. In addition to this it is recommended that the desk study attempts to identify potential land-based sources of natural shingle and cobble material for storm beach nourishment. The desk study would be followed-up with site, planning and legal investigations. (This study is subsumed within the geomorphological study to be undertaken for the whole of the Welsh coastline funded directly by National Assembly for Wales).

Estimated Study Cost : £10-50,000.

- S6 Tidal Flows: Tidal flows/or streams are presently defined with little detail or resolution over the whole sub-cell and there is little data available in the nearshore and inshore zones. Work is required to build upon, supplement and update the Coastal Response Study 1993 and the Bristol Channel Marine Aggregate Study. Data will be required at fixed positions over time where current/depth profiles can be determined for typical tide cycles. In addition to fixed position data, surface float tracking in the vicinity of bathymetric features such as sand banks, sub-surface rock outcrops and headland features can provide useful data for the definition of coastal process behaviour. It will be necessary to review any studies currently in progress to determine a precise specification for inshore and nearshore tidal flow monitoring. Comprehensive tidal flow data is a prerequisite in most tidal environments to gaining knowledge on sediment movement.

Estimated Study Cost : £10-50,000

- S7 Sediment Movement Definition: Sediment movement is usually depicted by direction and may be loosely defined in general terms such as weak, moderate or high. The need for further qualitative assessments of sediment drift (pathways) within Swansea bay has been identified with specific reference to the potential linkages between sand banks also between sand banks and beaches. The results of this study should be assessed in terms of its relevance to the Shoreline Management Plan and where applicable remaining gaps in knowledge should be identified and further studies considered. Further studies may take the form of numerical modelling and/or data collection. This study is linked to the Bristol Channel Marine Aggregate Study and should be funded by NAW.

Estimated cost of Further Study : potentially over £50,000

- S8 Intangible Benefit Evaluation: Policies have been identified in the strategic policy appraisal which propose maintenance, management and sometimes the construction of new coastal defence works. The justification for such works is usually based upon a detailed economic analysis of tangible benefits such as land, property and infrastructure. In some areas the benefits are not readily quantifiable and take the form of intangible benefits such as Environmental Gains / Losses and Recreational use. For example; a seawall with a promenade may be an important element in attracting visitors to a town whom in turn provide considerable support to the local economy. Although these benefits may not be easily quantified for inclusion in the required economic analysis, it may be clear to a community that such assets are of crucial importance to the local economy.

The evaluation of environmental assets is likely to be based on the willingness of the public to pay to see particular conditions conserved rather than the costing of specific elements of the natural environment.

A review study is recommended that will aim to identify management units where significant intangible benefits exist. Management units that may benefit from such a study are listed in the Plan and this list would be confirmed, modified and updated by the review.

Estimated cost of Review : < £10,000

Estimated cost of Further Study : £10-50,000 per site

- S9 Coastal Survey Review: The principal source of coastal defence data used in the preparation of the Shoreline Management Plan has been supplied by the National Assembly for Wales. The survey is incomplete and, occasionally, inaccurate or out of date and it is therefore recommended that an independent review of the defence survey should be undertaken to update, correct and supplement the existing survey. It may be appropriate to prepare a pro-forma which may be used to record data for each defence element around the coastline. The survey would utilise a portable differential global positioning system to determine location in grid co-ords and this data would be supplemented by a general description, photographs etc. and include specific records of the condition form and dimensions of all access points around the shoreline for both pedestrians and vehicles with disabled access points highlighted.

Estimated Study Cost : £10-50,000

- S10 Land and Foreshore Ownership/Lease: The Shoreline Management Plan determined land ownership for significant areas of the hinterland. It will be necessary to undertake a review of current knowledge of land ownership as a number of relevant consultees were unable to supply information and indicated that such a task would involve significant effort.

Estimated Study Cost : £10-50,000

- S11 Beneficial Use/Re-Use of Natural Materials for Beach Nourishment: Limited trials have taken place in South Wales to re-use natural materials that would otherwise be dumped at sea or possibly taken to landfill. Materials include sand dredged for navigation access to ports and natural gravels excavated as part of Environment Agencies river maintenance programme. A study is required to pursue further opportunities for the beneficial use of materials (Agenda 21) including an examination of whether use can be made of dredged material with high silt contents such as that collected for navigation access and presently dumped at sea.

Work carried-out to date has demonstrated a high degree of co-operation between Industry, Local Authorities and a range of other government bodies (CCW, EA, MAFF, DETR etc).

Estimated Study Cost: £10 - £50,000

- S12 Nash Bank Sand Tracer Study: To deploy sand tracer material and hydrographic instrumentation to determine residual sediment movements over time between Nash Bank and the adjacent shoreline (similar to work carried out at Helwick bank for the BCMAS). This study is linked to the Bristol Channel Marine Aggregate Study and should be funded by NAW.

5.3.2 LOCAL STUDIES

Specific studies relevant to individual or small groups of management units have been identified as follows :

- L1 **Dune Management Studies at specific locations** : Following on from the PD strategic dunes survey (Report date 1996; Survey date 1993; sponsored by Welsh Office) and present dunes management policy more detailed site specific studies are required to determine a sustainable approach to future dune management and to confirm or modify the policy of either Hold the Line or Managed Retreat. The proposed locations for this study include - Port Eynon (MU 1/ 2), Oxwich Burrows (MU 1/4), Nicholaston Burrows (MU 1/4), Penard Dunes (MU 1/4), Blackpill (Mumbles MU 2/3)), Crymlyn Burrows (MU 3/3), Baglan Burrows (MU 3/3 & MU 3/4), Margam Burrows (MU 4/2), Kenfig (MU 4/3), Merthyr Mawr (MU 4/7).

Estimated Study Cost : < £10,000 per site.

- L2 **Localised review of cliff stability** : A detailed review of previous works is required specifically around South Gower and Vale of Glamorgan. Following this, further localised work is recommended to monitor and study specific sections of coast path where the margin between the path and cliff edge is deemed to be small. The stability of the rock shore varies and geological conditions have a significant relevance to erosion rates. Particular attention would be required along the Vale of Glamorgan coastline and parts of south Gower (Langland to Worms Head). The study will increase knowledge regarding sediment inputs and drift

Applies to the following Coastal Process and Management Units:

- S Gower - CPU 1 & part of CPU 2 - MU's 1/1 to 1/9 & MU 2/1.
S Vale of Glamorgan - CPU 5, 6, 7 & 8 - ALL MU's

Estimated Study Cost : < £10,000

- L3 **Local Study of Coastal Defences**: The defences at certain locations should be reviewed in local bay wide context in order that a local plan can be developed to suit future land use in these areas. This study would need to cover the elements adduced in the interim guidelines for strategy studies issued by the Government. The selected locations include -

SUMMARY OF LOCAL COASTAL DEFENCE STUDIES	
Coastal Process Unit CPU	Location and Management Unit Reference
CPU 1	Port Eynon (MU 1/ 2) Oxwich (MU1/4) Caswell (MU 1/6)
CPU 2	Swansea Bay - Mumbles Head to Swansea Docks (MU2/1, MU 2/2 & MU2/3)
CPU 3	Neath (in association with strategic study) (MU 3/3)
CPU 4	Corrus industrial dune/tip frontage (MU4/2) Porthcawl review required (MU's 4/4, 4/5 & 4/6)
CPU 5	Dunraven Bay (MU5/2)
CPU 6	Nash Point East - Atlantic Collage (MU 6/1) Cwm Col Huw -Periodic review (MU6/2) Aberthaw Power Station (MU6/4) Rhoose Point development - Review (MU6/5) The Knap (MU6/6) Barry Harbour (MU6/7)

SUMMARY OF LOCAL COASTAL DEFENCE STUDIES	
Coastal Process Unit CPU	Location and Management Unit Reference
CPU 7	Whitmore Bay (MU7/1) Barry Docks (MU7/2) Sully Bay (MU's 7/3 & 7/4)
CPU 8	A number of coastal defence issues need to be addressed along coastal process unit 8 between Lavernock Point and Penarth Head - Penarth Coastal Link project is acknowledged but will not cover all relevant issues over CPU 8.

The above studies would, where appropriate, link into separate studies examining future land use development potential, private sources of funding and also larger, strategic studies.

Estimated Study Cost : < £10,000 each

L4 to L10 - Impacts of Current Changes in Land Use on Coast Protection at Specific Frontages - The plan has identified a number of locations where land use has recently changed or may change in short to medium term. Changes may result from development or the closure/ potential closure of industrial facilities. It is important that awareness of coast protection issues are raised whenever changes in land use are likely in order that appropriate action can be taken in line with the aims of the Shoreline Management Plan. Examples include the following:

- The reliance and responsibility on/for existing coast protection elements from which development may directly or indirectly benefit.
- Changes in long term shoreline activities such as navigation dredging and maintenance of harbour/port facilities
- Consequences of coastal erosion along industrial frontages that are, or may be no longer in commission - eg remediation

The following local studies generally fall under the above heading:

L4 **Swansea Docks and Jersey Marine (MU 3/2)**: It is understood that BP's operations in Swansea Docks and in the area extending east will undergo significant change and the present coastal protection should be assessed alongside present hinterland make-up and potential future land use. Possible changes in the near shore channel leading towards Crymlyn Burrows should be included in this work and linked into other strategic and local studies to the east.

Estimated Cost < £10,000

L5 **Neath Estuary Management (MU 3/3)**: The Neath Estuary is an important feature in Swansea Bay and is likely to undergo management changes in the near future. A greater understanding of coastal processes is required in order that sustainable and appropriate management can be determined that will compliment both environmental and development issues. An informed management approach is required that will satisfy local interests and aspirations. The study should include the area of eroding dunes to the east and assess the vulnerability of the treatment works. This approach will be best achieved by adopting a long term interest that should comprise the following:

1. Examination of existing data followed by further measurement and survey work
2. Ongoing monitoring and review to inform the management and development process

Estimated Study Cost : 1 - £10,000 2 - £3-5,000 per annum

- L6 Aberavon Development Review (MU 3/4): Development plans and actions in the Aberavon sea front area should be reviewed in the light of the Shoreline Management Plan. Previous studies including recent coast protection works at the eastern end are acknowledged and would be used to carry out a review in the context of the relevant Management Unit.

Estimated Cost: < £10,000 (£3 - £5,000)

- L7 Port Talbot - Port and Steel Works - Coastal Issues Resulting from Potential Changes in Land Use (MU4/1 & 4/2): Maintenance of the deep water port and navigation channel is funded by steel production at the Port Talbot Steel Works. Globalisation appears to have increased volatility in a range of markets and effected confidence in the, medium to long term, future of steel making in Wales. Whilst no suggestion is being that steel making at Port Talbot is likely to cease, it would not be responsible to ignore the consequences of such an event on the coastal environment. Indeed, there are current coastal management issues to be addressed for maintaining the status quo.

The study needs to address issues applying to a number of scenarios and both the organisation responsible for existing coastal management and the coast protection authority should be aware of these issues in order that an informed, managed approach can be adopted.

Estimated Cost: £10 - £15,000 (excluding site investigation within predicted recession zone - £10 - £50,000)

- L8 Aberthaw Power Station (MU 6/4): A review of the coastal defences has been recommended in L4 above and this should be supplemented with an examination of the composition of the hinterland (made ground and stock pile area) along with a review of long term land use.

Estimated Cost : £5 - £10,000 (excluding site investigation £0 - £20,000)

- L9 Rhose Point Shoreline Development Area (MU 6/5): A long term management strategy is required along the site of the former quarry which is now being developed. It is noted that quarrying activities occurred very close to the cliff coast resulting in breaches to the foreshore being imposed from the landward side. Minor coast protection have been installed through this area and it is now important that a long term coastal management strategy if produced that takes account of coastal process and land use.

Estimated Cost : £3 - £5,000

- L10 Barry Development (MU 7/1 & MU 7/2): Current and proposed development at Barry Island and within the Dock area should be reviewed in the context of coast protection. The review should examine present and future coastal defences requirements including long term management and maintenance needs. Benefits and responsibilities also need to be examined to ensure sustainable coastal management.

Estimated Cost : < £10,000

A summary of the strategic and local studies proposed is provided in Table 5.2.

TABLE 5.2 SUMMARY OF STRATEGIC AND LOCAL STUDIES

Strategic Ref.	Strategic Study Title	Local Ref.	Local Study Title
S1	Wave/Water Level Joint Probability	L1	Dune Management Studies at Specific Locations
S2	Sediment Tracers	L2	Localised Review of Cliff Stability
S3	Neath Estuary	L3	Local Study of Coastal Defences
S4	South Gower	L4	Swansea Docks and Jersey Marine
S5	Geomorphology Study	L5	Neath Estuary Management
S6	Tidal Flows	L6	Aberavon Development Review
S7	Sediment Movement Definition	L7	Port Talbot - Port and Steel Works - Coastal Issues resulting from Potential Changes in Land Use
S8	Intangible Benefit Evaluation	L8	Aberthaw Power Station
S9	Coastal Survey Review	L9	Rhoose Point Shoreline Development Area
S10	Land and Foreshore Ownership/Lease	L10	Barry Development
S11	Beneficial Use/Re-Use of Natural Materials for Beach Nourishment		
S12	Nash Bank Sand Tracer		

NOTE Ref. Keys refer to abbreviations used in Section C.2 of Management Unit Policy Appraisal

5.3.3 COASTAL STRATEGIES

In addition to the specific strategic and local studies identified above, particular coastal process units or groups of management units lend themselves to a wider approach to management than on an individual basis.

MAFF have provided interim guidance on the development of coastal strategies and generally a strategy will be appropriate:

- S Where there is advantage in considering problems and solutions in the longer term and over a wide geographic area. For example, enhancement of beaches by large scale intervention in coastal process systems or the initiation of long term changes in estuary or river morphology.
- S Where implementation of a programme of works or management is to be carried out over long time scale, typically greater than five years, such as the ongoing long term management of beaches.
- S Where there is a hydraulic or process connection between physically separate works. Such connections may not always be obvious or readily apparent and some may only become known as a result of further research, such as that into the processes, form and function of estuaries. Examples of obvious connections are the provision of a river flood relief channel which may well increase peak flows downstream or a beach control structure which will interrupt longshore sediment drift to adjacent beaches.
- S Where there is a physical interconnection between benefit areas, for example, situations where flood risk areas are contiguous and a breach or overtopping in any one of several locations could lead to flooding of the whole area.
- S Where several smaller problems can be addressed in an integrated way, for example where flood alleviation can be achieved by enhancement of the total storage in a catchment or by a major river diversion scheme.

- S Where environmental or other implications extend outside the immediate area of a scheme. For example, the continuing erosion of a cliff or foreshore providing a source of recharge for down-drift beaches, mudflats or saltmarshes. Particular consideration will be required where works may effect the integrity of a site designated under the Habitats Directive or other protected area.

The primary criteria for identifying appropriate lengths of shoreline for development of strategy plans should be the Coastal Process Unit (CPU) division identified within the first stage of the SMP Process.

However because there can be a wide range of coastal defence measures i.e. from natural defence to hard vertical sea walls, applying across a CPU it will not always be appropriate for strategies to cover the whole of a unit and shorter lengths, consisting of one or more management units (MU) may form the basis of strategy development, dependent on coastal process implications.

The preferred policies and the future intervention timescale identified by the SMP has provided the initial basis for identification of whether a strategy would be appropriate for a particular length or lengths of shoreline and Table 5.3 below provides a preliminary assessment for sub-cell 8b.

TABLE 5.3 POTENTIAL STRATEGY LENGTHS		
LENGTH	DESCRIPTION	SHORT-TERM PREFERRED POLICIES
SUB-CELL 8b		
CPU 1	South Gower	Selective Hold the Line / Do-Nothing / Retreat
CPU 2	Mumbles to Swansea Docks	Hold the Line
CPU 3	Swansea Docks to Port Talbot Docks	Hold the Line / Do-Nothing
MU4/4 - MU4/6	Porthcawl	Hold the Line
CPU 6	Nash Point to Barry	Selective Hold the Line / Retreat
CPU 7	Barry to Lavernock Point	Hold the Line / Retreat

5.3.4 INTEGRATION WITH OTHER PLANS AND NOTE FOR NEXT REVIEW

Whilst the SMP is primarily concerned with issues relating to coastal defence, it has acknowledged a broader range of issues concerning the Natural, Human and Built Environment applying to the marine, intertidal zone and coast edge. These areas, which may be referred to as the coastal zone, are clearly of specific interests to other bodies and various plans are either in place or being prepared that have statutory and non-statutory status.

There is a need for an integration of the various plans to ensure that a consistent approach is being adopted and updated. For example, Biodiversity Action Plans (BAPs) (ref. section 3.2.1 Part C) are statutory plans under the Countryside Rights of Way Act implemented by Local Authorities. Local Authorities also administer local planning regulations, development and are usually the Coast Protection Authority. Reference has been made throughout this document to Unitary Development Plan (UDPs) and these documents need to acknowledge the policy recommendations of the SMP which is a non-statutory document.

SMPs need to continue to take account of the importance of the natural environment and fully acknowledge the land value of the existing shoreline in works proposals. Much of the coastline is natural and there is ongoing awareness of

the need to promote "Green Tourism". Green Tourism is defined as -

- S being socially and environmentally considerate;
- S draws upon natural beauty and character of the area;
- S is small in scale and develops slowly;
- S supports the local and for economy and employs local people;
- S cares about quality;
- S brings together conservation and recreational benefits;
- S re-uses existing buildings and derelict land;
- S favours public transport

5.4 PLAN REVIEW PROCEDURE AND UPDATING

The policies and actions defined within this Plan document are proposed to be implemented at the present time, however as stated previously the Plan and its supporting volumes are living documents to be refreshed at regular intervals as new information and data become available.

This concept will ensure that new information, such as that resulting from the additional studies or future monitoring described, as well as any future changes in planning policy or environmental needs can be incorporated into the SMP.

These factors may necessitate a change in coastal defence strategy, however a continuous review and change to the strategy would not be feasible as changes to policies will require consultation and consideration. The approach therefore must be one by which the new information is made available to those who have adopted the Plan on an annual basis such that on-going works design or shoreline examination can make use of the most up to date information available. This information would however only be incorporated within any review of the SMP and the implications of this upon the present policies assessed at specified longer intervals. A maximum time span of 5 years between such reviews is recommended. Notwithstanding this, formal change in defence policy could be implemented at any time if monitoring data or study results so require.

The proposed time frame will allow the monitoring recommendations to be implemented and further studies, recommended at this stage, to be carried out prior to the first review of the SMP.

It is recommended that the annual update of the SMP database be carried out by an independent party, appointed by the Coastal Group, to collate all the information and present within an annual updated copy of the Volume 1 document - the 'Data Collation' report.

Ultimately the responsibility for updating and reviewing the SMP lies with the Authorities involved and close co-operation is necessary. It is important that new information is shared and that each Authority maintains an up to date SMP to avoid a number of different versions existing. This may be best achieved by nominating one Authority as a central co-ordinator with overall responsibility for maintaining the SMP, or appointing an independent party to fulfill this role. The Partnership SMP management group should meet regularly and review the updates in the database.

Finally, there has been public consultation throughout the development of this SMP to develop awareness and seek comment. This consultation should be continued and the SMP could be seen as the vehicle to facilitate public involvement in coastal development in the future.

5.5 OVERALL SHORELINE MANAGEMENT PLAN RECOMMENDATIONS

Development of the Shoreline Management Plan for sub-cell 8b has provided a number of specific recommendations from which sustainable coastal defence can be achieved. Adoption of the Plan by the Group and others who have overseen and co-ordinated its development requires agreement to the following :

- 1) that sub-cell 8b be split into a series of 39 management units between Worms Head and Lavernock Point for on-going coastal defence management;
- 2) that the preferred policies identified in the Shoreline Management Plan be implemented by the operating authorities and used to inform the local statutory planning process, as appropriate;
- 3) that the cell wide strategic system of monitoring identified within the plan be implemented within the first review cycle of the Plan;
- 4) that the additional studies identified in the Plan be carried by an apportionment between the first review cycle of the Plan and the succeeding five years;
- 5) that the Data Collation Volume of the Plan be updated annually to incorporate such additional information obtained under items (3) and (4) and from any other sources that may become available;
- 6) To consider during the first review cycle of the Shoreline Management Plan, whether any changes to the overall legislative boundaries of the Plan should be considered prior to the review being carried out;
- 7) to carry out a first review of the Shoreline Management Plan not more than 5 years from its date of original adoption.

6.0 PLAN SUMMARY

This final section of the Shoreline Management Plan provides an easily accessible summary in tabular and graphical presentations of the main actions of the SMP.

Table 6.1 overleaf contains details of the following :

- S Management Unit Definition (Geographical Limits)
- S Shoreline Management responsibilities
- S Proposed Short and Longer Term Policies
- S Future Actions (Annual Monitoring Requirements; Further Studies).

TABLE 6.1 PREFERRED POLICY SUMMARY										
No.	M.U. EXTENTS	GRID CO-ORD.		APPROX. LENGTH (Km)	COAST PROTECTION AUTHORITY	COASTAL MANAGERS	SHORT TERM POLICY	ANTICIPATED LONG TERM POLICY	ANNUAL MONITORING	PROPOSED STUDIES
		START (E/N)	FINISH (E/N)							
1/1	Worms Head to Port Eynon Point	238300/187700	247000/184300	7.5	CCS	CCS	Monitor/managed retreat of coast paths	Do Nothing/Managed Retreat	M1, M2, M3, M4, M6, M7, M11, M13, M15	S1, S2, S4, S5, S6, S7, S9, S10, S11, L2
1/2	Port Eynon Point to Horton (East End) (Port Eynon)	247000/184300	248000/185500	5	CCS	CCS	Hold line in east, viability of hold dune should be investigated.	Hold line - possible future retreat	M1, M2, M3, M4, M6, M7, M8, M9, M11, M15, M16, M17	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L1, L2, L3
1/3	Horton (East) to Oxwich Point	248000/185500	251000/184800	3.5	CCS	CCS	Do Nothing/Monitor >Set Back Path	Monitor & Set Back Path	M1, M2, M6, M7, M15	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11
1/4	Oxwich Point to Three Cliffs Bay	251000/184800	254000/187700	6	CCS	CCS	Review management strategy by carrying out a specific investigation of various options including natural solutions such as dune management and beach nourishment including the use of storm beaches. Options for management at south western end should be included in such an investigation	Retreat with selective hold in south west (strategic elements such as highway/hotel)	M1, M2, M3, M4, M6, M7, M8, M9, M11, M14, M15, M16	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L1, L2, L3
1/5	Three Cliffs (east) to Caswell Bay (west)	254000/187700	258900/187500	6	CCS	CCS	Do Nothing, Monitor > Retreat	Do Nothing with retreat when required	M1, M2, M3, M4, M6, M7, M15	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2
1/6	Caswell Bay to Caswell Bay East (Caswell Bay)	258900/187500	259500/187500	2	CCS	CCS	Hold Line. Discharge any CPA obligation in respect of private frontages. Adopt liaison & public safety role. Retreat coast paths.	Hold Line	M1, M2, M3, M4, M6, M7, M11, M15, M16, M17	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2, L3

TABLE 6.1 PREFERRED POLICY SUMMARY										
No.	M.U. EXTENTS	GRID CO-ORD.		APPROX. LENGTH (Km)	COAST PROTECTION AUTHORITY	COASTAL MANAGERS	SHORT TERM POLICY	ANTICIPATED LONG TERM POLICY	ANNUAL MONITORING	PROPOSED STUDIES
		START (E/N)	FINISH (E/N)							
1/7	East Side Caswell to Snaple Point (Caswell to Langland)	259500/187500	260500/186900	1	CCS	CCS	Do Nothing + Monitoring > set-back path	Do Nothing moving towards retreat of coast path	M1, M2, M6, M7, M15	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2
1/8	Snaple Point to Rothers Sker (Langland & Rotherslade)	260500/186950	261100/187200	0.7	CCS	CCS	Hold the line & monitor/set back paths	Hold the line.	M1, M2, M3, M4, M6, M7, M8, M9, M11, M15, M16	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2
1/9	Rothers Sker to Mumbles Head (Limeslade)	261100/187200	261400/186900	3	CCS	CCS	Maintain existing defences, Do nothing along natural cliff coast but retreat coast path as required	Maintain existing defences, Do nothing along natural cliff coast but retreat coast path as required	M1, M2, M3, M4, M6, M7, M13, M15	S1, S2, S4, S5, S6, S7, S8, S9, S10, S11, L2
2/1	Mumbles Head to Oystermouth (B4593) (Mumbles)	263500/187100	261650/188200	2.5	CCS	CCS	Hold Line	Hold Line	M1, M2, M3, M4, M6, M7, M8, M10, M11, M12, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3
2/2	Oystermouth to Black Pill (West Cross)	261650/188200	262050/190750	2.5	CCS	CCS	Hold Line	Hold Line	M1, M2, M3, M4, M7, M8, M11, M12, M15, M16, M17	S1, S2, S5, S6, S7, S9, S10, S11, L3
2/3	Black Pill (East) to Swansea Docks (Swansea)	262050/190750	266500/192250	5.5	CCS	CCS	Hold the line	Hold the line	M1, M2, M3, M4, M7, M8, M11, M12, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L1, L3
3/1	West Breakwater to East Breakwater (Swansea Docks & Channel)	266600/292000	266600/292000	0.5	CCS	ABP/CCS	Hold Line	Hold Line - subject to long term future/development of Swansea Docks.	M1, M2, M7, M13, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11
3/2	Swansea Docks (east side of entrance) to BP Tank Farm (SSSI boundary)	266900/191800	270300/193000	4.0	CCS	ABP/BP/CCS	Hold Line	Unsure	M1, M2, M3, M4, M7, M11, M12, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L4

TABLE 6.1 PREFERRED POLICY SUMMARY										
No.	M.U. EXTENTS	GRID CO-ORD.		APPROX. LENGTH (Km)	COAST PROTECTION AUTHORITY	COASTAL MANAGERS	SHORT TERM POLICY	ANTICIPATED LONG TERM POLICY	ANNUAL MONITORING	PROPOSED STUDIES
		START (E/N)	FINISH (E/N)							
3/3	BP Tank Farm to Whiteford Point (Neath Estuary Area)	270300/193000	273000/191000	3.4	NPTCBC	NPTCBC	Do nothing apart from Neath estuary and possibly eastern dune system (Aberavon). Local strategy study required to examine full range of management options throughout MU set against proposals for hinterland development, port economics, environmental assets and effects on adjacent MU's.	Anticipated Long Term : Subject to outcome of local study.	M1, M2, M3, M4, M5, M7, M8, M10, M11, M12, M14, M15, M16, M17	S1, S2, S3, S5, S6, S7, S9, S10, S11, L1, L3, L5
3/4	Whiteford Point to Port Talbot Docks (Afon Afan) (Aberavon Beach)	272700/191400	274600/188800	3.2	NPTCBC	NPTCBC	Hold line through defended shoreline and review policy in west	Hold line	M1, M2, M3, M4, M7, M8, M9, M11, M12, M15, M16	S1, S2, S5, S6, S7, S8, S9, S10, S11, L1, L6
4/1	Port Talbot Docks (including River Afan)			2.0	NPTCBC	NPTCBC	Continue with existing. Re-consider dumping policy by examination of more appropriate drop zones within near shore system.	Entirely dependant upon the future of steel making in the UK/Wales	M1, M2, M3, M4, M7, M12, M13, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L7
4/2	Port Talbot Docks (East) to Afon Cynfig (Margam)	275900/187300	278000/183300	4.5	NPTCBC	CORRUS/ NPTCBC	Hold line along industrial frontage until the composition of the hinterland is understood. Dunes - monitor	Hold or retreat	M1, M2, M3, M4, M7, M8, M9, M11, M15, M16, M17	S1, S2, S5, S6, S7, S9, S10, S11, L1, L3, L7
4/3	Afon Cynfig to Sker Point (Sker)	278000/183300	278800/179800	3.8	BCBC	BCBC	Do Nothing, monitor	Retreat	M1, M2, M3, M4, M7, M15	S1, S2, S5, S6, S7, S9, S10, S11, L1

TABLE 6.1 PREFERRED POLICY SUMMARY										
No.	M.U. EXTENTS	GRID CO-ORD.		APPROX. LENGTH (Km)	COAST PROTECTION AUTHORITY	COASTAL MANAGERS	SHORT TERM POLICY	ANTICIPATED LONG TERM POLICY	ANNUAL MONITORING	PROPOSED STUDIES
		START (E/N)	FINISH (E/N)							
4/4	Skер Point to Hutchwns Point (Rest Bay)	278800/179800	280700/177000	3.5	BCBC	BCBC & Private	Selective Hold Line (do nothing along limestone cliff area to south) - further consultation	Selective hold line with retreat	M1, M2, M3, M4, M7, M8, M11, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L3
4/5	Hutchwns Point to Porthcawl Point (Porthcawl)	280700/177000	281900/176300	1.4	BCBC	BCBC	Hold Line	Hold Line	M1, M2, M3, M4, M7, M8, M11, M15, M16	S1, S2, S5, S6, S7, S8, S9, S10, S11, L3
4/6	Porthcawl Point to Newton (slipway) (Harbour, Sandy & Trecco Bay)	282000/176300	283700/176900	1.4	BCBC	BCBC	Hold or possibly advance subject to development proposals.	Hold or advance.	M1, M2, M3, M4, M7, M8, M10, M11, M12, M13, M15, M16, M17	S1, S2, S5, S6, S7, S9, S10, S11, L3
4/7	Newton to Ogmore River (Merthyr Mawr)	283700/176900	286100/175600	3.2	BCBC	BCBC	Do Nothing, monitor	Retreat	M1, M2, M3, M4, M7, M12, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L1
5/1	Ogmore River to Dunraven Bay (West side) (Ogmore-by-Sea)	286100/175700	288200/173300	3.3	VOGC	VOGC	Do Nothing/Monitor for long term set back	Set Back	M1, M2, M3, M4, M6, M7, M15	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2
5/2	Dunraven Bay (West) to Trwyn y Witch (Dunraven Bay)	288100/173300	288500/172600	0.8	VOGC	VOGC	(managed by maintenance of cobble beach until this becomes uneconomic, re-route access road)	Retreat	M1, M2, M3, M4, M6, M7, M8, M11, M15	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2, L3
5/3	Trwyn y Witch to Nash Point (Nash Point West)	288500/172600	291600/168100	2.2	VOGC	VOGC	Do nothing/Set -back coast path	Do nothing/Set-back coast path	M1, M2, M3, M4, M6, M7, M8, M11, M13, M15	S1, S2, S5, S6, S7, S8, S9, S10, S11, S12, L2
6/1	Nash Point to Cwm Col Huw (Nash Point East)	291600/168100	295600/167500	3.0	VOGC	VOGC	Set back (land acquisition), monitor built areas Atlantic Collage and Tressilian	As short term with possible set back throughout	M1, M2, M3, M4, M6, M7, M8, M11, M15	S1, S2, S5, S6, S7, S9, S10, S11, S12, L2, L3

TABLE 6.1 PREFERRED POLICY SUMMARY										
No.	M.U. EXTENTS	GRID CO-ORD.		APPROX. LENGTH (Km)	COAST PROTECTION AUTHORITY	COASTAL MANAGERS	SHORT TERM POLICY	ANTICIPATED LONG TERM POLICY	ANNUAL MONITORING	PROPOSED STUDIES
		START (E/N)	FINISH (E/N)							
6/2	Llantwit Major (Cwm Col Huw)	295600/167500		0.2	VOGC	VOGC	Hold or advance in west and managed retreat in east. Establish new access across valley floor to built assets and provide formal parking behind life savers building (Ref Study)	Allow east to retreat and eventually shoreline assets will need to be abandoned as cliff recession progresses	M1, M2, M3, M4, M6, M7, M15, M16	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2, L3
6/3	Cwm Col Huw to Limpert Bay (St. Athan)	295600/167500	300850/166300	5.1	VOGC	VOGC	Monitor for pinch points and localised set back guided by public safety	Retreat	M1, M2, M6, M7, M15	S1, S2, S5, S6, S7, S9, S10, S11, L2
6/4	Limpert Bay to Leys Beach (Aberthaw)	300850/166300	304000/166000	3.2	VOGC	VOGC	Hold line	Hold line unless power station closes	M1, M2, M3, M4, M6, M7, M8, M10, M11, M13, M15, M16, M17	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, L8
6/5	Fontygary to Bullcliff Rocks (Rhoose)	304000/166000	309200/166700	5.5	VOGC	VOGC	Hold line along railway frontage, retreat along remainder - policy at Rhoose point to determined following further investigation	Hold along railway - retreat along remainder.	M1, M2, M3, M4, M6, M7, M8, M11, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, L9
6/6	Bullcliff Rock to Cold Knap Point (The Knap)	309200/166700	310400/166000	1.4	VOGC	VOGC	Review feasibility of hold line	Hold or Retreat	M1, M2, M3, M4, M6, M7, M8, M9, M11, M15, M16, M17	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3
6/7	Cold Knap Point to Friars Point (Barry Harbour)	310400/166000	311100/165900	2.4	VOGC	VOGC	Hold Line along built sections - excluding headlands (review erosion along soft rock shore on west side of MU - potential do nothing policy)	Hold Line	M1, M2, M3, M4, M6, M7, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3

TABLE 6.1 PREFERRED POLICY SUMMARY										
No.	M.U. EXTENTS	GRID CO-ORD.		APPROX. LENGTH (Km)	COAST PROTECTION AUTHORITY	COASTAL MANAGERS	SHORT TERM POLICY	ANTICIPATED LONG TERM POLICY	ANNUAL MONITORING	PROPOSED STUDIES
		START (E/N)	FINISH (E/N)							
7/1	Friars Point to Nell's Point (Whitmore Bay)	311100/165900	312000/166100	1.4	VOGC	VOGC	Hold line/prepare local strategy to determine policy (excluding SSSI cliff coast)	Hold or possibly retreat	M1, M2, M3, M4, M6, M7, M8, M11, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, L10
7/2	Nell's Point to Bendrick Rock (Jackson's Bay & Barry Docks)	312600/166100	313200/166800		VOGC	VOGC	As existing - Local study required to determine long term future (form) of port, condition of breakwaters, management strategy & funding	Hold line or possibly retreat	M1, M2, M3, M4, M6, M7, M8, M11, M12, M13, M15, M16	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3, 10
7/3	Bendrick Rock to East Side of Sully (Sully Bay West)	313200/166800	315200/167900	2.7	VOGC	VOGC	Monitor and examine opportunities for set-back - Coast Path	Set-back	M1, M2, M3, M4, M6, M7, M8, M11, M15, M17	S1, S2, S5, S6, S7, S9, S10, S11, L2, L3
7/4	West Side Sully to Swanbridge West (causeway) (Sully Bay East)	315200/167900	316500/167500	1.7	VOGC	VOGC	Assess Vulnerability and economics for medium term hold the line - Set up monitoring package	Retreat	M1, M2, M3, M4, M6, M7, M8, M11, M15	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2, L3
7/5	Swanbridge East to (incl. Sully Island) to Ball Rock (Swanbridge)	316500/167500	317500/167500	1.0	VOGC	VOGC	Hold or Advance along present defended section with retreat along cliff coast (Ex Sully Island)	Hold or advance (Ex Sully Island)	M1, M2, M3, M4, M6, M7, M8, M11, M15, M16	S1, S2, S5, S6, S7, S8, S9, S10, S11, L2
7/6	Ball Rock to Lavernock Point (St. Mary's Well Bay)	317500/167500	318800/168100	1.5	VOGC	VOGC	Do Nothing/Retreat Assets	Retreat	M1, M2, M3, M4, M6, M7, M8, M11, M13, M15	S1, S2, S5, S6, S7, S9, S10, S11, L2

APPENDIX A

Relevant Planning Policies

APPENDIX A

Relevant Planning Policies (from 1999) (Extract from Stage 1 Consultation Document)

3.4.3 Summary of Unitary Authority Plan Policies, Plan 13

The Stage 1 consultation document included a plan (Plan Wide Plan 13) which indicates the general locations around the sub-cell of the policy summaries referred to below. The following summary does however stand along as the locations are indicated within the text. The Local Plans referred below are 'deposit draft' and are therefore potentially subject to amendment (1999). The relevant Authorities include City and County of Swansea, Neath Port Talbot County Borough Council, Bridgend County Borough Council and the Vale of Glamorgan Council. The Policies will be listed from West to East around the Sub-Cell.

" **City and County of Swansea** [9332,9333] administer from Gower in the west to the eastern end of Swansea Dock adjacent to Crymlyn Burrows. The relevant area to the Shoreline Management Plan extends from Worms Head, Gower to the eastern limit. The first section of shoreline to be considered extends from Worms Head Mumbles for which Policy's CL2, CL3, CL4, CL5 and CL6 apply. These policies relate to landscape conservation as follows:

Policy CL2 - On sites designated as special areas of conservation, special protection areas and areas designated under the RAMSAR Convention, development and land use changes not directly connected with or necessary to the management of the site and which is likely to have significant adverse affects on the site (either individually or in combination) will not be permitted unless:

- (i) There is no alternative solution.
- (ii) There are important reasons of overriding public interest.

Where such development takes place, planning conditions and/or obligations will be used to secure all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected.

Policy CL3 - Within the designated area of outstanding natural beauty and heritage coast, priority will be given to the protection and enhancement of their exceptional and nationally valued landscape qualities and their nature conservation interest.

Where there are irreconcilable conflicts between conservation and other objectives, priority will be given to the protection of natural beauty.

Major new development will not be permitted unless:

- (i) It is of overriding national importance.
- (ii) No alternative sites or routes are available.
- (iii) Its environmental effects have been rigorously examined and full mitigation measures incorporated.

Small scale development will only be allowed where it is in service of the economic and social well being of existing communities and provided :

- (a) It is in accord with the character and scale of the local area;
- (b) There is no unacceptable traffic generation;
- (c) It does not contribute to unacceptable cumulative impact.

- # **Policy CL4** - On sites designated as sites of special scientific interest and/or national nature reserves, development will only be permitted if it is in service of the local community and it does not unacceptably harm the sites nature conservation interests.

Where development is permitted conditions will be imposed and obligations sought to protect and enhance those interests and where necessary provide mitigating measures.

- # **Policy CL5** - The landscape quality, archeological heritage and nature conservation interests of areas designated as landscapes of exceptional heritage interests, local nature reserves and land held by the national trust will be protected from inappropriate development.

Where in exceptional circumstances development is permitted which would damage the landscape, archeological or nature conservation interests, appropriate compensatory measures will be sought.

- # **Policy CL6** - Comprehensive environmentally sensitive management plans of all common land will be actively protected.

The remainder of the coastal zone administered by City and County of Swansea, from the Mumbles to Crymlyn Bog, is covered by policies NE 2 and TRS 25 as follows:

- # **Policy NE 2** - Within the defined landscape protection areas, the existing landscape, wildlife and geological features will be conserved.

Development will only be permitted in exceptional circumstances in service of agriculture, landscape improvements, woodland planting, management measures for landscape and nature conservation, appropriate sustainable recreation and essential operational development by statutory undertakers.

- # **Policy TRS 25** - the landscaping around Swansea Bay will be extended and enhanced through sensitive and imaginative improvements. Leisure development opportunities are identified at Black Pill and within the maritime quarter. Other than environmental improvement works development will be restricted to these areas. Measures to improve the amenity and safety of the Swansea Bay cycle route will be implemented.

City and County of Swansea's easterly neighbour is Neath Port Talbot County Borough Council. The Local Plans received applied to the former Borough Councils of Neath and Port Talbot. The former Borough of Neath accounts for the section of coast from Crymlyn Bog to the River Neath and is identified as a special landscape area. Crymlyn Burrows is a Site of Special Scientific Interest.

- " **The former Port Talbot Borough Council's Local Plan** [9334,9335] covers the remainder of the coast to the River Cynfig. The first policy is I12 (B1 = Business/ Light Industrial Use) and applies to 6.2 hectares of land to the rear of Endeavour Close available for B1 use class. Next is Policy I10 (B1 = Business/Light Industrial Use) which is 1.9 hectares of land at Endeavour Close available for B1 use class. Following these are a series of policies covering the Aberavon seafront. Those policies potentially affecting the coast and immediate hinterland along the seafront are listed and are identified on Plan 13.

- # **Policy AS 2** - Land is identified for housing development at the Aberavon Seafront at the following locations:

- (i) 7.1 hectares at Little Warren.
- (ii) 1.6 hectares between Princess Margaret Way and the Promenade between the former Days site and the Afan Lido.

- # **Policy AS 3** - Land is identified for development as housing suitable for occupation by senior management at the Aberavon Seafront at the following locations.
- (a) 3.38 hectares between Princess Margaret Way, Pier Way and Tir Morfa Road.
- # **Policy AS 4** - Land is identified at the following locations for retailing and associated uses (Classes A1, A2 and A3) for offices, and residential development, subject to there being no overriding amenity considerations.
- (i) 0.6 hectares on lands at the North Winds Roundabout.
- (ii) 0.5 hectares on lands adjacent to the Jersey Beach Hotel.
- # **Policy AS 5** - Land is identified at the following locations for uses connected with tourist and leisure development subject to any development being compatible with the need for coastal protection in the areas not protected by existing sea defences.
- (i) 5.3 hectares on land between the Afan Lido Sports Centre and the Aberafan Hotel.
- (ii) 11.9 hectares on land between Scarlet Avenue / Purcell Avenue Industrial Estate and the seafront including car parking for up to 600 cars and a boat / trailer park of up to 300 spaces and a golf course.
- (iii) 3.62 hectares on land centred around the existing beach play area, including car parking for up to 450 cars.
- # **Policy AS 7** - A car park for up to 300 cars will be developed at Princess Margaret Way / Afan Lido.
- # **Policy RT 15** - Facilities for fresh water angling in the River Afan and Eglwys Nunydd Reservoir and sea angling from the Aberafan Beach will be permitted.
- # **Policy RT 16** - The expansion of facilities for water sports at both Eglwys Nunydd Reservoir and Aberafan beach will be permitted.
- # **Policy I 13** - 88 hectares of land at the Port Talbot Docks and Port Talbot Industrial Estate is available for redevelopment for residential, recreational, commercial and industrial uses, subject to proposals being part of a comprehensive scheme encompassing the whole of the area. Proposals relating to existing and new uses will be considered against the impact on the aims of this policy for redevelopment.
- # **Policy E 31** - Land is allocated for a water treatment works at Port Talbot Docks.
- # **Policy T 1** - the construction of the Port Talbot Peripheral Distributor Road will be promoted and encouraged and the land requirements for the road construction as identified in the proposals map shall be safeguarded against development which could adversely affect the construction of the road.
- # **Policy I 14** - 100 hectares of land at Margam Moors south of British Steel and to the west of the mainline railway as a major contingency site only to be developed in the event of a need arising from an exceptionally large land user of high employment potential. Any such proposal will be subject to a rigorous environmental appraisal which will give full consideration to the impact of the development on the Margam Moors SSSI, the Kenfig National Nature Reserve and any other nationally important sites of nature conservation interest. The proposed development will also pay full regard the operational requirements of British Steel.

- # **Policy E 19** - It is the policy of the Council that would adversely affect either directly or indirectly any site of special scientific interest would not be allowed.

Land extending from the river Cynfig to the River Ogmore is administered by **Bridgend County Borough Council** [9336] and recently produced deposit draft plans were provided (now understood to be adopted). The first section of coastline includes Kenfig Sands and Kenfig Burrows which lies within Kenfig National Nature Reserve for which the following policies apply :

- # **Policy EV 8** - Development which would adversely affect, or visually impinge upon, the following areas and/or their settings will not be permitted.

Also it is a Site of Special Scientific Interest which comes under Policy EV 15 and EV 16;

- # **Policy EV 15** - Development which would destroy or adversely affect, either directly or indirectly, sites and/or their settings recognised as being nationally, regionally or locally important for nature conservation will not be permitted.

- # **Policy EV 16** - Where development proposals are acceptable in terms of EV 15, the applicant will still be required to demonstrate that the decrease in the nature conservation value of the site has been kept to a minimum and wherever possible any loss is compensated for by appropriate habitat creation / local enhancement elsewhere within the site or borough.

At Porthcawl the beach front area on the western side of the town comes under Policy RC 9, which is;

- # **Policy RC 9** - The Borough Council will promote the provision of amenity open space where suitable opportunities arise.

The area around the harbour and the breakwater (including Sandy Bay) at Porthcawl are governed by Policy TM 4, which states;

- # **Policy TM 4** - The development of appropriately located tourist facilities in the borough will be favoured - (See also Plan 13)

Merthyr Mawr Warren and the beach front at Ogmore are Sites of Special Scientific Interest and come under policies EV 15 and EV 16 as stated above.

- # **The Vale of Glamorgan Council** [9337] administrative area includes the coastal frontage from the River Ogmore around to Penarth Head (Eastern limit of this document - Note eastern limit of sub-cell is Lavernock Point). Policy ENV 4 related to the Glamorgan Heritage Coast which extends from west of the River Ogmore to Breaksea Point in the east. Policy ENV 4 states:

- # **Policy ENV 4** - The special environmental qualities of the Glamorgan Heritage Coast will be conserved and enhanced. With the exception of limited informal recreational facilities at Cwm Col Huw, Ogmore by Sea and Dunraven Bay, the remainder of the area will be treated as a remote zone with priority being given to agriculture, landscape and nature conservation.

The remainder of the coastline to east and Penarth Head is covered by the East Vale Coast Policy ENV 5, which states:

- # **Policy ENV 5** - Outside the Glamorgan Heritage Coast, development or change within the developed coastal zone should have regard for the coastal location. Development in the undeveloped coastal zone will be permitted if:
- (i) A coastal location is necessary for the development;
 - (ii) The proposal would not cause unacceptable environmental effects by way of:
 - S Visual or noise intrusion,
 - S Impact on areas of landscape importance,
 - S Air, land or water pollution,
 - S Hazardous operations;
 - (iii) The proposals will not have an unacceptable effect on the ecology of the coastal zone, including terrestrial shoreline and marine ecosystems, or on features of geological or geomorphological importance.

This area of coast is also interspersed with other policies. At Rhoose Point there are a series of Housing, Recreational and Mineral Policies governing the area (including former Bullin's camp), which are listed below;

- # **Policy MIN 9 (Derelict Sites)** - The council will seek to prevent further mineral extraction at the following sites and, where appropriate, will seek to secure restoration and landscaping works. (Current mineral extraction permission for Rhoose Quarry will be terminated by legal agreement once redevelopment begins.)
- # **Policy REC 5** - Land is allocated for the provision of playing fields.
- # **Policy REC 11** - Land is allocated for informal open public space and for country park extensions.
- # **Policy HOUS 1** - Land allocated for residential development during the plan period.
- # **Policy EMP 1** - Land is allocated for employment uses.

The next area to be considered in the Local Plan applied to proposed development at Barry, the first part of which comprises a proposed recreational route which will extend along the coast from Bullcliff Rocks to Cold Knap Point and also outcrop at Friars Point and Nell's Point. This is covered by REC 12 which states:

- # **Policy REC 12** - (Public Rights of way and recreation routes) During the plan period, the council will maintain and improve the existing pattern of public rights of way (including bridle ways) and establish the following recreation routes as a framework for a network of linkages for the enjoyment of the countryside.

The land behind this area is covered by residential settlement boundaries and at Barry Harbour is covered by a series of policies for Barry Waterfront comprehensive redevelopment area for housing, retail, leisure, industrial and business. The following policies apply :

- # **Policies ENV 5, HOUS 1, and EMP 1** have been quoted earlier.
- # **Policy TRAN 3** - The development of rail facilities.

- # **Policy SHOP 3** - Sites are allocated for retail development.

- # **Policy SHOP 4** - Proposals for the provision of retail warehousing within the comprehensive redevelopment of Barry Waterfront will be permitted if the proposal:
 - (i) Is located in the area of land east of the proposed Gladstone Link Road and south of the railway line;
 - (ii) Will not have an unacceptable effect, on the vitality, viability and attractiveness of Barry Town Centre;
 - (iii) Will not have an unacceptable effect on traffic flows, traffic patterns, energy use and vehicle emissions;
 - (iv) Provides car parking and servicing facilities in accordance with the approved council guidelines;
 - (v) Provides adequate utility services that can be readily and economically provided.
 - (vi) Incorporates a high standard of design.

- # **Policy COMM 3** - Land is reserved for the development of schools.

Areas of land at Atlantic Trading Estate and at Sully Bay are covered by Policy EMP 1 as stated above. Also immediately east at Southleigh Community Home there is an area of land designated as REC 5, which is also referred to above.

The eastern area of land is at Penarth and includes the promenade, Pier and coastline along to the boundary of the Vale of Glamorgan Council coast to Cardiff Bay. Policies associated to the Cardiff Bay Development Corporation are stated in the Plan and include REC 12 and TRAN 8, REC 12 which have been referred to above and TRAN 8 which states:

- # **Policy TRAN 8** - Facilities for cyclists will be developed including:
 - (i) Safe and convenient links between the Vale of Glamorgan and Cardiff;
 - (ii) Links with the national cycle network;
 - (iii) Cycle parking facilities;
 - (iv) A network of routes in the rural vale.

Note:

Reference Numbers in [] are data base references where the original information is stored.

APPENDIX B

Draft Monitoring Proposal



Date : 20th June 1997
Ref : SB/CG/PCB/003

Director of Highways, Technical & Property Services
City and County of Swansea
County Hall
Oystermouth Road
SWANSEA SA1 3SN

For the attention of Mr. R.P. Thomas

Dear Sir,

SWANSEA BAY COASTAL GROUP Monitoring

Further to our recent discussions regarding the above I provide the following proposal for your consideration :

1.0 OBJECTIVE

To provide a cost-effective, coherent monitoring system extending along the Group's shoreline and nearshore zone to provide useful data for the ongoing shoreline management of coastal defence interests. (Monitoring programme to extend over five years at a total non-discounted cost of £ 152.5K).

2.0 BACKGROUND

The absence of coherent time-series monitoring data on coastal processes has provided a serious constraint upon the development of understanding shoreline behaviour. Whilst the introduction of computers has allowed the development of numerical models and improved data management there has been little progress made on advancing the basic physics of coastal processes. There is a need to compile coherent time-series monitoring data both for medium-term gain (5-15 yrs) and long-term (> 15 yrs) so that process trends can be more accurately determined thereby improving the timing and extent of any intervention works. In order for returns on monitoring investments to be optimised it is essential that the accuracy of any measurement matches its intended use. This is considered in greater detail within Appendix I.

3.0 PROBLEM

The Group members and their predecessors have undertaken coastal monitoring previously but the work has been limited in scope, extent and frequency largely due to resource constraints but also due to limited returns from the data collected into the ongoing management of the coastal defence. The problem now is that the available monitoring data do not provide sufficient definition of design criteria for coastal defences to ensure resources are not being wasted. Although studies can contribute to such definition they too can be subject to significant error by extrapolating in time over the relatively large periods of scheme service life from a short period data base.

4.0 PROPOSED SCHEME

The proposed monitoring system is summarised by task, frequency and annual cost in the table below which is followed by a series of task descriptions to more fully define the monitoring system :

TABLE A MONITORING SYSTEM SCHEDULE			
SBCG	=	Swansea Bay Coastal Group	
SMP	=	Shoreline Management Partnership	
TASK	FREQUENCY (p.a.)	EXECUTOR	COST (£K)
Ground Shoreline Inspection	1	SMP	3.0
Aerial Shoreline Inspection	1	SMP	1.5
Sea Bed Samples	1	Contractor	2.0
Beach Profiles	2	Contractor	20.0
Environmental Data	1	Contractor	1.0
Inshore Wave Monitoring	-	SBCG / SMP	1.5
Reporting	-	SMP	1.5
TOTAL (per annum)			£ 30.5K
<p>NB. The inshore wave monitoring costs do not include for Group Member inputs estimated at ten man days per annum maximum for each local Council Member and the Environment Agency. (Availability of video cameras is also assumed for the organisations cited).</p> <p>The Contractor elements of the monitoring work would be carried out by competitive quotation except for the environmental data which would be obtained from POL and Met. Office.</p>			

The rationale for the proposed monitoring system is as follows :

- (i) The ground and aerial inspections of the shoreline and intertidal zone provide a contextual setting for the quantitative monitoring data. The aerial inspection provides an insight to the major bank and channel dispositions and the influence of river outlets along the Swansea Bay shoreline together with the interaction of soft and hard sections of coast. These aspects cannot be qualitatively assessed from the ground. The ground inspection allows detailed examination of interaction between coastal defences and the intertidal zone and pinpoints problem areas for more quantitative examination from other monitoring data. This inspection also provides early warning of changes where attention can be focused from the more spatially discrete measurements such as inshore wave monitoring.

The inspections are presented in report form with special camera photographs to illustrate the inspection set to provide the 'human-eye view'. Further details of this technique are provided in Appendix II.

- (ii) The beach profiles provide level definition of beach form for the generally two dimensional sections of shoreline. Local contour surveys will be taken where a more three dimensional behaviour is evident (e.g. in the vicinity of breakwaters). Sections of shoreline that support saltmarsh across their frontage will be monitored by marsh-edge perimeter surveys since level differences in these areas are small. The results will be stored as digital and hard copy data displaying profiles graphically with surface material identified together with tabulated data on contour offsets to identify temporal trends. As such this survey work defines quantitatively the response of the intertidal zone to the forcing agents of wind, water level, waves, currents and freshwater inputs. This work would be carried out to the same specification adopted for Carmarthen Bay.

- (iii) The environmental data comprise water level and barometric pressure data recorded for the Swansea / Port Talbot and Cardiff area together with the purchase of Met. Office forecast of offshore wave climate. These data are entered into `SANDS` analysis package together with the beach survey information to examine the typicality of the surveyed response to the measured forcing agents. The `SANDS` analysis package is described in Appendix III.
- (iv) Inshore wave monitoring is carried out using video-records of a three pole array located typically 100.0m from the shoreline. One of the poles is graduated so that the system provides data on:
 - R wave height, period, direction, breaker type;
 - R balance of incident and reflected wave energies;
 - R wave grouping.

This information is used to establish design criteria for coastal defences and to refine offshore / inshore wave transformation co-efficients to improve `SANDS` calculations of storm typicality, on-offshore and longshore energies against tide level bands etc. Typical results are summarised in Figure 1.

Numerical model prediction of inshore wave climate becomes inaccurate in shallow water where non-linear effects dominate wave behaviour making the linear model simulation inappropriate. The inshore wave monitoring provides direct measurements in the area of most relevance for coastal defence design. Further details of this technique are provided in Appendix IV.

5.0 DESIGN

The design of the monitoring system proposed accords with similar systems either in whole or part presently in operation at :

- R Gwynedd Council
- R Carmarthen Bay Coastal Engineering Group
- R Lancaster City Council
- R Barrow Borough Council
- R Wyre Borough Council
- R Suffolk Coastal District Council
- R Environment Agency (Anglian Region)

6.0 ESTIMATED COST

FINANCIAL YEAR	1997 / 98	1998 / 99	1999 / 00	2000 / 01	2001 / 02
COST (£)	30.5	30.5	30.5	30.5	30.5

7.0 SCHEME JUSTIFICATION

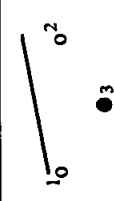


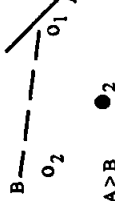


The Group has over 110km of shoreline in its area with a coastal defences capital asset value of over £50 million. The nett present value of the proposed monitoring expenditure is around £0.5 million if carried out in perpetuity using a 6.0% discount rate. This represents an investment of 1.0% of overall capital value to ensure that further investments in maintenance and/or replacement are appropriately designed and timed within a worsening operating environment.

I hope that the foregoing provides the necessary information for the Group to progress implementation of a coherent coastal monitoring system and I shall be pleased to discuss matters arising at your convenience.

Yours faithfully

Dr. P.C. Barber

TABLE 13 (... continued)

Co-ordinates of Monitoring Pole														
X = 631672.774 E Y = 234989.887 N Z = -1.559 m AOD														
LOCATION : Jacobs Ladder														
DATE	HIGH WATER		WIND		RECORD DETAILS			WAVE DETAILS			WATER DEPTH	COMMENTS		
	Height	Time (GMT)	Force	Direction	Flood	H/W	Ebb	Typ. Height (H _t)	Est. Max. Height (H _{max})	Period (Secs)			Direction	Condition
14.02.94	3.7m ACD	13.50	8	E	Yes	Yes	Yes	1.25 m	1.75 m (B)	7.0		Plunging	Medium	
15.02.94	3.5m ACD	14.23	7	SE	Yes	Yes	Yes	1.0 m	1.5 m	6.5		Plunging	Medium	
17.01.95	3.6m ACD	11.53	7	SSE	Yes	Yes	Yes	1.25 m	1.5 m	5.5		Unbroken / Plunging	Medium	No graduated pole.
22.02.95	3.4m ACD	16.30	7-8	SSW		Yes		1.0 m	1.5 m	4.5		Unbroken / Plunging	Medium	
24.10.95	4.0m ACD	11.11	5-6	SSE		Yes	Yes	1.0 m	1.5 m	4.5		Unbroken / Plunging	Deep	
24.10.95	4.2m ACD	11.55	6	SW	Yes	Yes	Yes	0.5 m	0.75 m	3.5		Unbroken / Spilling	Deep	Strong offshore wind.



**LIVERPOOL BAY SHORELINE MANAGEMENT PLAN
SUB-CELL 11a - GREAT ORME'S HEAD TO FORMBY POINT
PLAN WIDE MONITORING AND STRATEGIC STUDIES**

MONITORING

ID	Monitoring Description	Frequency	Estimated Annual Cost	Extent	Total Annual Cost	Comments
M1	Annual aerial intertidal inspection	1 per year	7,500	Cell-Wide with local reports	7,500	Final price will be subject to change with number of report copies.
M2	Annual ground shoreline and structure inspections	1 per year	A = 6,750 B = 4,750 C = 2,750	Per Authority	23,750	A = Conwy B = Flintshire, Wirral, Sefton C = Denbighshire
M3	Sediment sampling at specific locations & contours	1 per year	2,500	Per Authority	12,500	
M4	Beach profile & topographic surveys (open coast)	1 per year	A = 7,500 B = 6,500 C = 4,500	Per Authority	31,500	
M5	Marsh area surveys (estuaries & sheltered waters)	1 per year	2,500	Dee-wide	2,500	
M6	Inshore wave monitoring at strategic sites	1 campaign per 5 years per Authority	8,000	One Authority	8,000	Anticipated that the work will move each year to a different Authority.
M7	Vertical aerial photography	Every 2 years	25,000	Sub-cell-Wide	25,000	
M8	Littoral Drift measurements at strategic sites	1 campaign per 5 years per Authority	8,000	One Authority	8,000	Anticipated that the work will move each year to a different Authority.
M9	Hydrographic beach profile extensions	Every 5 years	3,000	Per Authority	3,000	
M10	Tide level recording at strategic sites	On-going, with annual report	5,000	One Authority	5,000	Anticipated that the work will move each year to a different Authority.
M11	Storm typicality and shoreline energy assessments	On-going, with annual report	3,750	Sub-Cell wide	3,750	
M12	Hydrographic surveys of estuary & approaches	Every 5 years	18,000	Dee & Mersey estuaries	18,000	
M13	Monitoring of bird populations at strategic sites	As advised by EN / CCW	3,000	Specific sites	3,000	One per annum.
M14	Biological monitoring of specific sites		3,000	Specific sites	3,000	One per annum.
M15	Analyse data and compile annual report	1 per year	3,750	Sub-cell wide and per authority	3,750	
				Total	158,250	