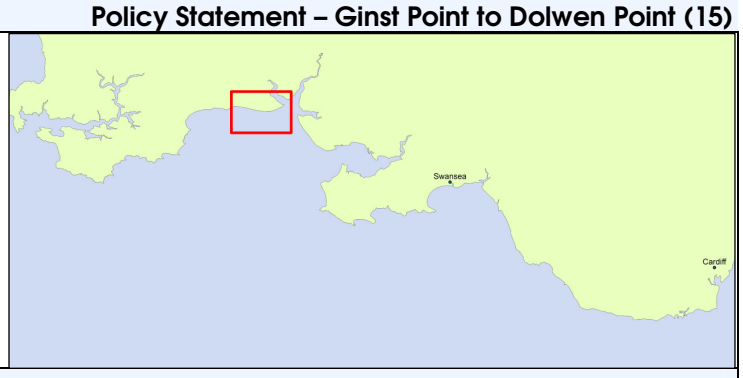
Ginst Point to Dolwen Point (15)



Recommendations:

Long Term Plan

This frontage comprises the large, mainly undeveloped beach and dune barrier of Laugharne and Pendine Burrows. The Qinetiq weapons testing and evaluation facility, which is operated for the MoD, is located within the dunes, just inshore of the beach, and includes a 1500m long missile testing track, the longest in Europe. This facility is currently considered by the MoD/ Qinetiq as critical infrastructure. At the western end of this frontage lies the village of Pendine and associated amenity/ tourist facilities.

The plan is managed realignment to allow natural evolution of the undeveloped dune system, which is of national and international importance in terms of its habitat and landscape value, with minimal interference, whilst undertaking monitoring and allowing localised dune management as required to reduce the risk of coastal erosion and flooding to Qinetiq assets, in particular the 1500m long missile testing track due to it's proximity to the seaward edge of the dunes. This is likely to involve adaptation measures such as asset level flood protection, resistance or resilience measures or asset relocation. It is recommended that no further defences are constructed adjacent to or within the dunes and that existing defences should be removed if they begin to have an adverse impact on the natural functioning of the dune system. Existing defences at Pendine village will be maintained in the short to medium term through a policy of hold the line. A policy of managed realignment is recommended in the long term, subject to further detailed investigations, to enhance the amenity beach and tourist facilities at Pendine.

Location (Policy Unit)		Preferred SMP2 policy and proposed approach to implementing the Plan		
		0-20 years	**20-50 years**	**50-100 years**
15.1	**Pendine Burrows (Ginst Point to Pendine village east)**	To allow this extensive dune system to respond and evolve naturally, a long term policy of **managed realignment** is proposed. This will enable long term habitat management and introduction of adaptation measures, as necessary, to monitor and manage, as far as possible, the risk of coastal erosion and flooding to assets within the Qinetiq weapons testing and evaluation facility. It is also recommended that long term options for this facility be carefully considered, through consultation with MoD/ Qinetiq.		
15.2	**Pendine village**	Whilst studies into sustainable options for Pendine village are undertaken, the policy is to continue to **hold the line,** through maintaining existing defences in the short and medium term, which is likely to result in an increased risk of flooding as a result of future climate change/ sea level rise. Subject to the future availability of public funding it may be possible to upgrade the existing defences to reduce the risk of overtopping and coastal flooding along this frontage. Given the longer term aim and the location of Pendine at the western extremity of an internationally protected dune system, extending existing defences to the east is not recommended.		The long term policy is to implement **managed realignment**, through provision of a set back defence. This is subject to further detailed studies to investigate potential merits/ impacts of managed realignment as part of a wider redevelopment of Pendine. This policy is also subject to the future availability of public funding for coastal erosion and flood risk management, however there are wider coastal tourism benefits.

A review of the impacts of the preferred SMP2 policies on coastal evolution and behaviour is provided in Appendix E: Policy Development and Appraisal, Section E1.3.

Policy sensitivities and key uncertainties (further detail is included in Appendix K)

Policy unit 15.1 - the risk of coastal erosion and flooding to assets comprising the Qinetiq weapons testing and evaluation facility need to be monitored, in particular the 1500m long missile testing track, and further detailed studies undertaken to assess the potential technical, environment and socio-economic advantages or impacts of alternative adaptation measures, in order that a preferred solution can be implemented in good time. The preferred option would need to be in keeping with the overall policy of maintaining the natural dune system. It is also recommended that the impact of the existing localised defences at Pendine Burrows is monitored, to advise on mitigation measures as necessary. This policy is, however, sensitive to high level decisions within the MoD/ Qinetiq regarding the future management of the site. Qinetiq have advised that there is confidence that the role of this site will continue in the short term and is unlikely to change significantly for the foreseeable future, particularly as recently there has been significant investment in the strategic facilities at Pendine. However, the future viability of sites is under constant review by MoD/ Qinetiq.

Although the policy for the remainder of the dune system is considered to be of low uncertainty, there is uncertainty associated with how the dune system will evolve in future. Although due to its size, this dune system should be fairly resilient to change, the frontal dunes will still be sensitive to a number of factors, in particular changes in the wind-wave climate, including the frequency or severity of storms. There remains, however, considerable uncertainty regarding future changes in storminess and wind direction (see Appendix C for further discussion of climate change). This area will also be affected by the Three Rivers Estuarine Complex and changes within Carmarthen Bay. It is therefore recommended that the dunes system is monitored to assess how it responds to future climate change and changes in other factors such as the nearshore bathymetry and can also be used as an 'early warning system' for other sections of coastline.

Policy unit 15.2 - a study has recently been commissioned to develop and investigate alternative coastal erosion and flood risk management schemes for Pendine Village, which may involve a set back line. This study will fully consider the potential impacts of such a scheme on both the local and wider scale environment and will involve further consultation with the local community. It is therefore recommended that the SMP policy be reviewed once this study has been completed.

Changes from present management / SMP1 policy[1]

Policy unit 15.1 - SMP1 recommended a policy of 'do nothing', but with the same intent as the proposed SMP2 policy of managed realignment.

Policy unit 15.2 – SMP1 recommended a policy of hold the line in the short term and retreat in the long term at Pendine village. The proposed study should, however, look at more sustainable solutions for this frontage.

[1] The SMP1 documents should be referred to for more details as unit boundaries do not always align with SMP2 policy units and the policies refer to different time periods.

Ginst Point to Dolwen Point (15) (this is a summary of impacts, for full details see **Appendix G SEA Report**)	
Issue	**Appraisal**
Receptor: Property, population and human health The majority of this frontage is undeveloped. The village of Pendine is situated at the western end of the frontage, and comprises a range of residential, non-residential and holiday properties. The main village is situated on higher ground. The Pendine village frontage is protected by a range of defences. Along Pendine Burrows frontage there are a number of localised defences installed to reduce the risk of coastal erosion and flooding to the Qinetiq weapons testing and evaluation facility.	
Will SMP policy maintain coastal settlements and manage the impact of coastal flood and erosion?	+ In the short and medium terms, the Plan aims to continue to reduce the risk of coastal erosion to Pendine village by maintaining existing defences, with a subsequent increased risk of flooding as a result of future climate change/ sea level rise, unless public funding is available to enable upgrading of existing defences. – In the long term, the aim is to undertake a managed realignment scheme at Pendine, subject to the recommendations of an ongoing study. Although this scheme would aim to continue to reduce the risk of coastal erosion and flooding to the wider village, some seafront properties are likely to be lost.
Will SMP policy directly increase the actual or potential coastal erosion or flood risk to communities?	– Although the majority of this frontage is undeveloped, at Pendine there will be an increased risk of overtopping and coastal flooding in the short to medium term, unless public funding is available to enable upgrading of existing defences. The managed realignment scheme may result in increased flood and erosion risk to a small area along the seafront in the long term, subject to the recommendations of an ongoing study which is considering alternative solutions for the redevelopment of Pendine village and realigning existing defences inshore..
Is SMP policy sufficiently flexible to take account of dynamic coastal change?	+ The SMP policy recognises dynamic coastal change, with a policy of managed realignment at Pendine Burrows. This will allow natural beach and dune evolution, although some localised dune management could be undertaken, if necessary. The implementation of a managed realignment scheme at Pendine recognises potential impacts of climate change, and a study is currently underway to develop and assess alternative options for the future redevelopment of Pendine which will consider impacts on the environment, and on coastal processes.
Could there be a detrimental impact on the fabric of coastal communities?	– The Plan would reduce the risk of coastal erosion and flooding to the majority of the Pendine community in the long term. However there may be an increased risk of overtopping/ coastal flooding in the short and medium term, unless public funding is available to enable upgrading of existing defences and there could be some loss of properties along the seafront, dependent upon the future recommendations for redevelopment of Pendine and realigning existing defences inshore.
Receptor: Land use, infrastructure and material assets The frontage is generally undeveloped, consisting of a wide sandy beach and heavily vegetated dune system. Qinetiq weapons testing and evaluation facility, operated on behalf of the MoD, occupies much of the duned frontage. There are local defences which were installed to reduce the risk of coastal erosion and flooding to some of these assets. At the western end of the frontage there are infrastructure and assets associated with Pendine village including camping and caravan sites, the Museum of Speed and tourist/ amenity facilities.	
Will SMP policy maintain key industrial, commercial and economic assets and manage the impact of coastal flooding and erosion?	– In the short and medium term the risk of coastal erosion to, assets and infrastructure associated with Pendine village would continue to be reduced, although there may be an increased risk of overtopping/ coastal flooding in the short and medium term, unless public funding is available to enable upgrading of existing defences. In the long term, the aim would be to ensure that the risk of coastal erosion and flooding to the majority of the village is reduced; however, depending on how managed realignment is implemented, subject to the recommendations of an ongoing study, there may be some loss of seafront assets.
Will the SMP policy ensure critical services and infrastructure remain operational, for as long as required?	– There is limited infrastructure along this section of coast. In the long term, there may be some loss of infrastructure at Pendine village, although this would be affected by how managed realignment is implemented.
Will there be an impact on marine operations and activities?	x There are no large scale marine operations along this frontage.
Will SMP policy impact coastal flooding or erosion on agricultural activities?	x There are no agricultural activities along this shoreline.
Will the SMP policy ensure that MoD (Qinetiq) ranges remain operational?	– The Plan for the duned frontage is to allow natural evolution of the dune system, which will involve monitoring and limited dune management. This is likely to involve adaptation measures such as asset level flood protection, resistance or resilience measures or asset relocation. It is recommended that no further defences are constructed adjacent to or within the dunes and that existing defences should be removed if they begin to have an adverse impact on the natural functioning of the dune system.

Ginst Point to Dolwen Point (15)

(this is a summary of impacts, for full details see **Appendix G SEA Report**)

Issue	Appraisal
Receptor: Amenity and recreational use Due to the presence of the MoD assets, there is little amenity and recreational use along the majority of the frontage. Pendine village and beach is a popular amenity/ tourist destination, which attracts motorsports fans due to the historical use of Pendine Sands as a land speed testing venue, which is commemorated in the Museum of Speed.	
Could the SMP policy have an impact on tourism in the area?	+ The risk of coastal erosion to the main tourist assets in Pendine village would continue to be reduced. although there may be an increased risk of overtopping/ coastal flooding in the short and medium term, unless public funding is available to enable upgrading of existing defences. In the long term, the aim would be to ensure that the risk of coastal erosion and flooding to the majority of the village is reduced; however, depending on how managed realignment is implemented, subject to the recommendations of an ongoing study, there may be some loss of seafront assets.
Will SMP policy affect coastal access along, or to, the coast?	− The A4066 transitions into the B4314 at Pendine village. There may therefore be a risk of increased overtopping and coastal flooding to a short section of these local access roads in the short and medium term.
Receptor: Historic environment At the landward extent of Laugharne Burrows, there are listed buildings associated with East House Farm. There are also a number of wrecks on the foreshore.	
Will SMP policy maintain the fabric and setting of key historic listed buildings, cultural heritage assets and conservation areas?	x There is no risk of coastal erosion and flooding to the listed buildings at East House Farm due to the stability of the dune system. The future of this asset will need to be considered during the assessment of alternative managed realignment options for the adjacent East and West Marsh. − Potential risk to foreshore wrecks although risk is dependent on future rates of coastal erosion and sea level rise.
Will the SMP provide sustainable protection of archaeological and palaeo-environmental features or ensure adequate time for monitoring, assessment and mitigation measures to be devised in response to ongoing and future erosion.	● Wrecks on the foreshore are at risk from erosion and submergence. SMP policy would not affect whether there is adequate time for monitoring, assessment and mitigation measures as risk is dependent on sea level rise and erosion rates.
Receptor: Landscape character and visual amenity There are no specific landscape designations along this frontage; however, the area is noted for its vegetated sand dunes and for the wide sandy beach.	
Will SMP policy maintain a range of key natural, cultural and social features critical to the integrity of the coastal landscape?	+ The proposed policy would allow ongoing natural evolution of the system which would maintain the character of this landscape. The long term policy at Pendine village may lead to improvement of visual amenity and character, dependent on how it was implemented.
Could SMP policy lead to the introduction of features which could be unsympathetic to the character of the landscape?	− Assessment of alternative options for the redevelopment of Pendine would include consideration of potential landscape character impacts. The redevelopment will involve construction/ demolition which is likely to result in a short term adverse impact but a more attractive long term solution along this frontage.
Receptor: Biodiversity, flora and fauna The foreshore and intertidal area is designated as part of the Carmarthen Bay and Estuaries SAC, SPA and Ramsar sites. This frontage is also within the Carmarthen Bay Dunes SAC. The dune systems, and the saltmarshes to landward, are designated as Laugharne-Pendine Burrows SSSI.	
Will SMP policy enable a sustainable approach to habitat management?	+ A policy of managed realignment at Pendine Burrows will allow the dune and beach barrier system to continue to evolve naturally. − At Pendine village, the long term aim is to develop a managed realignment scheme to enhance the amenity value of the beach and adjacent area and to reduce the risk of coastal erosion and flooding to the village. However there may be adverse impacts associated with holding the existing line in the short to medium term
Will SMP policy maintain or enhance any international, national or local sites of natural conservation interest?	+ The shoreline will continue to evolve naturally. ● Natural narrowing, of the wide intertidal sand beach may occur if the vegetated dunes retreat at a slower rate than the beach narrows due to sea level rise. This may therefore result in a reduced habitat for wading birds, subject to the current use of the wide intertidal sand beach, the rate of future sea level rise and the rate of dune retreat. ● Sea level rise may result in erosion of vegetated dunes and potential inundation of dune slacks, which could affect species supported.
Will SMP policy <u>accelerate</u> intertidal narrowing (coastal squeeze) and will this affect designated habitats?	+ The shoreline would be allowed to evolve naturally along most of the frontage. Natural intertidal narrowing may still occur as the heavily vegetated dunes may not retreat at the same rate as the sea level rises and the intertidal beach narrows. − At Pendine village, in the short and medium term there may be accelerated intertidal narrowing due to the presence of the hard defences. However, realigning the defences would be expected to reduce this effect.
Will there be a net loss of BAP habitat within the SMP timespan as a result of SMP policy?	+ Extension of intertidal habitat in the short, medium and long term due to realignment of the defences.

Ginst Point to Dolwen Point (15) (this is a summary of impacts, for full details see **Appendix G SEA Report**)	
Issue	**Appraisal**
Receptor: Earth heritage, soils and geology This frontage is within the Carmarthen Bay Dunes SAC and Carmarthen Bay and Estuaries SAC, SPA and Ramsar sites.	
Does SMP policy work with natural processes and enhance or maintain natural features?	+ A policy of managed realignment will allow continuation of natural processes and maintenance of significant coastal features.
Will SMP policy maintain or enhance the visibility of coastal geological exposures, where designated?	● Sea level rise will lead to narrowing of the wide flat intertidal sand beach.
Receptor: Water There are numerous coastal, freshwater, transitional (areas of water near river mouths, which are partially saltwater but are influenced by freshwater) and groundwater bodies in the SMP2 area that have the potential to be affected by SMP2 policies.	
Will SMP policy manage the risk of pollution from contaminated sources?	x There are no known contamination issues along this shoreline, although there may be unexploded ordnance within the Qinetiq weapons testing and evaluation facility.
Will SMP policy adversely affect water bodies in the coastal zone?	+ The Carmarthen Bay water body will see improvement in biological quality elements as MR would allow the development of further dune wetland habitats. Although HTL at Pendine village (PU15.2) will prevent natural beach and dune development (in the short and medium term) this represents less than 10% of the frontage in this policy scenario area and effects are not likely to be significant at the larger scale of the Carmarthen Bay. This will support WFD objectives. ● The Tywi, Taf & Gwendraeth groundwater body and will be unaffected. There are no associated surface freshwater bodies.

Impact colour key	+ Positive	● Neutral	− Negative	x Not applicable

Ginst Point to Dolwen Point (15)						
ACTION PLAN						
Action	**Action Ref**	**Policy Unit**	**Action Description** (to be approved)	**Potential source for funding** (subject to approval)	**Responsibility** (lead partner * (supporting partners)	**When by** (subject to funding)
1. Studies for Scenario Area	1.1	All	Undertake study to investigate the future evolution of Carmarthen Bay and adjacent estuaries to confirm impacts of future climate change. This will require the collection of data relating to bathymetric change, wind and wave regime, tidal regime, rainfall, river discharge, sediment sources, transport pathways and sediment fluxes in the long term since there is currently a lack of such data to enable a full understanding of the interactions between physical processes and coastal morphological change.	WAG	Coastal Group (Wales Coastal Monitoring Centre)	0 to 100 years
2. Studies for Policy Units	2.1	15.1	Develop management strategy for the Qinetiq weapons testing and evaluation facility within Pendine Burrows dunes to confirm management objectives and triggers for intervention, in order to confirm the best approach to deliver the managed realignment policy. Consider future development of the adjacent estuarine system and dune system as a result of future climate change/ sea level rise and assess alternative adaptation measures such as asset level flood protection, resistance or resilience measures or asset relocation in order to develop a technically, socio-economically and environmentally viable solution for the facility which is sustainable in the long term.	Qinetiq	Qinetiq	0 to 20 years
	2.2	15.2	Undertake a scoping assessment to identify when a feasibility study of the upgrading/improvement options to existing defences needs to be carried out and/or identify the criteria/factors that would trigger this feasibility study. The timing of this feasibility study will be influenced by factors such as existing frequency of flooding, type of receptors at risk, depths and velocity of flooding and residual asset life. Consider alternative funding options where it is not possible to justify public investment in coastal erosion and flood risk management.	WAG	CCC	0 to 20 years
	2.3	15.2	Complete study to assess the technical, socio-economic and environmental viability of alternative options for future coastal erosion and flood risk management at Pendine village which include consideration of managed realignment options and wider redevelopment including tourist/ amenity/ recreation elements. Assessment should include consideration of the potential opportunities and impacts of alternative solutions on Pendine Burrows. It is recommended that community engagement is undertaken at the early stages of this study. Consider alternative funding options where it is not possible to justify public investment in coastal erosion and flood risk management.	WAG	CCC	Ongoing
3. Strategy			-			
4. Scheme work			-			
5. Monitoring (data collection)	5.1	All	Undertake beach and coastal defence asset monitoring to inform future studies and future SMP reviews. In particular beach levels and rates of coastal evolution should be monitored. This information should not only be used in future coastal management, but also to assist in stakeholder liaison by use of data in public education campaigns.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 100 years
	5.2	All	Continue with existing beach profile monitoring programme and provide information to the Wales Coastal Monitoring Centre for storage and analysis. Use beach profile data to identify the future risk of undermining and overtopping of existing defences,	WAG	Coastal Group (Wales Coastal Monitoring Centre)	0 to 100 years
	5.3	All	Undertake periodic defence inspection, including condition assessment and photographs, Confirm defence crest levels.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 100 years
	5.4	All	Undertake further studies, and associated modelling, to better understand sediment regimes in the SMP area and inform future coastal management.	WAG	Coastal Group	0 to 20 years
	5.5	All	Monitor risk to the coastal footpath and investigate potential re-routing of the path where appropriate.	WAG	CCC	Ongoing
6. Asset management	6.1	All	Ensure that extents of public and privately owned defences are defined and mapped to inform future management decisions.	WAG	CCC (Wales Coastal Monitoring Centre)	0 to 20 years
	6.2	All	Undertake an appraisal of asset inspection and beach profile monitoring data to assess the existing and future risk	WAG	CCC (Wales	0 to 20 years

			of undermining and overtopping of existing structures.		Coastal Monitoring Centre)	
7. Communication	7.1	All	Undertake consultation with the local community, key stakeholders and general public during the development of alternative solutions and whenever appropriate to ensure an acceptable approach is developed and adopted.	WAG	CCC	0 to 20 years
	7.2	All	Undertake monitoring and management of Action Plans to ensure SMP policies are put into practice.	WAG	Coastal Group	0 to 100 years
8. Interface with planning and land management	8.1	All	Continue with risk-based improvements to flood risk maps to provide an appraisal of likely future projected sea level rise.	WAG	EAW	0 to 20 years
	8.2	All	Ensure SMP policies and flood and erosion risks are accounted for in the next revisions of land use plans in order to help manage residual risks from coastal erosion and flooding, and to inform future planning decisions.	WAG	CCC planning	0 to 20 years
9. Emergency response	9.1	15.2	Development, monitoring and review of emergency response plans to prepare for storm events which are likely to exceed existing defence standards of protection or lead to failure of existing defences (for example following breach or overtopping).	CCC/ Qinetiq	CCC/ Qinetiq	0 to 20 years
10. Adaptation/ resilience			-			
11. Flood forecasting and warning	11.1	All	Continue with risk-based improvements to flood risk maps and inundation modelling to provide improved flood warning service.	WAG	EAW	0 to 20 years
12. Habitat creation and environmental mitigation	12.1	All	Welsh Assembly Government instructed Environment Agency Wales to scope out the scale of potential coastal habitat gains and losses for Wales. The scoping exercise was completed in February 2011 and identified potential options for implementation of a National Habitat Creation Programme for Wales. How this programme is to be delivered and funded has yet to be decided.	WAG	TBC	Ongoing
* Note: It is recommended that the lead partner/s investigate the potential for local partnerships and alternative sources of funding.						