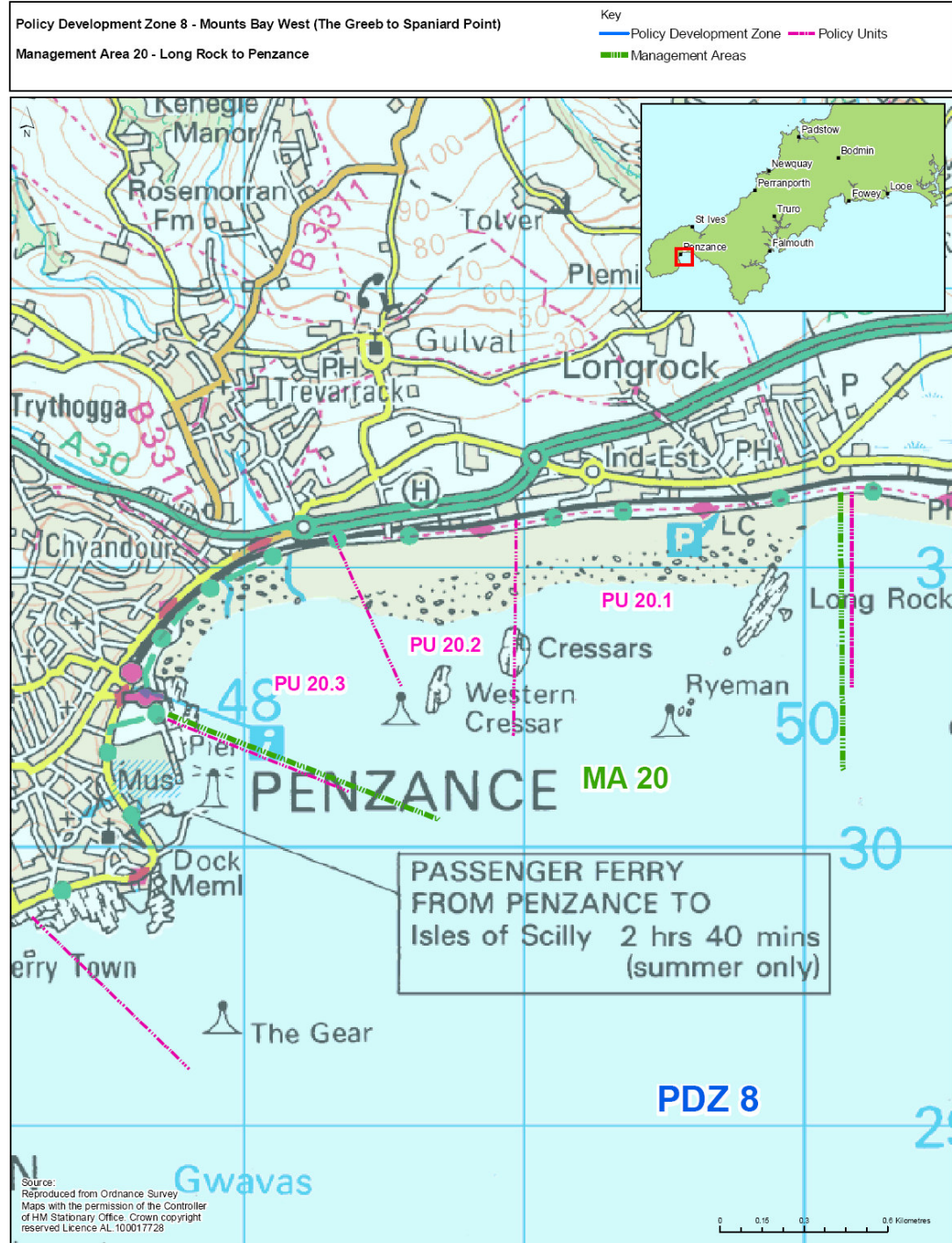


Location reference: Longrock to Penzance
Management Area reference: MA20
Policy Development Zone: PDZ8



Cornwall & Isles of Scilly
Shoreline Management Plan Review

CORNWALL COUNCIL
 Cornwall and the Isles of Scilly Coastal Advisory Group
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 ROYAL HASKONING

DISCUSSION AND DETAILED POLICY DEVELOPMENT

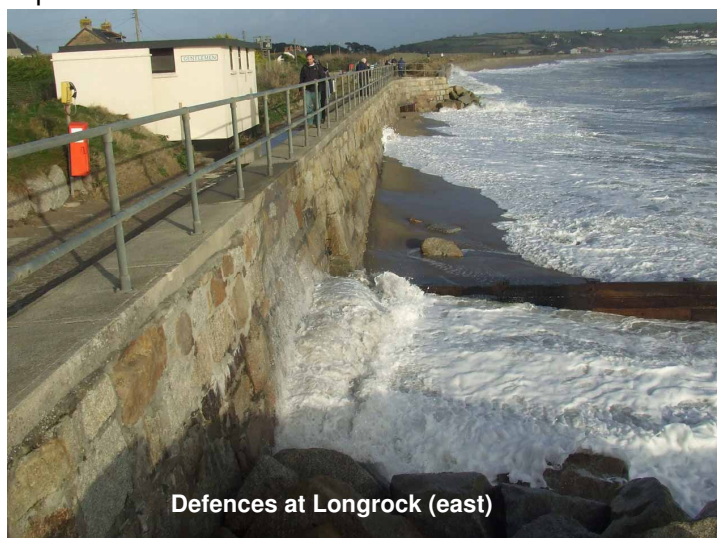
The **Longrock and Eastern Green** frontage extends for around 2.5km from the western edge of Marazion Marsh to Chyandor, just east of Penzance Harbour. This entire frontage is very constrained by the presence of the rail line and the defences seaward of it. Immediately landward of the rail line there is significant residential and commercial development within the Longrock area (see inset photo right), which sits at around mean sea level. Toward the western end of the frontage there is more commercial development immediately landward of the rail line and the main A30 road moves across to within 45m of the mean high water mark. The preferred plan should not be unduly constrained by the presence of this transport infrastructure in terms of seeking a long term sustainable solution - but at the same time it has to make a realistic assessment of the shorter term likelihood of flexibility.



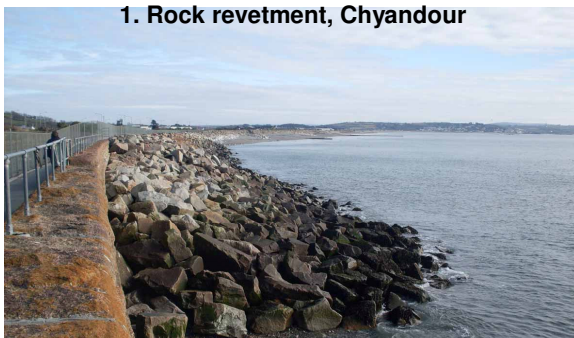
There is little doubt that this frontage will start to display the effects of coastal squeeze during the 3 epochs, however it may be a slightly more resilient shoreline position in the short term due to the shelter afforded by the offshore rock outcrops previously mentioned, which help to reduce wave energy reaching the shoreline and encourage the retention of sediment on their nearshore side. Sea level rise will inevitably reduce these effects however through time and this will become particularly noticeable beyond epoch 1.

Storms and rough sea from the south-east to south-west currently cause direct impact upon the defences (see inset picture, right).

The current defences along the western end (Network Rail maintained rock armour revetment, see inset photo, below) are in reasonable condition and might be expected to have a residual life in the order of 20 years. The sloped concrete revetments, matted revetments and embankments further east along the frontage (see inset photo, below) are directly impacted during stormy conditions and some sections are in poor condition, as seen in the photo 3 below which was taken



during large swell conditions in November 2009 (photos 1 & 2 taken during calmer conditions). It should be noted that the damaged sections shown in photo 3 below were repaired by Network Rail promptly and the damaged SW coastal footpath behind the defences was also re-instated. The inset graphic below shows the significant and maximum wave heights attained during this event and provides a good example of the type of extremely energetic wave events that this frontage is subject to. These matted revetments have significantly lower residual life. There is a 350m section of the shoreline and railway extending west from the Longrock beach car park which is defended only by a sand and earth embankment, with some small fore dunes, the seaward face of which shows on-going erosion, see inset picture, below left.



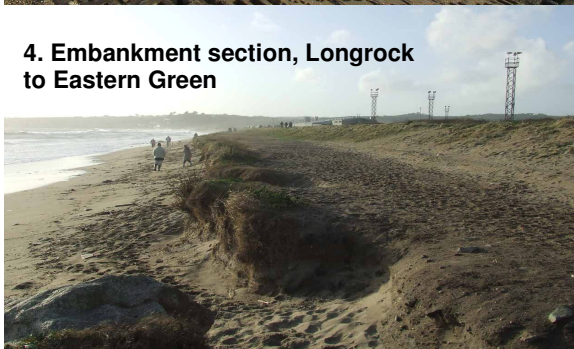
1. Rock revetment, Chyandour



2. Rock revetment & sloped matted revetment, Eastern Green



3. Damaged mat revetment, Longrock, (during storms, Nov 2009)



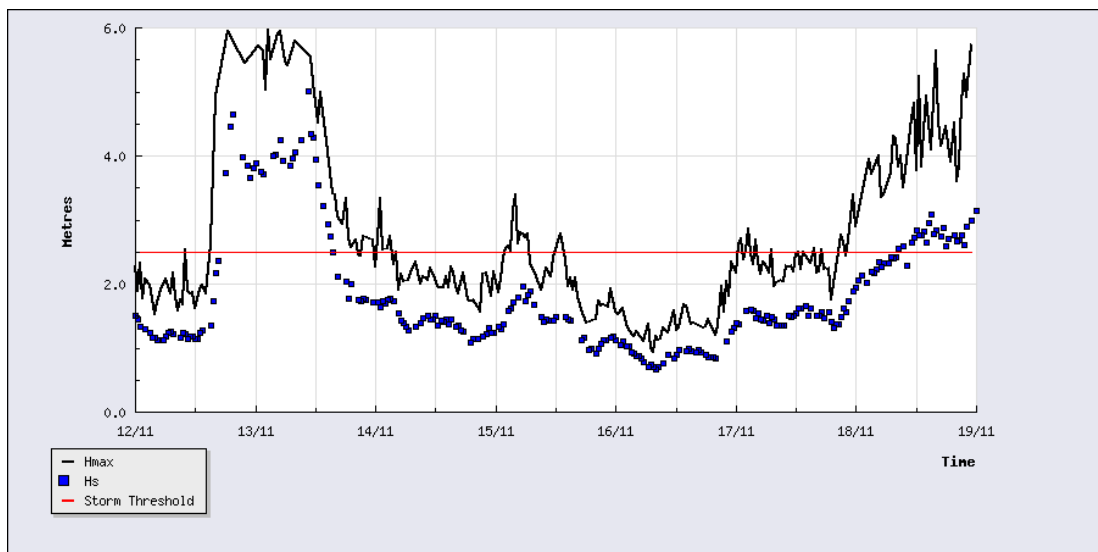
4. Embankment section, Longrock to Eastern Green

car park which is defended only by a sand and earth embankment, with some small fore dunes, the seaward face of which shows on-going erosion, see inset picture, below left.

The assessment of flood and erosion risk indicates the possible extent of recession and flooding under the NAI scenario. Recession could be much as 110m, and flood risk is extensive by 2105, putting in excess of 130 properties at risk, indicating the vulnerability of this frontage, its low-lying nature and how it is already held forward of its natural alignment due to the presence of defences.

The strategically important nature of the frontage's transport links are recognised, but the long term risk and increased technical difficulty in holding an unsustainable shoreline position must also be acknowledged. Therefore the preferred plan would be to hold the line through epochs 1 with movement of the shoreline to be facilitated to a managed realignment policy during epoch 3. Obviously the nature and extent of any realignment in the longer term would need to be carefully studied and consulted upon in the shorter term to identify the acceptable options.

As already mentioned, of particular importance within this Management Area are the transport links. The links which both rail and road provide into Penzance, one of the key seven urban conurbations within Cornwall, are critical to the local economies of Penzance itself,



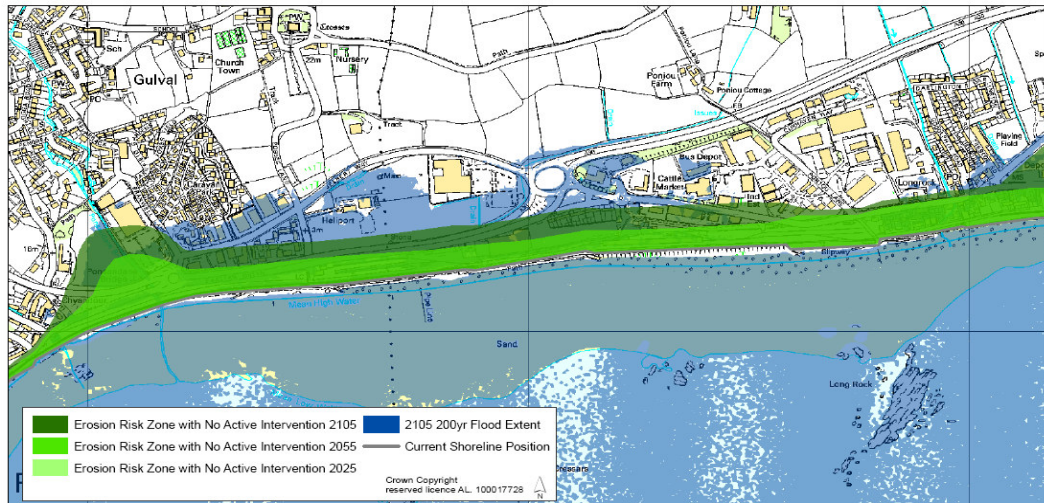
Recorded wave heights (Hmax & Hs), 12th – 19th November 2009.

Source: channel Coastal Observatory

Newlyn, Marazion, Mousehole and the wider Lands End peninsula. In addition, Penzance provides the key mainland travel links with the Isles of Scilly, in terms of ferry and helicopter services. The Penzance Heliport is located within the Longrock – Eastern Green corridor, and is located within the zone of flood risk.

The Local Transport Plan (LTP) for Cornwall identifies the importance of the rail route into Penzance. A part of the future strategy to tackle congestion within Penwith is the establishment of Park & Ride facilities at St Erth, which aims to reduce vehicle numbers travelling into both Penzance and St Ives. Part of this strategy would be to increase the frequency of rail service along the St Erth – Penzance route. The LTP also identifies that improving rail services to the key centres across Cornwall is an important part of the regeneration strategy and this is particularly applicable to Penzance. However despite the strategic nature of the rail link, this should not be justification for attempting to sustain the current position of the rail line indefinitely.

The pressures along this frontage and the vulnerability of the immediate hinterland dictate that the SMP should be guiding land use planning along the Longrock – Eastern Green frontage toward a policy of realignment. Feasibility of re-routing the rail link is an assessment which will inevitably become necessary as part of future strategic assessments of transport requirements within Penwith. Withdrawal of the terminating point of the line to outside of Penzance, possibly back at Longrock, would necessitate less defence of vulnerable track length. Earlier termination at St Erth may be a future option which would avoid the necessity to maintain the Marazion Marsh section.



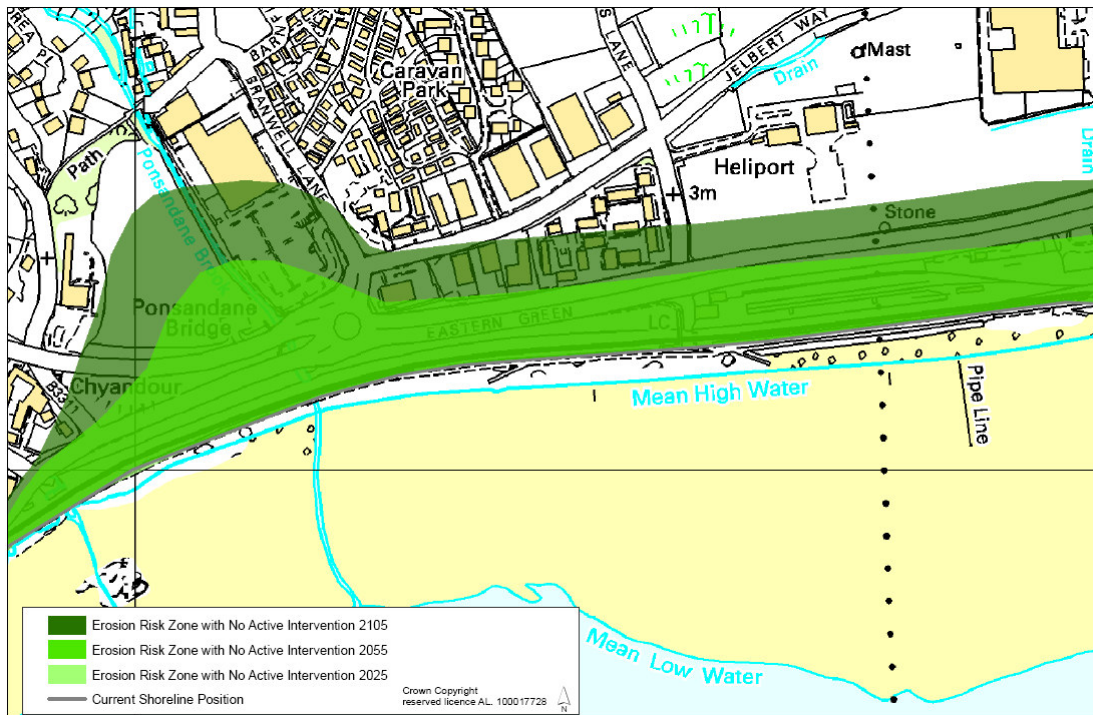
Any such future options would of course require suitable alternative transport links into the centre of Penzance in order to prevent impacts on the local economy. Such options could be developed as part of a future sustainable transport strategy for Penzance. An apparent opportunity and potential benefit of either realignment or withdrawal of the rail line position would be the opening up of the beach frontage.

Currently the long stretch of sandy beach between Penzance Harbour and Longrock is fairly inaccessible and rendered a less attractive amenity by the presence of the railway line and the revetments which defend it and the Eastern Green corridor. This is essentially a very safe area of amenity and bathing beach with iconic views across to St Michael's Mount and could make a substantial contribution to the local economy as part of a wider regeneration strategy.

The main A30 road is also extremely vulnerable under the future erosion and flood scenarios. The road system ultimately appears more flexible than the rail link however. The low-lying nature and current land use characteristics of the hinterland between the A30 junction just west of Longrock and Gulval on the eastern side of Penzance, where the topography rises quite steeply onto the Penwith peninsula, means that the main route could, theoretically, be realigned along behind the site of the Heliport and Tesco's superstore, possibly along the route of the existing unclassified Jelbert Way (see inset map, below).

It should be noted that under the preferred plan, HTL during epoch 1 along the Longrock – Eastern Green - Chyandour frontage could lead to some intertidal narrowing and erosion of the upper beach areas prior to MR being implemented. The mean high water position is likely to adjust itself landward and closer to the defences during this period but the magnitude of this will depend on acceleration of sea level rise and any increases in storminess.

The high level economic assessment for Management Area 20 provides a benefit / cost value of 1.23 (refer to the Economics Summary Table below and Appendix H) which generally supports the hold the line approach proposed during epoch 1 for the frontage. It is important to note that this high level assessment does not take specific account of benefits derived from the rail, road and air links etc.



An additional consideration is the presence of the Heliport, the third important aspect of the transport infrastructure along this frontage. Erosion may potentially affect the southern boundary of the site by 2105 under the NAI. A managed realignment policy would seek to control this risk to the Heliport and ideally maintain its long-term functionality although we understand that discussions are underway for the redevelopment and reorganisation of the site that may also support this. A secondary aspect of the Heliport site is the presence of historic landfill. This would need to be managed / controlled under a future managed realignment, to prevent pollution risks. Any redevelopment of this site should seek to remediate any contamination risks.

Despite the potential uncertainty, technical difficulties and cost involved in re-aligning and adjusting the transport links into Penzance, it is felt the SMP's preferred plan must not fall short of putting forward a sustainable solution to managing the shoreline and providing the correct guidance to long term planning and development. In addressing these issues now, there is time and scope to investigate different solutions. However very recent (October 2009) south to south-westerly storm conditions which were unlikely to have exceeded the 1 in 1 year storm event, have damaged a section of the existing defence along the Longrock frontage. This underlines the vulnerability of this frontage, particularly to an extreme south westerly event. Given potential increases in storminess and the current vulnerability of the frontage, the defences could potentially be seriously compromised through the period of one or two tides during an extreme storm event.

A policy of hold the line during epoch 1 will retain the defence of the rail line and the A30. Maintenance of the revetments to the end of epoch 1 would provide a residual defensive span of up to 40 years. However pressure on the frontage is such that it is

recommended to move to a policy of realignment within epoch 2 and continued through to epoch 3.

The Chyandour frontage provides a link between the potential large scale change along the Longrock-Eastern Green frontage and the fixed frontage of Penzance Harbour. The main road link into Penzance town centre and the waterfront car parking (Chyandour Cliff road) is located directly adjacent to the shoreline at this point. HTL along this short frontage would allow the route and the link into the train and bus station area to be maintained. The critical Mount's Bay strategy would however need to look at this section of frontage as part of the larger MR to the east and refinement of this policy may be necessary as part of that process.

This frontage, in combination with the adjacent management areas, presents the area of greatest coastal change in Cornwall. A Flood and Coastal Risk Management Strategy will be required to provide detailed investigations for Managed Realignment options for the future. However, it is essential that this strategy is coordinated with both the Local Development Framework and the Local Transport Plan which both need to consider the long term adaptation of this area to sea level rise. The area should be identified as a Coastal Change Management Area, which should extend far enough inland to take account potential alterations to the transport infrastructure, as well as the inland migration of the Marazion Marsh. This scale of change should support development of an Area Action plan in the next round of Local Development Framework. Transport Planners need also consider the long term options for the road and rail network through the area.

SUMMARY OF PREFERRED PLAN RECOMMENDATIONS AND JUSTIFICATION PLAN:

| | |
|-----------------------------------|-----------------------------|
| Location reference: | Longrock to Penzance |
| Management Area reference: | MA20 |
| Policy Development Zone: | PDZ8 |

| PREFERRED POLICY TO IMPLEMENT PLAN: | |
|--------------------------------------|---|
| From present day (0-20 years) | HTL at Longrock; HTL at Eastern Green; HTL at Chyandour |
| Medium term (20-50 years) | MR at Longrock; MR at Eastern Green; HTL at Chyandour |
| Long term (50 -100 years) | MR at Longrock; MR at Eastern Green; HTL at Chyandour |

SUMMARY OF SPECIFIC POLICIES

| Policy Unit | | SMP1 Policy 50 yrs | SMP2 Policy Plan | | | Comment |
|-------------|---------------|-----------------------|------------------|------|------|--|
| | | | 2025 | 2055 | 2105 | |
| 20.1 | Longrock | Hold the line | HTL | MR | MR | Identification of most suitable and technically feasible strategy for realignment of transport links is critical in securing future sustainability of the frontage. |
| 20.2 | Eastern Green | Hold the line | HTL | MR | MR | Identification of most suitable and technically feasible strategy for realignment of transport links is critical in securing future sustainability of the frontage. |
| 20.3 | Chyandour | Hold the line | HTL | HTL | HTL | Holding the line at Chyandour will provide control point to east of Penzance Harbour and provide defence to main route into the town, plus assist in minimizing impacts on Gulval. |

Key: HTL - Hold the Line, A - Advance the Line, NAI – No Active Intervention
MR – Managed Realignment

ENVIRONMENTAL ASSESSMENT

Strategic Environmental Assessment (SEA):

The overall policies of HTL and MR will continue to protect the settlements of Longrock, Eastern Green and Chyandour in regards to maintaining the current standards of defence, although it is unclear at this stage the impacts of MR on transport infrastructure such as the main A30 road. The HTL policy will continue to protect the structure and setting of Jubilee Pool (LB); 22 Regent Terrace (LB); Stanley Guest House (LB); 21 Regent Terrace (LB).

Appropriate Assessment (AA):

HTL for all Epochs is proposed at Marazion Town, St Michael's Mount (Harbour), Marazion West, Marazion Marsh, Chyandour, Penzance Harbour and Docks, Newlyn, Cliff Road, and Mousehole. HTL in the first Epoch followed by MR (or NAI) for the remaining Epochs is proposed at St Michael's Mount (Causeway), Longrock, Eastern Green, and Wherry Town. NAI is proposed for all undefended cliffs, Marazion east, and Sandy Cove. The Habitats Regulation Assessment has not been able to discount adverse impacts of Managed Realignment on Marazion Marsh due to constraints on the relocation of the site to a more resilient inland location. Hold the Line has therefore been adopted to ensure that the plan does not introduce impacts to the site. However, as the site will remain vulnerable

in its present location, Managed Realignment options should nonetheless be considered as part of any future Strategy or Local Development Framework. .

IMPLICATION WITH RESPECT TO BUILT ENVIRONMENT

| Economics Summary | | by 2025 | by 2055 | by 2105 | Total £k PV |
|-------------------|------------------------------------|---------|---------|--------------------------------------|-------------|
| Property | Potential NAI Damages (£k PV) | 0.0 | 4090.1 | 1625.2 | 5715.2 |
| | Preferred Plan Damages (£k PV) | 0.0 | 0.0 | 69.1 | 69.1 |
| | Benefits of preferred plan (£k PV) | 0.0 | 4090.1 | 1556.1 | 5646.1 |
| | Costs of Implementing plan £k PV | 1687 | 1654 | 1233 | 4575 |
| | | | | Benefit/Cost ratio of preferred plan | 1.23 |

Notes

No account or rail or road assets or disruption has been included