The character of flooding in the Eastern Yar Catchment

Caveat:

The information contained in this document is for information only and not for Development Control or other purposes. The information was accurate at time of writing in October 2006 however this may have been superseded by new information. The Eastern Yar Strategy is ongoing and as such the thoughts and conclusions outlined may have changed following further work. As such these are draft project outputs and do not necessarily reflect the views of the Isle of Wight Council and the Environment Agency.

The Eastern Yar River ('The Yar') rises at Niton and flows 27km north and north-eastwards, gathering the Wroxall Stream, Scotchells Brook and a number of small tributaries before cutting through a gap in the island's central Chalk ridge. To the north of the ridge the Eastern Yar flows across reclaimed land, which once formed Brading Harbour. The Yar discharges into Bembridge Harbour through tidal sluices at St Helens, to join the Solent. Many sections of the main river and its tributaries have been dredged and straightened over the years; sections between Brading and St Helens were straightened when the railway line to Bembridge Harbour was constructed. Previously, flood embankments were built for around 1.2 km from the sluices at St. Helens. The Eastern Yar drains a total area of 88km^2. The channel has also been engineered for land reclamation and agricultural drainage.

The outer Harbour is dominated by the sand dune systems at the Duver, St Helens to the north and at Bembridge Point to the north-east. The upper foreshore consists of sand and shingle, extending down to an area of intertidal sands. The coastline is moderately developed with residential, tourism and commercial properties, and a small gravel extraction industry located at Bembridge Point. Old St. Helen's Church tower lies to the north of the study area. The approach channel to the harbour is difficult for incoming and outgoing craft to navigate. The channel alignment is heavily influenced by the littoral transport from south-east to north-west along the coastline. From a flood and coastal management perspective, the catchment can be categorised as:

- Predominantly rural, with limited urban development encroaching on the floodplain.
- The lower catchment from Alverstone to Bembridge is land reclaimed from the sea. The old defence line was located in what is now Brading Marshes, along the raised embankment that runs through Great Sluice and Little Sluice. The existing defence line runs along Embankment Road.
- The lower catchment is therefore low-lying and made up of significant marshland area, including Alverstone and Brading Marshes.
- The lower catchment is protected from tidal flooding by the Bembridge Tidal Sluice Complex and Embankment Road. These structures act to preserve the upstream marshes as valuable freshwater habitats. Without these structures in place, the river would be tidally influenced upstream as far as Alverstone.
- A number of important flow control structures exist in the catchment. The key structure is the Bembridge Tidal Sluice, a complex of 4 sluice gates that prevent tidal inundation of the river channel and Brading Marshes. Under normal operation the gates are closed on the flood tide to prevent tidal ingress and opened on the ebb tide to allow discharge of the river flow and prevent fluvial flooding. During periods of low fluvial flow, the gates remain closed for longer to maintain river levels upstream.

- All other weirs or sluices in the catchment are designed to influence in-channel levels during periods of normal or low flow and are not designed to influence channel or floodplain levels during large magnitude floods. The presence of these structures in the channel during a significant flood has only a localised impact on flood levels.
- Some of the bridges and associated embankments would act as significant barriers to channel and floodplain flow during an extreme event.