Isle of Wight
Strategic Flood Risk Assessment MK2

Appendix F
Yarmouth

June 2010

Overview

The topography of Yarmouth is relatively flat, with western parts of the town below 3 mAOD, and is classified as a Rural Service Centre. Flood risk in the town is complex with the tidal risk from the sea along the northern edge of the town, and a combination of tidal and fluvial risk from the estuary to the south and west.

Please review this discussion in conjunction with the mapping provided in this Appendix.

Sustainability and Regeneration Objectives

Development within the wider countryside will be focused on the Rural Service Centres such as Yarmouth and should support their role as wider centres for outlying villages, hamlets and surrounding countryside. For the rural service centres development will be expected to ensure their future viability. Within the rural service centres and outlying rural areas, development will be expected, in the first instance, to meet a rural need and maintain or enhance the viability of local communities and will be subject to local considerations.

Yarmouth RSC has been identified as having the potential to accommodate further development to meet the regeneration aims and needs of the local community, through improving local services and strengthening public transport. Development will be encouraged on brownfield sites in the first instance and tourism will be promoted

Sites at Risk

Tidal flood risk in Yarmouth is significant, however one two of the six potential development sites are impacted by the 2115 Flood Zone 3 extent. Tidal Flood Zone extents are more extensive than the fluvial extents on all sides of the town.

Although not exactly related to a particular potential development site, the current Environment Agency Flood Zones appear to completely encircle the town. This potentially presents serious problems relating to access and egress routes for existing and proposed developments and emergency planning. In the event of the 1 in 200 year tidal event, the A3054 is predicted to flood (see figure 24). This situation has the potential to restrict the ability of emergency services to access the settlement and thus becomes an emergency planning consideration for the council.

Climate Change

Increasing sea levels as the result of climate change have the most significant impact in the west of the town, where the topography is the flattest. The extent of the flood zones in 2115 do not include any additional potential sites that are not already included by the current flood zone extents.

Potential Surface Water Flow Routes and Ponding Areas

Method

The potential surface water flow routes and ponding areas presented in the SFRA, illustrate areas of predicted flooding greater than $25m^2$ in spatial extent and only flooding which is more than 0.1m deep. This refinement of the TuFLOW model output is necessary so as to establish the primary areas of predicted flood risk. The modelling approach utilises a 5m resolution ground model grid. The TuFLOW model does not incorporate the Southern Water surface water drains or sewers, which during a storm event would provide storage capacity. Southern Water advised that the modelling should assume that the surface water sewer network could accommodate the 1 in 20 year storm. Therefore, the 1 in 20 year rainfall depths for the critical storm were subtracted from the 1 in 100 year (plus climate change) rain fall depths.

The 1 in 100 year (plus climate change) winter profile storm hyetographs (hyetograph refers to a graph presenting rainfall depth over time) were generated by deriving catchment descriptors from the Flood Estimation Handbook CD-ROM (FEH) and applying the FEH Rain Profile Method. The storm durations were determined by the critical drainage pathway lengths in each of the model areas. The model boundaries were determined by the topography, the local watersheds were traced to ensure that all contributing parts of the catchments were included in the model.

Results

The town of Yarmouth is completely surrounded by low land, as such there town does not have an upslope surface water catchment that can deliver surface water run-off to the town. As such the modelling predicts there to be a minimal surface water flood risk in Yarmouth. There are only a small number of areas where the model has predicted accumulations of water over 0.1m deep and greater than $25m^2$ in area. These small pockets of flooding do not appear to follow a particular flow route and are more likely to be the product of small variations in the recorded LiDAR ground levels.

Surface Drainage and Infiltration SuDS Potential

The runoff potential of soils in Yarmouth is only available for the east of the town which has a SPR of approximately 50%, thus indicating a high runoff potential. The groundwater vulnerability map of the area also shows much of Yarmouth overlying a Unproductive Strata, expect for the south west edge of the town which is characterised by a Secondary Aquifer with a high leaching potential, and the east of the town which is associated

with a Secondary Aquifer of low leaching potential. Infiltration potential is classified as low for Yarmouth other than for the south western edge of the town which has a medium infiltration potential. The low infiltration potential of the town makes infiltration SuDS techniques unsuitable except of the south west of the town, that is, under the assumption that appropriate precautionary measures are employed to prevent pollution of the underlying aquifer.

The sea north of Yarmouth and the Western Yar estuary, west of the town, are designated as a SAC. Thornley Brook is associated with a SPA and SSSI, which extend towards the coast between The Mount and Thornley Road. The close proximity of a SAC, SAP and SSSI around the town means it is important that measures be considered to mitigate against pollutants entering the estuarine environments through surface water discharges. The estuarine and coastal waters around Yarmouth allow for an unconstrained volume of runoff discharge, assuming water is free of contaminants. Consideration should be given to the potential for tide locked surface water drainage outfalls. On site attenuation and storage will need to be provided to ensure that high tides do not result in sites flooding.

Wave Exposure Risk

The coastline of West Wight has been classified as being at low risk of wave exposure (see Section 6 of the SFRA Report). It is recommended that for any site within the 20m buffer, where ground levels are less or equal to the predicted peak 1 in 200 year tide in 2115 level plus a 4m allowance for wave height, building design should consider the impact of being potentially exposed to airborne beach material and the corrosive effects of sea spray.

Flood Risk Management Guidance and Site Specific FRAs

The principal of avoidance should be applied when considering sites within West Wight. The development of any previously undeveloped site in Flood Zones 2 and 3 is considered by PPS25 as an increase in flood risk and should be avoided. The redevelopment of any previously developed sites within the Flood Zones will require the PPS25 Sequential test to be passed and the Exception Test satisfied where necessary.

Factors to be considered in safe development could include:

- Ensuring that the sequential approach to landuse planning is, where possible, applied on site. This approach would see more and highly vulnerable landuse types being placed in the lower risk zones.

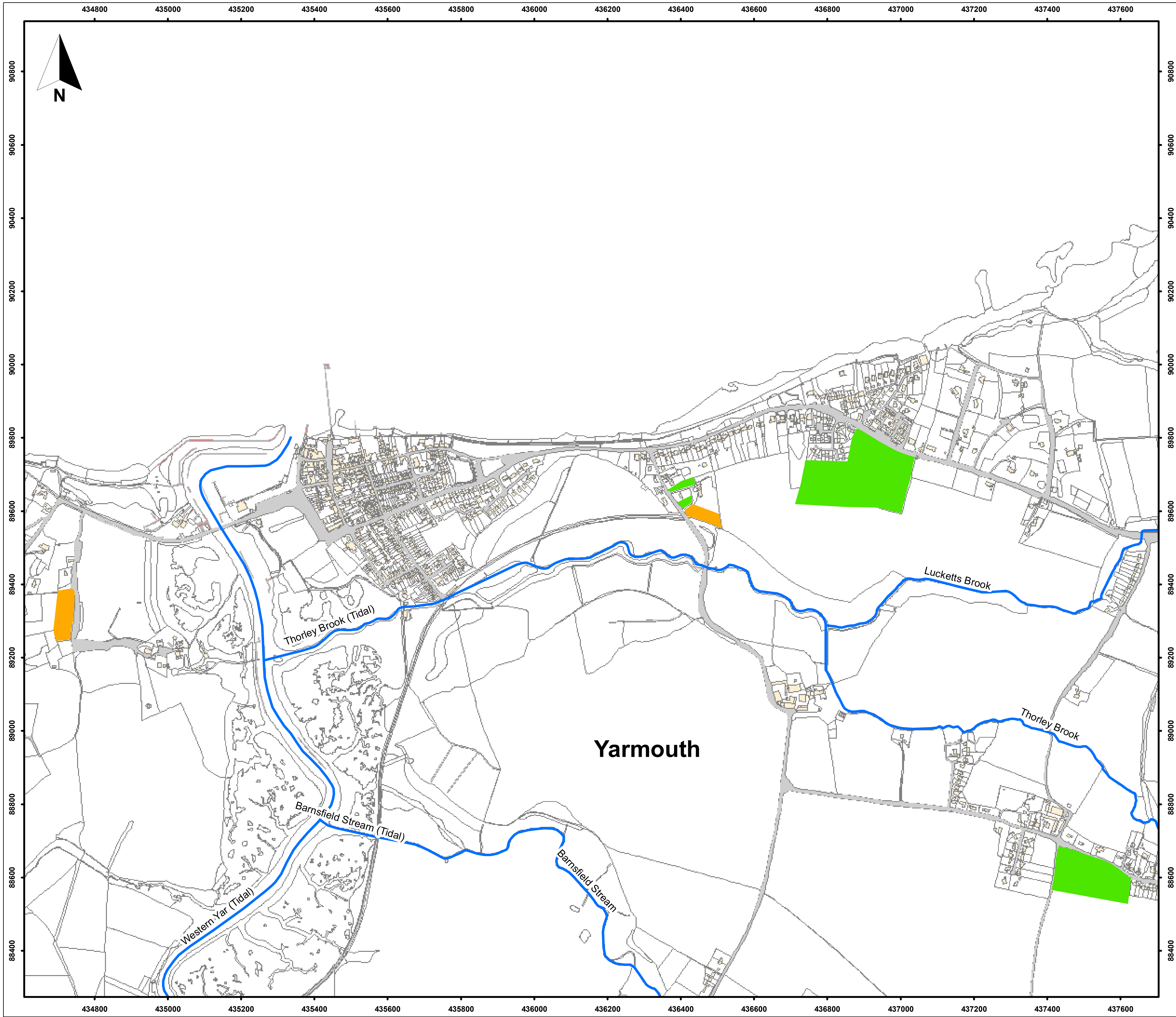
- Finished first floor levels should be set above the predicted 1 in 100 year fluvial flood levels, plus a climate change allowance and above the 1 in 200 year predicted tide levels for the year 2115. The Environment Agency should be consulted for fluvial flood levels and the Environment Agency should be asked to confirm if the predicted tide levels in Figure 1 in Appendix B are still the most recent predictions. A freeboard allowance should be applied, again the Environment Agency should be consulted on this aspect of the design.

- Buildings should be designed so that safe access and egress can be facilitated in the event of the 1 in 100 year (plus climate change) and 1 in 200 year tidal event (plus climate change).

- Development should not increase the risk of flooding elsewhere. As such, the potential for displaced flood water to impact adjacent areas should be considered. This typically applies if an existing building footprint is being increased in fluvial floodplains and defended tidal floodplains. The displacement of water aspect of development along an undefended coastline is not necessarily a concern.

- Building design should account for the potential depths of water that might occur and appropriate flood resilient and or resistant design features should be incorporated.

- Surface water generated by development should be managed using sustainable techniques. The FRA or drainage assessment should explore the Environment Agency and CIRIA SuDS hierarchy. Discharge rates and volumes should not increase post development, in addition to this PPS25 requirement, the Council and the Environment Agency want to see developers seeking to reduce run-off rates and volumes.



Key:

Main Rivers

Probability of Flooding

- Functional Floodplain
- High Probability
- Medium Probability
- Low Probability

Notes:
Site is attributed with the flood probability associated with the highest probability flood zone the site intersects

The mapped extent of Flood Zone 3b has been used to identify Functional Floodplain The 1 in 100 year fluvial flood zone for the present day and the 1 in 200 year tidal extent predicted for the year 2115 has been used to identify sites at a High Probability. The 1 in 1000 year fluvial flood zone for the present day and the 1 in 1000 year tidal extent predicted for the year 2115 has been used to identify sites at a Medium Probability. Sites only in Flood Zone 1 have been assigned a Low Probability

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 25
Potential Development Sites Qualitative Flood Risk Yarmouth

November 2009
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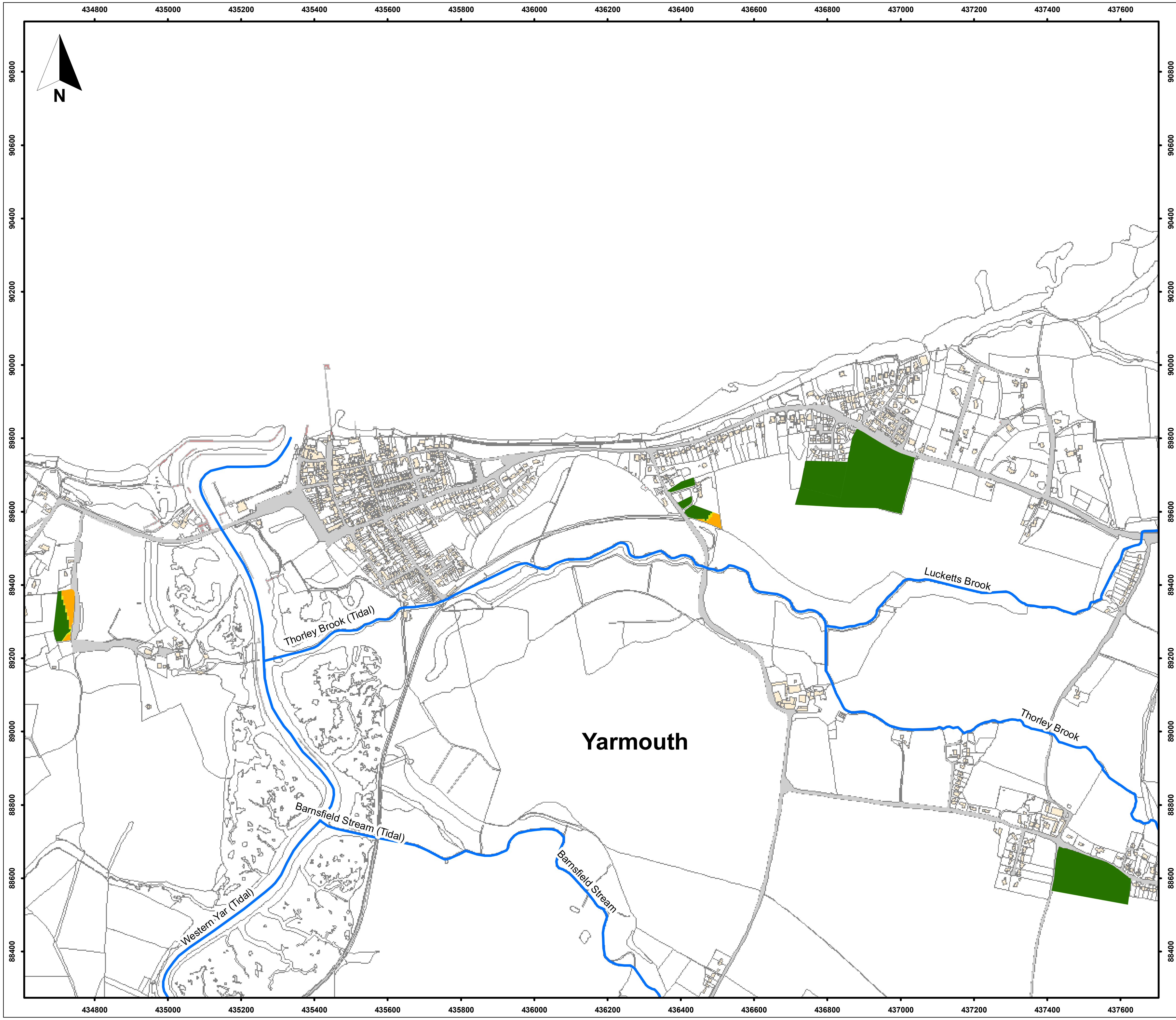

Key:

Main Rivers

Probability of Flooding

- Functional Floodplain
- High Probability
- Medium Probability
- Low Probability

0 200 400 Meters

Scale: 1:10,000 @ A3

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Figure 26
Potential Development Sites
Site Specific Flood Risk Definition
Yarmouth

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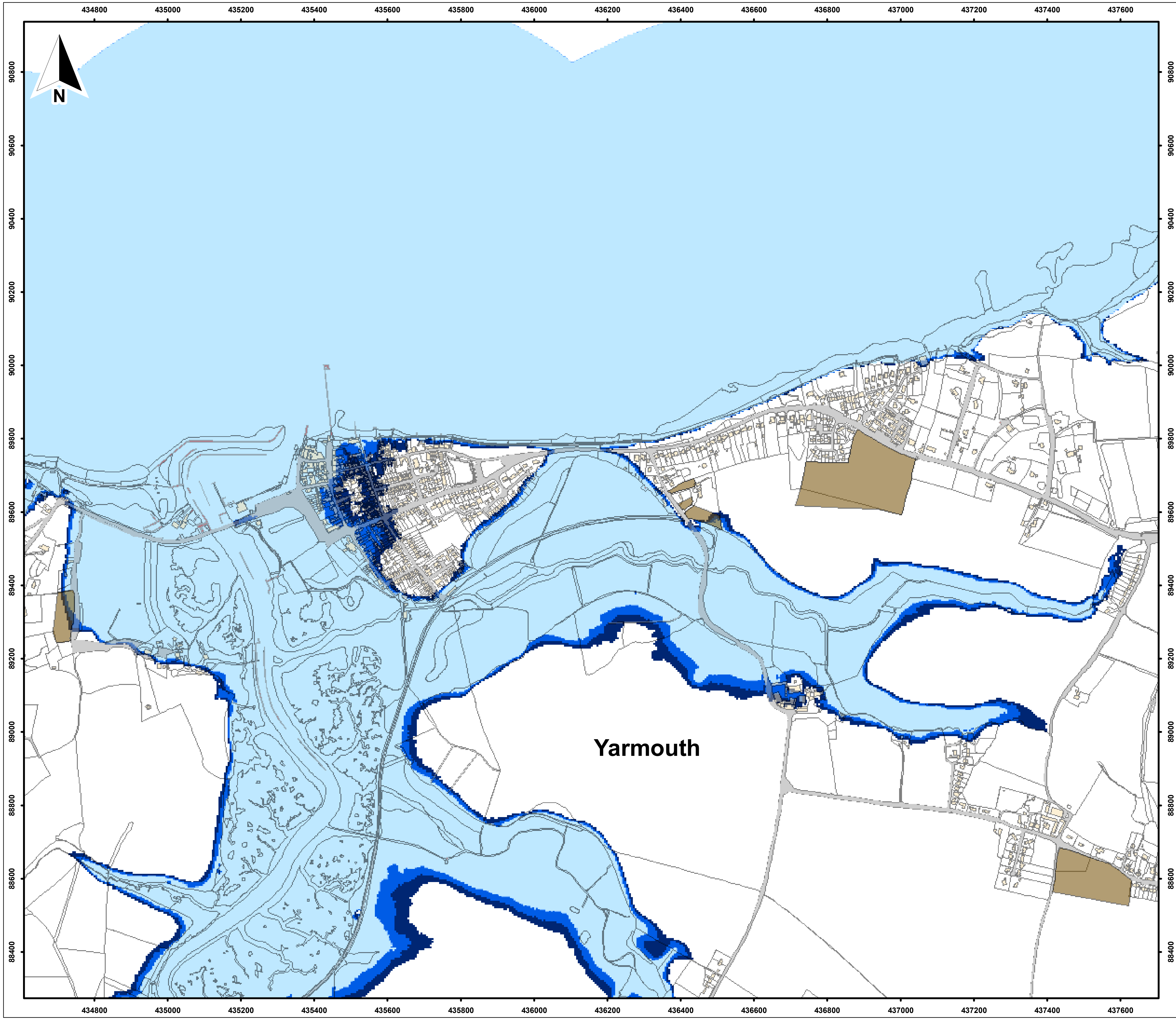

Key:

Predicted 1 in 1000 year Tidal Extents

- Year 2010
- Year 2045
- Year 2080
- Year 2115

- Potential Development Sites

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 27
Potential Development Sites
Flood Zone 2
Climate Change Scenarios
Yarmouth

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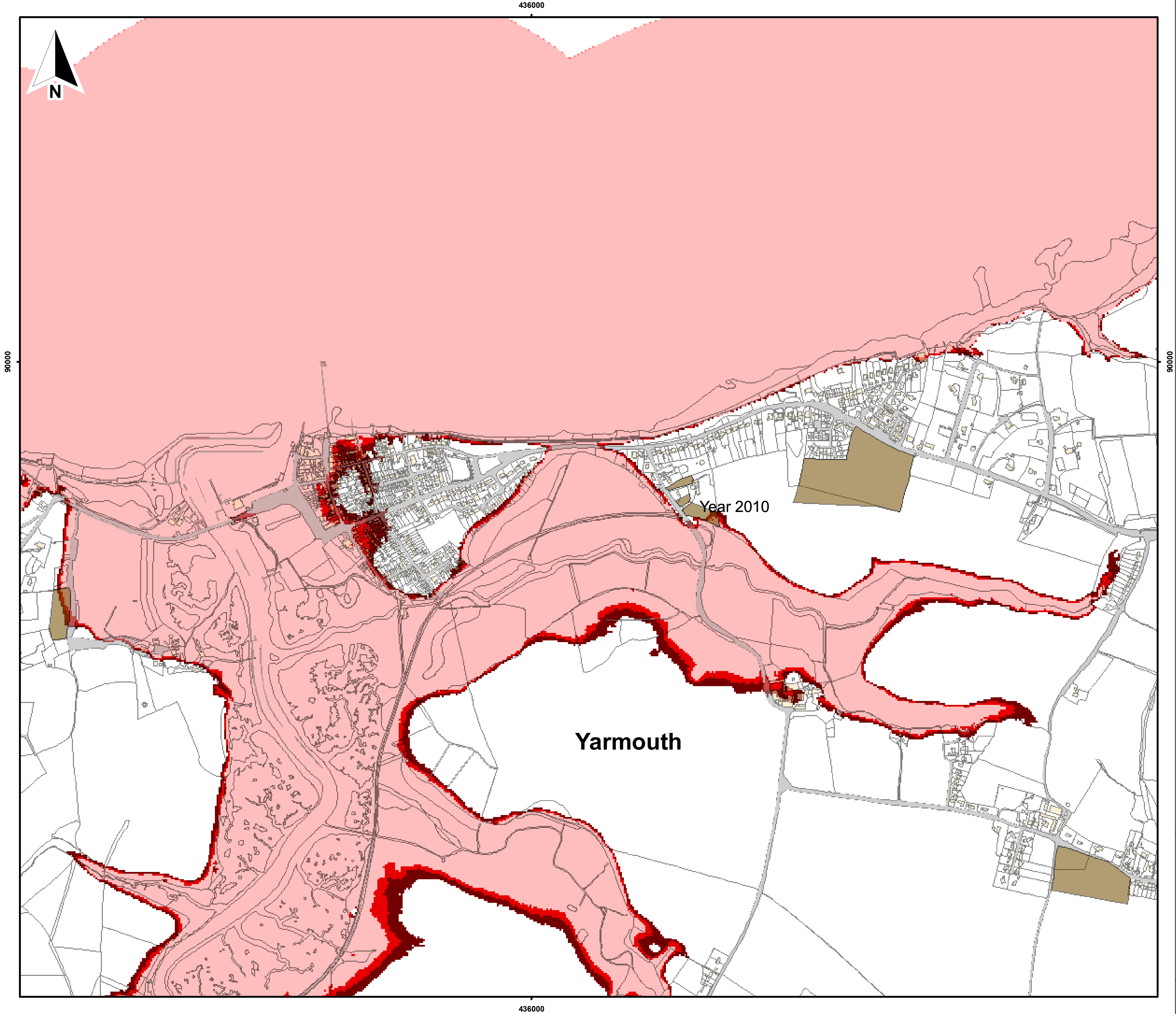

Key:

Predicted 1 in 200 year Tidal Extents

Year 2010

Year 2045

Year 2080

Year 2115

Potential Development Sites

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 28
Potential Development Sites
Flood Zone 3
Climate Change Scenarios
Yarmouth

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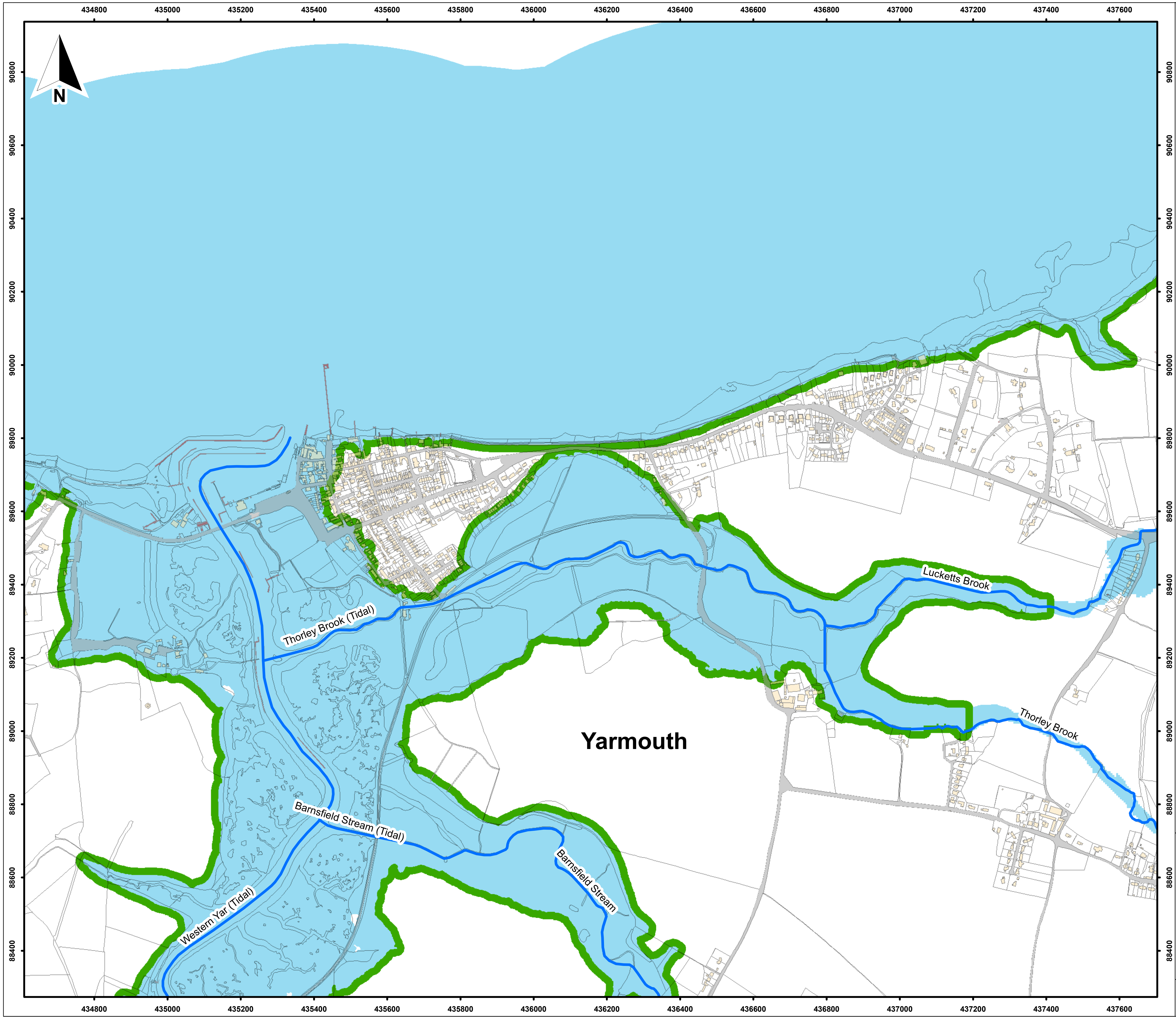

Key:

Main Rivers

Potential Exposure Risk

- High
- Medium
- Low

Environment Agency Flood Zone 2 (November 2009)

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 29
Qualitative Wind and Wave Exposure Risk - Yarmouth

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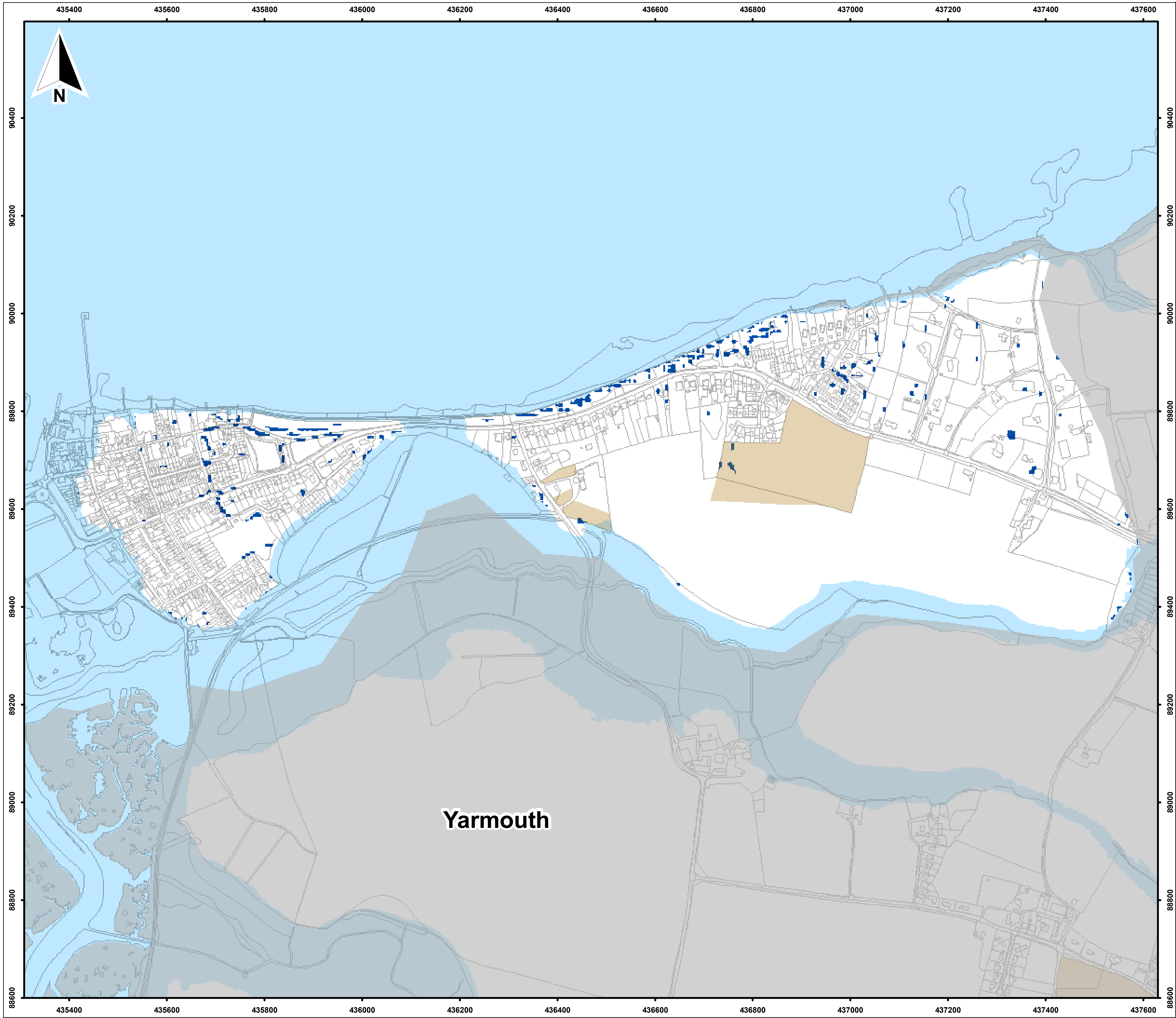

Key:

Location of reported surface water flooding issues. Supplied by Southern Water for the period upto and including 2006.

Environment Agency Flood Zone 2 (November 2009)

Potential Surface Water Flow Routes and Ponding areas (1:100+cc)

Potential Development Sites

Outside the Limits of the Surface Water Model

Notes:
Only predicted surface water flow routes and ponding areas, over 0.1m deep and greater than 25m2 are shown

0 200 400 Meters

Scale: 1:7,500 @ A3

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Isle of Wight SFRA MK2

Figure 30
Potential Surface Water Flow Routes and Ponding Areas (1 in 100 year storm + climate change) - Yarmouth

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