

# Isle of Wight Strategic Flood Risk Assessment MK2

## Appendix T Chale



June 2010



### Overview

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

Chale is classified as a Rural Service Centre (RSC) and is located in the south of the Island to the west of St Catherine's Down. The Environment Agency flood zones do not extend to cover watercourses with drainage areas of less than 3km<sup>2</sup>, this has resulted in the flood zones not being produced for Chale or Chale Green. Nevertheless, the surface water modelling has provided an indication of route of the floodplain in Chale Green. Any development proposal in Chale or Chale Green, although currently in Flood Zone 1, should be accompanied by an FRA which either confirms the Flood Zone 1 location or demonstrates that any flood risks are appropriately managed in line with the requirements of PPS25.

### Sustainability and Regeneration Objectives

Development within the wider countryside will be focused on the Rural Service Centres (RSC) such as Chale 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.

Chale 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

The potential development sites identified in Chale and Chale Green are located along the corridor of the B3399, all of which have been assessed as being in Flood Zone 1. This is because the settlement of Chale Green is located at the head/source of the River Medina. The OS mapping suggests however, that the water course does extend slightly further south into Chale Green than the Environment Agency flood zones. The inconsistency between the up valley extent of the flood zones and the OS mapping is because the Environment Agency typically on model watercourses with drainage areas of more than 3km<sup>2</sup>, this threshold must be reached just down valley of Chale Green.

Two other small watercourses are identified on the OS mapping, which flow from north east to south west (St Catherine's Down to Walpan), again flood zones are not associated with these watercourses. The potential risk presented by these watercourses should be defined as part of any future development in the area.



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### Climate Change

The results of the assessment approach outlined in Section 5.2 of the SFRA report do not identify any significant increase in the extent of fluvial flood risks, as the flood zones do not extend into the settlement centre. Owing to the headwater location of this settlement and the narrow valley floor, it is likely that the increased river flows predicted as a result of climate change, will have little impact on the spatial extent of the flood risk zone.

### 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<sup>2</sup> 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 surface water modelling has highlighted a potential flow route/ponding area in the north of Chale Green. It is likely that this is an indication of the potential flood risk zone associated with the uppermost reaches of the River Medina (currently not covered by flood zones). Indeed the surface water flow route/ponding area does appear to follow the line of the river on the OS map.

The modelling also suggests that there is a potential flow route from St Catherine's Down towards Chale. The flow route appears to follow highway and the path of a small unnamed water course.

The large potential development site to the south of Chale, adjacent to the coast is highlighted by the modelling as being significantly at risk of surface water flooding. This location, under St Catherine's Hill, is very steep and topographic data in this area does not include any drainage gullies which would otherwise funnel the flow into defined flow routes. The result is an expansive *sheet* flow across the slope and water appears to being ponded behind undulations in the cliff slope. It is unlikely that the under an extreme rainfall conditions, the resultant



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patterns would reflect the modelling predictions in this particular location. The very steep nature of much of the southern coastal fringe, results in a similar pattern of surface water flooding results.

### Surface Drainage and Infiltration SuDS Potential

With the exception of the large coastal site, which is in an area of geological mass movement, the rest of Chale and Chale Green have been assessed as having a high suitability for the use of infiltration SuDS. All the identified sites are located outside the Source Protection Zones (SPZs). Nevertheless, a large SPZ is defined immediately north of Chale (in the Rookley area) and there is a small designation to the east near Niton. The SPZ mapping is however subject to change, and should be reviewed with the Environment Agency when proposing any form of SuDS solution.

### Wave Exposure Risk

The coastal margin of the large potential development site to the south of Chale is identified as being within a zone of high potential exposure risk. For details of this classification process please consult Section 6 in the main SFRA document. If this site were to be brought forward for development, the potential risks posed by the action of waves and spray should be evaluated and appropriately managed. Mitigation measures could include corrosive resistant building materials and strengthened glass. A detailed investigation of ground levels may allow for the wave exposure risk to be re-evaluated.

### Flood Risk Management Guidance and Site Specific FRAs

The principal of avoidance should be applied when considering sites within the Chale area. Any future development of the identified potential development sites in Chale and Chale Green, despite being in flood Zone 1 should be accompanied by a FRA to confirm the Flood Zone 1 designation. Currently un-modelled watercourses are considered to present a potential risk to the identified sites.

Factors to be considered in safe development could include:

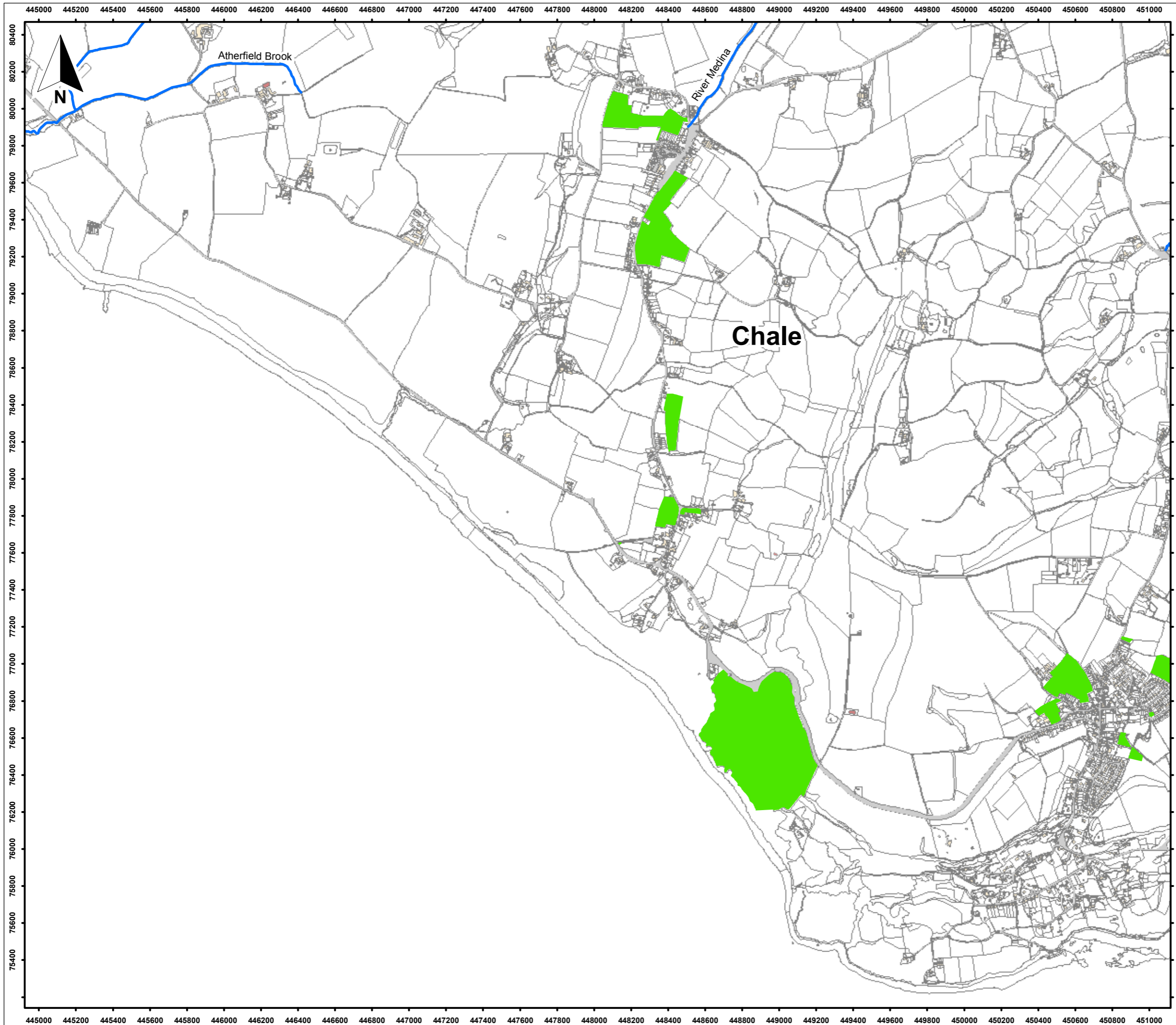
- Ensuring that the sequential approach to landuse planning is, where possible, applied on site. This approach would see more and highly vulnerable landuse types being placed in the lower risk zones.
- Finished first floor levels should be set above the predicted 1 in 100 year fluvial flood levels, plus a climate change. The Environment Agency should be consulted for fluvial flood. A freeboard allowance should be applied, again the Environment Agency should be consulted on this aspect of the design. Site specific hydraulic modelling may be required to define these levels.
- 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).



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- 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:**

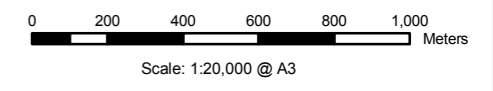
- Main Rivers

**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

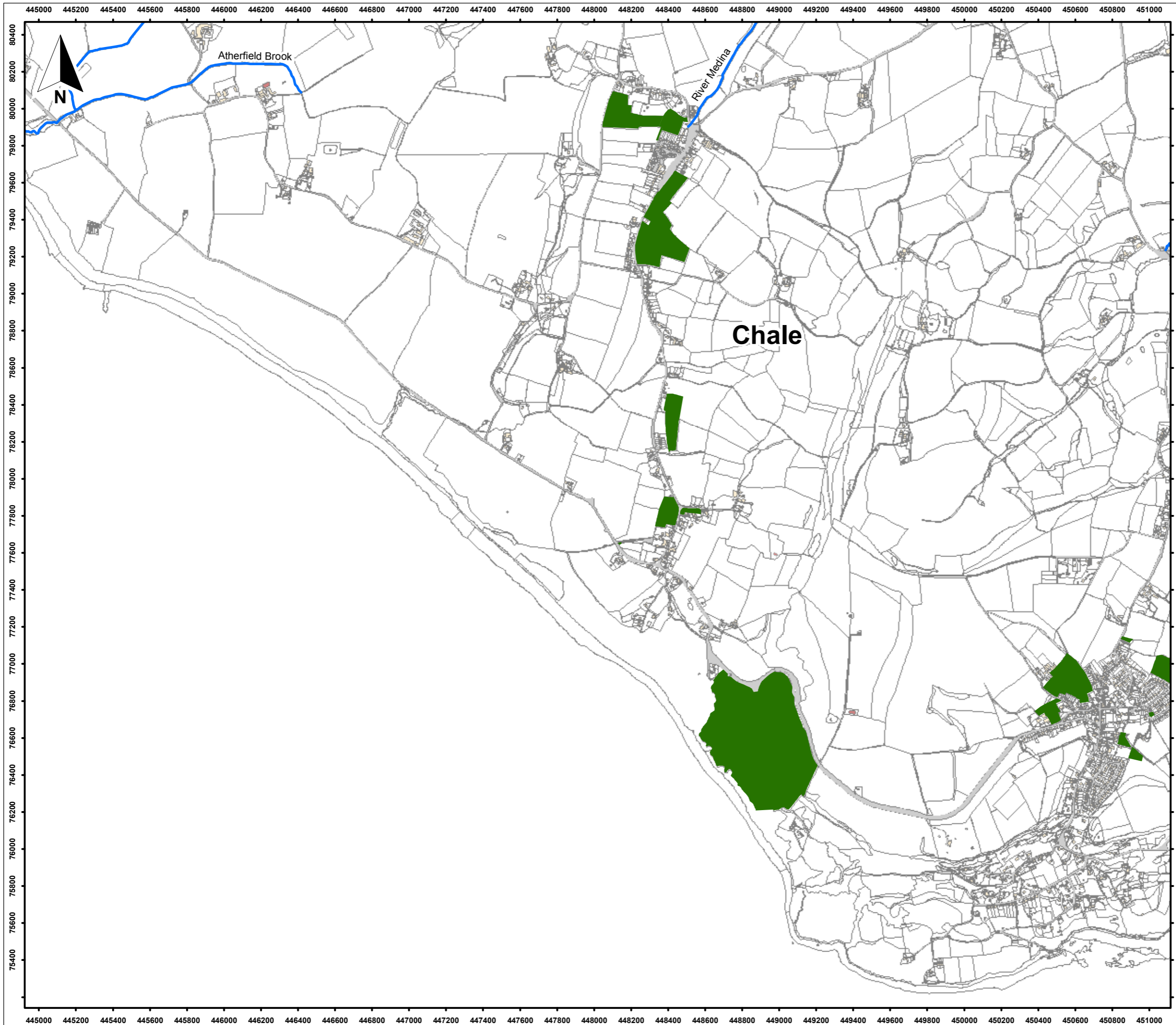


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**Figure 100**  
**Potential Development Sites**  
**Qualitative Flood Risk - Chale**

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**Key:**

- Main Rivers

**Probability of Flooding**

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

0 200 400 600 800 1,000 Meters

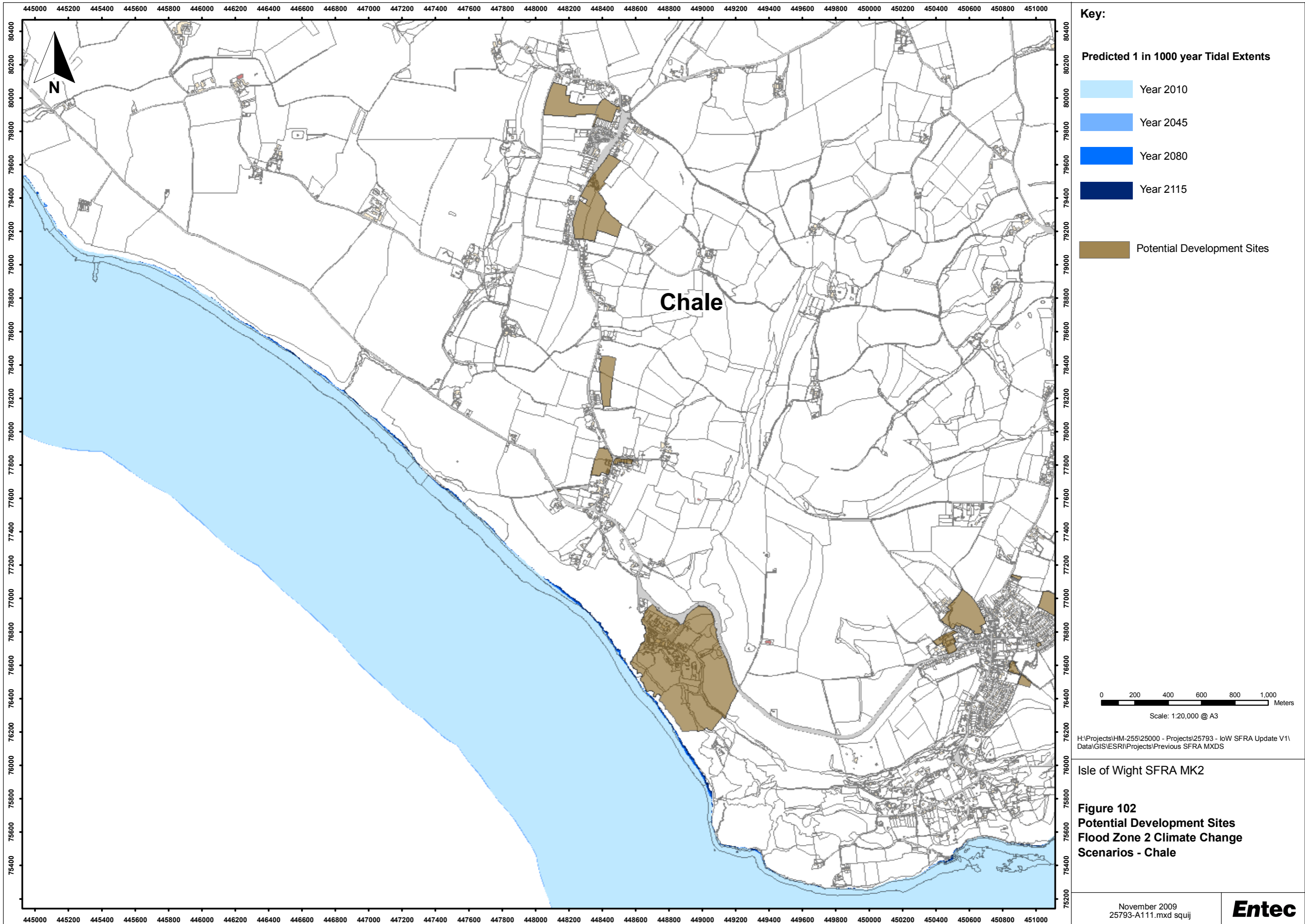
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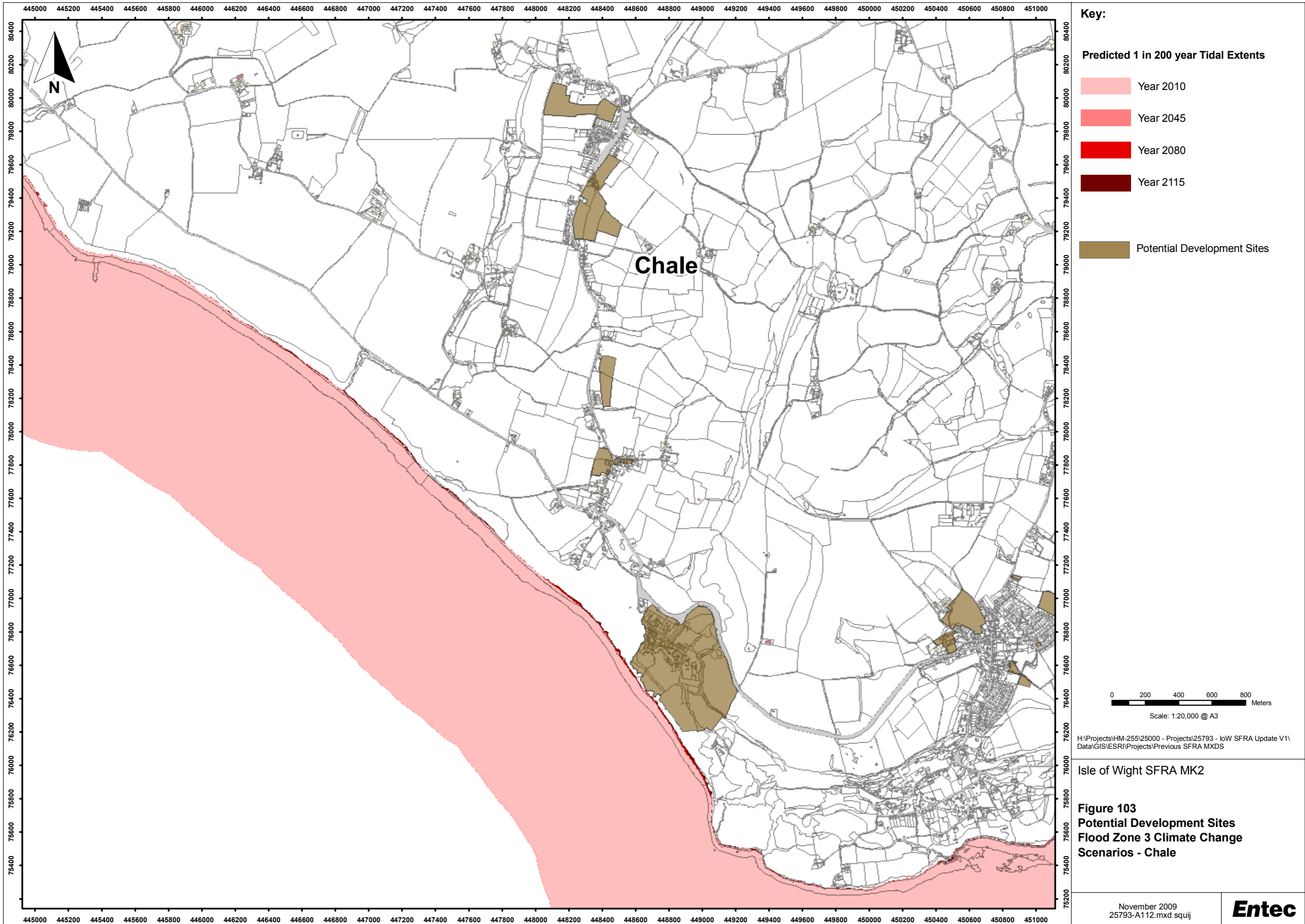
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**Figure 101**  
**Potential Development Sites Site**  
**Specific Flood Risk Definition - Chale**

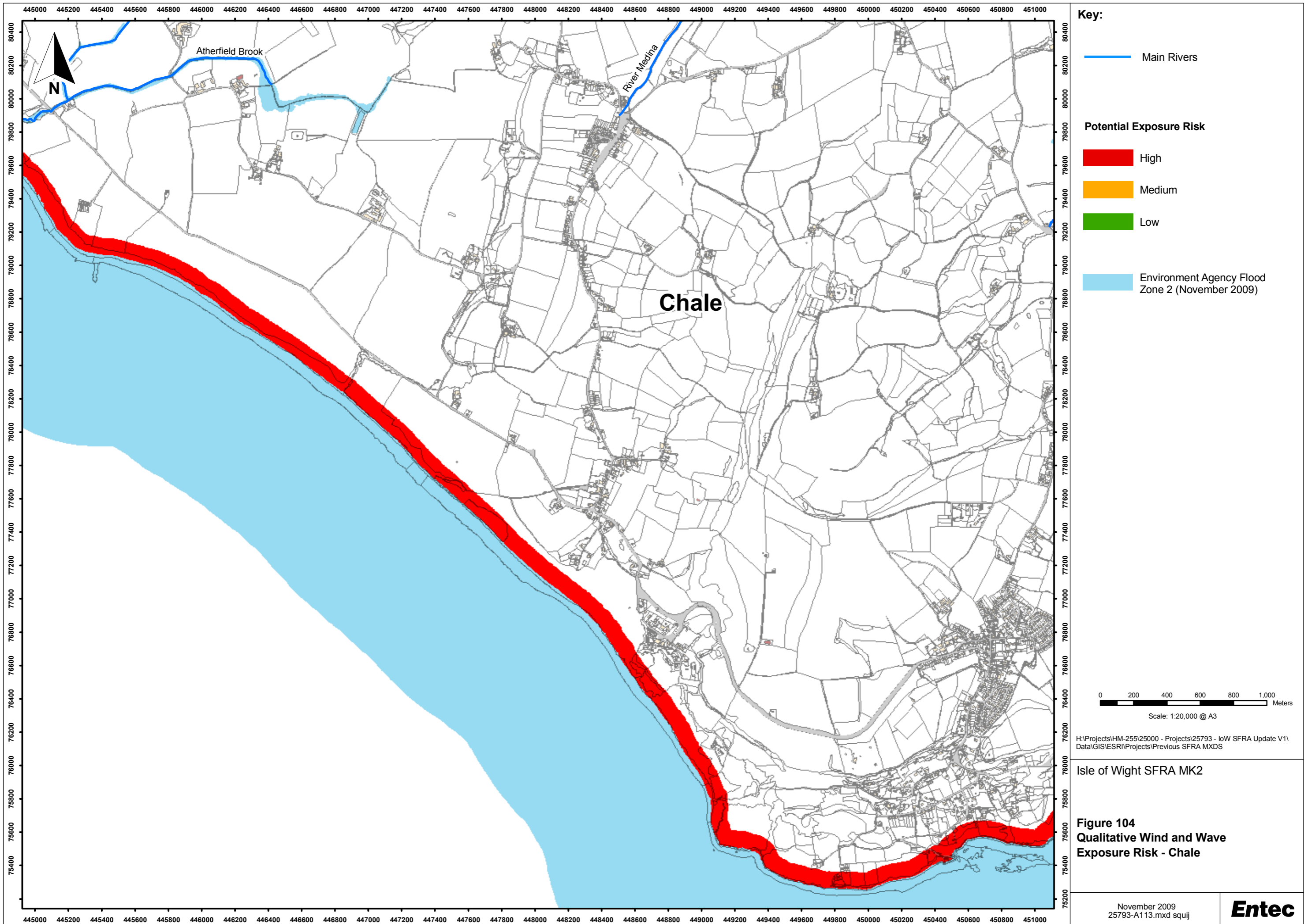
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**Key:**

- Main Rivers

**Potential Exposure Risk**

- High
- Medium
- Low

■ Environment Agency Flood Zone 2 (November 2009)

0 200 400 600 800 1,000 Meters  
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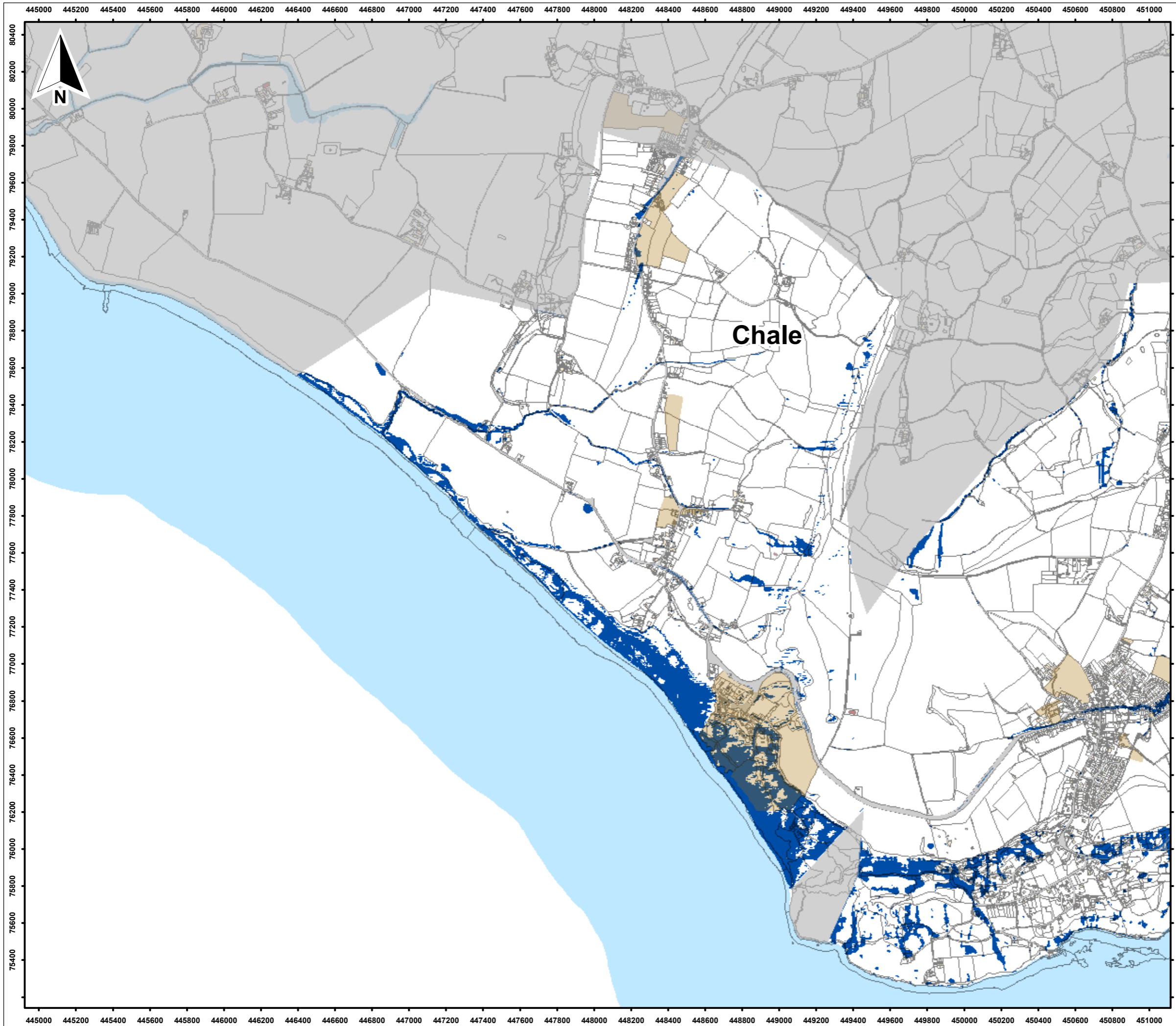
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**Figure 104**  
Qualitative Wind and Wave Exposure Risk - Chale



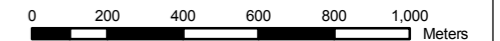
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**Key:**

- 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) Over 0.2m deep
- 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 25m<sup>2</sup> in areas are shown



Scale: 1:20,000 @ A3

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**Figure 105**  
**Potential Surface Water Flow Routes and Ponding Areas (1 in 100 year storm + climate change) - Chale**

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