

Flood Risk Assessment:

20 Nyewood Lane, Bognor Regis, West Sussex PO21 2QB

The proposals are for change of use from a detached residential house, to a house in multiple occupation. The context of the external elevations remains unchanged. The Nyewood Lane road kerb level is above road level and therefore considered an evacuation route within 6.0m of the site boundary at the extent of predicted flood. Climate change is noted as an uncertainty at this time by the Report extracts below. Where the fabric of an existing building is unchanged, it would be unreasonable to apply a change in risk, to create a greater flood risk in this location.

The Environment Agency and Arun District River Arun to Pagham Flood and Coastal Erosion Risk Management Strategy Appraisal Report 2015 identifies:

The Problem

1.2.1 The Strategy frontages include sand and shingle beaches, beach control structures, earth bunds and concrete walls. At Aldwick and Middleton, these defences protect against the primary risk of coastal erosion. The defences also provide protection from flooding and the risk of breach at specific vulnerable points in all frontages. There are currently 561 total properties at risk of flooding from the sea and the west bank of the River Arun in a 1 in 200 flood event. Although concerns exist over erosion risk to properties at Pagham Beach, this lies beyond the boundary of this Strategy and is an area which will not be affected by recommended options. There are no properties imminently at risk from erosion in this Strategy's area.

1.2.2 The Standard of Protection (SoP) against flood risk varies along the frontages, ranging from 1 in 5 (20%) annual exceedance probability (AEP) at Middleton (overtopping) to 1 in 500 (0.2%) AEP at Elmer. However, this relies on continued maintenance of existing sea walls, groyne fields and beach levels. The volume of shingle on the beach has reduced over recent years, leading to exposure of the sea walls and increasing the risk of breach and erosion. A number of beach control structures have an estimated residual life of less than five years. The flood defence assets on the River Arun West Bank frontage vary in condition and standard of protection (as low as 1 in 10 (10%) in places).

1.2.3 If defences were not maintained, in 100 years the total number of properties at coastal flood and erosion risk would rise to 3,034 (including 319 at only erosion risk).

1.2.4 Securing funds to maintain and repair the existing defences will be a challenge. This Strategy provides risk management authorities with clarity on the technical issues that can be used as a framework for negotiating and securing contributions for future work.

1.2.5 The Strategy lies predominantly within the Sussex Coastal water body. This is a heavily modified water body with a WFD objective to reach Good Ecological Potential by 2027 through implementation of hydro-morphological mitigation measures.

1.4 Recommended Strategy and Economic Case

1.4.1 For the Elmer, Middleton, Bognor Regis, Felpham and Aldwick frontages, we recommend Maintain options. Details of options recommended for all frontages are provided in Table 1-1.

1.4.2 We recommend 'Do Minimum (coastal) and Sustain (river)' for the Climping and River Arun West Bank frontage.

1.4.3 For the section of Climping coastal frontage that is not covered by legal agreements, the cost of major repair or renewal of defences is more than the economic benefits of doing the work. We recommend that Do Minimum maintenance should be undertaken as long as the benefit of ongoing flood risk management work remains greater than the costs. Once it becomes uneconomic to continue investment, or there is a significant breach in the defences requiring costly repairs, the Environment Agency will no longer be justified in further expenditure and will be required to cease maintenance. As with all recommendations, implementation of Do Minimum works at Climping are subject to funding being available.

1.4.4 For the section of frontage covered by legal agreements, the recommended Do Minimum (Legal) means carrying out work needed to comply with the existing agreements. The

Environment Agency will continue to engage with the landowners concerning the requirements of the agreements and the future management of the affected coastline.

1.4.5 The recommendations accord with SMP and CFMP policies, apart from the proposed managed realignment west of Climping which was rejected as, environmentally the topography does not suit this option and economically its selection is not justified.

1.4.6 The recommended Strategy options are not expected to cause deterioration in status of any waterbodies or prevent them from meeting their RBMP objectives, and are therefore considered compliant with WFD. Under the preferred options, beach management practices undertaken sensitively will contribute to the WFD objectives of the Sussex Coastal water body relating to beach control and preserving habitats. Letters of support for the Strategy have been received from Natural England and Arun District Council.

Table 4-5 Short listed options:

Aldwick Option Description Do Minimum • Patch and repair of defences and recycling of beach material. • This process will delay the predicted Do Nothing erosion process by up to ten years. • This option has been short-listed solely as it is the fall back option should the preferred option not be affordable. Maintain • Maintain defence heights at current levels (including some significant remedial works to repair current assets), which will prevent beach loss, erosion damages. • Beach recharge and recycle works would be required with a programme of replacement and ongoing maintenance of timber groynes. • The rock revetment toe at Dark Lane would need to be extended. • Implementation of the Maintain option over the 100 year period will prevent erosion of the frontage. The beach management investment will also serve to mitigate the overtopping issues at Dark Lane and provide a more consistent SoP across the whole frontage. Based on predictions in sea level rise, the minimum SoP for the frontage to overtopping would be 5%AEP in 100 years time. Sustain • Generally as for Maintain but with an increased intensity of beach recharge and recycling. Works to ensure a consistent SoP of 0.5% AEP (1 in 200) along the frontage would result in no damage due to overtopping or erosion throughout the appraisal period.

5.2 Environmental Assessment

5.2.1 We undertook a Strategic Environmental Assessment (SEA) and produced an Environmental Report (Appendix C) to assess the environmental impacts of the short-listed options on all of the relevant receptors for each of the Strategy frontages. We produced an Addendum to the SEA Environmental Report to consider the revised options for Climping (Appendix C). 5.2.2 Within the SEA, each short-listed option was assessed for impacts on the SEA objectives. The impacts were assessed by their 'significance of impact' on the objectives to determine their environmental ranking. The option with the lowest ranked score is the SEA preferred option. The summary of this assessment is shown in Table 5-1. The Elmer Sustain option was not assessed by the SEA as it had been discounted in the early stages of the economic appraisal (see Tables 4-2 and 6-2).

5.2.3 The SEA preferred option is to Sustain for Climping, Middleton, Bognor Regis and Felpham and Aldwick. For the River Arun West Bank it is Improve and for Elmer it is Maintain. The main determining factor was the retention of the current level of flood risk to life and property into the future under these options. The Strategy's economic appraisal, however, found that the level of capital investment required to deliver the SEA preferred options may not be economically justified in every frontage. 5.2.4 In May 2010 we completed an assessment for compliance with the Water Framework Directive (WFD) (Appendix M) and this was subsequently updated in April 2012 to consider the revised Climping options appraisal. The WFD compliance of each option is described in Chapter 6.

6.1.23 The economically preferred option is to Maintain the Aldwick frontage. This option has the highest BCR. It is not possible to step up to Sustain since the IBCR is zero. 6.1.24 The environmentally preferred option for Aldwick is Sustain since this protects the highest number of receptors from flood and erosion risk over time. Maintain is still considered to provide adequate protection over the short term and was preferred over Do Minimum since beach profiles would be maintained protecting amenity value and habitats. 6.1.25 The WFD assessment concluded that this option would not cause a deterioration in

status of any water bodies, and that hydro-morphological mitigation measures for Sussex Coastal relating to beach control and preserving habitats could be delivered through sensitive beach management practices.

Climate Change Uncertainty

6.2.6 The application of the 2011 Climate Change advice is addressed in Section 5.1. Specific impacts are described below. 6.2.7 The Sustain element of the preferred option for the River Arun frontage is where application of the Lower scenario curve may have the most impact on the economic analysis. The damages for all options will be reduced most likely in proportion to each other. For the Sustain option, the costs will reduce as defences can be built lower and future interventions can be delayed or may no longer be required. The effect of climate change on the Climping frontage is likely to be small, due to the short residual life of defences under the do minimum recommendation.

6.2.8 For the remaining four coastal flood cells at Elmer, Middleton, Bognor and Felpham and Aldwick, the draft Strategy recommends to 'Maintain' the existing defences. Based on trends of the Central and Upper estimate 2011 climate change data compared to the 2006 data used by this Strategy, it is considered there is unlikely to be enough difference to change the draft Strategy recommendations in the short to medium term. The Lower estimate scenario prediction starts to diverge away from the current trends from around 2025. The application of this lower estimate is highly unlikely to change the preferred Maintain option for the coastal frontages, but may delay the need for certain capital works. Under this option, no work is currently being proposed which will prevent any changes in management of flood and coastal risks in the future, should the Lower estimate prediction of climate change be realised. 6.2.9 We conclude that the new Adapting to Climate Change Advice does not influence the investment decision recommended by this Strategy in the short to medium term.

Aldwick

7.2.35 The Strategy recommends maintaining the existing defences at their current levels at Aldwick. This will require investment to replace the existing groyne fields, annual beach monitoring and recycling and periodic beach recharge as shown in Table 6-10. Delivery of this is reliant on Natural England assent to recycle beach material through the Bognor Reef SSSI. 7.2.36 If funding isn't available for Aldwick, the principal risk is from erosion as a result of failure of the sea wall at Dark Lane with flooding from wave overtopping a secondary concern. Providing the rock revetment can be reformed and the beach re-profiled, it is estimated that the minimum maintenance option could extend the life of the defences by ten years when compared to the Do Nothing scenario.

Source : The Environment Agency and Arun District River Arun to Pagham Flood and Coastal Erosion Risk Management Strategy Appraisal Report 2015.

The property is identified location in Flood Zone 1 :

Site and perimeter boundary have Low probability of flooding: Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.

Road and part of frontage Flood Zone 3 shown in light mauve on the Flood Map and identifies that the road level is such that flood may occur across the site frontage, partially impeding access and escape. Flood zone 2 does not appear to reach the site.

Assessment

The property location is identified within and above defined flood zone 1. There is no actual record of flooding on the site. From the flood risk evaluation table 3, Zone 3a, indicates "More Venerable" development may be appropriate with an exception test.

Flood map for planning surface water flood risk.

Water depth in a low risk scenario is identified as below 300mm, the site is identified with ground level as above flood level.

Flood map for planning extent of flooding from sea or river flood risk.

Water depth in a low risk scenario, the site is identified with ground level as above flood level.

Estimated flood Levels.

The building floor level is interpolated at 6.3m above ordnance datum with ground level 150mm below floor level. The site is identified more than 25m from the sea. The change of use of the existing building fabric, will not increase risk elsewhere.

Climate change

Allowance for the South East over 100 year period, higher allowance indicated as 13.1mm change in level.

Floor level

Floor level is unchanged. External ground levels are 150mm below floor level.

Flood resistance and resilience.

Introduction of measures to protect the property, assess where water might enter the building.

Supporting plans

Plans by hda projects ltd

2021 32 01 Block and location plans

2021 32 02 Plans as Existing

2021 32 03 Elevations as Existing

2021 32 04 Plans as Proposed

2021 32 05 Elevations as Proposed

2021 32 06 Perspective Views

Relevant standing advice when appropriate:-

Doors and window openings to be flood resistant to at least 600mm above estimated flood level.

Proprietary demountable door flood barrier at each entry door.

Raise all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level

Making it easy for water to drain away after flooding such as installing a sump and a pump

Making sure there is access to all spaces to enable drying and cleaning

Ensuring that soil pipes are protected from back-flow such as by using non-return valves

Where appropriate anti flood air brick, non return valves on drainage pipes, sealing around cable entry points and any cracks.

Check house insurance providers requirements.

Soakaways

Surface water drainage serving the existing property no change.

Environment Agency

<https://www.gov.uk/guidance/flood-risk-assessment-standing-advice#standing-advice-for-vulnerable-developments>

