Kelling to Lowestoft Ness Shoreline Management Plan

Appendix H: Economic Appraisal

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Contents

H1   Introduction

A review of economic viability has been carried out for the policies determined to deliver the SMP Plan. A review has not been carried out for locations where no capital or maintenance expenditure is envisaged.

It should be noted that this review is <u>not</u> to establish the economic justification for a scheme (as defined by FCDPAG3), simply to make a broad assessment of the economic robustness of the preferred policies. The economic review therefore determines whether or not each policy is:

- clearly economically viable
- clearly not economically viable, or
- of marginal viability (and therefore may be in need of more detailed assessment at a later date, e.g. as part of a strategic plan, although some commentary on this is provided within this report).

It must be recognised that the justification for a particular policy is not necessarily dependant on economic viability, as impacts on other benefits may be considered more important (e.g. holding existing defences to sustain a designated habitat). Any policies where this is the case could be considered economically insufficient under current Treasury guidance.

The following sections detail how the economic assessment has been undertaken. This is followed by a series of economic statements for each policy unit, and spreadsheets providing the numerical analysis performed as part of the SMP (see Annex H1).

H2   Use of existing information

A number of strategy plans and scheme assessments have been developed for this coast over recent years. These contain detailed information on assets, benefits, and management costs. Where this is directly applicable, such information has been used, e.g. at Gorleston.

However, the justifications in these previous studies are only applicable if all other aspects are the same, i.e.

- the timeframe: many strategies have looked at economics over only 50 years and use different discount factors to those now required by Treasury
- the area determined to be at risk: the SMP may have a modified assessment of the area that could be affected by erosion or flooding
- the preferred option matches that from the strategy: the SMP may be advocating a change from previous policy or management practice.

Where the above conditions are not realised, some of the raw data from the strategy plans has still been used, where it is readily available, as it is useful in validating or modifying information from the broad-scale SMP assessment.

H3   Generation of new data

Where there is not existing information that can be used directly to confirm robustness of the SMP policy, new economic data has been derived through application of the Modelling and Decision Support Framework (MDSF) tool (which consists of a customised GIS (ESRI ArcView) and a data management toolkit). This 'Broad-scale Economic Review', described below, uses nationally available information on property locations and values and the risk maps developed through the assessment of shoreline interactions and responses (see Appendix C: Baseline Process Understanding). In line with the guidance this assessment does not take into account wider economic issues, such as tourism revenue. Where appropriate, further studies are included in the SMP Action Plan, which are designed to allow local economic factors to be taken into account.

H3.1   DETERMINING DAMAGES AND BENEFITS

The benefits are the damages averted or deferred by the Plan, i.e. the difference in losses between implementing this and No Active Intervention (NAI) scenario. These have been calculated for each epoch.

Although the policy appraisal has determined a zone of likely future erosion, only the most landward extents of the indicative erosion zones, for the periods 0 to 20, 20 to 50 and 50 to 100, have been used. These lines have been mapped and overlain with the property location/value data to calculate potential economic losses and economic benefits for the NAI scenario and the preferred scenario. However, where the economic appraisal indicates a marginal case, an assessment has been undertaken with regard to the impact of assuming a lower rate of erosion.

In calculating damages and benefits for the preferred scenario, no account has been taken of the potential for short-term accelerated or delayed losses down-coast compared to NAI, other than the total adjustment in shoreline position at the end of each epoch.

The SMP does not take account of standards of protection as it is only defence management policy that is being determined, whereas standards of protection relate to implementation (which will be determined at strategy level).

H3.1.1 Benefit values

Losses and benefits have been calculated only on the basis of residential and commercial property values. Other assets, such as utilities, highways, and intangibles, such as recreation, impacts upon the local economy or environment, have not been valued or included. Exclusion of these factors will robustly confirm economic viability, as these would provide added value.

Losses and Benefits have been calculated using MDSF. This was populated with the Address Point dataset, which identifies the location of residential properties, and current average residential property prices were obtained from www.upmystreet.co.uk, which provides property price statistics by postcode. For non-residential properties, commercial values have been obtained from the Focus database (from the Valuation Office).

Using the 20, 50 and 100 year erosion contours, MDSF has been used to calculate the Capital Value (CV) and discounted Present Value (PV). For the flood risk areas (generally defined by the coastal and tidal/fluvial IFM), GIS has been used to simply sum the CV for all built assets within the flood area, using the same data as above. This is based upon the assumption that under NAI, all properties at risk would be written off once defences failed. This is taken as an indicative figure for the assets potentially protected by defence structures.

H3.1.2   Generation of new defence cost information

Future coastal defence management approaches for each Policy Unit have been developed as part of the Plan. From this, the broad replacement and maintenance requirements for each epoch have been determined.

Where there is no existing information relating to future defence costs for an area, e.g. from a strategy plan, costs have been generated using other nationally available information.

(a)   Cost Rates

Replacement costs for general defence types have been taken from the recently developed Environment Agency database. This suggests average replacement costs for linear structures (e.g. revetments, seawalls) as £2.7million/km and costs for beach management schemes at £5.1million/km. Groyne field costs are taken as £0.6million/km.

Maintenance costs have been taken from the Defra National Appraisal of Defence Needs And Costs (NADNAC) study (2004). This used annual maintenance costs for linear structures and for groyne fields of £10,000/km, and for beach schemes £20,000/km.

Both replacement and maintenance costs for "low cost" defence structures (e.g. timber revetments) have been taken to be the same rate as for timber groynes.

(b)   Cost Calculations

It has been assumed that the timing of full scheme reconstruction required (i.e. design life) is at least once every 100 years for linear defences such as seawalls, every 50 years for beach schemes and every 30 years for groynes. However, these periods may become more frequent for areas where erosion potential is high and where areas are prominent, e.g. Cromer, and thus subject to increasingly high exposure. Maintenance has been assumed to be the same rate every year throughout the life of the scheme; however, in reality, this will be less in early years and will increase in later years of the scheme's life.

Allowance has also been made for the increase in costs due to climate change, based upon factors developed for the NADNAC study (2004). This takes account of the need to make structures higher, deeper, and more resilient to increased exposure. The assumptions were: no cost increase for the 0-20 year epoch; costs factored up by 1.5 times present day rates for the 20-50 year epoch; and costs factored up by 2.0 times present day rates for the 50-100 year epoch.

Optimism bias, in accordance with most recent Defra guidelines, was finally applied to all costs (at 60%) to reflect uncertainty in broad level analysis at the SMP scale.

H3.2   COMPARISON OF COSTS AND BENEFITS

As this review is not a full economic assessment, a formal benefit-cost assessment using BCR has <u>not been</u> conducted; rather, the information available has been used to review robustness of the Plan.

In comparing likely benefits and likely costs for the policies for an individual location over the full 100 year period it is, however, still useful in some instances to be able to consider these in terms of Present Value (PV).

Present Value is the value of a stream of benefits or costs when discounted back to the present day. For this SMP the discount factors used are the latest provided by Defra for assessment of schemes.

For calculation of PVdamages and PVbenefits, the approximate timing of property losses has been determined using MDSF and corresponding discount factors applied accordingly. For calculation of PVcosts for defence replacement, the average discount factor for each epoch has been used, the actual timing of works being uncertain at present. The year-on-year maintenance PVcosts have been calculated using the total of the discount rates for that epoch.

H4   Economic appraisal summary table

The Table below provides a summary of the economic review of the preferred Plan for each Policy Unit; it outlines any information used in this review, including benefits (property only) and costs, together with a statement on economic robustness.

Supplementing these tables are summary pages setting out the economic damages for No Active Intervention and the Plan, together with a calculation sheet identifying the build up of defence costs; these are included in Annex H1.

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
6.01	Kelling Hard to Sheringham	No previous studies have been referred to.	***NAI Damages:*** By 2025: none By 2055: up to £0.4m By 2105: up to £1.1m	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	
6.02	Sheringham	Strategy study in progress – no data currently available.	***NAI Damages:*** By 2025: none By 2055: up to £1.8m By 2105: up to £106.9m ***Preferred Plan Damages:*** By year 2025: none By year 2055: none By year 2105: none	Extend linear defences. Maintenance of all structures. Cost: £1.8m See details for years 50 to 100	Extend linear defences. Reconstruct groynes. Maintenance of all structures. Cost: £7.3m See details for years 50 to 100	Reconstruct linear defences. Maintenance of linear defences. Cost: £14.0m The plan for this Policy Unit to hold the present line over 100 years is **Economically Robust**. Whilst the PVbenefit of up to £8.1m compares to a PVcost of £5.0m, the capital value of property protected is £107m, compared to a	*It is possible that under NAI the seawall along the main frontage could fail earlier than anticipated which would increase the PVbenefit.* *It should also be noted that only property benefits have been considered and that inclusions of*

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[1] The maximum extents of the indicative erosion zones were used in MDSF calculations

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
						cost over the same period of only £23m, a ratio of nearly 5:1.	*other assets such as infrastructure could significantly increase the PVBenefit.*
6.03	Sheringham to Cromer	Strategy study in progress – no data available at time of review.	***NAI Damages:*** By 2025: none By 2055: up to £0.2m By 2105: up to £2.5m	Maintenance to existing walls at beach gaps. Cost: <£0.1m	No defence works	No defence works	*Benefit provided by the beach access points has not been included in the calculation.*
				The economic case for doing these works needs to be assessed at a local level against the benefits of providing beach access and extending the period of protection to local utilities. **Marginal**.	No economic case to be made	No economic case to be made	
6.04	Cromer	**Cromer Strategy Study:** Calculated property value of £52m assuming 50 year Do Nothing. Various options reviewed for 50 Year scheme including: Seawall = 4.2m PVcost Groynes = 2.6m PVcost Rock groynes = 2.4m PVcost	***NAI Damages:*** By 2025: none By 2055: up to £72.6m By 2105: up to £137.4m ***Preferred Plan Damages:*** By year 2025: none By year 2055: none By year 2105: none	Construct beach scheme. Maintenance of groynes and existing seawall. Cost: £14.1m See details for years 50 to 100	Extend linear defences and replace groynes. Maintenance of all structures. Cost: £6.0m See details for years 50 to 100	Reconstruction of linear defences. Maintenance of linear defences. Cost: £18.7m The plan for this Policy Unit to hold the present line over 100 years is **Economically Robust**, with a PVbenefit of up to £24.8m compared to a PVcost of £13.9m.	*It is possible that under NAI the seawall along the main frontage could fail earlier than anticipated which would increase the PVbenefit. It should also be noted that only property benefits*

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		Nourish = 5.3m PVcost					*have been considered and that inclusions of other assets such as infrastructure could significantly increase the PVBenefit.*
6.05	Cromer to Overstrand	No previous studies have been referred to.	**NAI Damages:** By 2025: none By 2055: none By 2105: up to £0.2m	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	
6.06	Overstrand	**Overstrand to Walcott Strategy Study:** No cost-benefit data available, but calculated property value of £57.9m assuming 100 year Do Nothing (which differs from erosion zone used in this SMP) Additional information from this study is the replacement costs for outfalls and pumping stations (£1.7m).	**NAI Damages:** By 2025: up to £7.9m By 2055: up to £13.4m By 2105: up to £30.3m **Preferred Plan Damages:** By year 2025: up to £0.4m By year 2055: up to £13.0m By year 2105: up to £29.9m	Maintenance to existing seawall, groynes and timber revetment. Cost: £0.7m	No permanent defence works or maintenance. *Provide temporary erosion slowing measures if required, and acceptable, in due course.* *(Estimated cost: £1.6m)*	No permanent defence works or maintenance. *Provide temporary erosion slowing measures if required, and acceptable, in due course.* *(Estimated Cost: £2.1m)*	
				The plan for this Policy Unit to hold the present line over 20 years is **Economically Robust**, with a PVbenefit of up to £4.5m compared to a PVcost of only £0.5m.	The additional cost of temporarily deferring erosion as relocation takes place will need to be economically tested on a needs basis at that time.	The additional cost of temporarily deferring erosion as relocation takes place will need to be economically tested on a needs basis at that time.	*Even assuming a lower erosion rate any maintenance works are expected to be economically justifiable.*
6.07	Overstrand to Mundesley	**Overstrand to Walcott Strategy Study:** No cost-benefit data	**NAI Damages:** By 2025: up to £1.6m	No defence works **No economic case to**	No defence works No economic case to	No defence works No economic case to	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		available, but calculated property value of £57.9m assuming 100 year Do Nothing.	By 2055: up to £7.7m By 2105: up to £21.0m	**be made**	be made	be made	
6.08	Mundesley	**Overstrand to Walcott Strategy Study:** There was no benefit-cost assessment available at the time of the SMP policy appraisal, although information was available valuing property at £35.1m. However, this is for all property in an area which extends landward of the 100 year NAI high-erosion contours identified by this SMP. Additional information from this study is the cost for permanent diversion of the highway (£1.3m) and replacement costs for outfalls and pumping stations (£1.4m).	_**NAI Damages:**_ By 2025: up to £4.7m By 2055: up to £23.4m By 2105: up to £48.2m _**Preferred Plan Damages:**_ By year 2025: up to £1.1m By year 2055: up to £1.3m By year 2105: up to £48.2m Comparison with Strategy Study data suggests that these figures are an overestimate of property values.	Replace timber revetment and extend linear defences. Replace groynes. Maintenance of all structures. Cost: £2.7m See details for years 20 to 50	Maintenance of all linear structures. Cost: £1.2m The plan for this Policy Unit to hold the present line over 50 years is **Economically Robust**, with a PVbenefit of up to £7.7m compared to a PVcost of only £2.3m (even allowing for the possible overestimate of property values the capital value of property protected against cost of doing so has a ratio of approximately 5:1).	No permanent defence works or maintenance. *Provide temporary erosion slowing measures if required, and acceptable, in due course. (Estimated cost: £3.3m)* The additional cost of temporarily deferring erosion as relocation takes place will need to be economically tested on a needs basis at that time.	*Assuming a lower rate of erosion along the Cliftonville frontage, PVbenefit may reduce to as low as £1.2m, although defence needs and costs will also be lower. It should also be noted that only property benefits have been considered and that inclusions of other assets such as infrastructure would increase the PVBenefit.*
6.09	Mundesley to Bacton Gas Terminal	**Overstrand to Walcott Strategy Study:** There was no benefit-cost assessment available at the time of the SMP policy appraisal, although	_**NAI Damages:**_ By 2025: up to £1.9m By 2055: up to £3.5m By 2105: up to £11.1m	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	*Some benefit is achieved in this Policy Unit as a consequence of the policies to the north and*

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		estimated a property valuation figure of £75.4m for coastline between Mundesley and Walcott i.e. not an equivalent area.	***Preferred Plan Damages:*** By year 2025: up to £1.6m By year 2055: up to £2.7m By year 2105: up to £11.1m				*south.*
6.10	Bacton Gas Terminal	**Overstrand to Walcott Strategy Study:** Estimated a valuation figure of £250m for BGT and estimated costs for replacement of shafts = £73m.	***NAI Damages:*** By 2025: none By 2055: none By 2105: none	Construction of new linear defence. Maintenance of linear defence. Cost: £5.1m	Maintenance of linear defence. Cost: £0.8m	No defence works	*No AddressPoInt data was available for BGT.*
			Preferred Plan Damages: By year 2025: none By year 2055: none By year 2105: none	See details for years 20 to 50	PVcost of £3.9m, therefore assuming Strategy figures, the plan for this Policy Unit to hold the present line over 50 years is **Economically Robust**.	No economic case to be made	
6.11	Bacton, Walcott and Ostend	**Overstrand to Walcott Strategy Study:** There was no benefit-cost assessment available at the time of the SMP policy appraisal, although information was available valuing property at £75.40m for coastline between Mundesley and Walcott, i.e. not an equivalent area. The risk zone is also not as predicted by this SMP. Additional information	***NAI Damages:*** By 2025: up to £16.6m By 2055: up to £32.2m By 2105: up to £65.8m ***Preferred Plan Damages:*** By year 2025: up to £5.3m By year 2055: up to £ 33.3m By year 2105: up to £65.8m	Maintenance of existing seawalls, timber revetments and groynes Cost: £2.2m	No defence works	No defence works	
				The plan for this policy unit is **Economically Robust** with a PVbenefit of £7.1m compared to a PVcost of only £1.6m.	No economic case to be made	No economic case to be made	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		from this study is the cost for permanent diversion of the highway at Walcott (£1.3m).					
6.12	Ostend to Eccles	**Ostend to Cart Gap Strategy Study:** Estimated a replacement cost of Happisburgh Church of £5.5m. **Ostend to Cart Gap Strategy Implementation Review:** For Happisburgh village alone determined benefits as £1.0m (discounted value £0.6m) over 50 years. (This compares to the PV of 1.5m calculated by the original Strategy study).	*NAI Damages:* By 2025: up to £2.2m By 2055: up to £4.0m By 2105: up to £6.6m	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	
6.13	Eccles to Winterton Beach Road	**DETAILS TO BE PROVIDED BY HAPP-WIN STRATEGY REVIEW**	No calculation undertaken – awaiting information from the Happisburgh to Winterton Strategy Review.	*(awaiting information)* *(awaiting information)*	*(awaiting information)* *(awaiting information)*	*(awaiting information)* *(awaiting information)*	
6.14	Winterton to Scratby		*NAI Damages:* By 2025: up to £0.2m By 2055: up to £10.7m By 2105: up to £29.6m	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	
6.15	California (to Caister-on-		*NAI Damages:*	Maintenance of rock bund, rock groynes and	No defence works	No defence works	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
	Sea)		By 2025: none By 2055: up to £14.7m By 2105: up to £22.6m ***Preferred Plan Damages:*** By year 2025: none By year 2055: up to £10.6m By year 2105: up to £21.0m	walls. Cost: £0.4m			
				See details for years 20 to 50	With a PVbenefit of £1.4m by 2055, a PVcost of £0.3m in the first 20 years (i.e. by 2025) means that this policy will be **Economically Robust**. *It should also be noted that only property benefits have been considered and that inclusions of other assets such as infrastructure could significantly increase the PVBenefit.*	No economic case to be made	
6.16	Caister-on-Sea	**Caister Seawall Repair: Final Appraisal Report:** Direct benefits for 50 year scheme valued at £4.64m (PV £2.1m), with an additional estimated cost of relocating a mains sewer of £0.5m.	***NAI Damages:*** By 2025: none By 2055: up to £4.9m By 2105: up to £21.1m ***Preferred Plan Damages:*** By year 2025: none By year 2055: none By year 2105: up to £6.0m Year 50 PVb from Caister Seawall Repair report of £2.5m compares with PVb of only £1.5m from Broad-scale Review, i.e. need to consider	Some reconstruction of existing defences (depending upon Ness migration). Maintenance of beach and control structures. Cost: £6.0m	Maintenance of beach and control structures. Cost: £3.7m	No defence works planned although some measures may be appropriate at a later date.	
				See details for years 50 to 100	See details for years 50 to 100	Whilst the total damages averted/delayed over the next 100 years is nearly £16m, this only has a PVbenefit of £2.3m, which compares with a PVcost of 5.4m for works up to year 2055. Consequently	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
			that benefits may be up to 40% higher due to additional assets.			this approach would appear to be ***Not Economically Viable.*** However, it should be noted that the capital value of property protected would be almost double that spent on defence management. The assessment has also only taken account of property not other assets such as infrastructure. Furthermore, PVb may be higher than quoted here, whilst without ness migration, the PV costs are likely to be closer to £2.6m; therefore case may be **marginal to viable**. This needs more detailed review as part of subsequent strategy work.	
6.17	Great Yarmouth	No economic appraisal was undertaken in the Great Yarmouth Shoreline Management Strategy Study. Broad-scale	***NAI Damages:*** By 2025: uncertain By 2055: uncertain By 2105: uncertain	Reconstruction of linear defences where required. Maintenance of seawalls and groynes. Cost: £10.2m	Replacement of some linear defences. Maintenance of linear defences. Cost: £7.2m	Maintenance of linear defences. Cost: £4.5m	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		assessments were undertaken as part of the NADNAC study (property only): this calculated 100 years discounted erosion damages of £8.9m and flood damages of £2.0m, but this increased to £4.3m if the area to the south of the river (i.e. landward of Gorleston) was included. These are likely to be underestimates, due to both the broad scale of analysis.	*Preferred Plan Damages:* By year 2025: none By year 2055: none By year 2105: none	See details for years 50 to 100	See details for years 50 to 100	PVcost of £10.0m This needs more detailed investigation to accurately identify areas that would be at risk from flooding. But highly likely this will be **economically robust**, particularly in view of Outer Harbour developments and from using the broad-scale NADNAC data (which does not take account of infrastructure and intangibles).	
6.18	Gorleston	**Gorleston Project Appraisal Report:** Assets valued at £81m (PV) for 100 year Do Nothing, although this includes a £40m allowance for relocating the sewerage works buried beneath the Lower Esplanade and Marine Parade.	*Although damages have been calculated and are included in the accompanying data sheets, the Strategy provides more detailed data which is directly applicable and has therefore been used in the Economic Review.*	Construction of 8 shore-parallel rock reefs, with recharge in years 5 and 10, followed by maintenance recharge and seawall maintenance. Cost: £8m	Maintenance beach recharge and annual monitoring Cost: £5.2m	Maintenance beach recharge and annual monitoring Cost: £3.5m	*At time of SMP, scheme awaiting approval*
				See details for years 50 to 100	See details for years 50 to 100	Strategy Study determined a PVcost of £10.3m compared with a PVbenefit of up to £81m, therefore the plan for this Policy Unit to hold the present line over 100 years is **Economically Robust**.	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	**Broad-scale Review (this SMP)[1]**	**Years 0 to 20**	**Years 20 to 50**	**Years 50 to 100**	
6.19	Gorleston to Hopton	**Gorleston to Lowestoft Strategy Study:** For Golf Course determined benefit of £0.3m (discounted value of <0.1m) over 50 years.	*NAI Damages:* By 2025: none By 2055: none By 2105: none	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	
6.20	Hopton	**Gorleston to Lowestoft Strategy Study:** Determined direct benefits as £4.0m (discounted value of £0.7m) over 50 years.	*NAI Damages:* By 2025: none By 2055: up to £0.9m By 2105: up to £2.2m *Preferred Plan Damages:* By 2025: none By 2055: up to £0.9m By 2105: up to £2.2m	Maintenance of existing seawall, timber revetment, and groynes. Cost: £0.7m This approach could have a PVcost of £0.5m, whilst the PVbenefit will be <£0.1m, although this does not allow for delayed losses within the epoch or loss of land (see comments). Consequently, this is **Not Economically Viable** for grant aid although the works are only maintenance which might be sourced locally.	No defence works No economic case to be made	No defence works No economic case to be made	*Possible higher benefits for Holiday Village and Potters Holiday and Leisure Centre.* *Generic costs are also possibly overestimating this frontage's needs*
6.21	Hopton to Corton	**Gorleston to Lowestoft Strategy Study**: Determined direct benefits as £0.2m over	*NAI Damages:* By 2025: none By 2055: none By 2105: none	No defence works **No economic case to be made**	No defence works No economic case to be made	No defence works No economic case to be made	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		50 years – includes relocation costs of Broadland Sands Holiday Park.					
6.22	Corton	**Corton Village Project Appraisal:** A benefit-cost assessment was available: this identified PV benefits of approximately £4.0m for a 20 year scheme with PV costs marginally below this. This, assessment, only applied to the present scheme, which has a life of only 20 years. Therefore Broad-scale review has been necessary for years 20 to 50 and 50 to 100.	*NAI Damages:* By 2025: none By 2055: up to £3.2m By 2105: up to £12.4m *Preferred Plan Damages:* By 2025: none By 2055: up to £3.2m By 2105: up to £12.4m	Maintenance of existing linear defences. Works in year 10 (£0.3m) plus annual maintenance (£5,000 per annum) Cost: £0.3m --- This approach will have a PVcost of £0.2m. The economic case for this expenditure has already been justified as part of the scheme already constructed in 2003-04, consequently, this is **Economically Viable**	No permanent defence works or maintenance. *Provide temporary erosion slowing measures if required, and acceptable, in due course. (Estimated cost: £1.4m)* --- The additional cost of temporarily deferring erosion as relocation takes place will need to be economically tested on a needs basis at that time.	No permanent defence works or maintenance. *Provide temporary erosion slowing measures if required, and acceptable, in due course. (Estimated cost: £1.9m)* --- The additional cost of temporarily deferring erosion as relocation takes place will need to be economically tested on a needs basis at that time.	
6.23	Corton to Lowestoft	**Gorleston to Lowestoft Strategy Study:** Determined direct benefits as £0.7m (discounted value of £0.2m) over 50 years – includes consideration of Azure Seas Caravan Park, nature	*NAI Damages:* By 2025: none By 2055: none By 2105: none	No defence works --- **No economic case to be made**	No defence works --- No economic case to be made	No defence works --- No economic case to be made	

Location		Calculation of Damages and Benefits		Assumed Defence Works & Costs			Comments
				Broad-scale Economic Review			
		Previous Studies	Broad-scale Review (this SMP)[1]	Years 0 to 20	Years 20 to 50	Years 50 to 100	
		conservation land and replacement of gas and sewage pipelines.					
6.24	Lowestoft North	**Gorleston to Lowestoft Strategy Study:** Determined direct benefits as £8.2m (discounted value of £0.8m) over 50 years. Additional costs associated with flood damage were calculated to be £3.5m to £5m. But if relocation costs are included this would be at an estimated damage of £20m (PV £3.5m).	***NAI Damages (excluding flooding):*** By 2025: none By 2055: none By 2105: up to £12.3m ***Preferred Plan Damages:*** By year 2025: none By year 2055: none By year 2105: none *Analysis has not included loss of properties south of the SMP boundary but within the same flood plain*	Reconstruct groynes. Maintenance of groynes and existing seawall. Cost: £2.7m See details for years 50 to 100	Replace linear defence structures. Maintenance of linear defences. Cost: £12.2m See details for years 50 to 100	Maintenance of linear defences. Cost: £2.7m PVcost of 6.1m PV damages are uncertain but would be of a similar magnitude as costs (or possibly greater). Therefore the economic case may be marginal and needs to be conducted in more detail as part of a more detailed strategy for this floodable area.	

H5   References

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NADNAC (National Appraisal of Defence Needs and Costs). (2004) Halcrow in association with HR Wallingford Limited & John Chatterton & Associates. Defra.

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Gorleston to Lowestoft Coastal Strategy Study (1999). Halcrow.

Corton Village Project Appraisal (2002). Halcrow.

Annex H1: Supporting economic appraisal data

SUMMARY TABLE

Explanation of Table Columns

(a) POLICY UNIT
These relate to the units defined in the main document. In places, e.g. Sheringham to Cromer, the coast has been sub-divided further for the economic analysis.

(b) YEAR
Relate to the epochs used for policy setting.

(c) ASSET VALUE LOSS PER EPOCH (DAMAGES): NAI
The calculated capital value of property (£m) that would be lost during the identified time period for NAI (No Active Intervention).

(d) ASSET VALUE LOSS PER EPOCH (DAMAGES): PREFERRED PLAN
The calculated capital value of property (£m) that would be lost during the identified time period for the preferred Plan.

(e) CUMULATIVE DAMAGE/ LOSS (PV): NAI
The Present Value of the property loss under the NAI scenario (i.e. the values from column (c), discounted to reflect timing of loss). This is a cumulative measure, i.e. the 50 year value includes all losses or damages from year 0 to year 50, and the 100 year value includes all losses or damages from year 0 to year 100.

(f) CUMULATIVE DAMAGE/ LOSS (PV): PREFERRED PLAN
The Present Value of the property loss under the preferred Plan scenario (i.e. the values from column (d), discounted to reflect timing of loss). This is a cumulative measure, i.e. the 50 year value includes all losses or damages from year 0 to year 50, and the 100 year value includes all losses or damages from year 0 to year 100.

(g) MANAGEMENT COST PER EPOCH (PREFERRED PLAN)
The calculated cost of defence and management measures for the preferred Plan during that identified time period. The calculation of these values is presented in the subsequent table.

(h) PREFERRED PLAN BENEFITS (PV):
The cumulative benefits expressed in terms of Present Value. This is the difference between the preferred Plan damages (column (f)) and the No Active Intervention damages (in column e).

(i) PREFERRED PLAN COSTS (PV):
The Present Value of the costs of providing the preferred Plan (i.e. the values from column (g) discounted to reflect timing of activities). This is a cumulative measure, i.e. the 50 year value includes all losses or damages from year 0 to year 50, and the 100 year value includes all losses or damages from year 0 to year 100. However, for years where no defence works are proposed, columns have been left blank.

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
		ASSET VALUE LOSS PER EPOCH (DAMAGES)		CUMULATIVE PROPERTY DAMAGE / LOSS (PV)		MANAGEMENT COST PER EPOCH (PREFERRED PLAN)	PREFERRED PLAN	
POLICY UNIT	YEAR	NAI	PREFERRED PLAN	NAI	PREFERRED PLAN		PROPERTY DAMAGES AVERTED (PV)	COSTS (PV)
6.01 Kelling Hard to Sheringham	20							
	50	£0.4m	£0.4m					
	100	£1.1m	£1.1m					
6.02 Sheringham	20					£1.8m		£1.2m
	50	£1.8m		£0.4m		£7.3m	£0.4m	£3.6m
	100	£106.9m		£8.1m		£14.0m	£8.1m	£5.0m
6.03(i) Sheringham to Cromer (Open Coast)	20							
	50	£0.2m	£0.2m					
	100	£2.5m	£2.5m					
6.03(ii) Sheringham to Cromer (Runton Gaps)	20					<£0.1m		<£0.1m
	50							
	100							
6.04 Cromer	20					£14.1m		£10.0m
	50	£72.6m		£19.5m		£6.0m	£19.5m	£11.9m
	100	£137.4m		£24.8m		£18.7m	£24.8m	£13.9m

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
POLICY UNIT	**YEAR**	**ASSET VALUE LOSS PER EPOCH (DAMAGES)**		**CUMULATIVE PROPERTY DAMAGE / LOSS (PV)**		**MANAGEMENT COST PER EPOCH (PREFERRED PLAN)**	**PREFERRED PLAN**	
		NAI	**PREFERRED PLAN**	**NAI**	**PREFERRED PLAN**		**PROPERTY DAMAGES AVERTED (PV)**	**COSTS (PV)**
6.05 Cromer to Overstrand	20							
	50							
	100	£0.2m	£0.2m					
6.06 Overstrand	20	£7.9m	£0.4m	£4.8m		£0.7m	£4.5m	£0.5m
	50	£13.4m	£13.0m	£6.4m		*£1.6m*	*£2.9m*	*£1.0m*
	100	£30.3m	£29.9m	£7.7m		*£2.1m*	*£2.9m*	*£1.2m*
6.07(i) Overstrand to Mundesley (Open Coast)	20							
	50							
	100							
6.07(ii) Overstrand to Mundesley (Trimingham)	20	£1.6m	£1.6m	£1.0m				
	50	£7.7m	£7.7m	£2.7m				
	100	£21.0m	£21.0m	£3.8m				
6.08 Mundesley	20	£4.7m	£1.1m	£3.1m		£2.7m	£2.5m	£1.9m
	50	£23.4m	£1.3m	£8.4m		£1.2m	£7.7m	£2.3m
	100	£48.2m	£48.2m	£9.8m		*£3.3m*	*£6.2m*	*£2.6m*
6.09 Mundesley to Bacton Gas Terminal	20	£1.9m	£1.6m	£1.2m			£0.2m	
	50	£3.5m	£2.7m	£1.7m			£0.5m	
	100	£11.1m	£11.1m	£2.3m			£0.4m	
6.10 Bacton Gas Terminal	20					£5.1m		£3.6m
	50					£0.8m		£3.9m
	100							
6.11 Bacton, Walcott and Ostend	20	£16.6m	£5.3m	£10.7m		£2.2m	£7.1m	£1.6m
	50	£32.2m	£33.3m	£15.6m			£4.4m	
	100	£65.8m	£65.8m	£18.6m			£4.5m	
6.12(i) Ostend to Eccles (Open Coast)	20							
	50							
	100							
6.12(ii) Ostend to Eccles (Happisburgh)	20	£2.2m	£2.2m	£1.6m				
	50	£4.0m	£4.0m	£2.2m				
	100	£6.6m	£6.6m	£2.4m				

(a) POLICY UNIT	(b) YEAR	(c) ASSET VALUE LOSS PER EPOCH (DAMAGES) NAI	(d) ASSET VALUE LOSS PER EPOCH (DAMAGES) PREFERRED PLAN	(e) CUMULATIVE PROPERTY DAMAGE / LOSS (PV) NAI	(f) CUMULATIVE PROPERTY DAMAGE / LOSS (PV) PREFERRED PLAN	(g) MANAGEMENT COST PER EPOCH (PREFERRED PLAN)	(h) PREFERRED PLAN PROPERTY DAMAGES AVERTED (PV)	(i) PREFERRED PLAN COSTS (PV)
6.13 Eccles to Winterton Beach Road	20							
	50							
	100							
6.14 Winterton to Scratby	20	£0.2m	£0.2m					
	50	£10.7m	£10.7m	£2.5m				
	100	£29.6m	£29.6m	£4.3m				
6.15 California (to Caister-on-Sea)	20					£0.4m		£0.3m
	50	£14.7m	£10.6m	£4.6m			£1.4m	£0.3m
	100	£22.6m	£21.0m	£6.0m			£1.9m	£0.3m
6.16 Caister-on-Sea	20					£6.0m		£4.3m
	50	£4.9m		£1.4m		£3.7m	£1.4m	£5.4m
	100	£21.1m	£6.0m	£2.6m			£2.3m	£5.4m
6.17 Great Yarmouth	20					£10.2m		£7.2m
	50					£7.2m		£9.5m
	100					£4.5m		£10.0m
6.18 Gorleston	20	Strategy study economic analysis used						
	50							
	100							
6.19 Gorleston to Hopton	20							
	50							
	100							
6.20 Hopton	20					£0.7m	<£0.1m	£0.5m
	50	£0.9m	£0.9m	£0.2m				
	100	£2.2m	£2.2m	£0.3m				
6.21 Hopton to Corton	20							
	50							
	100							
6.22 Corton	20					£0.3m	£0.2m	£0.2m
	50	£3.2m	£3.2m	£0.8m		*£1.4m*		*£0.6m*
	100	£12.4m	£12.4m	£1.6m		*£1.9m*		*£0.9m*

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
POLICY UNIT	**YEAR**	**ASSET VALUE LOSS PER EPOCH (DAMAGES)**		**CUMULATIVE PROPERTY DAMAGE / LOSS (PV)**		**MANAGEMENT COST PER EPOCH (PREFERRED PLAN)**	**PREFERRED PLAN**	
		NAI	**PREFERRED PLAN**	**NAI**	**PREFERRED PLAN**		**PROPERTY DAMAGES AVERTED (PV)**	**COSTS (PV)**
6.23 Corton to Lowestoft	20							
	50							
	100							
6.24 Lowestoft North	20					£2.7m		£1.9m
	50					£12.2m		£5.8m
	100	£12.3m		£0.6m		£2.7m	£0.6m	£6.1m

COST CALCULATIONS

Explanation of Table Columns

(a) POLICY UNIT
These relate to the units defined in the main document. In places, e.g. Sheringham to Cromer, the coast has been sub-divided further for the economic analysis.

(b) PERIOD
Relate to the epochs used for policy setting.

(c) NOTES
Additional information on assumptions made.

(d) REPLACEMENT LENGTH (B, L, G)
The length of shoreline (kilometres) over which certain defence replacement activities are required during each of the specified time periods: B=beach schemes, L=linear defences, G=groynes or lower cost protection measures (e.g. timber revetments).

(e) REPLACEMENT COST (£m)

The cost of providing the replacement works in column (d) during each of the specified time periods. Also see note below, with regard to assumptions made for costs.

(f) MAINTENANCE LENGTH (B, L, G)
The length of shoreline (kilometres) over which certain maintenance activities are required during each of the specified time periods: B=beach schemes, L=linear defences, G=groynes or lower cost protection measures (e.g. timber revetments).

(g) MAINTENANCE COST (£m)
The cost of providing the maintenance works in column (f) during each of the specified time periods. Also see note below, with regard to assumptions made for costs.

(h) TOTAL COST (£m)
The total replacement and maintenance costs for the specific time period. This is the sum of columns (e) and (g).

(i) TOTAL WITH OPTIMISM BIAS (£m)
Optimism bias (at 60%) applied to all costs when examining viability, to reflect uncertainty in broad level analysis at SMP scale.

(j) FINAL TOTAL (CUMULATIVE) (£m)
The cumulative total costs (including optimism bias), i.e. the 50 year total includes all costs from year 0 to year 50, and the 100 year total includes all costs from year 0 to year 100.

(k) PV COST: REPLACEMENT (£m)
The Present Value of the costs of providing the preferred Plan, in terms of replacement works, i.e. the values from column (e) discounted to reflect timing of activities. This is a cumulative measure, i.e. the 50 year value includes all losses or damages from year 0 to year 50, and the 100 year value includes all losses or damages from year 0 to year 100.

(l) PV COST: MAINTENANCE (£m)
The Present Value of the costs of providing the preferred Plan, in terms of maintenance works, i.e. the values from column (g) discounted to reflect timing of activities. This is a cumulative measure, i.e. the 50 year value includes all losses or damages from year 0 to year 50, and the 100 year value includes all losses or damages from year 0 to year 100.

(m) PV COST: CUMULATIVE TOTAL (£m)
The sum of columns (k) and (l).

Basis for cost assumptions

- Replacement costs taken from Arup database prepared for EA. This sets replacement cost for linear structures (e.g. revetments, seawalls) at £2.7million/km and cost for beach management schemes at £5.1million/km. Groyne field costs are taken as £0.6million/km
- Maintenance costs taken from NADNAC study prepared for Defra. This sets annual maintenance cost for linear structures and for groyne fields at £10k/km and for beach schemes £20k/km.
- Assumed design life (and thus full scheme reconstruction will be required) as 100 years for linear defences, 50 years for beach schemes and 30 years for groynes.
- Allowance for maintenance as a linear cost, although realistically less in early years and increasing in latter years of scheme life.
- Allowance for increase in costs due to climate change: Period 20-50 years - costs factored up by 1.5 x present day rates; Period 50-100 years - costs factored up by 2.0 x present day rates.
- For "low cost" defence structures use same rate as groynes
- Rates for typical defences types used:

	Replacement Rate	Maintenance Rate
BEACH (B)	£5.10m	£0.02m
LINEAR (L)	£2.70m	£0.01m
GROYNE/OTHER (G)	£0.60m	£0.01m

(a)	(b)	(c)	(d) REPLACEMENT LENGTH B	L	G	(e) COST	(f) MAINTENANCE LENGTH B	L	G	(g) COST	(h) TOTAL COST	(i) WITH OPTIMISM BIAS	(j) CUMULATIVE TOTAL	(k) PV COSTS REPLACEMENT	(l) MAINTENANCE	(m) CUMULATIVE PV TOTAL
6.01 Kelling Hard to Sheringham	0 - 20															
	20 - 50															
	50 - 100															
6.02 Sheringham	0 - 20			0.2		£0.54m		1.3	1.5	£0.56m	£1.10m	£1.76m	£1.76m	£0.61m	£0.64m	£1.25m
	20 - 50			0.4	1.7	£2.10m		1.5	1.7	£0.96m	£4.59m	£7.34m	£9.10m	£1.59m	£0.73m	£3.57m
	50 - 100			1.3		£3.51m		1.7		£0.85m	£8.72m	£13.95m	£23.06m	£1.18m	£0.28m	£5.03m
6.03(i) Sheringham to Cromer	0 - 20															
	20 - 50															
	50 - 100															
6.03(ii) Sheringham to Cromer: Gaps	0 - 20	*local maintenance*						0.3		£0.06m	£0.06m	£0.10m	£0.10m			£0.07m
	20 - 50												£0.10m			£0.07m
	50 - 100												£0.10m			£0.07m
6.04 Cromer	0 - 20		1.6			£8.16m	1.6	1.6		£0.64m	£8.80m	£14.08m	£14.08m	£9.28m	£0.73m	£10.01m
	20 - 50			0.2	1.6	£1.50m	1.8	1.6		£1.02m	£3.78m	£6.05m	£20.13m	£1.14m	£0.77m	£11.92m
	50 - 100			1.8		£4.86m	2.0			£1.00m	£11.72m	£18.75m	£38.88m	£1.64m	£0.33m	£13.88m
6.05 Cromer to Overstrand	0 - 20															
	20 - 50															
	50 - 100															
6.06(i) Overstrand (North)	0 - 20						0.6	0.6		£0.24m	£0.24m	£0.38m	£0.38m		£0.27m	£0.27m
	20 - 50				0.6	£0.36m					£0.54m	£0.86m	£1.25m	£0.27m		£0.55m
	50 - 100				0.6	£0.36m					£0.72m	£1.15m	£2.40m	£0.12m		£0.67m
6.06(ii) Overstrand (South)	0 - 20							1.0		£0.20m	£0.20m	£0.32m	£0.32m		£0.23m	£0.23m
	20 - 50	*manage*			0.5	£0.30m					£0.45m	£0.72m	£1.04m	£0.23m		£0.45m
	50 - 100	*manage*			0.5	£0.30m					£0.60m	£0.96m	£2.00m	£0.10m		£0.56m
6.07(i) Overstrand to Vale Road Beach Access	0 - 20															
	20 - 50															
	50 - 100															
6.07(ii) Vale Road Beach Access to Sea View Road	0 - 20															
	20 - 50															
	50 - 100															
6.08(i) Cliftonville	0 - 20				1.0	£0.60m			1.0	£0.20m	£0.80m	£1.28m	£1.28m	£0.68m	£0.23m	£0.91m
	20 - 50								1.0	£0.30m	£0.45m	£0.72m	£2.00m		£0.23m	£1.14m
	50 - 100	*manage*			1.0	£0.60m					£1.20m	£1.92m	£3.92m	£0.20m		£1.34m
6.08(ii) Mundesley South	0 - 20			0.1	0.6	£0.63m		0.6	0.6	£0.24m	£0.87m	£1.39m	£1.39m	£0.72m	£0.27m	£0.99m
	20 - 50							0.7		£0.21m	£0.32m	£0.50m	£1.90m		£0.16m	£1.10m
	50 - 100	*manage*			0.7	£0.42m					£0.84m	£1.34m	£3.24m	£0.14m		£1.29m

(a)	(b)	(c)	(d)		(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)
			REPLACEMENT			MAINTENANCE			TOTAL COST			PV COSTS		
POLICY UNIT	PERIOD	NOTES	LENGTH		COST	LENGTH		COST	TOTAL COST	WITH OPTIMISM BIAS	CUMULATIVE TOTAL	REPLACEMENT	MAINTENANCE	CUMULATIVE PV TOTAL
			B	L	G		B	L	G							
6.09 Mundesley to Bacton Gas Terminal	0 - 20														
	20 - 50														
	50 - 100														
6.10 Bacton Gas Terminal	0 - 20			1.1		£2.97m		1.1		£0.22m	£3.19m	£5.10m	£5.10m	£3.38m		£0.25m	£3.63m
	20 - 50							1.1		£0.33m	£0.50m	£0.79m	£5.90m		£0.25m	£3.88m
	50 - 100												£5.90m			£3.88m
6.11 Bacton. Walcott and Ostend	0 - 20							3.5	3.5	£1.40m	£1.40m	£2.24m	£2.24m		£1.59m	£1.59m
	20 - 50												£2.24m			£1.59m
	50 - 100												£2.24m			£1.59m
6.12(i) Ostend to Happisburgh Village	0 - 20														
	20 - 50														
	50 - 100														
6.12(ii) Happisburgh Village	0 - 20														
	20 - 50														
	50 - 100														
6.12(iii) Happisburgh Village South	0 - 20														
	20 - 50														
	50 - 100														
6.13(i) Cart Gap to south of Bramble Hill	0 - 20														
	20 - 50														
	50 - 100														
6.13(ii) South of Bramble Hill to Winterton-on-Sea	0 - 20														
	20 - 50														
	50 - 100														
6.14 Winterton-on-Sea to Scratby	0 - 20														
	20 - 50														
	50 - 100														
6.15 California (to north end of Caister)	0 - 20							1.4		£0.28m	£0.28m	£0.45m	£0.45m		£0.32m	£0.32m
	20 - 50												£0.45m			£0.32m
	50 - 100												£0.45m			£0.32m
6.16 Caister-on-Sea	0 - 20			1.0		£2.70m	2.6			£1.04m	£3.74m	£5.98m	£5.98m	£3.07m	£1.18m	£4.25m
	20 - 50						2.6			£1.56m	£2.34m	£3.74m	£9.73m		£1.18m	£5.44m
	50 - 100												£9.73m			£5.44m
6.17(i) Caister South to Great Yarmouth (Pleasure Beach)	0 - 20							0.8		£0.16m	£0.16m	£0.26m	£0.26		£0.18m	£0.18m
	20 - 50			0.8		£2.16m		0.8		£0.24m	£3.60m	£5.76m	£6.02m	£1.64m	£0.18m	£2.02m
	50 - 100							0.8		£0.40m	£0.80m	£1.28m	£7.30m		£0.13m	£2.13m

(a)	(b)	(c)	(d) REPLACEMENT			(e)	(f) MAINTENANCE			(g)	(h) TOTAL COST	(i)	(j)	(k) PV COSTS	(l)	(m)
			LENGTH				LENGTH									
POLICY UNIT	PERIOD	NOTES	B	L	G	COST	B	L	G	COST	TOTAL COST	WITH OPTIMISM BIAS	CUMULATIVE TOTAL	REPLACEMENT	MAINTENANCE	CUMULATIVE PV TOTAL
6.17(ii) Great Yarmouth South Beach	0 - 20			2.0		£5.40m		2.0	2.0	£0.80m	£6.20m	£9.92m	£9.92m	£6.14m	£0.91m	£7.05m
	20 - 50							2.0		£0.60m	£0.90m	£1.44m	£11.36m		£0.46m	£7.50m
	50 - 100							2.0		£1.00m	£2.00m	£3.20m	£14.56m		£0.33m	£7.84m
6.18 Gorleston-on-Sea	0 - 20															
	20 - 50													Data taken from strategy		
	50 - 100															
6.19 Gorleston-on-Sea to Hopton-on-Sea	0 - 20															
	20 - 50															
	50 - 100															
6.20(i) Hopton-on-Sea North	0 - 20							0.6		0.6	£0.24m	£0.24m	£0.38m	£0.38m		£0.27m	£0.27m
	20 - 50													£0.38m			£0.27m
	50 - 100													£0.38m			£0.27m
6.20(ii) Hopton-on-Sea South	0 - 20							0.5		0.5	£0.20m	£0.20m	£0.32m	£0.32m		£0.23m	£0.23m
	20 - 50													£0.32m			£0.23m
	50 - 100													£0.32m			£0.23m
6.21(i) South of Hopton-on-Sea	0 - 20															
	20 - 50															
	50 - 100															
6.21(ii) Hopton-on-Sea to Corton	0 - 20															
	20 - 50															
	50 - 100															
6.22 Corton	0 - 20							1.7			£0.17m	£0.17m	£0.27m	£0.27m		£0.19m	£0.19m
	20 - 50				1.0	£0.60m					£0.90m	£1.44m	£1.71m	£0.46m		£0.65m
	50 - 100				1.0	£0.60m					£1.20m	£1.92m	£3.63m	£0.20m		£0.85m
6.23 Gunton Warren	0 - 20															
	20 - 50															
	50 - 100															
6.24 Lowestoft North Beach	0 - 20				1.7	£1.02m		1.7		1.7	£0.68m	£1.70m	£2.72m	£2.72m	£1.16m	£0.77m	£1.93m
	20 - 50			1.7		£4.59m		1.7			£0.51m	£7.65m	£12.24m	£14.96m	£3.48m	£0.39m	£5.80m
	50 - 100							1.7			£0.85m	£1.70m	£2.72m	£17.68m		£0.28m	£6.08m