NRA

NATIONAL RIVERS AUTHORITY
(Southern Region)

NORTHERN SEA WALL (RECULVER) IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

DECEMBER 1993

Prepared by

Environmental Assessment Services Limited

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1. INTRODUCTION AND TERMS OF REFERENCE

1.1 This Environmental Statement reports on the assessment of the probable effects of the proposed Northern Sea Wall (Reculver) Improvement Works on the environment of the North Kent coastline between Reculver and Minnis Bay. See Fig. 1. Sea defence and land drainage are the responsibility of the National Rivers Authority (NRA) on this frontage. The assessment has addressed the impacts on the relevant aspects of the environment as set out in Chapter 2 below and this Statement includes appropriate recommendations for the implementation of mitigating measures, monitoring and amenity improvements.

Terms of Reference

1.2 On 7 October 1993 Environmental Assessment Services Limited was appointed by Robert West and Partners, consulting engineers to the National Rivers Authority (NRA) Southern Region, to carry out the environmental assessment and prepare the Environmental Statement for the proposed Northern Sea Wall (Reculver) Improvement Works.

1.3 The assessment investigated the probable environmental effects of the proposed construction of 14 rock groynes, three of which incorporate reconstructed outfalls, combined with shingle beach nourishment, see Figs. 2 & 3.

2.0 SCOPE OF THIS ASSESSMENT

2.1 The range of aspects considered in this Environmental Statement are generally as required under Statutory Instrument 1988, No. 1217 the Land Drainage Improvement Works (Assessment of Environmental Effects) Regulations 1988 based on the specification given in Annex III of EC Directive 85/337 namely:-

i) Human beings, fauna and flora.

ii) Soil, water, air, climate and the landscape.

iii) Interaction between the factors in i) and ii) above.

iv) Material assets and the cultural heritage.

2.2 Preparation of this Environmental Statement comprised the following:-

- A review of the conclusions of the preliminary assessment.
- Research and analysis of data relevant to the locality.
- Consultation and liaison with affected local people, their representatives and organisations with a professional or commercial interest in environmental matters relating to the coastline between Reculver and Minnis Bay.
- A qualitative site survey which took into account the geomorphological, ecological and archaeological significance of the works on the locality.
- Investigations into the impacts of the proposals on the landscape.
- An evaluation of the proposals as they relate to air and water quality.
- Comment on climatic conditions in terms of projected rises in sea level.
- An assessment of the impacts of construction.
- A non-technical summary of the findings of the assessment.

3. DESCRIPTION OF THE WORKS

3.1 The purpose of the works is to control coastal erosion, and reduce the risk of overtopping of the existing sea wall by storm driven high tides; to reduce the risk of breaching of the Northern Sea Wall and to control the highly variable rates of sand and shingle movement.

3.2 The works will reduce the risk of flooding for the large area of low lying land to the south of the sea wall comprising productive agricultural land and a section of British Rail's Network South East track between Herne Bay and Birchington. The adjacent vegetated shingle bank and areas of saltmarsh which fall within the boundary of part of the Thanet Coast Site of Special Scientific Interest (SSSI), see Fig 4, will also be protected by the proposed works.

3.3 The works will comprise some 14 rock mound type groynes and shingle beach nourishment. Three of the groynes will incorporate re-constructed outfalls for the local land drainage system. There will also be some improvement works to the sea wall to the West of the Towers apron. The rock mound type groynes will generally comprise a landward section with a crest level of +5m OD, sloping downwards at a slope of approximately 1 in 10 to terminate some 70m seaward of the sea wall at a small distance above Mean Low Water Springs. The works are basically as given in Option 2 of the preliminary assessment. See Figs. 2 and 3.

3.4 The stone size for the rock armouring of the groynes will be between 3 and 6 tonnes. The origin and type of rock to be used has not yet been specified in detail although it will be a requirement of the contract that the material be delivered to the beach by sea.

3.5 The three reconstructed outfalls, North Mouth, Coldharbour and Brooksend, will comprise concrete culvert units secured between steel sheet piling and armoured with rock to give a similar appearance and profile to the groynes. The seaward ends of these outfall groynes will be "fish tailed" in plan with the discharge point between the two lobes of the "tail".

3.6 Beach nourishment will comprise dredged sea bed material, shingle and sand, deposited on the beach from a barge at high tide. The origin of the dredged material has not been specified and it is assumed that the impacts of extraction from the chosen dredging ground will have been assessed as part of the dredging licence application.

3.7 The groynes will be marked with red truncated cone type markers supported on poles at a level of MHWS + 2m.

3.8 Apart from minor improvement works to the sea wall to the West of the Towers apron, the existing Northern Sea Wall has been considered to remain satisfactory in both height and condition. The proposed works are to protect the existing wall by retaining the beach in front of it.

3.9 The distribution of the proposed groynes along the frontage tends to be concentrated at the West end and at Plum Pudding Island where the beach levels in front of the sea wall are presently at their lowest.

4. THE PRELIMINARY ASSESSMENT

4.1 In May 1993, Environmental Assessment Services Limited, prepared a preliminary environmental assessment as part of the Coastal Defence Study for the Reculver to Minnis Bay frontage commissioned by the NRA.

4.2 The preliminary assessment identified the principal environmental parameters of the study area, and considered the environmental impacts of four sea defence options for the frontage. The options were as follows:-

Option 1 - Managed Retreat (see Figs. 5 & 6)

4.3 This option proposed allowing the coastline between Reculver and Minnis Bay to re-adjust to its own alignment whilst reinforcing existing defences to prevent the sea outflanking at either end. Works comprised raising and reinforcing the western end of Rushbourne Sea Wall, general levelling and revetting of the seaward face of the Chalk Wall alongside the railway embankment in the centre of the frontage and raising and reinforcing the embankment from the railway line to the shore at Plumpudding Island.

Option 2. - Rock Groynes (see Figs. 2 & 3)

4.4 This option proposed stabilising the coastline on its existing alignment by building rock groynes (between 80 and 100m long) over the western 2 km of the frontage with similar structures on the eastern 1.5 km up to Plumpudding Island. Imported shingle placed between the groynes would recharge the beach.

Option 3. - Revetment Schemes (see Figs. 7 & 8)

4.5 This option comprised reinforcement of the existing shoreline at each end of the frontage by use of rock armoured or concrete apron type revetment works. Including revetting the western 1.4 km and the eastern 0.6km of the frontage and leaving the centre section of the frontage un-touched.

Option 4. - Headlands/breakwaters (see Figs. 9 & 10)

4.6 This option proposed coast protection by maintaining littoral material on the frontage using offshore/inter-tidal breakwaters or headlands. This would result in local realignment of the beach by trapping littoral material in the lee of the breakwater headlands combined with initial charging of the compartments formed by the structures with imported shingle.

4.7 The range of aspects considered in the preliminary assessment were as listed under Article 3 of the EC Environmental Assessment Directive No. 85/337. The most significant issues addressed in the preliminary study were as follows:-

- Social and socio economic impacts of flooding.
- Ecological considerations.
- Impacts on fisheries interests.
- Impacts of construction & maintenance of the works.
- Geomorphological impacts on the existing coastal regime and climate.
- Visual and landscape considerations.

4.8 As the entire site forms part of the Thanet Coast SSSI, close liaison was maintained with English Nature during the preliminary consultation process to ensure that the interests of the SSSI were taken into proper account during the early design process.

4.9 English Nature's comments on the four options were:

Option 1 - Managed Retreat

Since there has been a net loss of saltmarsh and mudflat habitats in the UK in recent years due to coastal erosion, this option was welcomed as it had considerable potential for helping recreate valuable coastal habitat. However, it was accepted that the benefits for local ecology and wildlife and conservation interests would not justify the costs involved in adopting the scheme.

Option 2 - Rock Groynes

It was considered that groynes could restrict sediment movement along the coast causing problems at other locations.

Option 3 - Revetment Schemes

This scheme was of concern as without other beach retention measures it was likely to exacerbate erosion of the beach due to waves reflected off the revetment and the revetment construction would obliterate important habitats along the top of the beach.

Option 4 - Headlands/breakwaters

The works would inevitably interrupt the movement of coastal sediment, probably resulting in increased erosion downdrift.

4.10 The response of English Nature was that all the schemes proposed, with the exception of the Managed Retreat option, contained elements to which they would object. English Nature stated that of Options 2, 3 and 4, option 4 appeared to have the least adverse impacts on their interests.

4.11 Both breakwaters (Option 4) and groynes (Option 2) have the potential to restrict longshore drift by encouraging accretion of beach sediment on the section of frontage where they are located.

4.12 The degree of accretion in the "shadow" of offshore breakwaters depends on the proportion of wave energy transmitted through, over and around the structures, which in turn depends on the dimensions and geometry of the individual breakwaters and their siting with respect to each other and to the shoreline.

4.13 Similarly, the dimensions of a groyne in terms of its projection across the shore and above the beach will affect the extent to which it will interfere with longshore drift. In addition the permeability of a rock groyne increases the means by which beach sediment may by-pass it.

4.14 Both Options 2 and 4 include a considerable element of shingle nourishment intended to preform an adequate beach for the purposes of flood protection and in both cases, the initial large scale nourishment would be supplemented by periodic topping-up.

4.15 With Option 2 - the groynes need only be of sufficient proportions to retain the beach at its initial design height. In this way down-drift beaches should not suffer a period of drift starvation as experienced when new groynes are accreting material.

4.16 The barrier to longshore drift created by offshore breakwaters as proposed in Option 4 is the deposited material itself which forms a tombolo or salient feature behind the breakwater. In its ultimate form a tombolo may act as a complete cross-shore barrier connecting the breakwater to the shoreline. As such, the restriction to long shore drift caused by a tombolo is likely to exceed that of a low profile permeable groyne.

4.17 Consequently, for cost and engineering reasons, English Nature agreed to the NRA proceeding with Option 2 - Rock Groynes - provided:

a) It can be demonstrated that interference with longshore sediment transfer is minimised, such that the adjoining coastline does not suffer increased erosion.

b) That the Ministry of Agriculture, Fisheries and Food (MAFF) have expressed their overall agreement with the engineering costs quoted for the Managed Retreat Option.

4.18 Of the four options only the Managed Retreat offered significant environmental benefits in terms of local ecology, wildlife and conservation interests. Options 2, 3 and 4 all offered socio-economic benefits by providing improved protection from tidal inundation for the adjoining agricultural land and nearby railway line. Similarly there are amenity benefits for local people and visitors who use the existing frontage for a variety of leisure pursuits.

4.19 It was therefore concluded that of the four schemes identified, costed and assessed, Option 2 was preferred on a combination of cost, engineering and environmental grounds. The conclusions of the preliminary assessment were summarised in matrix form (high score = preferred):

OPTION NUMBER	1	2	3	4
Socioeconomic impacts of flooding	1	5	5	5
Coastal geomormophology	2	4	2	4
Ecological Impacts	5	2	3	2
Impacts on amenity/access	2	3	2	3
Visual Impacts	2	2	2	1
Effects on Fisheries	3	3	3	2
Historical Impacts	2	2	2	2
Archaeological Impacts	3	2	3	2
Construction Impacts	2	2	2	1
TOTALS	22	25	24	22

Key: 5 = major +ive impact 4 = minor +ive impact
3 = no significant change
2 = minor -ive impact 1 = major -ive impact

5. THE EXISTING ENVIRONMENT

5.1 The site extends East from Reculver to Minnis Bay comprising some 4.5 km of sea defences fronted by mobile shingle beaches. The land to the South has a low lying aspect. There are no residential settlements in the immediate locality, however there is a caravan park to the East of Reculver, an occupied public house at Reculver sea front and a residence called "The Cottage" at Plumpudding Island.

Geology

5.2 The entire frontage falls within the boundary of the Thanet Coast Site Special of Scientific Interest (SSSI), in part for reasons of geological exposures present along this section of the coast. However, the section of the SSSI between Reculver and Minnis Bay has no special geological significance, see Chapter 6.

Ecology/Ornithological Interests

5.3 The frontage is also within the boundary of the Thanet Coast Site SSSI for reasons of its ecology and in particular for the use made of the site by wintering waders and (in summer) by little terns, see Chapter 7.

Historical/Cultural

5.4 English Heritage is responsible for the fabric and structure of the Ancient Monuments of Reculver Roman Fort and the adjacent ruins of St Mary's Church. Canterbury City Council (CCC) maintains the grounds surrounding the ancient monuments and is developing the area as a Country Park. There is evidence of extra mural archaeological features associated with the Roman Fort located within the grounds of Canterbury City Council's caravan park, adjacent to and the Southeast of the remains of the fort walls, see Chapter 8.

Access

5.5 Access to the frontage at the western limit of the site is presently via a track owned by the NRA, which passes immediately to the South and East of the Ancient Monuments at Reculver. However, alternative access for construction purposes has been proposed by routing traffic through Canterbury City Council's caravan park, rather than using the NRA's track, see Fig. 11 and Chapters 8 and 16.

5.7 Access from the Eastern end of the frontage is via the promenade at Minnis Bay.

Other Interests

5.8 These comprise:

* Seasalter Shellfish (Whitstable) Ltd operates a mollusc (oyster) hatchery which is located behind the seawall at Reculver.

* An equestrian centre is located at Plumpudding Island.

* Sailing and windsurfing clubs operate in the Minnis Bay area.

* There are several angling clubs, both sea and freshwater which fish within the study area.

5.9 The effects of the proposals on all of the above are discussed in detail under the relevant Chapters below.

6. GEOMORPHOLOGY

6.1 This section addresses the possible impacts on the geomorphology (land form) in the affected area including those natural processes, erosion and accretion, which have formed and may alter the existing coastline. As the principal purpose of the proposed works is to reduce the risk of flooding at least partially by modifying the existing geomorphological regime, the impacts on this aspect have been considered extensively during the engineering investigations and design.

Historical Development

6.2 Some 6000 years ago rising sea levels separated the Isle of Thanet from the mainland, leaving a channel between it and the higher ground at Reculver. Eventually siltation reconnected the Isle of Thanet to the rest of Kent. The land thus formed was low lying and swampy. Subsequent drainage works have allowed agricultural use of the land and embankments have been built to reduce the risk of inundation from the sea. The principal hinterland flood embankments comprise the Rushbourne Seawall and the Chalk Wall (along side the Whitstable - Margate railway line) which connects to the coast at Plumpudding Island.

Geological Features

6.3 The frontage falls within a Site of Special Scientific Interest (SSSI) designated in part for reasons of geological and geomorphological interest. However, these specific features do not occur in the section of the frontage subject to this assessment, see Ecology-Chapter 7 below, for further discussion of the SSSI.

6.4 At Reculver the mound upon which the ancient monuments stand is protected by a rock revetment. From Reculver westwards to the Coldharbour outfall the foreshore comprises mud and sand with small outcrops of the Thanet Formation clay and sand. From the Coldharbour outfall a shingle beach of flint pebbles dominates and at Minnis Bay, chalk outcrops are evident at low water.

Existing Coastal Defences

6.5 The existing hard defences comprise of various concrete structures built on a clay embankment, known locally as the Northern Sea Wall. This was constructed after the 1953 flood event. A shingle beach of varying width and depth fronts the seawall and the largely derelict remains of what was once an extensive groyne field, is evident at various locations along the frontage.

6.6 Land drainage culverts exit through the sea wall, these are at: North Mouth, Coldharbour and Brooks End.

6.7 A secondary flood bund, known in part as the Rushbourne Sea Wall, and elsewhere as the Chalk Wall, is located behind the front line of hard defences. Flapped sluices for the Twelve Foot Drain, River Wantsum and Brooks End watercourse are located in this secondary line of defence.

6.8 Principal tide levels are:

- Mean High Water Springs (MHWS) +2.48m OD
- Mean Low Water Springs (MLWS) -2.12m OD

The maximum water level recorded during the 1953 flood at the site was +4.28m OD (estimated to be a 1 in 200 year return period event). A 1 in 50 year return period storm surge and tide water level has been estimated at +4.02m OD (based on exisiting sea levels).

Need for the works

6.9 The history of coastal erosion on this frontage is well documented. Early photography at Reculver shows the long term use of timber groynes as a coast protection measure. The limited effectiveness of these groynes has probably been due to the ready erodability of the Thanet Formation and the lack of coarse littoral material produced as a product of that erosion. Some control of erosion has been established by the use of hard defences, inter-alia, the Northern Sea Wall. The sea wall also provides the main flood control measure for the Reculver to Minnis Bay frontage.

6.10 The Northern Sea Wall remains in good condition and provides flood protection to a level of +6.5m O.D. However, erosion of the beach in front of the wall, notably at Reculver and Plumpudding Island, has allowed the sea to reach the wall at high tide. The existing timber groyne fields are in a poor state of repair and their limited effectiveness in holding the beach in front of the wall is decreasing.

6.11 Thus the Northern Sea Wall is at risk of structural damage by undermining if the beach in front of it continues to erode unchecked. Such undermining could lead to the collapse of sections of the sea wall and failure of the flood protection function. Similarly, the flood protection value of the sea wall is already reduced by the encroaching sea causing increased overtopping during combinations of storms and high water levels.

6.12 The most effective way to preserve the flood prevention properties of the Northern Sea Wall is to preserve and enhance the protective beach in front of it. The proposed works are intended to do this. The groynes should limit the loss of beach material from the frontage and the beach nourishment should enhance the protective properties of the beach.

Probable impacts of the proposed works

6.13 The primary functions of the proposed works, preserving and enhancing the protective beach in front of the Northern Sea Wall and thus preserving the flood protection provided by the wall, should have largely beneficial impacts in the area, as detailed in other chapters, however, two particular areas of concern have been identified:

(i) The proposed groynes may exacerbate erosion elsewhere, notably to the West of Reculver.

(ii) The apparent gap in the proposed groyne field between the Coldharbour outfall (Groyne 9) and Groyne 10 mean the smaller lagoon immediately to the West of Plumpudding Island does not assist the stability of that section of the frontage.

6.14 The risk of the proposed groynes starving the down drift frontage was raised by a number of consultees, notably Canterbury City Council and English Nature. The latter requested that the existing longshore drift of littoral material be preserved or even enhanced.

6.15 The proposed shingle recharge between the groynes is intended to fill the groyne compartments to the extent that littoral material will continue to bypass immediately, thus not interrupting the supply of littoral material to the downdrift beaches. As the proposed re-charge material will be dredged, the size grading will not match the beach material size gradient and initially (provided an adequate volume of recharge is deposited) the longshore drift is likely to increase until such time as the sea has established the appropriate size gradient on the beach.

6.16 The apparent gap in the proposed groyne field is due to a number of reasons:

(i) The sea wall is not yet threatened by erosion between proposed Groynes 9 and 10.

(ii) The greatest risk of ecological disturbance would be from works between Groynes 8 and 11, thus minimal works in this sector were felt to be desirable.

6.17 Concerns that the proposed arrangement could exacerbate erosion in the centre of the frontage were raised by a number of consultees, notably St Nicholas at Wade & Sarre Parish Council and St Nicholas Court Farms Ltd.

6.18 The comments given in 6.14 above also apply in this case. Adverse impacts on the un-groyned section should be minimal if the supply of littoral material to the frontage is preserved, again through adequate recharge between the groynes. However, the natural variation in beach line between predominantly calm and stormy periods may be much greater on the un-groyned section.

The behaviour of the coastal lagoons

6.19 There are two coastal lagoons on the frontage, the larger at Coldharbour in the centre of the frontage and a smaller one closer to Plumpudding Island.

These lagoons are interesting wetland features of importance to the local ecology. However, these features are not stable and are subject to a number of threats.

6.20 The lagoons are formed by the shingle beach crest moving inland across low lying and marshy land and forming a pocket between the beach crest and higher land behind. The larger lagoon is probably related to an earlier outlet feature of the River Wantsum. The smaller may be the result of an earlier boundary line or drainage quirk which influenced the line of the flood embankment.

6.21 Of the two lagoons, the smaller is probably the more stable although both act as sinks for sediment and are slowly silting up.

6.22 There are two main threats to the lagoons:

(i) Erosion of the coastal sediments will cause the landward movement of the beach ridge, thus eventually filling the lagoon with shingle.

(ii) Overtopping of the beach ridge during storm surge events deposits shingle in the lagoon, slowly filling up the lagoon.

The first threat should be reduced by the proposed works, particularly for the smaller lagoon. The second threat is probably an inevitable feature of the dynamic coastal geomorphology of the site.

7. ECOLOGY

7.1 This section assesses the implications of the works for local flora and fauna. Three distinct habitat types are present in the study area, see Fig. 12. These are as follows:

* Terrestrial - which includes the narrow strip of land immediately adjacent to the south side of the sea wall, the crest of the shingle bank on the north side of the sea wall and the beach above Mean High Water Springs (MHWS).

* Saltmarsh/coastal lagoons - located at Coldharbour and to the east near Plumpudding Island

* Inter - tidal Zone - the area of the foreshore between MHWS and Mean Low Water (MLW).

Ornithological interests are discussed in detail under 7.11 below.

Terrestrial Habitat

7.2 The entire frontage is part of the Thanet Coast SSSI, see Appendix E. The SSSI amalgamates four SSSIs previously notified under the Wildlife and Countryside Act, 1981. Part of the Site is managed by Canterbury City Council as a Country Park. The site is proposed a SPA under the EC habitat directive and is part of a proposed RAMSAR site.

7.3 The study area falls within that section of the SSSI which comprises foreshore, incorporating shingle, sand and mudflats, with small areas of saltmarsh and two small coastal lagoons. The boundary of the SSSI extends to and includes the southern bank of the borrowdyke behind the seawall.

7.4 The vegetation between the southern bank of the borrowdyke and the revetment on the south side of the sea wall is dominated by the Common Reed (Phragmites australis) which flourishes at the margins of the watercourse and is tolerant of brackish conditions. The spreading underground rhizome system of the plant has a tendency to stabilise bankside areas such as this. A variety of flowering herbs bloom throughout the summer months in the grassy strip between the foot of the revetment on the south side of the sea wall and the borrowdyke. These in turn attract and help support a diversity of insect species. A comprehensive survey of these herbs and insects could not be carried out except during the flowering season.

7.5 A variety of plants characteristic of a marine/coastal habitat grow along the crest of the shingle bank. These include the following:

Sea beet	(Beta vulgaris)
Buck's-horn plantain	(Plantago coronopus)
Yellow horned poppy	(Glaucium flavum)
Scentless mayweed	(Tripleurospermum maritimum)
Ragwort	(Senecio sp.)
Yarrow	(Achillea millefolium)
Goosegrass	(Gallium aparine)
Dock	(Rumex sp.)
Viper's bugloss	(Echium vulgare)
Common mouse-ear	(Cerastium holosteoides)
Sea kale	(Crambe maritima)
Alexanders	(Smymium olusatrum)

7.6 A characteristic mixture of marine plant and animal remains feature in the strandline. Seaweeds include Serrated Wrack (Fucus serratus) and Bladder Wrack (Fucus vesiculosis), Sea Lettuce (Ulva lactuca), Oarweed (Laminaria digitata), Dulse (Rhodymenia palmata) and Hornwrack (a bryozoan) (Flustra foliacea). Shells of the gastropod molluscs, Whelk (Nucella spp.), Periwinkle (littorina spp.) and Slipper Limpet (Crepidula fornicata) are evident, as are those of bivalve molluscs such as mussels (Mytilus spp.), the Common Cockle (Cerastoderma edule) and oysters (Anomia sp.). Other organic debris includes the egg cases of the Lesser-spotted Dogfish (Scyliorhinus caniculus), the "mermaid's purse" and those of the Common whelk (Buccinum undatum). The presence of brown and red seaweeds such as Oarweed and Dulse in the strandline at the time of this study (mid-November 1993), was almost certainly due to it having been dislodged from its normal habitat at or below mean low-water during severe storms.

Saltmarsh and Coastal Lagoons

7.7 The two small coastal lagoons on the frontage, one at Coldharbour and a smaller one to the east near Plumpudding Island (see Fig. 12) are protected to the North by a shingle berm. However, in the November 1993 storms, the shingle berm at Coldharbour was overtopped, causing it to breach as the tide fell and the lagoon was open to the sea until the breach had healed. (See chapter 6).

7.8 The saltmarsh of the lagoons is dominated by Sea purslane (Halimones portulacoides) with some Sea aster (Aster tripolium) and Sea wormwood (Artemesia maritimum). During spring and early summer, the southern bank of the lagoon, adjacent to the sea wall is colonised mainly by Alexanders (Smymium olusatrum).

7.21 Studies on sea walls in the Netherlands have revealed:

i) Seaweeds spread to higher sea shore levels on limestone shores than on basalt shores.

ii) Greater quantities of certain species occur on limestone than on basalt.

iii) Seaweed species assemblages differ according to surface friability.

iv) Certain seaweed zones are absent from harder rocks. It is thought that the porosity of the substrate and its rate of drying during the inter-tidal period is an important determining factor.

On the Isle of Thanet seaweed growth on natural chalk cliffs has been compared with those on concrete and brick sea walls, limestone harbour walls and flint surfaces. Differential colonisation was apparent with algal zonation extending to higher shore levels on the more porous substrates such as chalk and brick; a wider range of species was present on porous surfaces and dominant species differed according to substrate. It appears that plants are more sensitive to substrate type than animals.

7.22 Brief appraisal of the new granite sea-walls at Herne Bay has revealed settlement by marine life and a succession of changes following pioneer colonisation. Further investigation of this site would present a much clearer picture of what might be expected to colonise the proposed groynes between Reculver and Minnis Bay.

7.23 The introduction of rock types different from those selected to fulfil the primary engineering function of the proposed groynes will enhance the diversity of habitat. However, this has not been undertaken elsewhere and it is difficult to predictively model settlement patterns of plants and animals on differing substrates. The Eocene clays and the chalk on Thanet are the nearest natural rocks, but neither would be practical since both erode rapidly. Limestones are harder and would be an appropriate alternative to granite, but such rocks vary widely in hardness and a softer form should be considered. The addition of Lower Greensand rock (Ragstone) might also be considered. It has been suggested that large boulders should be used as smaller boulders may be washed away by wave action. (Groyne stability requires the use of 3 - 6 tonne rock). It is also suggested that should the NRA elect to incorporate more than one type of rock in the groynes with a view to improving inter-tidal habitat, that consideration should be given to implementing a small monitoring programme to follow the succession of settlement on different substrata. This would provide valuable information for future similar improvement works.

7.24 Similarly, at high tide, there will be a positive effect for the sub-tidal regime. Greater numbers of fish and other mobile sub-littoral marine species should be attracted to the groynes to exploit enhanced opportunities for feeding and shelter, see Chapter 9 Fisheries.

7.25 The need to protect local ornithological interests was identified during the preparation of the preliminary assessment. Since that time, the NRA has liaised with English Nature (Wye), to seek to incorporate measures to avoid or mitigate any adverse impacts on birds using the frontage. English Nature agreed to allow the NRA to proceed with the proposals for Option 2 (subject to MAFF agreement on costs - see 4.17), to phase construction work according to the following work programme:

i) January/February 1994. Start and complete work on the North Mouth outfall. Commence importation and stockpiling of rock material at the western end of the works area (near North Mouth outfall), prior to March 1994.

ii) March/April 1994. Start and complete work on the Brooksend and Coldharbour outfalls. (These are closer to the wader roosts which should not be disturbed in January/February when the greatest numbers of birds will be using them).

iii) April - 24 May 1994. Work may progress with the stock piling of rocks and on the groynes running from Groyne 9 Eastwards as appropriate.

iv) June - July 1994. Work to be restricted to the Western groynes (numbered 1 - 8). Work should start on groyne number 1 first, working Eastward, then subject to the location of nesting Little Terns, work in and around groyne number 8 may need to be curtailed until nesting is finished. Alternatively, if for some reason the terns abandon the area in 1994 it may be possible to progress more rapidly with the work.

v) August - October 1994. The remainder of the work to be completed.

The RSPB have also been consulted in respect of accommodating the works at times which will not disturb wintering waders or nesting terns. The RSPB's view, following discussion with English Nature, is that the construction schedule proposed above is satisfactory.

7.26 Since the extent to which Little Terns may use the area cannot be accurately predicted, it is recommended that an ornithologist with local knowledge be consulted to provide on-site advice on the location and extent of activity by Little Terns, particularly during the critical months of June and July.

7.27 In order to prevent permanent loss of habitat and temporary disturbance for roosting and breeding birds it is recommended that the NRA give consideration to siting groyne number 10 further to the West (as shown on Fig 13) than originally proposed. This should be of considerable benefit to Little Terns as this species in particular should not be disturbed. However, the suggested relocation or addition of further groynes, see 12.8 below, would need to be considered in the context of geomorphological, ornithological and engineering requirements in order to develop the best strategy for the environment as a whole. (See also Chapter 6).

7.28 By phasing the work as set out under 7.25 i) - v) above, major disturbance to the waders' high-tide roosts will be avoided, helping to ensure that the impacts for these species are minimised. The natural tidal cycle will also help to protect roosting birds at Coldharbour and Brooksend, since of necessity, work on the outfalls and construction of the groynes can only be undertaken mainly at low/lower states of the tide. Similarly, any breeding pairs of Little Terns will be protected and remain undisturbed.

7.29 It is possible that the shingle beach nourishment may sufficiently improve the local habitat for Little Terns. The more stable shingle beach conditions together with the widening of the crest of the shingle banks at Coldharbour and Brooksend may encourage the return of greater numbers of breeding pairs of this species. Also, as the eggs and fledgling birds of this species are very vulnerable, it would be worthwhile to ensure that once construction is complete that people, typically pedestrians and anglers, are excluded from the critical areas when the birds are nesting.

7.30 The rock groynes should be of some benefit for birds exploiting the inter-tidal area. The large boulders will provide substrate and shelter for a variety of molluscs, crustaceans and other invertebrates which will provide an additional source of food.

Impacts of Marine Dredging on Coastal Ecology

7.31 There is no requirement for dredging to be undertaken at the site as part of the works, therefore there should be no adverse effects on local ecology from this activity locally.

7.32 Shingle for the beach nourishment will originate from a licensed offshore marine site. The impacts of this extraction should be addressed as part of the Crown Estates consent procedure and should thus be taken into account in the NRA's overall strategy for coastal protection and defence.

8. ARCHAEOLOGICAL AND HISTORICAL INTERESTS

Archaeological Background

8.1 A number of ancient sites are known to exist both under the sea wall and in the beach deposits to the north of it. These comprise remains of settlements inundated by a combination of post glacial sea level rise, coastal erosion and the land subsiding.

8.2 Reculver is principally known for its Roman fortress (lost in part to the sea) and the early Medieval church which stands within its precincts. However, both earlier and later remains also exist. West of the fort the eroding cliff of Thanet Beds have exposed the fill of pits and ditches containing Late Bronze - Early Iron Age material. North of the fort, in the inter-tidal zone, an area of collapsed masonry may be the remains of the inundated Medieval village of Reculver, the fallen walls of the Roman fortress, or the remains of both settlements.

8.3 As part of the data gathering programme for the preliminary environmental assessment, a qualified archaeologist from The Trust for Thanet Archaeology was present when trial pit excavations were carried out on the foreshore of the study area in August 1992.

8.4 Whilst no archaeological features were observed at the thirteen locations where trial pits were excavated, three areas were identified along the frontage as significant for local archaeology. See Appendix F - Notes on Archaeological Sites in the Inter-tidal zone between Minnis Bay and Reculver 1992: A Research Report. Of particular significance are Coldharbour and Gore End, see Fig. 14 (the site at Minnis Bay is outside the area of this study). At Gore End the features, although disparate in type and period, are in close proximity and comprise the following:

a) Wave-truncated well shafts filled with loam and exhibiting medieval sherds.

b) Romano-British horizons - brick earth cut by graves, one a 4th century inhumation.

c) Remains of the lost village of Gore End, including a collapsed Georgian cottage with stratified debris surmounted by roof thatch.

See below at 8.16 and 8.20 respectively, for further discussion of the features at Coldharbour and Gore End.

8.5 At Reculver, in what is now one of Canterbury City Council's (CCC's) caravan parks, evidence of what may be part of an extra mural civilian settlement has been discovered. In 1963/64, approximately 200 feet south-east of the Roman fort, excavations revealed a structure which was eventually identified as a corn-drying kiln. There is also evidence of other important artifacts/ features. (See the Kent Archaeological Rescue Unit report of 18th December 1993 in Appendix D).

Historical Background

8.7 Reculver Roman Fort and Church (scheduled Ancient Monuments ref. KE 27), see Fig. 15, are located at the western limit of the study area. The fort was part of the strategic Roman fortifications at Reculver. The fortifications are largely no longer evident above ground, nevertheless they remain of considerable archaeological importance.

8.8 The Church is Saxon in origin and the main feature above ground are two distinctive towers. These were purchased and restored by Trinity House in 1811 to preserve them as a landmark for mariners.

8.9 English Heritage is responsible for the structure and fabric of the building and Canterbury City Council, which maintains the surrounding grounds, is developing the area as a Country Park.

8.10 The potential for damage to the Fort and Church by vibration from construction traffic passing directly alongside the Historic Monument using the existing restricted NRA access was identified at an early stage of the proposals. The establishment of an alternative access route, which would provide operational access for construction or maintenance of groynes and beach nourishment is discussed under 8.12 below.

Probable Impacts of the Proposed Works

8.11 Three main elements of the works have been identified as being potentially damaging to archaeological features. These are:

i) Construction of alternative access to the western end of the site at Reculver, through CCC's caravan park, see Fig. 11.

ii) Repair and extension works to three existing outfalls at North Mouth, Coldharbour and Brooks End, see Fig 2.

iii) Construction of 14 rock groynes between Reculver and Minnis Bay, see Fig. 2.

8.12 Of the three elements above, construction of the alternative access through the caravan park will require particular care as the proposed route passes in close proximity to the kiln site.

8.13 In their letter dated 2nd December 1993 English Heritage requested further details of the proposed works on the apron to the West of the Towers and the proposed groynes to enable them to give form a view as to the likely impact on the Scheduled Ancient Monuments at Reculver.

Recommendations for the protection of archaeological features

8.14 In order to implement measures to properly protect this and any other archaeological features/structures in the vicinity of the proposed construction access, details of the heights above datum of archaeological stratigraphy outside the fort walls are required. It is understood that the NRA are now in consultation with the Kent Archaeological Rescue Unit who have access to records made when the site was excavated. It is also understood that once the information becomes available it will be used to help formulate a strategy to upgrade the track without causing damage to the archaeological horizons.

8.15 Kent County Council (KCC) Archaeological Unit have agreed to supply the NRA with a specification for the upgrading and extension of the proposed construction access, to be carried out in the most practicable way, without causing damage to archaeological features. This, combined with information supplied by the Kent Archaeological Rescue Unit, should allow for the access through the caravan park to be constructed without adverse effects for archaeological deposits.

8.16 Work on the three outfalls will involve driving sheet piling to a depth of approximately 1.5 metres, breaking out, replacing, repairing and extending existing structures. Only superficial excavations through mobile beach sediments will be required.

8.17 The eroded fragment of an island once situated at the north mouth of the Wantsum Channel is located at Coldharbour, see Appendix F. This was probably formed by an upfold of the Thanet Beds. However, KCC Archaeological Unit considers that the works on the Coldharbour outfall are sufficiently far to the West of the original Wantsum estuary not to affect this site.

8.18 Work proposed to West of the Reculver Towers will involve reinforcement to the existing revetment and KCC confirmed that this should not affect archaeological interests. However, liaison should be maintained with English Heritage during the works as this area abuts its Ancient Monument site.

8.18 It is recommended that a qualified archaeologist should be appointed to monitor events during construction of the outfalls. In the event that archaeological deposits are discovered, the NRA should be prepared to allow time for detailed mapping and sampling of the exposed deposits to be made. However, any delays in the construction programme will have to be considered in the light of the NRA's requirement to comply with English Nature's agreement that work is phased as set out under 7.25 i) iv) above. This is in order to prevent or minimise disturbance to breeding and roosting birds.

8.19 Groyne construction will also only require local and relatively superficial excavations within the existing mobile beach sediments. Therefore, as for the outfall works, the recommendation is for a "watching brief" to be maintained to monitor excavation during construction. If deposits are revealed, then the procedure recommended at 8.18 above would also apply.

8.20 During excavations for construction of Groynes 11, 12, 13, and 14 archaeological horizons may be encountered at Gore End, South of Plumpudding Island, see Fig 14. This has been identified as an area of archaeological importance, comprising three sites discovered in 1986, see 8.4 above.

8.21 Similarly, at the locations proposed for Groynes 2 - 6, whilst no features were found during the preliminary field survey, trenching did reveal inundated archaeological horizons and monitoring in these areas should be maintained.

8.22 The conclusion of this archaeological assessment is, that provided the NRA maintains close liaison with the County and local archaeological authorities and proceeds with due regard to their recommendations and the recommendations set out above, there should be no adverse effects for local archaeological interests. On the contrary, the works may reveal features of significance which may have otherwise remained concealed. However, it should be recognised that a conflict of interests may occur in the event of archaeological features being disclosed, as the time required to investigate such a "find" would almost certainly upset the requirement for phasing construction around critical periods for roosting and breeding birds. (See the Kent Archaeological Rescue Unit report of 18th December 1993 in Appendix D).

9. FISHERIES

9.1 The main concerns for fisheries interests relate to construction impacts:

- Waste or short dumping (the temporary depositing of rock or dredged material short of its final destination in the works) of construction materials.
- Disturbance to the sea bed.
- Loss/curtailment of opportunities/income
- Hazards to small vessels on passage through the area.

Ministry of Agriculture Fisheries and Food (MAFF)

9.2 During preparation of the preliminary assessment MAFF stated that none of the options should have any long term detrimental effect upon fishing interests in the area.

9.3 Any works involving "deposits in the sea" below Mean High Water Springs (MHWS) require a licence from the Ministry of Agriculture, Fisheries and Food (MAFF), Marine Environmental Protection Division B, under the Food and Environmental Protection Act 1985, Part II. It is understood that the NRA will take the necessary steps to procure this licence for the affected parts of the works.

9.4 If materials, particularly rock for construction of the groynes, are to be delivered at sea, MAFF will require the NRA as a condition of their deposits in the sea licence, to ensure that an agreed delivery channel is established and kept clear of fishing gear during construction. Once designated, this channel should be subject to pre and post construction surveys to ensure that new obstructions are not created by short dumping of materials.

Kent & Essex Sea Fishery Committee

9.5 The Committee's principal concern relates to the proposed marine supply of materials. It has previously encountered problems associated with waste and short dumping of materials in the Kent and Essex District, resulting from coastal defence works. The Committee suggests that only when all parties are satisfied that the sea bed is free of imported rock, should final payment be made to the Contractor.

9.6 It is the Committee's experience that trial trawl surveys alone are not satisfactory. Therefore recommendation is made that, in addition to monitoring the sea bed both before and after the marine supply of materials, as would be required by MAFF, see 9.4 above, that diving and side scan sonar surveys should also be included as part of any offshore monitoring.

9.7 There may be minimal effect on some fishermen during transportation of materials to the site by sea, since bargemasters and other operatives will require an exclusion zone on the seaward side of the workings, see 9.4 above. However, inshore fishing activity in this locality is presently very small.

9.8 Otherwise, it is the Committee's view that, provided the works are carried out with care and that no waste or short-dumped materials are left on the seaward side of the sea wall, the proposed works should not adversely affect fishing interests.

9.9 Mr John Stroud of the Kent & Essex Sea Fisheries Committee confirmed during preparation of the preliminary assessment that the mussel beds, just offshore and North of the Coldharbour Outfall, are not commercially fished.

Seasalter Shellfish (Whitstable) Limited

9.10 Seasalter Shellfish Limited have a mollusc hatchery at Reculver where oysters are farmed commercially (this is marked on existing maps as a lobster farm). As part of their normal operating procedure, sea water is pumped into ponds on the premises to supply the hatchery and oyster nursery.

9.11 The most delicate phase of the production process occurs in winter, when the larval stages are developing. This corresponds with the time when surface run-off is high and the Hillborough Sewage Treatment Plant appears to operate at less than optimal performance.

9.12 Oysters are a filter feeding species and as such have a requirement for relatively large quantities of uncontaminated sea water, from which they extract nutrients in the form of phytoplankton. To avoid contamination during the winter months, the hatchery abstracts sea water on a rising tide from mid tide until one hour after high tide.

9.13 Once the groynes are in place and the shingle recharge of the beach is complete, it is reasonable to assume that the hydraulic regime around the groynes will function as predicted and retain materials. A result of this may be that contaminated outfall water will have a tendency to impound in the vicinity of the intake pipe with obvious, adverse effects for the hatchery's interests.

9.14 It is understood that in order to prevent the above mentioned situation developing, the NRA in consultation with the Managing Director of the hatchery, is discussing the possibility of re-locating the intake pipe to the East and adjacent to groyne No. 3.

9.15 It should also be noted that Bonamia, a disease affecting the Native/European oyster (Ostrea edulis) can be transmitted by the occurrence of infected oysters in imported shingle or gravel. The two nearest control areas for the disease, regulated by MAFF are between Poole and Selsey Bill and from the North Thames to Harwich. Importation of shingle from these sites should be avoided, as legislation is in place which prevents shellfish movement from these areas. It is recommended that once the location from which the shingle is to originate is ascertained, the NRA should consult MAFF (Weymouth) to obtain confirmation that there is no likelihood of accidentally introducing the disease to the North Kent Coast.

9.16 In the context of farming shellfish, it is worthy of note that the Shellfish Association of Great Britain have recognised the need for coastal areas to be made available for the purpose of shellfish cultivation. The Department of the Environment is also aware of the need to designate areas for this purpose and this issue may be best addressed by the NRA when planning future coastal protection strategy.

9.17 Seasalter Shellfish (Whitstable) Ltd. also expressed interest in the proposed alternative access to the frontage through the caravan park. Following discussions with Canterbury City Council, the NRA, subject to advice on any requirement to protect local archaeological features, are to upgrade the alternative access only for the purposes of maintenance of the works, see Chapter 8 above and Chapter 16 below. Any permission for Seasalter Shellfish Ltd to use the route would be entirely at the discretion of Canterbury City Council.

Local Angling Clubs/Societies

9.18 Three local angling organisations were consulted:

i) Nayland Boat Angling Club - no reply yet

i) Birchington Sea Angling Association - no reply yet

iii) Wantsum Angling Association - see below:

9.19 The Wantsum Angling Association is a freshwater fishing club which fishes regularly along the River Wantsum- marked as the Wantsum Drain on existing maps. The Association's fishing season extends from mid-June to mid-March.

9.20 The works will not affect the interests and/or activities of the Association. However, the Association has reported an existing problem related to the operation of the sluice on the South side of the sea wall at the Coldharbour outfall. It appears that the sluice is operated manually, as required, according to seasonal requirements for drainage of the adjoining agricultural land. The Association reports that, on occasions, the discharge from the sluice can be such that the level of the Wantsum River/Drain drops as much as 1m in three hours, with an associated significant loss of freshwater fish into the sea. Under the circumstances, it seems reasonable that this problem should be investigated, if only for reasons of preventing freshwater fish from being transferred to a marine environment in which they are unable to survive. The Association has therefore asked if this matter could be addressed as part of the works on the Coldharbour outfall. An alternative mechanism, eg. a paddle which winds down, allowing water to flow over the top, until the required level is reached is suggested. Since the fish involved are typically species which live on the bottom, this should allow the desired water level to be achieved without loss of fish.

Independent Local Anglers

9.21 A number of independent anglers use the frontage at Reculver and an informal poll of some of those present in November 1993 revealed that typical catches comprised Whiting, Bass, Cod, Plaice and Sole - "most types (of fish) are caught at Reculver" was a typical response.

Probable impacts of the Proposed Works

9.22 It is concluded that there should be no long term detrimental effects for local fisheries interests, provided the recommendations above are properly implemented. These are summarised as follows:

- Measures to ensure the adverse effects of waste and/or short dumping of materials delivered by sea are avoided.

- If necessary the re-location of the intake pipe for the oyster hatchery be included in the works in order to reduce the risk of contaminated water being taken into the premises.

- Checks are made with MAFF to prevent the accidental introduction of Bonamia, a disease affecting the edible oyster, with dredged material from infected areas.

10. LANDSCAPE AND VISUAL

Existing landscape

10.1 The landscape in the vicinity of the site is largely a function of the geology. The most striking features being the flat marshy landscape visible to the South East right through to Sandwich Bay and the hump of eroded Thanet Formation to the West on which sits the site of the Roman Fort surmounted by the ruins of St Mary's Church with its outstanding twin towers. The view to the East from the frontage fades into the seafront buildings at Westgate on Sea visible on the horizon.

10.2 The inland view is pleasantly green and rural with the fields and drainage channels leading the eye to the horizontal barrier of the railway embankment, beyond which the cooling towers and stack of Richborough Power Station can be seen on the skyline to the South East. The seaward view frequently includes shipping and on clear days the piled platforms of offshore forts are visible.

10.3 The principle view points are from the sea wall as this, with the exception of St Mary's Churchyard, represents both the highest elevation and the easiest access. The view of the beach shows shingle ridges and gradual slopes to seaward interrupted by a variety of timber groynes. Looking back towards Reculver and the dominant twin towers, the caravan sites and the main mollusc hatchery building are quite intrusive. The most interesting seaward views are in the vicinity of the coastal lagoons, the beach ridges here are frequently embellished by the activities of birds.

Probable impacts of the proposed works

10.4 The crests of the proposed groynes will be at least 1.5m below the crest of the existing sea wall and will follow the slope of the beach. Thus they will have no impact on the landscape viewed from anywhere except St Mary's Churchyard and the sea wall. Viewed from the sea wall, the rock groynes will appear darker and more significant than the timber groynes although the irregular rock structure may appear as a more natural feature, particularly where beach levels are close to the crest. The groynes will be less intrusive when viewed from the East than when viewed from the West as the beach levels should be higher on the East side due to a dominant Westward littoral drift.

10.5 The visualizations, Figs. 16, 17, 18, 19 and 20, show the probable impacts of the proposed works. The most significant impacts being on the views from Reculver looking East and from Minnis Bay looking West.

10.6 The visual impacts of the works could be mitigated by constructing the groynes with a wide range of rock sizes, making the profile irregular, with seaward slopes to fit the beach rather than a constant slope and by using (at least occasionally) a lighter coloured or "softer" rock. The rock surfaces below high water level will tend to turn green and the upper surfaces may be lightened over time by bird droppings.

10.7 The NRA may wish to seek further advice on ideas to minimise the visual impact of the works.

Countryside Commission

10.8 During the consultation process for the preliminary assessment the Countryside Commission stated that "it did not wish to comment on the application". Reply to full consultation was received on 1 December 1993 stating that the Commission's Countryside Planning statement gives guidelines for projects on which they would wish to comment in detail and that this project falls outside those identified for individual comment in the guidelines.

11. SOCIAL AND AMENITY

11.1 The social and amenity use of the site is considerable and is centred on the Northern Sea Wall which provides both access for various recreational pursuits and an amenity in itself in the form of a 5km long walking, running, cycling and pet exercising track. Even in the winter, it is rare to encounter less than ten people in any one hour on the sea wall engaged in various activities and in favourable conditions to see thirty people on or adjacent to the wall is not uncommon. Summer visitors to the caravan parks and beach users swell these numbers in the warmer months.

11.2 The loss of sections of the existing sea wall to erosion and resultant flooding of the hinterland would adversely affect social access and amenity use of the site. Thus measures to preserve the wall and upper beach must be considered significantly beneficial in social and amenity terms.

Access & Safety

11.3 Pedestrian access to the frontage is available to the west at Reculver, through Reculver Country Park and to the east from Minnis Bay at the eastern end of the promenade. Both routes lead directly to the Northern Sea Wall. The sea wall is a popular causeway, widely used by pedestrians and cyclists. It offers the opportunity for the public to gain access to any point along the frontage between Reculver and Minnis Bay, without the intrusion of regular vehicular traffic in order to pursue a wide variety of leisure activities and as such, it is a significant and valued local feature.

11.4 The Northern Sea Wall forms part of the "Wantsum Walk" and links with the "Saxon Shore Way". These are part of a network of public footpaths in the area which also extend across the farm land to the south of the sea wall.

11.5 It is proposed that construction traffic will be routed through the caravan park to the south east of the Roman fort. The impacts of this aspect are discussed in detail under Chapter 8 above - Archaeological and Historical Interests - and under Chapter 16 below - Construction Impacts. It is intended that access to the frontage for construction vehicles will be quite separate from the existing pedestrian access through the Country Park, the latter will remain available and there will be no interruption of the existing public access.

11.6 At other times the NRA has separate access to the frontage via the sea wall, see Fig. 11. NRA staff control the use of the main gates at the western (Reculver) and eastern (Minnis Bay) limits of the Sea Wall. These are usually kept locked to prevent vehicles gaining unauthorized access on to the wall.

11.7 There is some risk to people using the sea wall as a footpath during high tides and stormy conditions. Flying shingle and waves bursting over the wall could cause injury or worse. Works which result in the effective movement of high water mark further seaward of the wall (by building up and retaining beach material) would reduce this risk.

11.8 At low tide the rock groynes could attract adventurous and inquisitive individuals, particularly children who are naturally inclined to regard rocks on the seashore as an integral part of the marine environment. In order to fulfil their function for sea defence, the rocks used to construct the groynes are very large with correspondingly large voids between them which are a potential hazard. Communities of marine flora and fauna will colonise those sections of the groynes which extend into the inter-tidal zone causing the surfaces to become very slippery. It is therefore possible that anyone climbing on the groynes would be at risk of slipping and/or falling into the voids and possibly becoming trapped. If this occurred below the high water mark, on a rising tide, it could have serious consequences.

11.9 The NRA should consider placing permanent notices at frequent intervals along the frontage to ensure that the public is fully aware of the dangers of climbing on the groynes. The NRA cannot be expected to take responsibility for persons who may choose to ignore these warning notices and over time deterioration due to exposure or vandalism may result in the warning becoming illegible. It is therefore recommended that regular oversight of these notices should be maintained in order to ensure that the potential danger is clearly indicated to the public at all times.

11.10 When construction is in progress, in the interests of safety, public access to areas of the beach will, of necessity, have to be restricted. This temporary effect is discussed under 16.3 below (Other Construction Impacts).

Tourism

11.11 Kent County Council summarises its approach to Tourism in the County in the 1990 Approved Kent Structure Plan and Explanatory Memorandum. "The tourism and recreation policies seek to strike a balance between meeting the justified demands of recreation, capitalising on tourism potential in the interests of the economy and minimising the prejudicial effects on the countryside and built environment".

11.12 The proposal in relation to relevant County and Local planning policies is discussed in detail in Chapter 13 below (The Planning Context). The landscape and visual impacts of the works are discussed in Chapter 10 above.

11.13 Reculver Country Park extends over 37 hectares with an Interpretation Centre located at Reculver. This is an area that has been relatively recently developed by Canterbury City Council and is a significant tourist attraction, particularly during the summer months. The park is becoming increasingly popular and incorporates features of geological, archaeological, historical, cultural and ecological interest. The park benefits from being close to the nearby sea side, with convenient parking provided. Access to Reculver by road is available and as noted under 11.3 above, via the sea wall. All these factors combine to make the locality of considerable value for tourism and recreation.

11.14 The extensive sandy beaches at Minnis Bay are an important tourist attraction. It is of particular concern to Thanet District Council that imported shingle for beach recharge will not be moved east by the mechanism of long shore drift with adverse effects for this important feature. The possible effects of the groynes interfering with or disrupting the flow of sand in, either the short term, or on a longer term basis and the consequences for beach development in North Thanet, are discussed above under Chapter 6 - Geomorphology.

Parish Councils

11.15 St Nicholas-at-Wade and Sarre Parish Council

The Parish Council commented on the absence of proposed groynes in Coldharbour area between groynes numbers 9 and 10 (see Fig. 2.), the need to prevent shingle transport to the east, towards Minnis Bay, in order to safeguard the beaches and the need to protect breeding birds. These aspects are discussed under the relevant chapters above which are respectively Chapter 6 (Geomorphology) and Chapter 7 (Ecology) Section 7.11 (Ornithological Interests).

Sailing

11.16 Access for beach launching of sailing dinghies from the Northern Sea Wall is poor. Slipways off the sea wall are only available in Minnis Bay. Minnis Bay sailing club has stated, in response to consultation, that they would wish the proposed groynes to be appropriately marked at the seaward end to make clear to sailing boat helmsmen the extent of the underwater obstructions at high tide. It is unlikely that properly marked rock mound groynes will be of any greater hazard to inshore sailing boats than the present miscellaneous timber groyne remains which litter the foreshore.

Windsurfing

11.17 The Minnis Bay Windsurfing Club were invited to comment on the proposals. Verbal comments made by the Commodore of the Club indicated that it is unlikely that the proposals will have any adverse or beneficial effects on the Club's activities.

Angling

11.18 The interests of local angling organisations are discussed under Fisheries in Chapter 9 above.

Equestrian Interests

11.19 The Plumpudding Equestrian Centre is located at Plumpudding Island at the eastern end of the study area. The proprietor of the establishment has commented that it is unlikely that the proposals will have any adverse effects for their interests. In fact it is considered that the benefits gained by the protection from flooding would probably be the single most important factor affecting the operation of the Centre.

Employment

11.20 The completed works are unlikely to have significant impacts on local employment. Maintenance of the works can probably be managed within the capabilities of the existing NRA workforce in the region. The initial construction work on the outfalls will employ some 10-15 people on site and this number should rise to 30-35 during the peak of the construction programme. It is probable that between 20% and 50% of this workforce will be recruited locally. There may be one or two additional employment opportunities created to cater for the construction workers by providing meals, site services, etc. It is likely that any impacts on local employment will outlast the construction period.

Probable impacts of the proposed works

11.21 Public access to the frontage will not be affected by the proposed works. The safety of persons climbing on the groynes is a significant issue but advice regarding the dangers of this practice should be clearly displayed to the public. The works will provide improved protection from flooding and reduce the risk of damage to the shingle banks and sea wall. This will ensure that both local people and visitors to the area can continue to enjoy uninterrupted access along the frontage, the amenities available at each end of the sea wall at Reculver and Minnis Bay and an opportunity to take advantage of the open space in between.

11.21 The likely effectiveness of the groynes in retaining the shingle recharge material and the implications of this issue for beach amenity at Minnis Bay is discussed above under Chapter 6 (Geomorphology).

12. SOCIO-ECONOMIC AND AGRICULTURAL INTERESTS

12.1 There will be long term socio-economic benefits for local landowners. As for local social and amenity interests, there will be a significant reduction in flood risk for the land South of the sea wall. This, combined with retardation of the more long-term loss of land due to coastal erosion will be a major benefit of the works.

Land Drainage

12.2 The primary objective of the works is to prevent flooding and damage to the existing sea defences. The existing drainage system should therefore be relieved of the occasional additional and severe burden of flood water which it is not designed to accommodate. Consequently, the implications are that there will be no adverse effects on land drainage interests, provided the mechanisms controlling the operation of the outfalls at North Mouth, Coldharbour and Brooks End are maintained in operation.

12.3 Sections of the railway line between Herne Bay and Margate were inundated during the 1953 flood event. The railway is an important link for the Isle of Thanet and the socio-economic benefit of ensuring that its operation is maintained at all times is significant for the overall local economy.

12.4 At Reculver the mollusc hatchery's requirement for salt water during its production process, is for controlled amounts in specified areas, not a general inundation. Flooding would have serious adverse effects on the hatchery's operation.

12.5 The interests of the Plumpudding Equestrian Centre would also be adversely affected by flooding, see 11.18 above.

Agricultural

12.6 St Nicholas Court Farms Limited farm all the land from the Southern bank of the borrowdyke South of the sea wall. Wheat, oil seed rape, peas and potatoes are cropped as part of the main 5 year rotations, other crops include cauliflowers, lettuce and bulb onions.

12.7 The Chislet Marsh area supplies irrigation water to large areas of upland cropping. These marshes are sufficiently far from the frontage not to be affected. However, any loss or pollution of irrigation water in these marshes would have serious adverse effect on productivity.

12.8 The principal concerns of St Nicholas Court Farms relate to the large gap proposed between groynes numbers 9 and 10, relate to a wider interest in the locality. At present there are a few wooden groynes in place at the western end of the Coldharbour coastal lagoon. The farm management have suggested that two additional groynes be constructed at each end of the lagoon in order to contain the shingle and enhance the wildlife value of the area, see Fig. 13. This is an issue which has been raised by other local people and is discussed above under Chapter 6 (Geomorphology) and Chapter 7 (Ecology).

12.9 Overall, agricultural land adjacent to the frontage should benefit from the works. The land will be protected from saline intrusion, which if allowed to occur regularly, would reduce productivity.

13. THE PLANNING CONTEXT

13.1 The works are being implemented by the NRA as Land Drainage Improvement Works and the environmental assessment has been carried out in accordance with S.I. 1988, No. 1217, the Land Drainage Improvement Works (Assessment of Environmental Effects) Regulations 1988, see also Section 2.1. As such, it is understood that there is no requirement to seek planning consent for the works. However, in order to demonstrate that the proposals do not run contrary to local planning policies, consideration was given to the proposed works in the context of local planning.

13.2 Policy CC11 of KCC's Approved Structure Plan 1990, whilst intending to maintain a presumption against harmful development along Kent's undeveloped coast, also recognises the scope for enhancement of these areas and the role of positive coastal zone management in achieving a balance of objectives and resolving conflict and congestion. Similarly policy ENV9 (Kent Structure Plan, Third Review, Draft Consultation Document - Kent County Council [KCC], 1992) seeks to protect undeveloped coast in such a way that it will be conserved, managed and enhanced.

13.3 Proposed policies ENV4 and ENV5 (Structure Plan, Third Review, 1992) will provide protection for designated areas of wildlife interest. It is recognised that there is a need for such sites to be the subject of public consultation and the local plan process provides an appropriate vehicle for this.

13.4 Existing KCC policy BE4 seeks to protect the architectural and historic integrity of buildings of special architectural and historic interest. Whilst proposed policy ENV16 paragraphs i) - iv), (Structure Plan, Third Review, 1992), also clarifies strategic priorities towards protection and enhancement.

13.5 Policy CAC 15, (Thanet Urban Local Plan, Written Statement 1984) states that the District Council, when considering development proposals at or near undeveloped coastline, will take into account the landscape, scientific value and character of the particular coastline and the nature, size, location, scale and likely impact of the proposed development in applying Structure Plan Policy, (See 13.2 above). The main thrust of this policy is now set out in Policies CL2 and SP19 of the new District Plan.

13.6 Policy R6 of Canterbury City Council's District Local Plan, Consultation draft, Written Statement, 1991, recognises the scenic importance of the coastline at Reculver and the adjoining countryside. The impacts of proposals at and adjoining the undeveloped coast, will be assessed for their impact and refused if considered to be detrimental to the area.

13.7 The effects of the proposals in relation to landscape, tourism, amenity, socio-economic, ecological, historical and archaeological aspects are discussed in more detail in the relevant chapters set out above.

Kent County Council

13.8 No formal reply had been received at the time of printing.

Canterbury City Council

13.9 Canterbury City Council's views were given in their letter of 10th December 1993. The Council asked that the following significant matters be addressed in the assessment:

- Nature conservation, with special reference to the SSSI, the proposed Special Protection Area and Ramsar Site designations.

- Landscape, with special reference to the proposal to define the affected area as an Area of High Landscape Value and as a Special Landscape Area in the Third Review of the Kent Structure Plan.

- Archaeology, with special reference to the area around the Reculver Towers.

- Recreation, including the Country Park at Reculver and the access to the East along the sea wall.

- Sea defence, with special reference the movement of littoral sediment.

Thanet District Council

13.10 It is the opinion of this Authority that the proposals could require a specific grant of planning permission. The District Council made a specific request that Landscape Issues, Tourism and Nature Conservation need to be addressed as a part of an Environmental Statement for the proposed Northern Sea Wall (Reculver) Improvement Works.

14. AIR QUALITY, WATER QUALITY AND CLIMATE

Air Quality

14.1 Some dust and exhaust fumes (NO_x, CO hydrocarbons etc.) will inevitably be generated by the movement of plant and construction vehicles during the construction of the works. This is most likely to be a problem during dry summer periods in the caravan park and elsewhere close to the access road. Any dust nuisance need not be significant if an adequate temporary surface is maintained on the access road. Similarly, the access road would only need to be used for plant and general supply purposes, not for a haul road for a major earthmoving operation. This would only be evident while the works are in progress and given the typically breezy conditions on the open frontage, should rapidly disperse. Once the works are completed, there should be no significant impact on air quality. See also Other Construction Impacts- Chapter 16 below.

14.2 It is understood that shingle for beach recharge is to be supplied by sea and will either be pumped on shore from a dredger or similar vessel or deposited on shore and then bull-dozed into position. The shingle is likely to have sandy/organic deposits adhering to it and occasionally this can include scattered amounts of a black organic deposit which is due to materials being removed from locations where anoxic conditions prevail. Wave action and rain will wash the fines and organic deposits down through the shingle fairly rapidly, but the rate of movement will depend on the amount of rainfall following the shingle nourishment. A period of hot, dry breezy weather may generate a relatively local and temporary rise in dust levels from the shingle, but this would not have any long term significance for air quality.

14.3 If the proposed rock groynes tend to trap more loose seaweed on the frontage than at present, there may be an increase in odour and fly impacts. However, studies carried out by Hydraulics Research Ltd for similar rock structures elsewhere have indicated that an increase in weed trapping is unlikely.

Water Quality

14.4 Provided the beach nourishment does no block the existing outfalls or interfere with the operation of the sluices at the outfalls there should be no long term impacts on water quality, see also Chapter 16 below (Other Construction Impacts).

Climate Change

14.5 Sea levels are dependent on a combination of global factors and local variations. Global factors include the total amount of water in the oceans, variations in water temperature and bathymetry. Local variations in the rate of change in sea level are influenced by winds, currents and land subsidence or emergence.

14.6 At present there is some consensus that a future rise in global temperature will be largely the result of increased concentrations of "greenhouse gases". As global temperature rises it is predicted that sea levels will also rise by the processes of thermal expansion and melting ice interacting with natural and man made systems.

14.7 Debate and research into methods of accurately predicting future sea level rise continue and present knowledge is insufficient to make accurate predictions. However, in spite of the uncertainty, it is necessary to include an allowance for a rise in sea level due to global warming during the design process for coast protection works. There is some variation in opinion, but the currently accepted value agreed jointly by the NRA and MAFF and generally adopted for schemes in the South East region of the UK is 6mm per year.

14.8 The design life of the coastal defence works at Reculver will be in the order of 50 years. Assuming a 6mm/year rise in sea level, the additional figure of 300mm should be incorporated in assessments of overtopping in order to account for this effect.

TABLE 15.1

LOCATION	L 90 dB(A) NIGHT	DAY
King Ethelbert Public House Facade. 100m from proposed Groyne 1	48	52
On sea wall above Groyne 2	63	69
On sea wall above Groyne 7	65	67
On sea wall above Groyne 10	59	64
On sea wall above Groyne 14	63	68
at The Cottage facade on Plumpudding Island 300m from Groyne 14	45	59

TABLE 15.2

WEATHER CONDITIONS AT THE TIME OF SURVEY

	Wind speed	sea condition	precipitation	tide
day	5 - 6 m/s	heavy swell	dry	high
night	5 - 6 m/s	heavy swell	drizzle	mid

Comments on the results

15.7 The highest readings were recorded on the sea wall at the most open and exposed positions and the lowest were away from the sea wall and screened from the surf zone.

15.8 As previously stated, the stormy weather conditions caused the high readings measured and L_{90}s of 40 dB(A) and 45 dB(A) for night and day respectively would be anticipated for calmer periods.

Noise generated by completed coastal defence works

15.9 The completed works will comprise 14 rock groynes, three of which incorporate reconstructed outfalls, and beach nourishment with shingle. An estimate of the probable noise impacts is given below:

- The groynes will not generate any significant additional noise. Waves breaking on the rock mound groynes and the water swirling through the interstices are unlikely to dominate the present rattle of moving shingle and hiss of water through the stones as experienced at present. In fact, as the works should tend to move the high tide mark seaward, there may be a marginal reduction in sea noise as experienced at the sea wall.

- It is possible that the rock groynes may attract perching and roosting birds (as has happened elsewhere). It is therefore quite possible that there will be some increase in the noise level generated by seabird calls once the proposed works are constructed. This would not be considered an adverse impact.

Noise generated during the construction of the proposed coastal defence works

15.10 The significant noise resulting from the construction of the proposed works will be generated by the mechanical plant and equipment. Information on the noise output for various types of construction plant and equipment was obtained from BS 5228:1984 Part 1 "Control of noise from construction and open sites".

15.11 The construction work would normally be confined to the daylight hours, however, the construction of the inter-tidal sections (i.e. most) of the groynes will be constrained by the tides. Thus it may be cost effective to work early mornings and late evenings when these coincide with low tides. Similarly, dredging for shingle is often a 24 hour operation and it may be practical to continue bringing ashore the beach nourishment shingle if the dredger or barges can bring it to the shore at night.

15.12 Typical items of plant required and corresponding noise outputs are given for each phase of the proposed construction of the proposed works, see Table 15.3 below:

TABLE 15.3

Site preparation

Item	Nos.	SWL ($dB_{(A)}$)	%ontime
Tracked excavator	2	97	80
Lorries	2	95	10
Dozer	2	114	100

Cont.

TABLE 15.3 (Cont.)

Forming the rock groynes and placing beach nourishment

Item	Nos.	SWL ($dB_{(A)}$)	%ontime
Sheet piling hammer	1	122	50
360° Excavators	2	100	100
360° Grabs	2	100	80
Lorries (delivery)	3	95	50
Dozer	2	114	100
Shingle pipe outlet	2	100	80

15.13 From the above, the maximum sound power level from the construction of the works will be 114 $dB_{(A)}$ generated during the forming of the rock groynes and the placing of beach nourishment and the more occasional 122 $dB_{(A)}$ from the sheet piling hammer. Maximum sound pressure level = 123 $dB_{(A)}$

15.14 The worst cases will be during the construction of the works closest to the residences. The actual worst case will be sheet piling for the apron works to the West of the Towers, close to the King Ethelbert public house.

Predicted noise levels at measurement locations

15.15 The predicted noise levels resulting from the construction of the works are derived from the calculation of basic sound pressure level (SPL) from the formulae:

$$SPL = SWL - (20Log_{10}r + 8)\ dB_{(A)}$$

Where r is the distance to the reception point.(The constant - (8) allows for hemispherical radiation).

The adjustment factors are applied to the calculated SPL to allow for screening, intermittency, duration and tonal effects (where relevant). In this case both of the residences are effectively screened from work on the foreshore by the sea walls.

15.16 The resultant predicted noise levels for the construction phase are given in Table 15.4 below:

TABLE 15.4

Location No.	r (m)	Basic SPL $dB_{(A)}$	Screening $dB_{(A)}$	Predicted noise level
King E/bert	100	75	-10	65
The Cottage.	300	61	-10	51

15.17 From the above results, the maximum predicted increase in noise level resulting from the construction of the proposed works for the above locations may be calculated. See Table 15.5 below:

TABLE 15.5

Location No.	increase in noise level over day-time L_{90} ($dB_{(A)}$)	increase in noise level over night-time L_{90} ($dB_{(A)}$)
King E/bert (pub)	13	17
The Cottage.	1	7

Note: If the construction work is confined to daylight hours, the increase in noise levels over the day-time ambient measurements only will apply.

Vibration

15.18 The proposed Works will not cause significant ground vibration during operation. There may be some reduction in vibration presently caused by waves at high tides hitting the sea wall as the works should reduce the frequency of such occurrences. Vibration risks to the remains of the Roman fort resulting from construction or maintenance traffic are addressed in Chapters 8 and 16.

15.19 There may be some vibration during the construction of the works as the outfalls will comprise culverts laid between sheet piles. Both the Coldharbour and Brooksend outfalls are a considerable distance from any houses which could be affected and a convenient transmission strata is unlikely to be found within the pile driving depth (see Section 6). The reconstruction of the North Mouth outfall and the piling of the apron to the West of the Towers will involve pile driving within 250m of St. Marys Church and closer to the King Ethelbert public house.

15.20 The piles will be driven into the clay and sand of the Tertiary Thanet Formation (the same formation that supports the towers) and will not reach the underlying chalk. It is unlikely that the soils of the Thanet Formation will transmit significant ground vibration, however the NRA Engineers opinion should be sought before work is commenced. There is a possibility of some ground shock due to occasional mis-handling of the large rocks used for the rock groynes, although this is most unlikely to be noticed at the distant residences.

Conclusions

15.21 There may be significant noise impacts during construction. The noise levels may increase noticeably at the King Ethelbert public house during plant operations involved in the construction of Groyne 1 and the piling work on the adjacent apron. The increase in noise above daytime ambient is predicted to be $13dB_{(A)}$. Such an increase is significant in terms of inviting complaint. The increase in noise level above night-time ambient was predicted to be $17dB_{(A)}$, i.e. likely to be considered a nuisance by the residents. Thus, by limiting the work (particularly pile driving) to daylight hours, the significant impacts should be minimised. Pile driving for the outfall works is likely to be noisy, however, there are no houses close enough to the outfalls to cause a noise nuisance to the residents. The pile driving for the apron works to the West of the towers will give the most severe impact but this activity should be confirmed to the daylight hours of a few days only.

16. OTHER CONSTRUCTION IMPACTS

Timing of Construction

16.1 The timing of the works must be in accordance with the schedule set out by English Nature see 7. above.

Traffic

16.2 It is understood that bulk delivery of materials is to be made by sea, therefore disruption to other traffic using the roads serving Reculver should be minimised. Site access is proposed via the caravan park South East of the Roman Fort at Reculver and should consist mainly of traffic associated with contractors mobilization and demobilization. This will significantly mitigate the effects of vibration on the ancient fort walls. At the height of construction there will probably be some 30 car/light van visits to the site and perhaps 5 HGV visits in a single day.

Beach Access and Safety

16.3 The works should allow for continued safe public access to the beach and should not make access along the beach unduly difficult or hazardous as the upper foreshore is a significant corridor of recreation for local people and visitors. It will be necessary to accept that access may be severely limited during construction, but the extent of this limitation should be mitigated by confining exclusion zones to the immediate vicinity of active construction.

Water Quality

16.4 In the course of the works sand and sediment disturbance may occur and the shingle nourishment of the beach is likely to generate some turbidity. These effects should rapidly diminish as the sand/sediments settle out from the shingle.

17. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Geomorphology

17.1 The purpose of the works is to control the risk of flooding by the control of coastal erosion and subsequent reduction in the risk of overtopping of the existing sea wall by storm driven high tides; to reduce the risk of breaching of the Northern Sea Wall and to control the highly variable rates of sand and shingle movement.

17.2 The primary functions of the proposed works, preserving and enhancing the protective beach in front of the Northern Sea Wall and thus preserving the flood protection provided by the wall, should have largely beneficial impacts in the area. Two particular areas of concern have been identified, namely; the proposed groynes may exacerbate erosion to the West of Reculver and the apparent gap in the proposed groyne field between Groyne 9 and Groyne 10 could exacerbate erosion on that section of the frontage. These concerns must be addressed by ensuring adequate beach recharge to prevent any interruption in the supply of littoral material.

17.3 It is considered that the proposed works will not result in a major change in sediment grading on the beach at Minnis Bay.

17.4 The proposed works will tend to preserve the coastal lagoons by preserving the protective beach berm. However, these lagoons are dynamic features that will, to some extent, continue to degrade under natural processes.

Ecology

17.5 As the entire frontage forms part of the Thanet Coast SSSI, close liaison has been maintained with English Nature throughout the early development of the proposals. Impacts on the three main habitat types of the frontage should be minimal and it is likely that small benefits may result for the species of plants and animals which will colonise what, in effect, will be the newly created habitat provided by the rock groynes in the inter-tidal zone.

17.6 The vegetated shingle above MHW is the most vulnerable part of the terrestrial habitat and it is recommended that, where practicable, construction traffic should be excluded from gaining access to the frontage at locations where plants are established.

17.7 Of greatest concern is the need to protect the birds which use the area. Whilst it is recognised that birds exploit the area throughout the year, the most critical months and the locations where disturbance must be kept to a minimum have been identified. Accordingly, a schedule has been agreed between English Nature and the NRA in which the proposed works will be phased around the species which would be particularly at risk. This has been arranged in such a way as to ensure that ornithological interests are properly protected and, provided the works are carried out as agreed, the risks to local bird populations should be minimised.

Archaeological and Historical Interests

17.8 Of the three main elements of the works, the proposal to upgrade an existing access through Canterbury City Council's caravan park has been identified as having the greatest potential to damage archaeological features thought to be in the vicinity of the works.

17.9 The NRA is presently liaising with local archaeological units in order to more accurately ascertain the location and depth of any features which might be disturbed or damaged by the re-construction work. The decision to explore the possibility of using this route as an alternative for construction access was made in order to protect the walls of the Roman Fort. These are located immediately adjacent to the NRA's existing access, but it was felt that vibration generated by frequent movements of heavy construction traffic would be detrimental to the integrity of the Roman wall.

17.10 When more information is available, it is understood that the NRA (in consultation with Kent County Council and other local archaeological groups) will formulate a specification for upgrading the track, which will take into account the need to protect archaeological interests.

17.11 The main works, involving repairs and extension of three existing outfalls, construction of fourteen rock groynes and shingle beach nourishment should have no adverse effects on known archaeological sites, although three sites of known significance have been identified in the inter-tidal zone. It is recommended that a qualified archaeologist should maintain a "watching brief" to monitor all excavations on the frontage. The excavations required for groyne construction will be almost entirely within the existing profile of mobile beach sediments, therefore it is unlikely that archaeological remains will be disturbed. However, if discoveries are made, the NRA should be prepared to allow time for investigation and mapping of exposed deposits.

Fisheries

17.12 The main concerns for fisheries interests relate to waste or short dumping of rocks during the marine supply of materials to the frontage. It is the experience of the Kent and Essex Sea Fisheries Committee that trial surveys before and after materials are supplied by sea do not always adequately ensure that the sea bed is free of obstructions.

17.13 It is recommended that in addition to trawl surveys, diving and side scan sonar surveys should also be included as part of an offshore monitoring programme. Further to this, consideration could be given to withholding final payment to the Contractor, until the appropriate parties are satisfied that the sea bed is clear of debris and imported rock.

17.14 There is the real possibility that the new local hydraulic regime resulting from the construction of the groynes will alter the existing arrangements for supplying sea water to the mollusc hatchery at Reculver. This would be to the detriment of the hatchery's successful operation. Arrangements to ensure that only uncontaminated water is pumped into the hatchery, are being considered by the NRA in consultation with Seasalter Shellfish (Whitstable) Ltd.

17.15 The NRA should also consult MAFF regarding the site of origin of dredged shingle for use in the works, as it is possible to inadvertently introduce a disease affecting oysters by the accidental inclusion of infected shellfish in the shingle to be used for beach recharge.

17.16 Provided the adverse effects of short or waste dumping are prevented/rectified and a method of ensuring that clean seawater is supplied to the mollusc hatchery are addressed and the origin of imported shingle is known, there should be no long term detrimental effects for fishing interests in the area.

Landscape and Visual

17.17 The landscape in the vicinity of the site is largely a function of the geology. The principle view points are from the sea wall and St Mary's Churchyard which represents both the highest elevations and the easiest access. The existing caravan sites and the main mollusc hatchery building are significantly intrusive.

17.18 The crests of the proposed groynes will be at least 1.5m below the crest of the existing sea wall and will follow the slope of the beach. Thus they will have no impact on the landscape viewed from anywhere except St Mary's Churchyard and the sea wall.

17.19 The visualizations, Figs. 16, 17, 18, 19 and 20, show the probable impacts being on the views from Reculver looking East and from Minnis Bay looking West. It is concluded that whilst the proposed works will have some impact on the views of the beach, these impacts will not necessarily be adverse.

17.20 It is recommended that the NRA seek further advice on ideas to minimise the visual impact of the works.

Social and Amenity

17.21 Public access to the frontage from Reculver and/or Minnis Bay and along the Northern Seawall will not be affected and one of the long term benefits of the works will be that this valued section, in a network of footpaths along this stretch of the coast, will be protected. Similarly, there will be no adverse impacts on the recreational value of Reculver Country Park, the amenity of the caravan park at Reculver and the many opportunities to enjoy a variety of leisure pursuits in the locality. The need to define exclusion zones in areas of active construction on the foreshore, for safety reasons, will only temporarily impair the amenity of the beach.

17.22 The groynes will be a potential hazard to the safety of persons who climb on them. The provision of prominent notices, located at regular intervals along the frontage will clearly warn of the dangers of climbing on the groynes and should significantly reduce this risk. It is recommended that the NRA regularly maintain these notices, to ensure that they remain legible.

17.23 The sandy beach at Minnis Bay is a significant local tourist attraction. The potential for imported shingle to move east via the process of long shore drift and spoil this characteristic element of the seaside is discussed above under 17.1 - Geomorphology.

17.24 Concern has been expressed regarding the possible adverse effects of the large gap between groynes Numbers 9 and 10. It is the view of some local people that this could be to the detriment of ecological interests. Various suggestions have been made, regarding the possibility of constructing additional groynes at this location and/or moving groynes to other positions on the frontage. If engineering considerations indicate that design amendments, in terms of the location and numbers of groynes proposed are required, these alterations would need to take into account the possible impacts on, inter alia, archaeological, historical and ecological interests.

Socio-economic and Agricultural Interests

17.25 There will be a significant reduction in flood risk to the land to the South of the sea wall. This will be of long term economic benefit to landowners as the risk of saline intrusion over productive agricultural land will be reduced, ensuring that productivity is not impaired. The railway line will also benefit from the works, as the risk of its operation being adversely affected by flooding will be largely removed.

17.26 The existing land drainage system should benefit from the proposed works, as the need to cope with occasional flood events should be considerably reduced.

The Planning Context

17.27 The works are being implemented by the NRA as Land Drainage Improvement Works and the environmental assessment has been carried out in accordance with S.I. 1988, No. 1217, the Land Drainage Improvement Works (Assessment of Environmental Effects) Regulations 1988. It is understood that there is no formal requirement for the NRA to seek planning consent.

17.28 However, in terms of existing Kent County Council Planning Strategy and policies set out by Canterbury City Council and Thanet District Council in their Local Plans, the proposals do not appear to be in conflict with existing policies. This is with particular reference to policies relating to tourism and recreation, landscape, archaeological, cultural and ecological issues.

Air Quality, Water Quality and Climate

17.29 There should be no long term changes in air quality. There is likely to be an increase in the turbidity of the sea during construction, but this should have no long term effects on water quality.

17.30 The significant issue relating to climate is whether account has been taken in the design of the works to allow for predicted rises in sea level during the life of the proposed works. There in no present plan to raise the level of the sea wall and, subject to the following comments, there appears no overwhelming need to. The present wall crest level being some 2m higher than the highest water level recorded to date, there appears to be an adequate margin against 6mm a year sea level rises for the likely design life of the works. The groynes and beach nourishment proposed should keep breaking waves well seaward of the wall and reduce the risk of overtopping.

Noise and Vibration

17.31 There are no significant noise and vibration impacts likely to result from the completed works.

17.32 There may be significant noise impacts during construction. The noise levels may increase noticeably at the King Ethelbert public house during the sheet piling work for the apron to the West of the Towers. The increase in noise levels above ambient have been predicted to reach nuisance levels particularly if the work was to be carried out at night. However, by limiting the work to daylight hours any significant impacts should be limited to a few days only. Pile driving for the outfall works is likely to be noisy, however, there are no houses close enough to the outfall sites to cause a nuisance to the residents. In the event of complaints, monitoring should be carried out during the noise generating operations.

Construction Impacts

17.33 Construction impacts are by definition only temporary. Provided the works are phased as agreed with English Nature, to protect ornithological interests and according to recommendations made to ensure that archaeological features are not damaged, there should be no serious or significant long term impacts on the area. However, coupled with these provisos is the need to incorporate measures to achieve a high standard of re-instatement and clearing away at the end of the contract.

Impact Matrix

PHASE OF WORKS	PERMANENT WORKS			CONSTRUCTION		
ENVIRONMENTAL ASPECTS	ROCK GROYNES	OUTFALL RECONSTRUCTION	BEACH NOURISHMENT	MARINE SUPPLY OF ROCK & SHINGLE	ACCESS & TRAFFIC	SITEWORK & PILING
GEOMORPHOLOGY	⊖ ⓂⓂ	⊖	⊖ ⓂⓂ	·	·	·
ECOLOGY	⊖ ⓂⓂ	⊖	⊖	◐	◐	◐
ARCHAEOLOGICAL	· ⓂⓂ	· ⓂⓂ	·	·	● ⊗ⓂⓂ	◒ ⓂⓂ
FISHERIES	⊖	·	·	● ⊗ⓂⓂ	·	◒
LANDSCAPE	◒ ⊗	◒ ⊗	⊖	·	·	·
SOCIAL & AMENITY	⊖	⊖	⊖ ⓂⓂ	⊖	◒	◒
SOCIO-ECONOMIC	○	⊖	○	·	·	⊖
AGRICULTURAL	⊖	⊖	⊖	·	·	·
AIR/CLIMATE	·	·	·	◒	◒	·
WATER QUALITY	⊖	○	◒	◒	·	·
NOISE/VIBRATION	·	·	·	◒	◒	●⊗ⓂⓂ

Key:

- ⊖ Minor beneficial effect
- ◒ Minor adverse effect
- ⊗ Partial mitigation possible
- ⓂⓂ Effects require verification by monitoring
- · No significant impact
- ○ Major beneficial effect
- ● Major adverse effect
- ⊗ Full mitigation possible

APPENDIX A

FIGURES

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER) IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

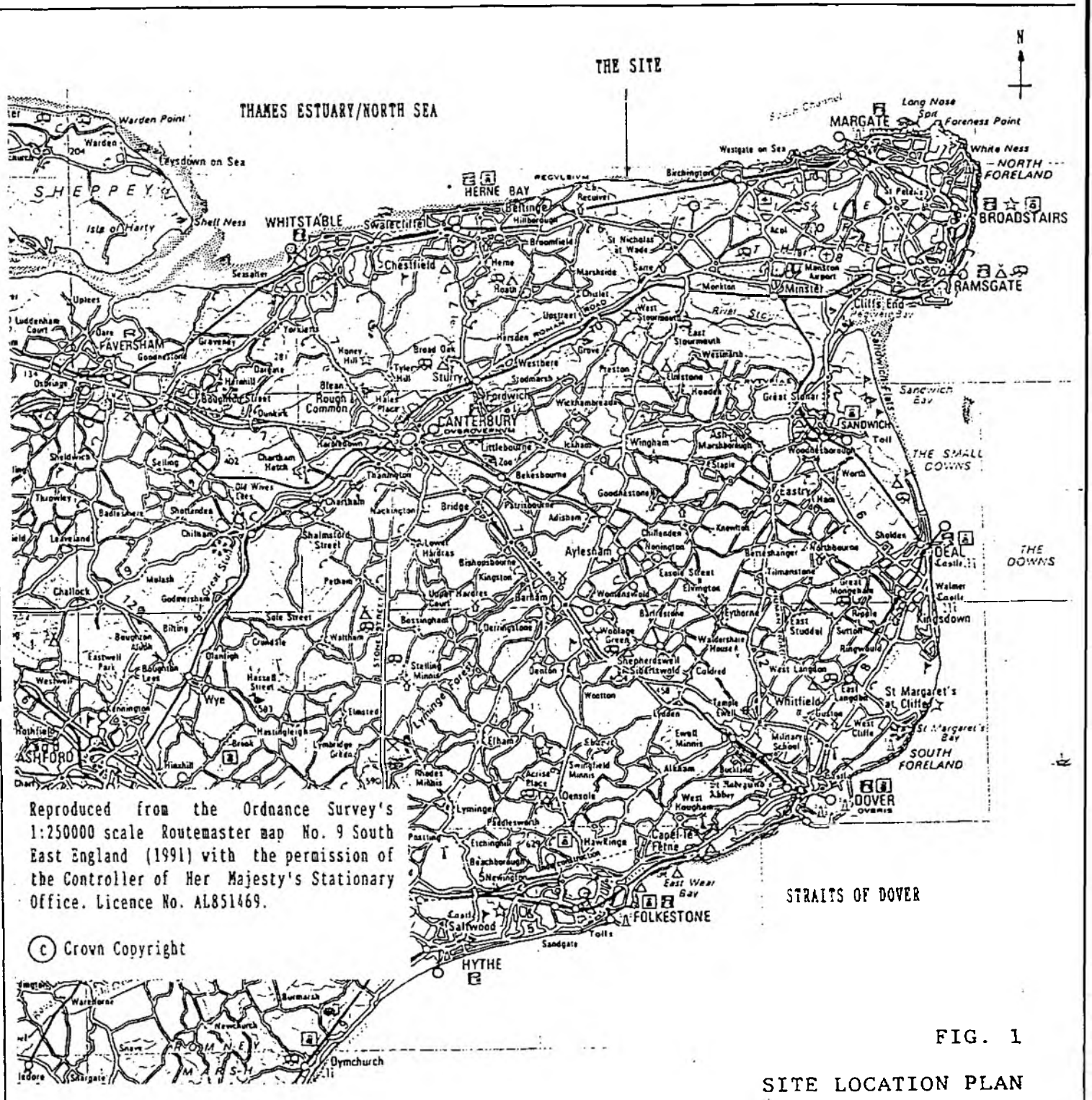

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FIG. 1

SITE LOCATION PLAN

Scale 1:250000

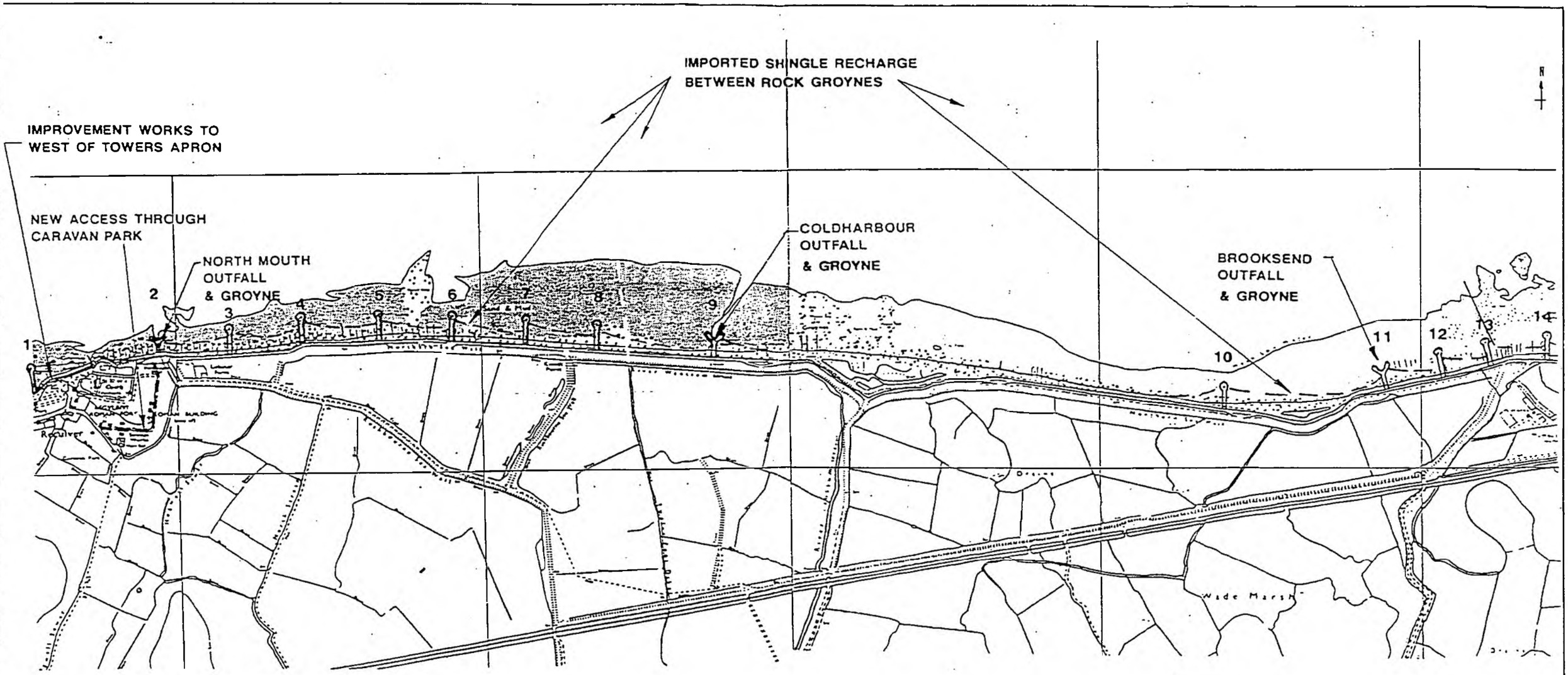


FIG. 2

PROPOSED IMPROVEMENT WORKS

ROCK GROYNES & BEACH NOURISHMENT

PREVIOUSLY KNOWN AS OPTION 2

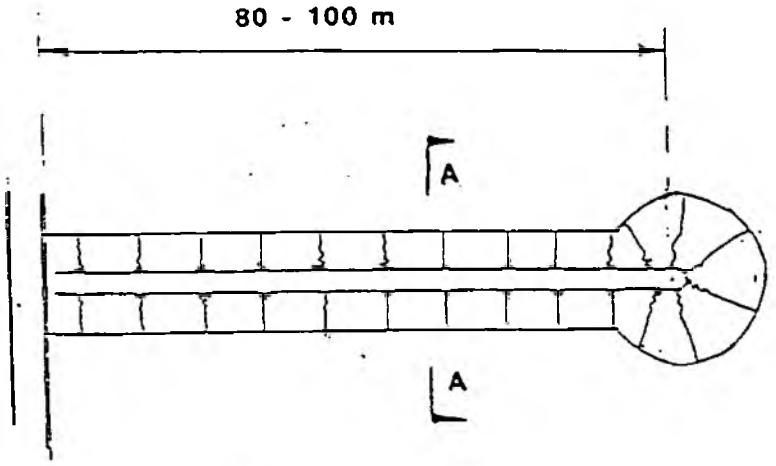
Scale 1:12500

NATIONAL RIVERS AUTHORITY
Southern Region

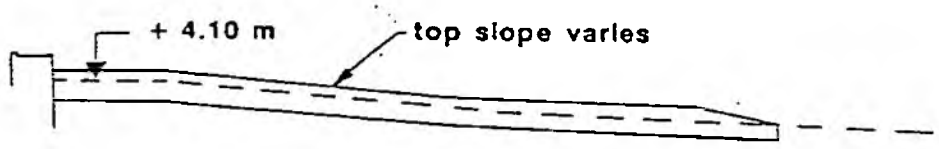
NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

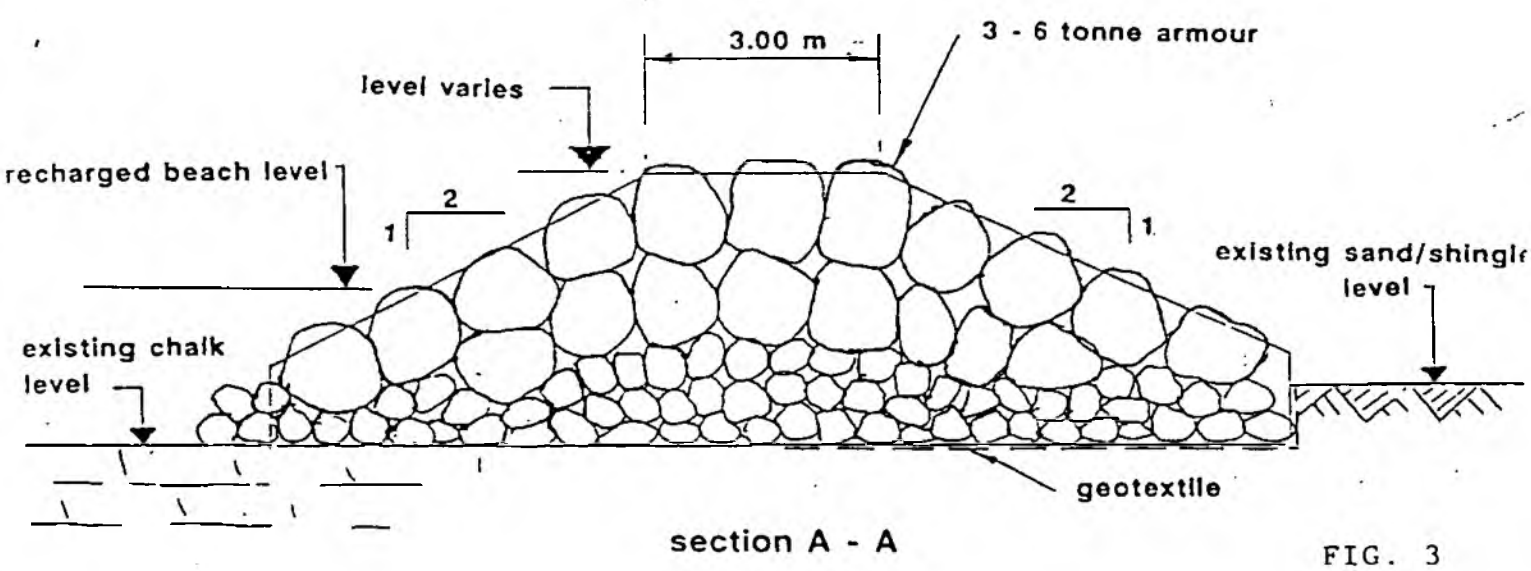
December 1993



plan



long section



section A - A

FIG. 3

PROPOSED IMPROVEMENT WORKS

DETAILS OF ROCK GROYNES

PREPARED BY ROBERT WEST & PARTNERS

Not to scale

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

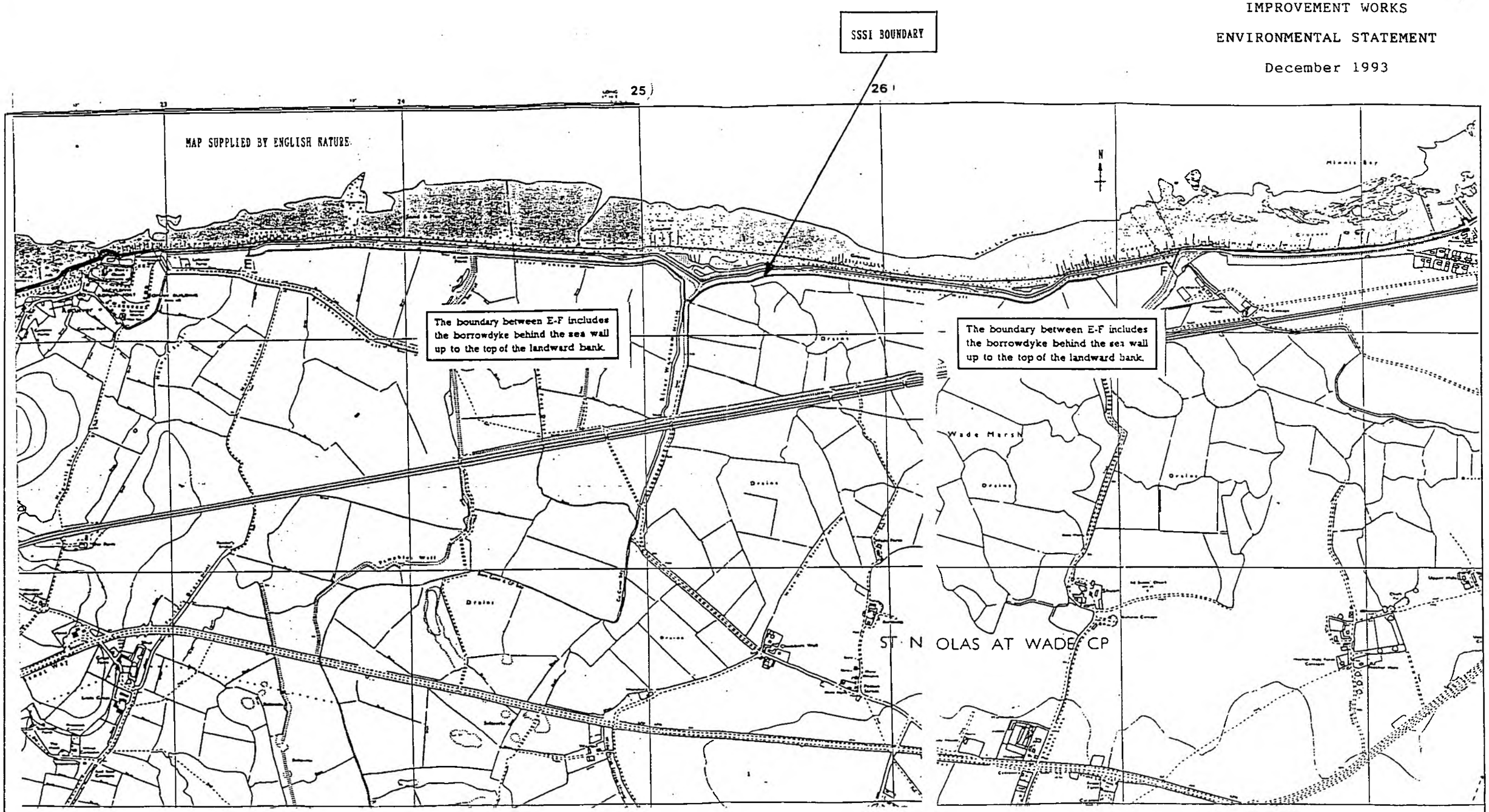


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FIG. 4

MAP SHOWING SECTION OF THANET COAST SSSI

Scale 1:15000

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

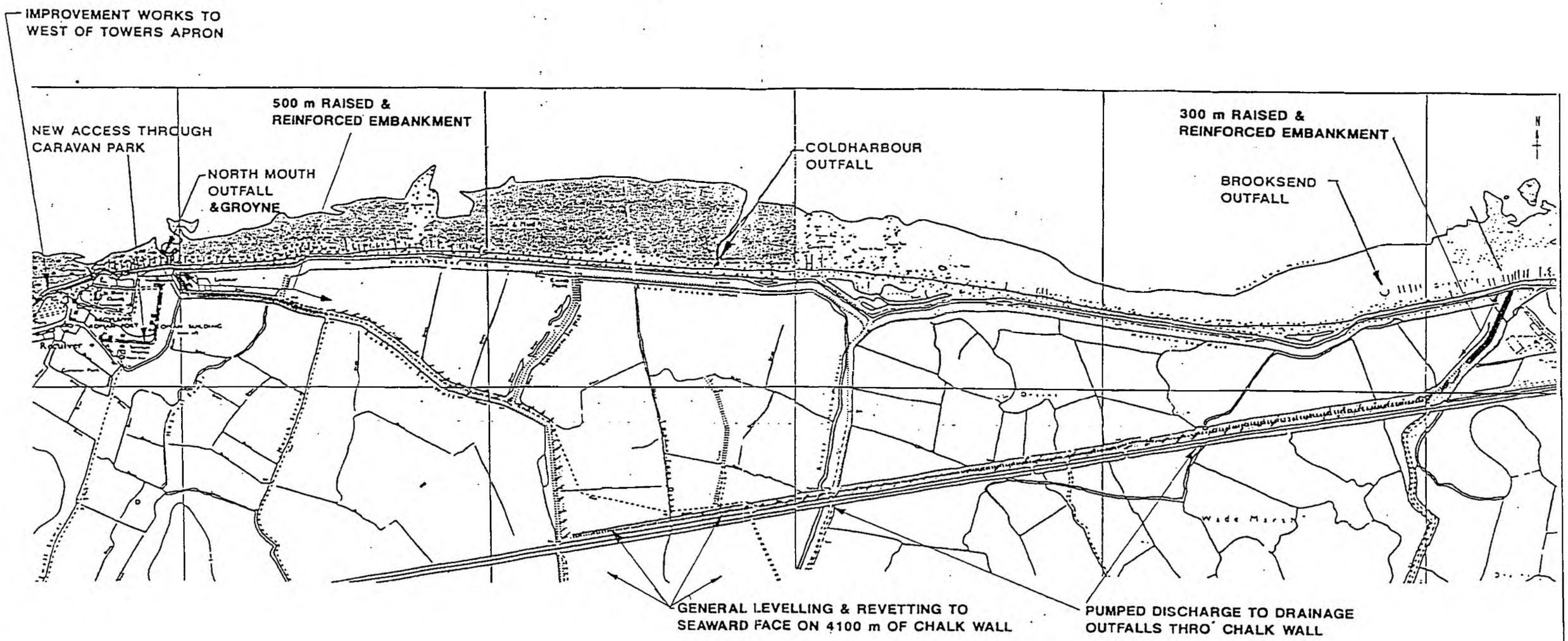


FIG. 5

PROPOSED IMPROVEMENT WORKS OPTIONS

OPTION 1 FROM PRELIMINARY ASSESSMENT

MANAGED RETREAT

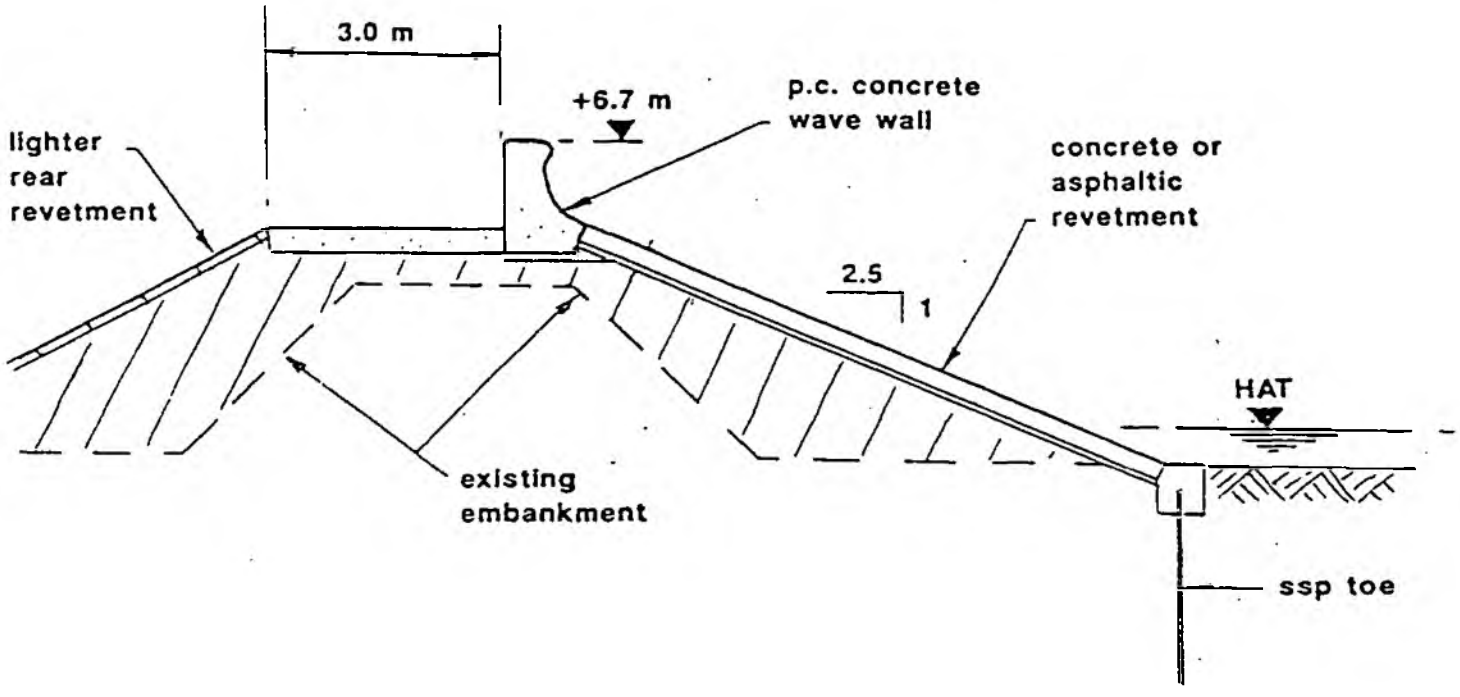
Scale 1:12500

NATIONAL RIVERS AUTHORITY
Southern Region

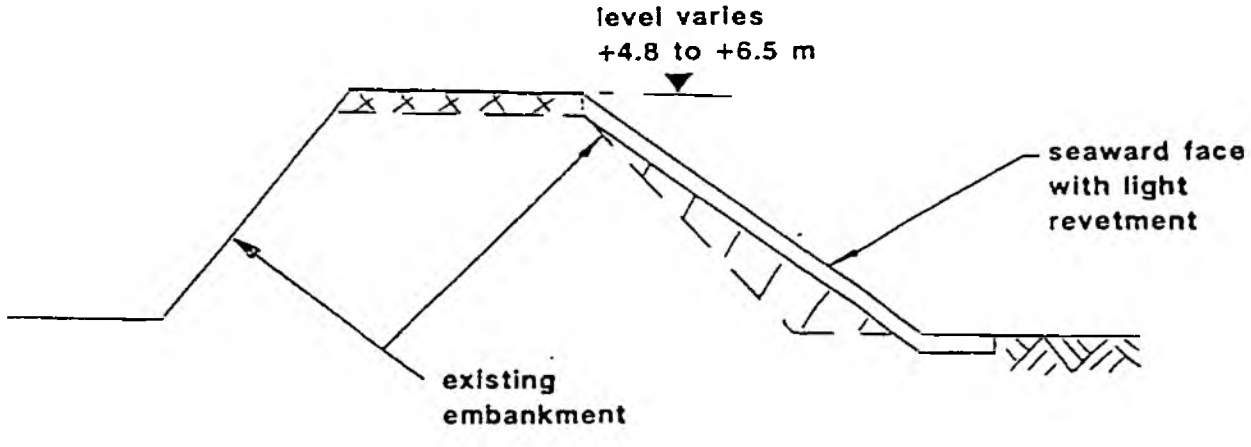
NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993



raised and reinforced embankment



levelled and revetted embankment

FIG. 6

PROPOSED IMPROVEMENT WORKS OPTIONS

DETAILS OF EMBANKMENT WORKS - OPTION 1

Not to scale

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

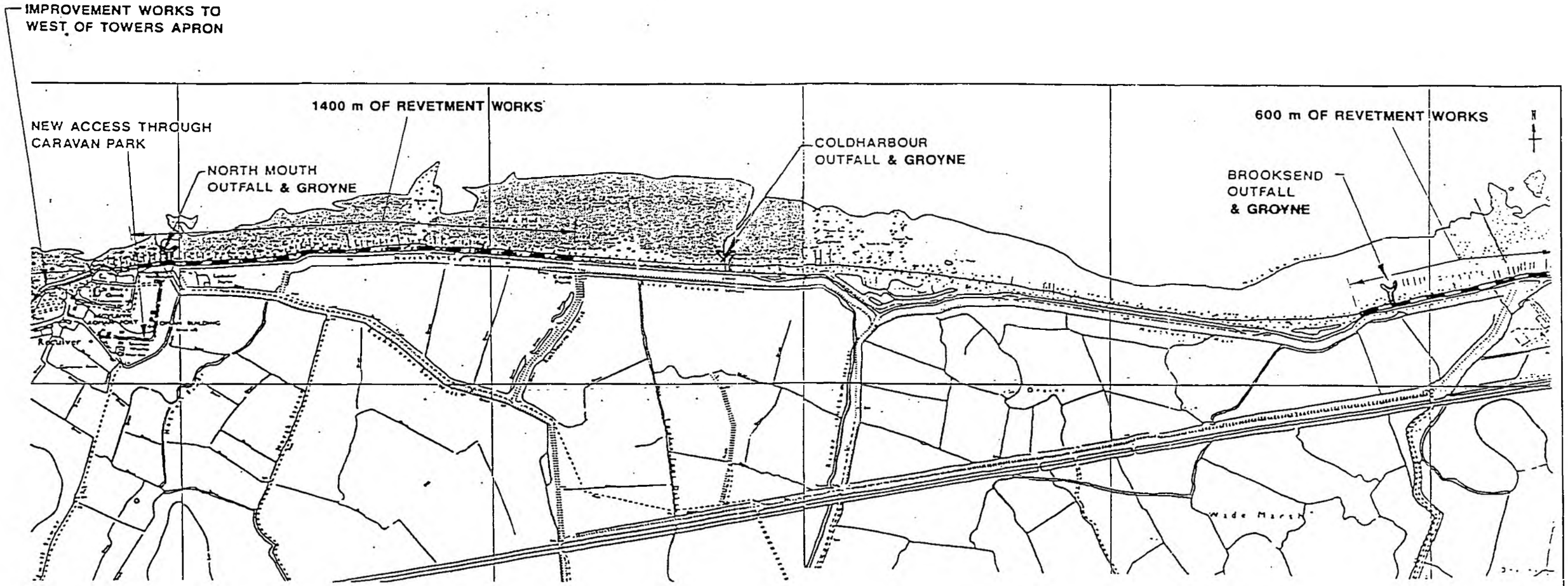


FIG. 7

PROPOSED IMPROVEMENT WORKS OPTIONS

OPTION 3 FROM PRELIMINARY ASSESSMENT

REVETMENT SCHEMES

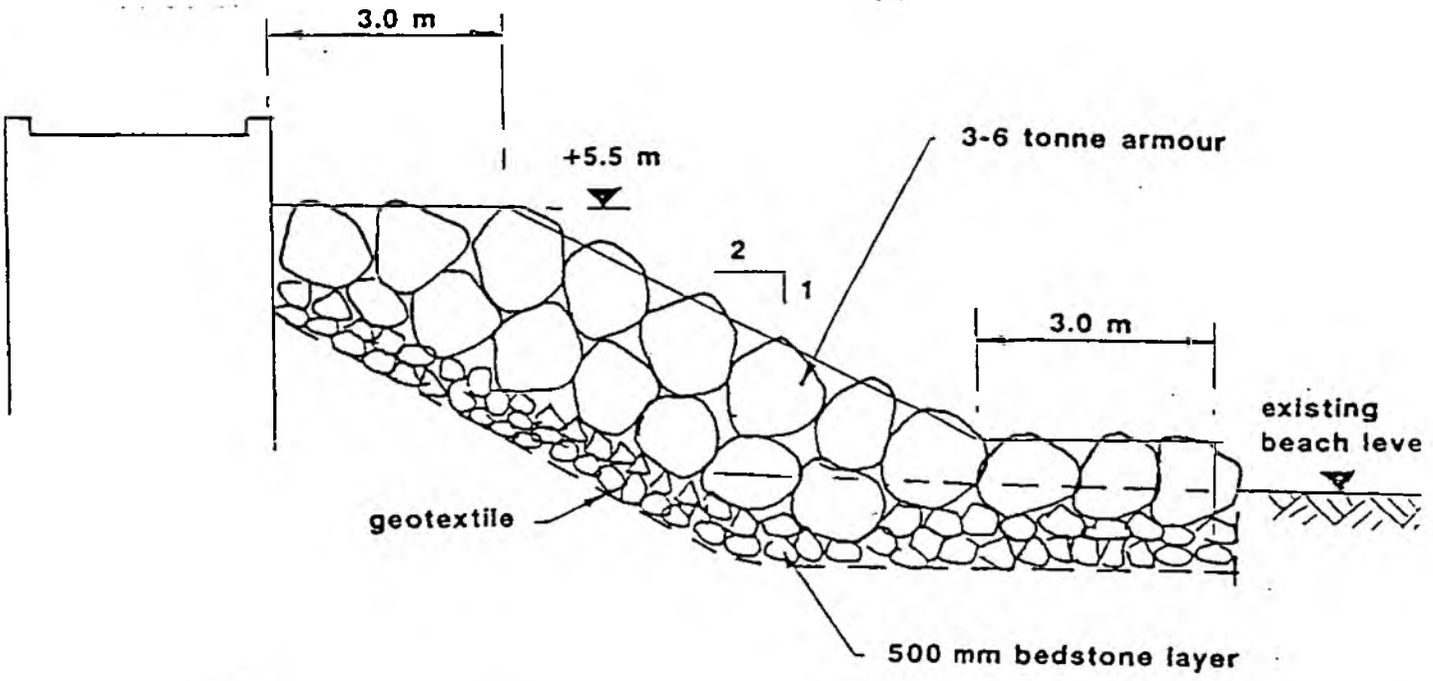
Scale 1:12500

NATIONAL RIVERS AUTHORITY
Southern Region

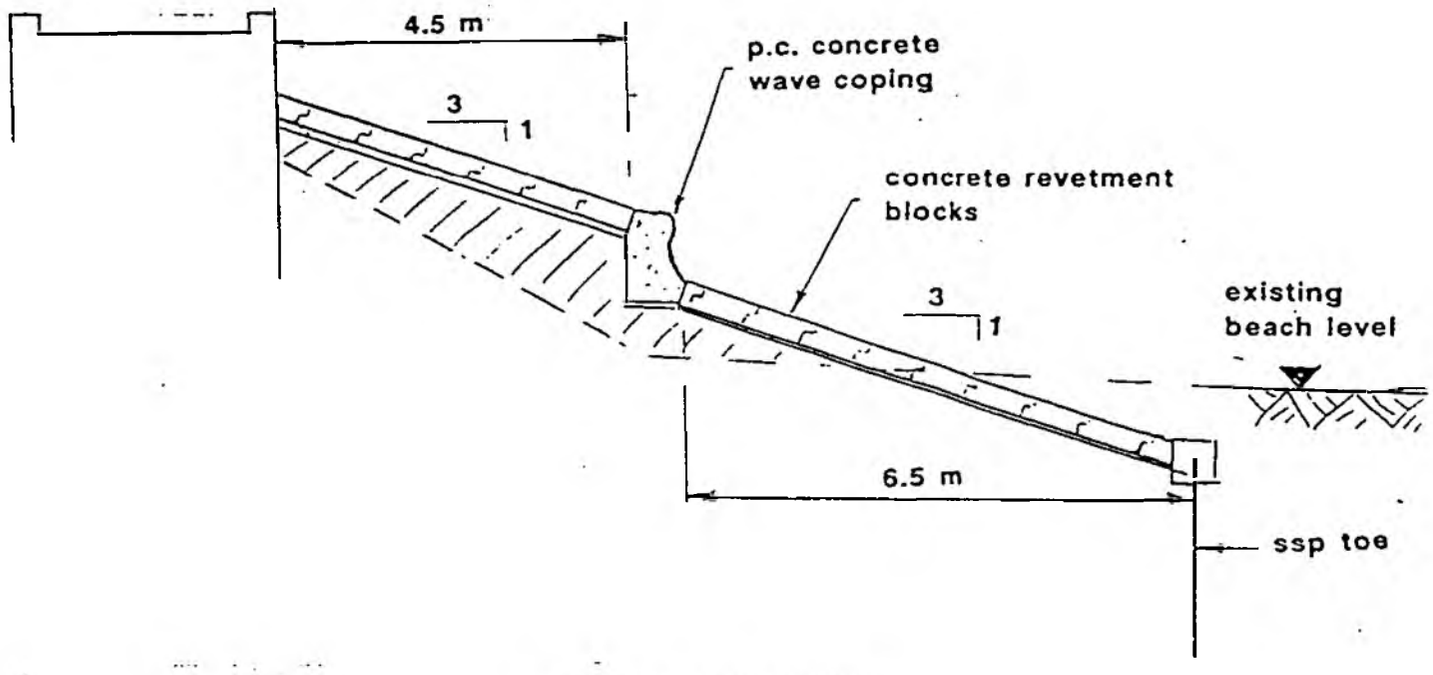
NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993



rock revetment



concrete revetment

FIG. 8

PROPOSED IMPROVEMENT WORKS OPTIONS

DETAILS OF REVETMENT TYPES - OPTION 3

Not to scale

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

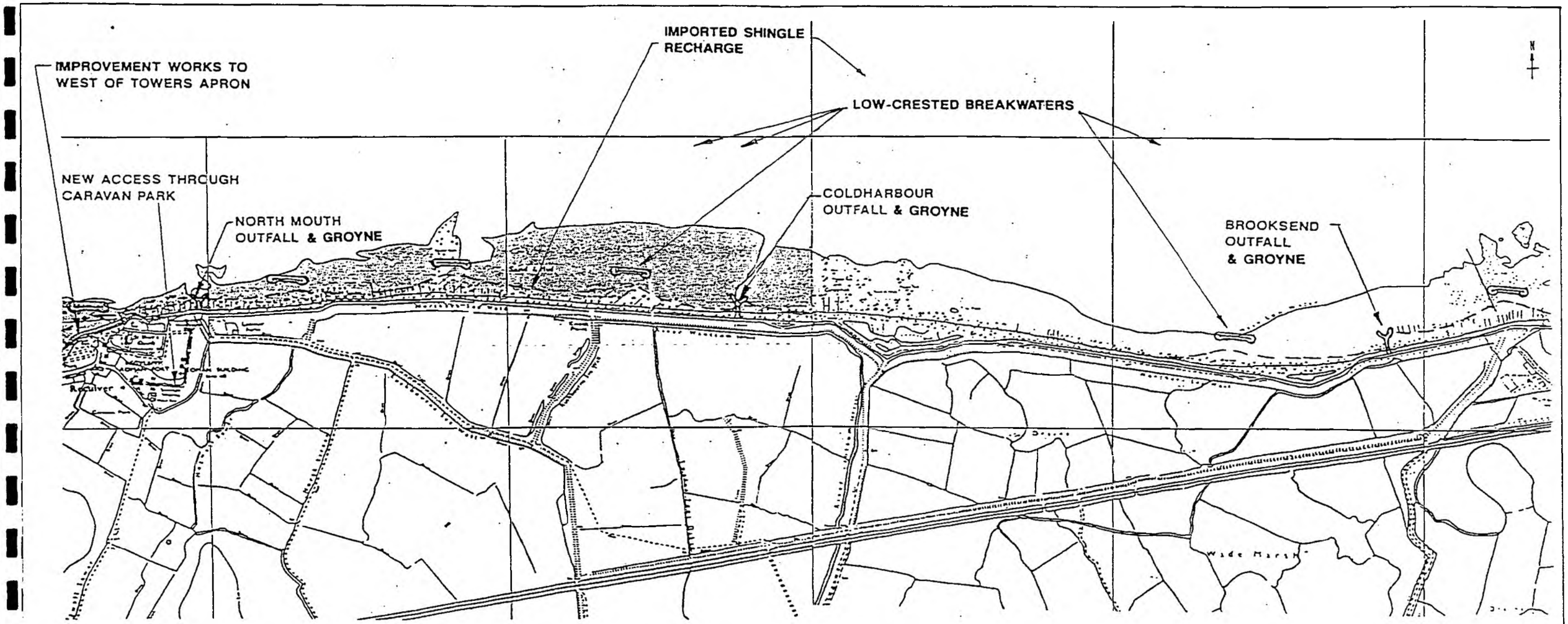


FIG. 9

PROPOSED IMPROVEMENT WORKS OPTIONS

OPTION 4 FROM PRELIMINARY ASSESSMENT

HEADLANDS/BREAKWATERS

Scale 1:12500

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

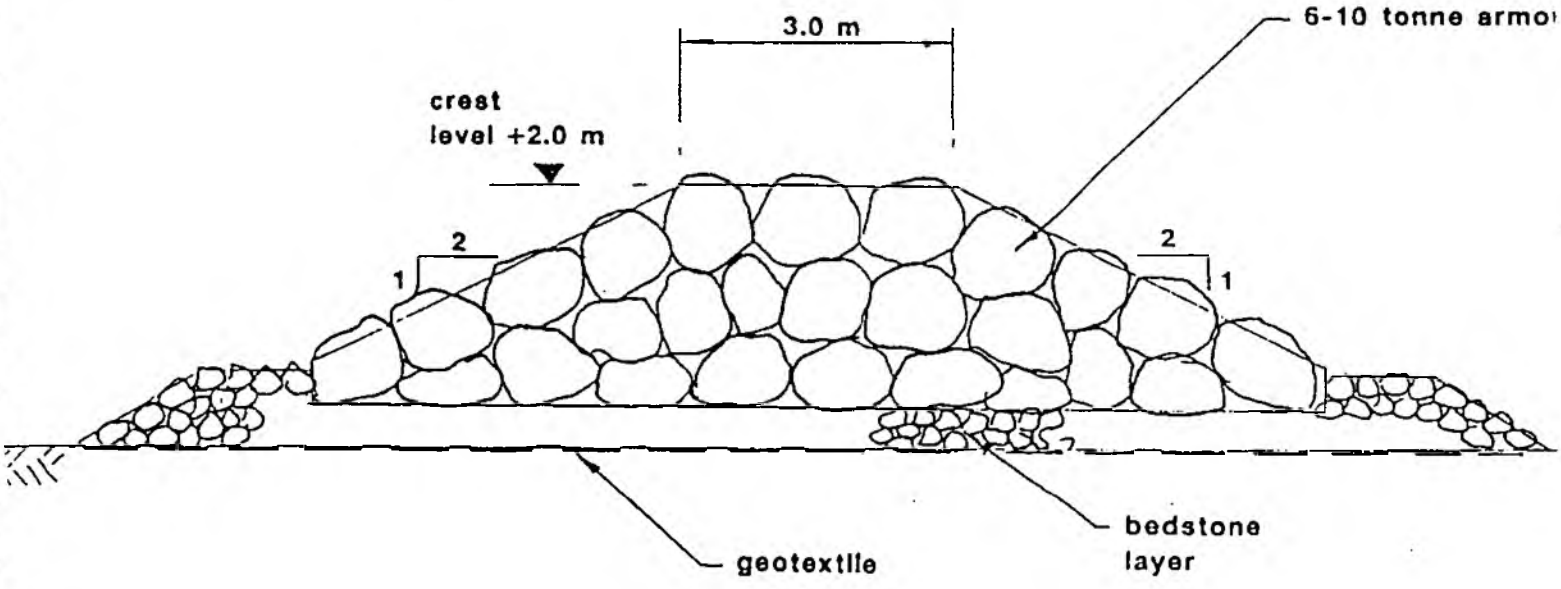


FIG. 10

PROPOSED IMPROVEMENT WORKS OPTIONS

SECTION THROUGH BREAKWATER - OPTION 4

Not to scale

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

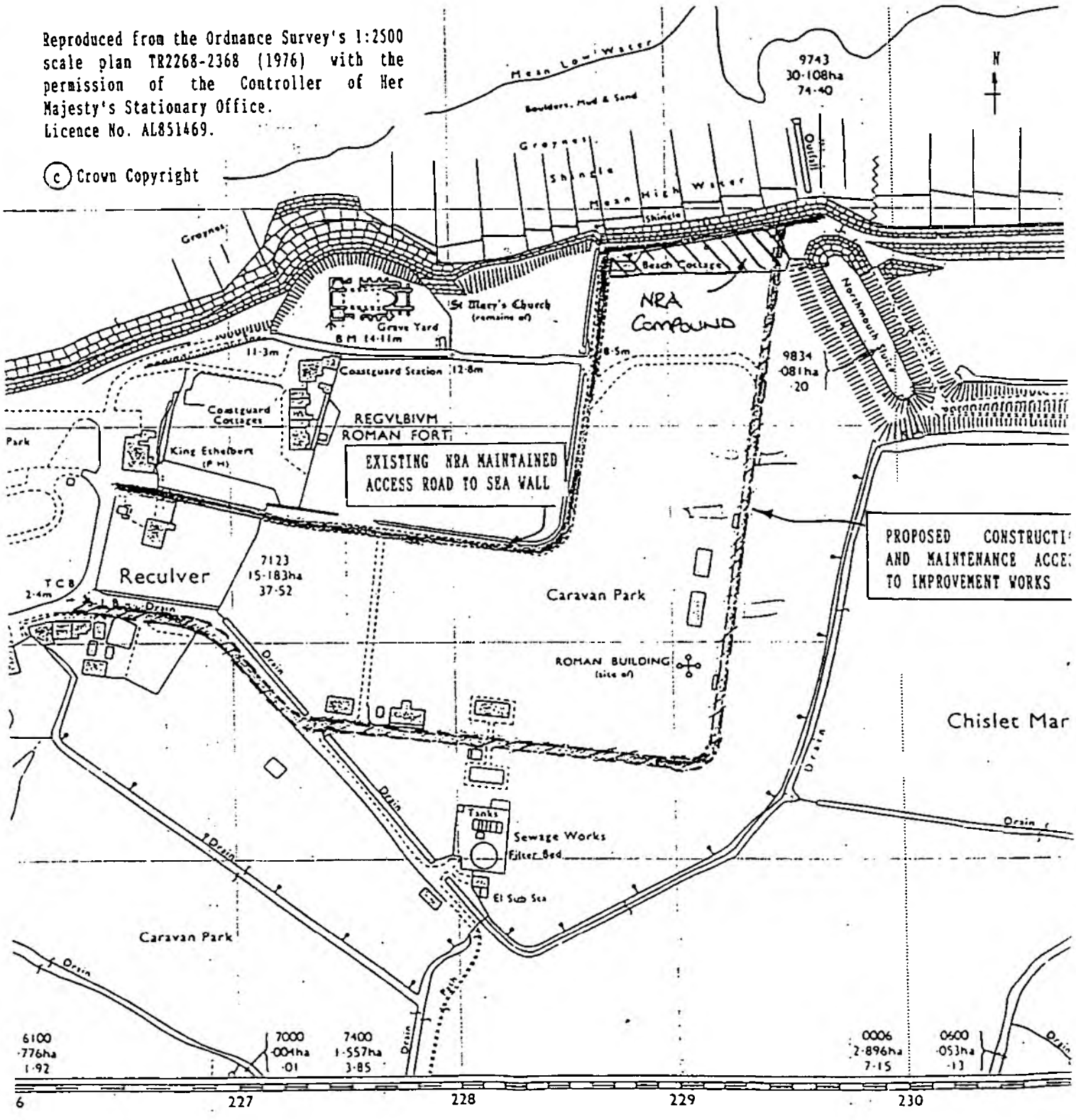


FIG. 11

PROPOSED CONSTRUCTION ACCESS TO SITE

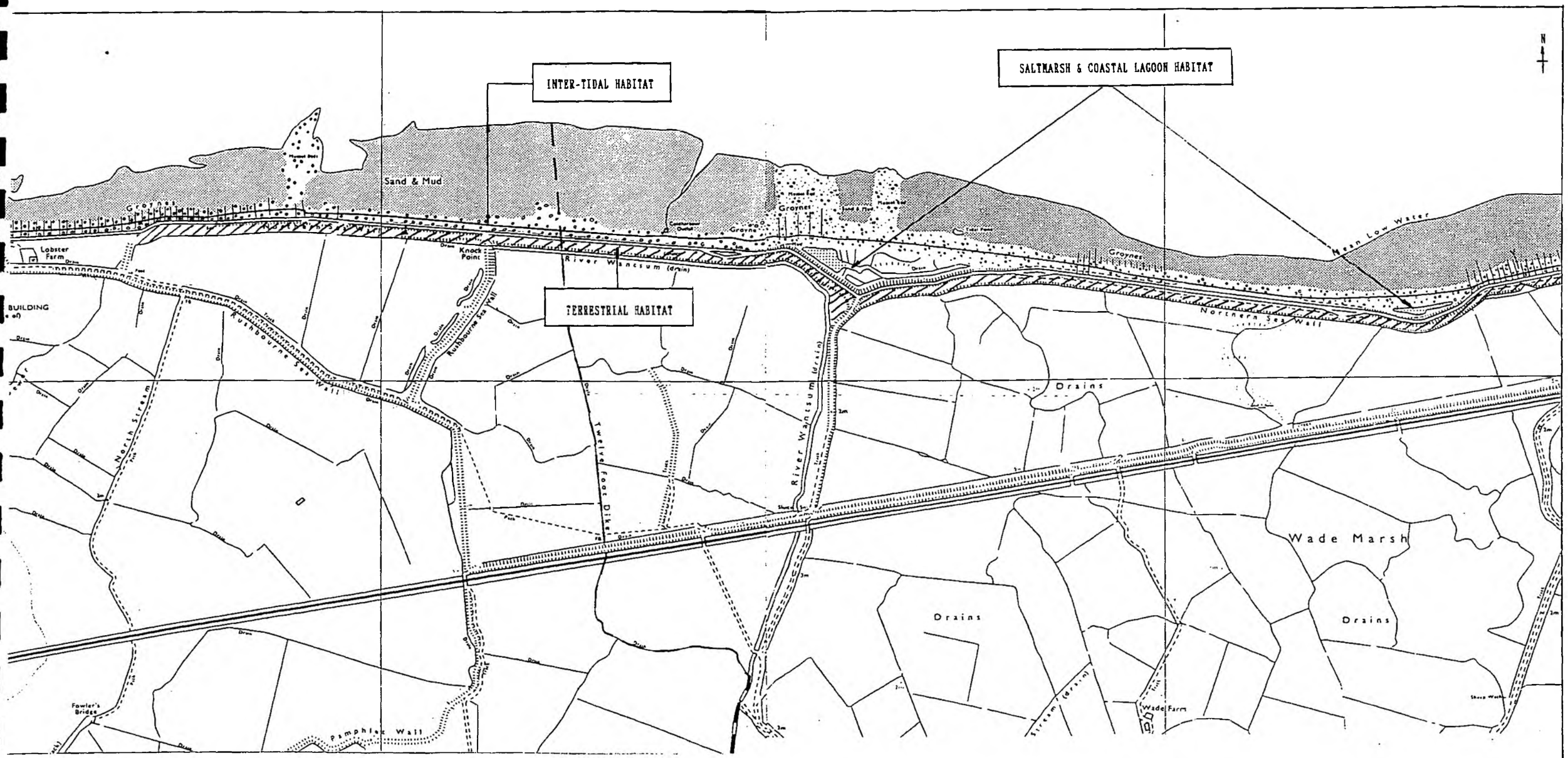
Scale 1:2500

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993



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Licence No. AL851469.

FIG. 12

HABITAT MAP

Scale 1:10000

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

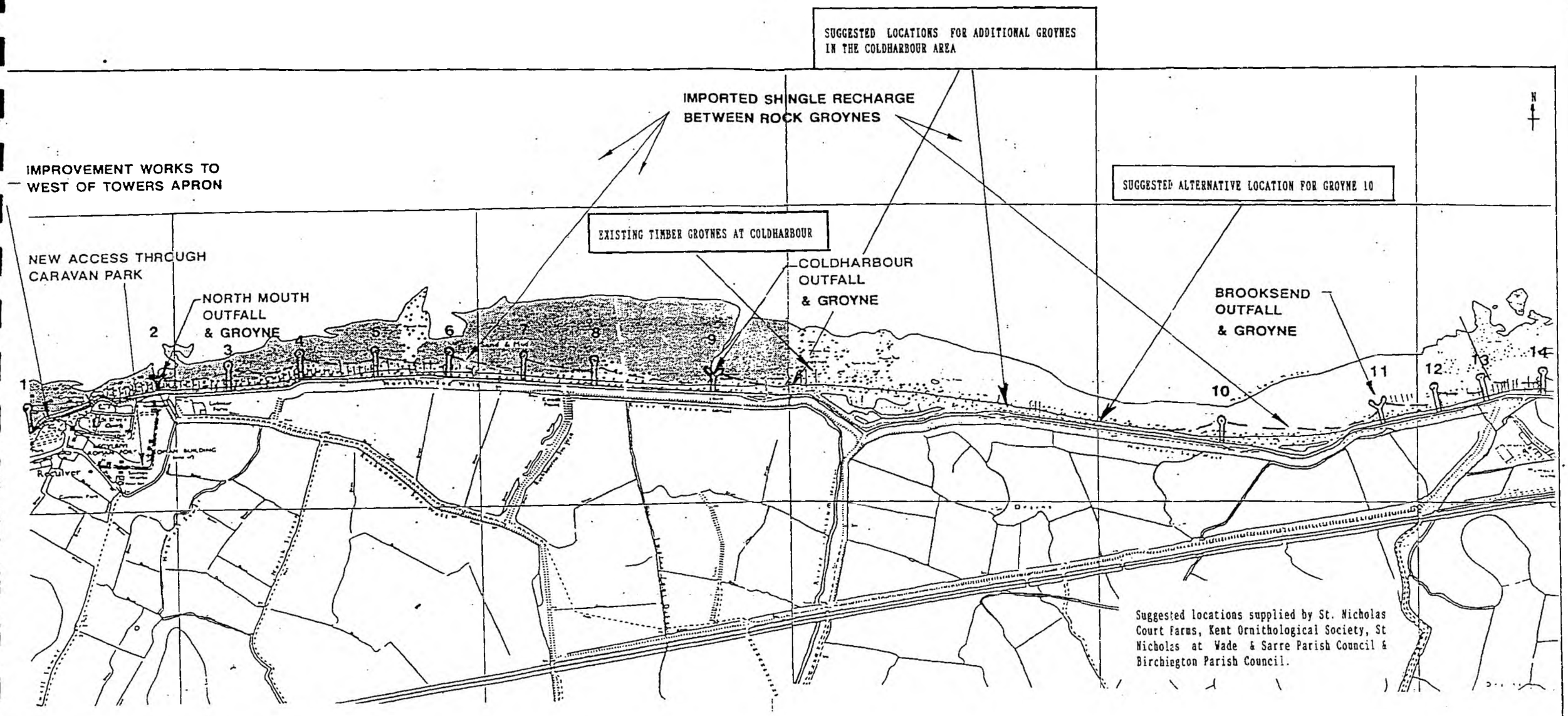


FIG. 13

SUGGESTIONS FOR REVISED LOCATION OF GROYNE 10

AND POSSIBLE ADDITIONAL GROYNES

BASED ON RESPONSES RECEIVED FROM CONSULTEES

Scale 1:12500

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

Map supplied by the Thanet Trust for Archaeology

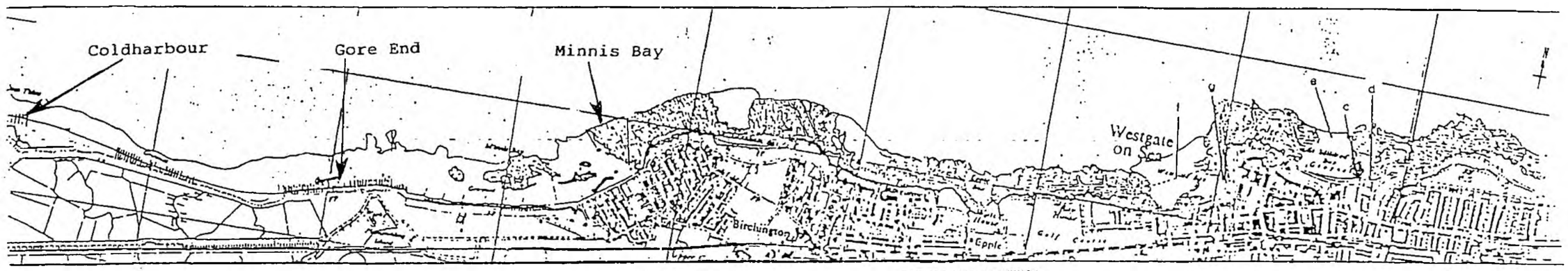


FIG. 14

KNOWN SITES OF ARCHAEOLOGICAL SIGNIFICANCE

COLDHARBOUR, GORE END & MINNIS BAY

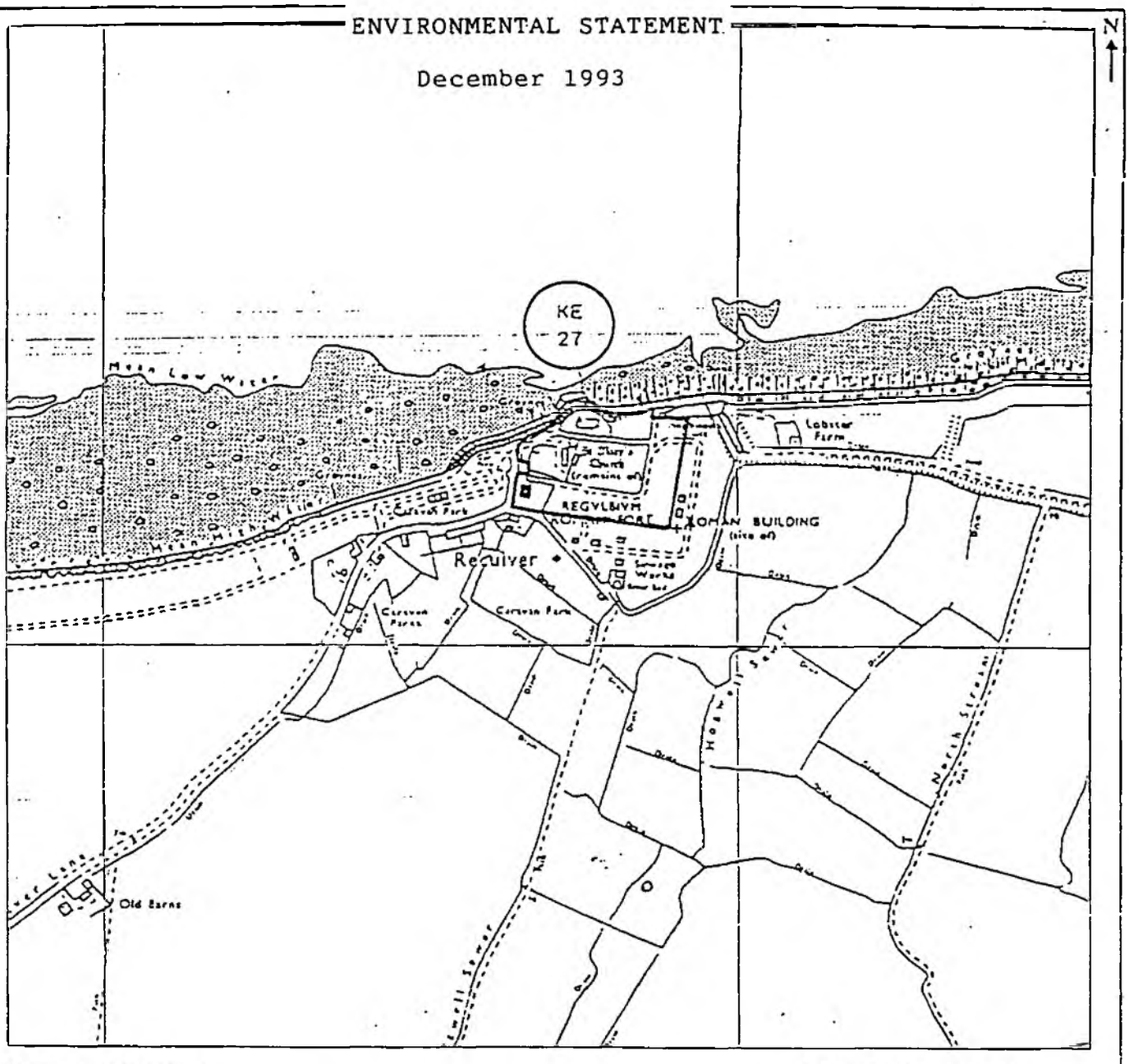
Scale 1:25000

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993



For identification purposes only

Site Name: Reculver Roman Fort and Towers		
County: Kent	District: Canterbury City	Parish: Herne Bay
Notes: Reculver Towers was formerly KE27a, & Reculver Fort was KE27b.		

English Heritage
Historic Buildings & Monuments Commission for England
Fortress House, 23 Savile Row, London W1X 2HE
Telephone 01-734 6010

Key: Location/extent of site; Excluded area		
Extract from OS sheet: TR26NW		Date: 19.4.89
Scale: 1:10000		NGR: TR22706930
Derived from: 1:10000		County No: KE27

FIG. 15

COPY OF ENGLISH HERITAGE SCHEDULED MONUMENT MAP

RECULVER ROMAN FORT & TOWERS

Scale 1:10000

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER) IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

FIG. 16

VISUALIZATION 1

VIEW EAST FROM RECULVER

CLOSE TO NORTH MOUTH SLUICE

(AS EXISTING AND WITH THE PROPOSED WORKS)

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

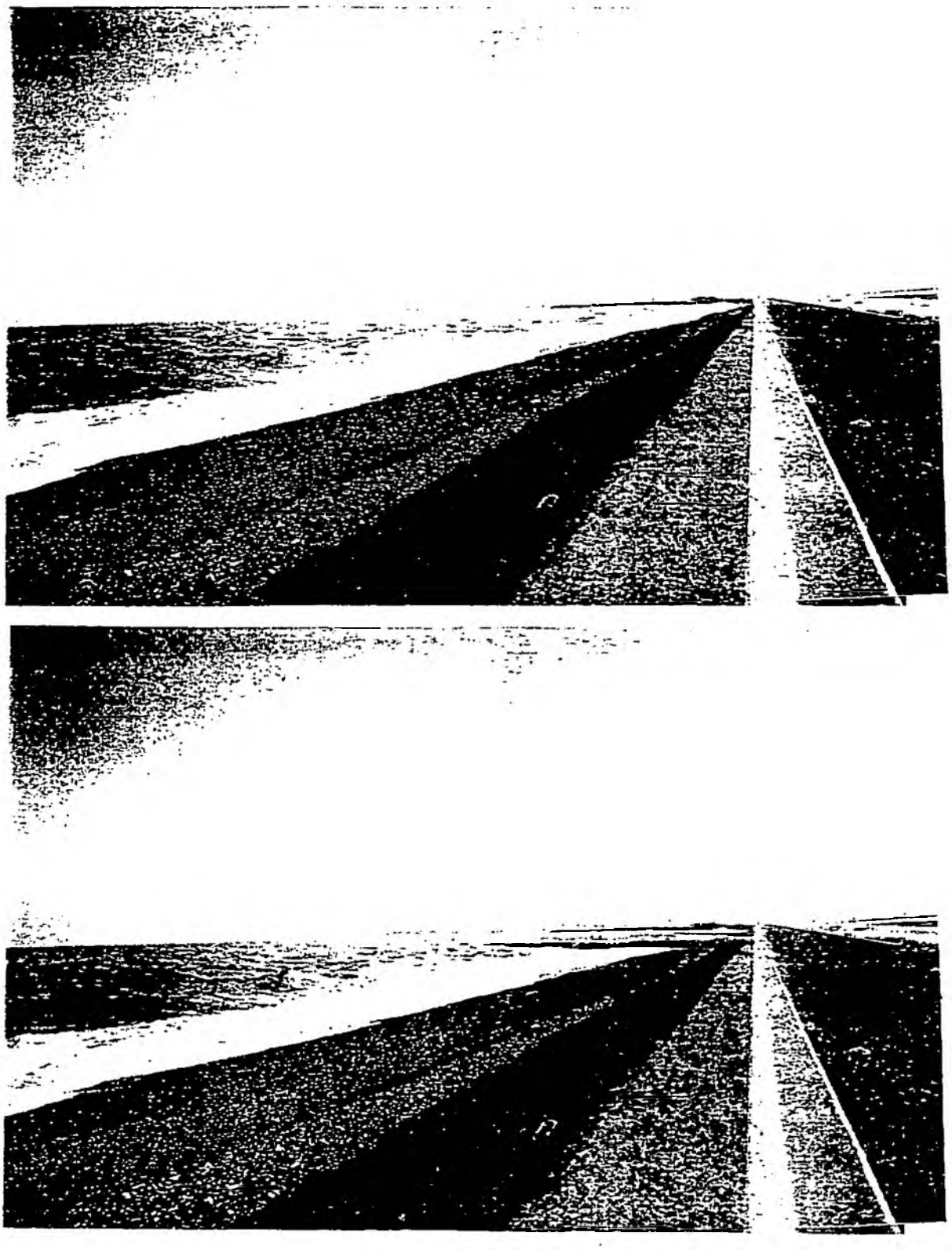


FIG. 17

VISUALIZATION 2

VIEW EAST FROM LOCATION OF GROYNE 7

(AS EXISTING AND WITH THE PROPOSED WORKS)

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

FIG. 18

VISUALIZATION 3

VIEW WEST FROM THE WESTERN EDGE

OF THE COLDHARBOUR LAGOON

(AS EXISTING AND WITH THE PROPOSED WORKS)

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993

FIG. 19

VISUALIZATION 4

VIEW EAST ACROSS THE

COLDHARBOUR LAGOON

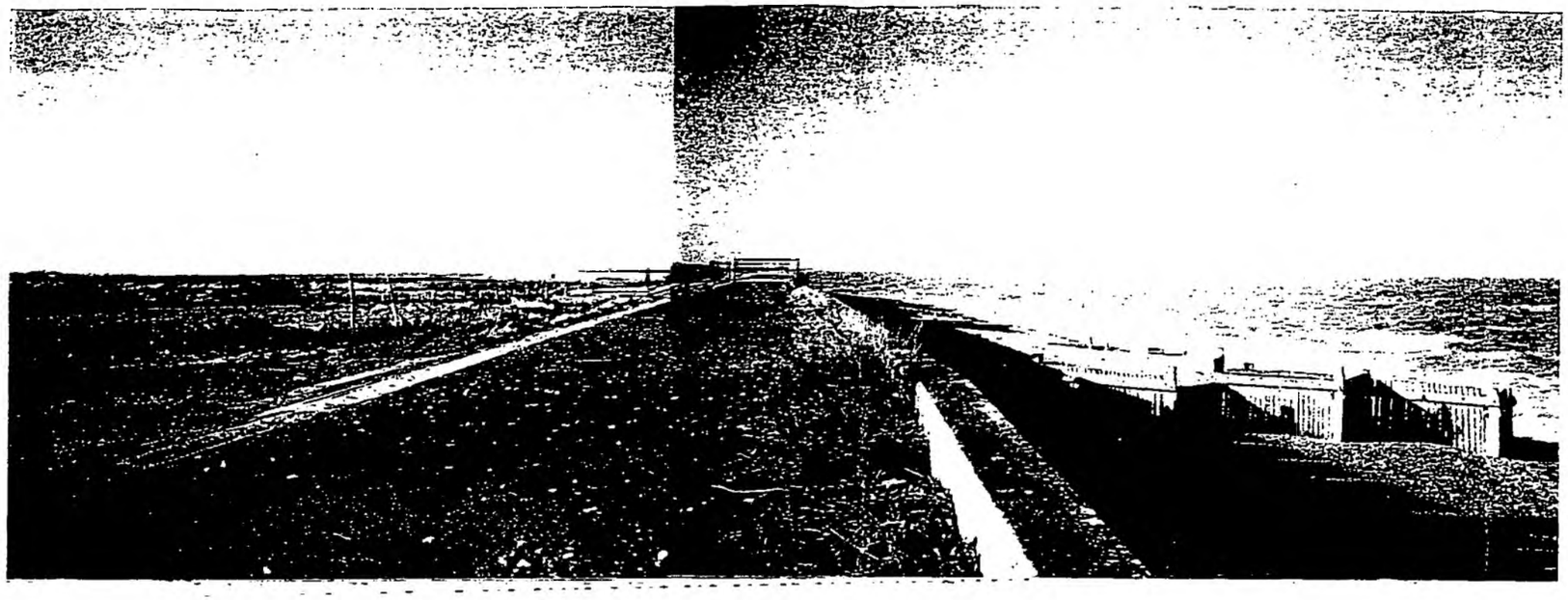
(AS EXISTING AND WITH THE PROPOSED WORKS)

NATIONAL RIVERS AUTHORITY
Southern Region

NORTHERN SEA WALL (RECULVER)
IMPROVEMENT WORKS

ENVIRONMENTAL STATEMENT

December 1993



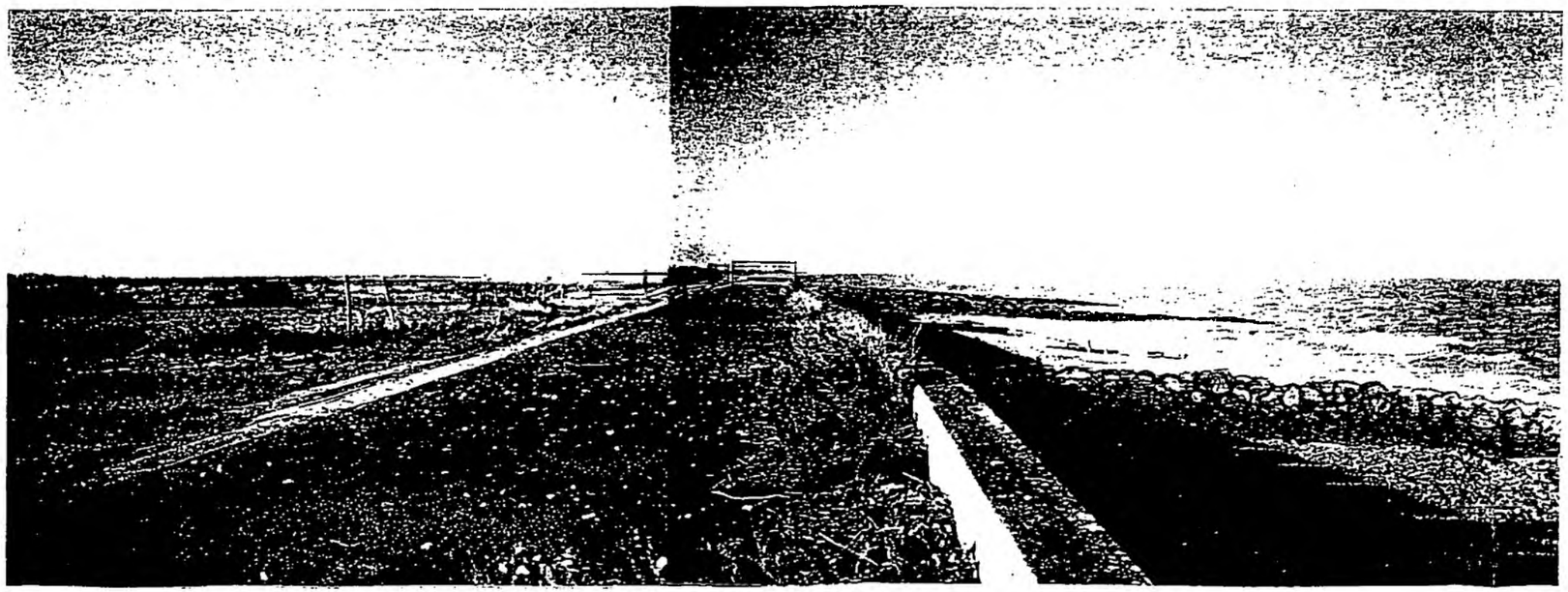


FIG. 20

VISUALIZATION 5

VIEW WEST FROM PLUMPUDDING ISLAND

(AS EXISTING AND WITH THE PROPOSED WORKS)

APPENDIX B

PHOTOGRAPHS

PHOTO 1. THE VIEW EAST FROM ST MARYS CHURCH AT RECULVER

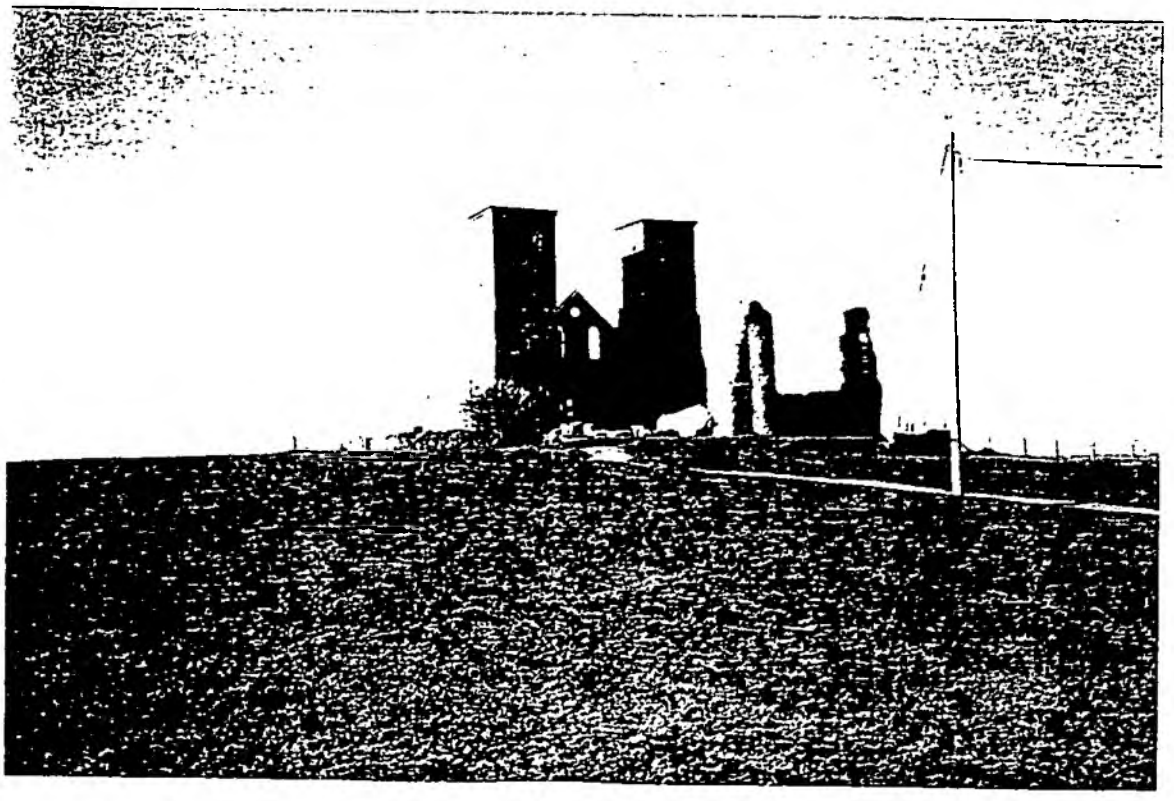


PHOTO 2. THE TWIN TOWERS - RECULVER LANDMARK

PHOTO 3. THE SEA WALL AT NORTH MOUTH SLUICE

PHOTO 4. THE NORTH MOUTH OUTFALL

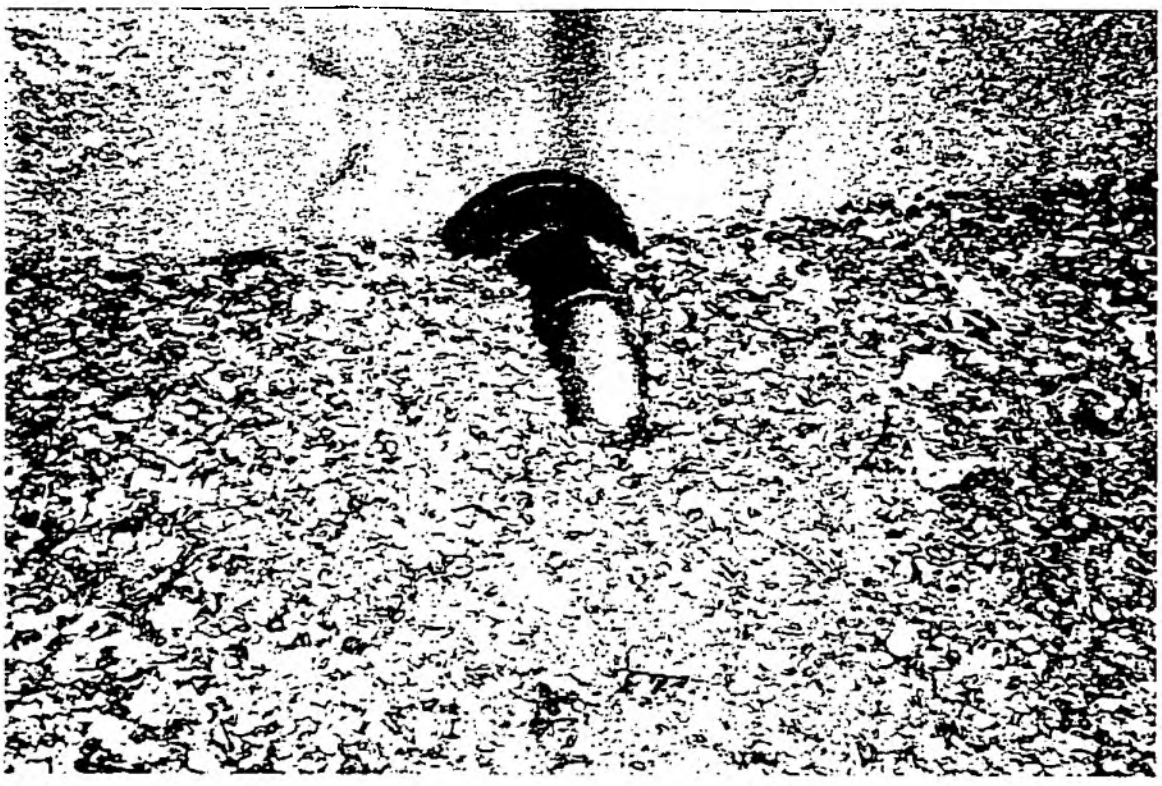


PHOTO 5. THE MOLLUSC HATCHERY INTAKE IN THE SEA WALL

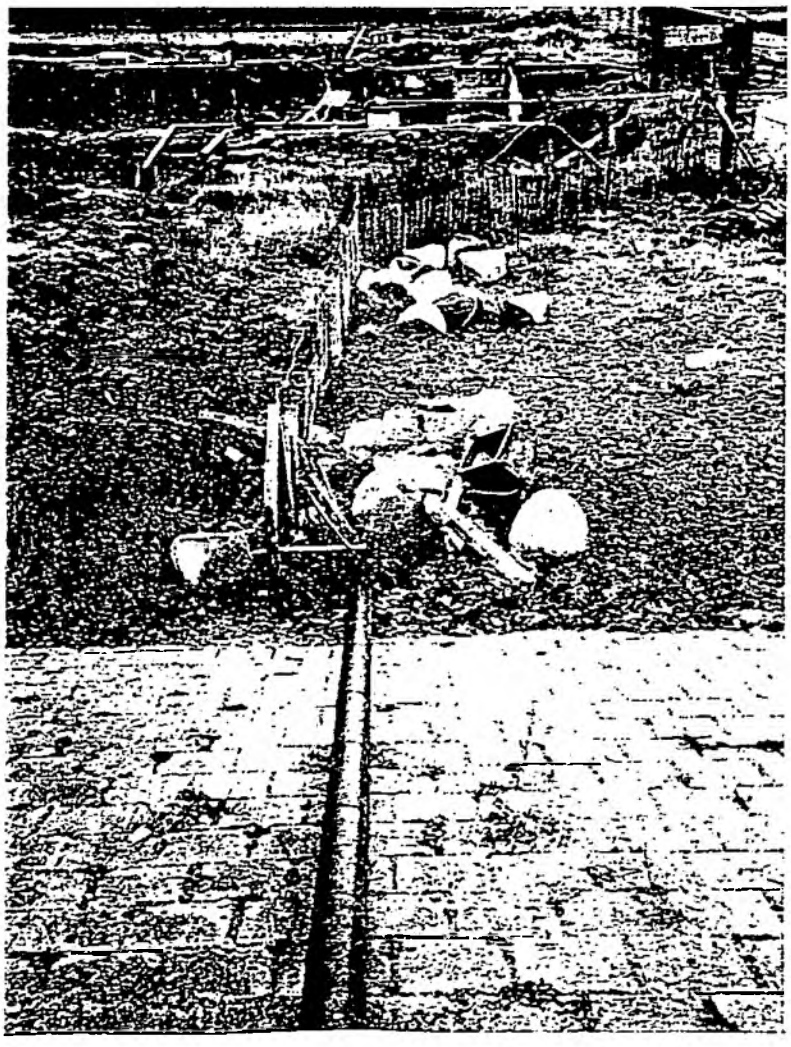


PHOTO 6. THE MOLLUSC HATCHERY INTAKE, LANDWARD SIDE

PHOTO 7. THE COLDHARBOUR LAGOON BARRIER SHOWING STORM DAMAGE

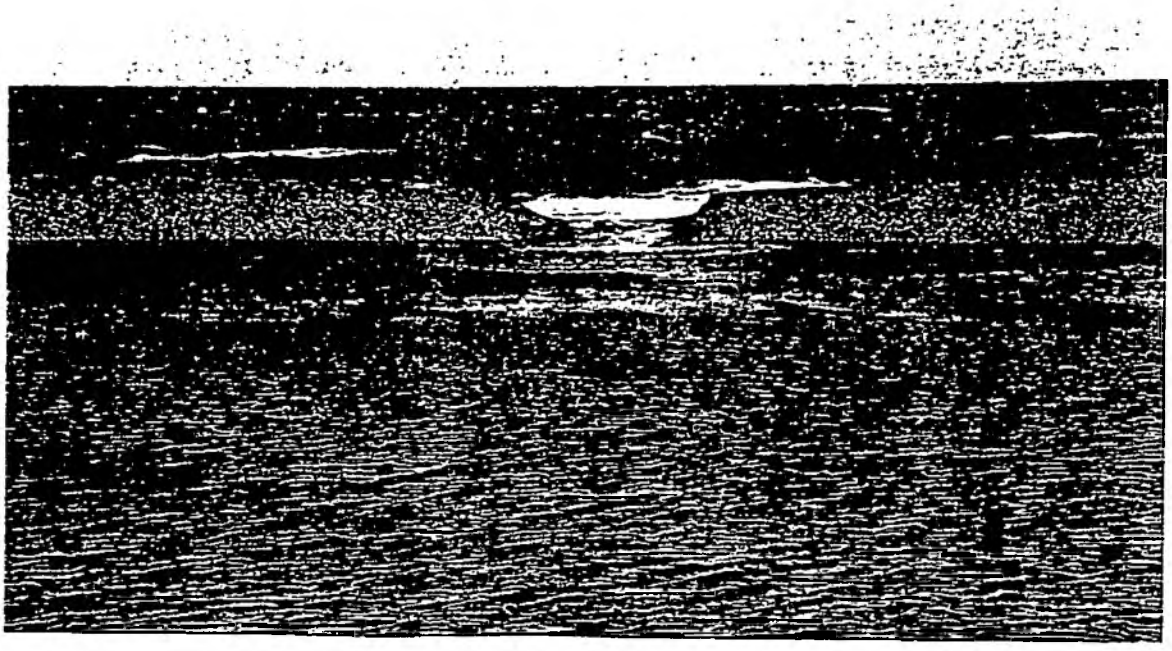


PHOTO 8. BREACH IN THE LAGOON BARRIER AFTER BREAKOUT

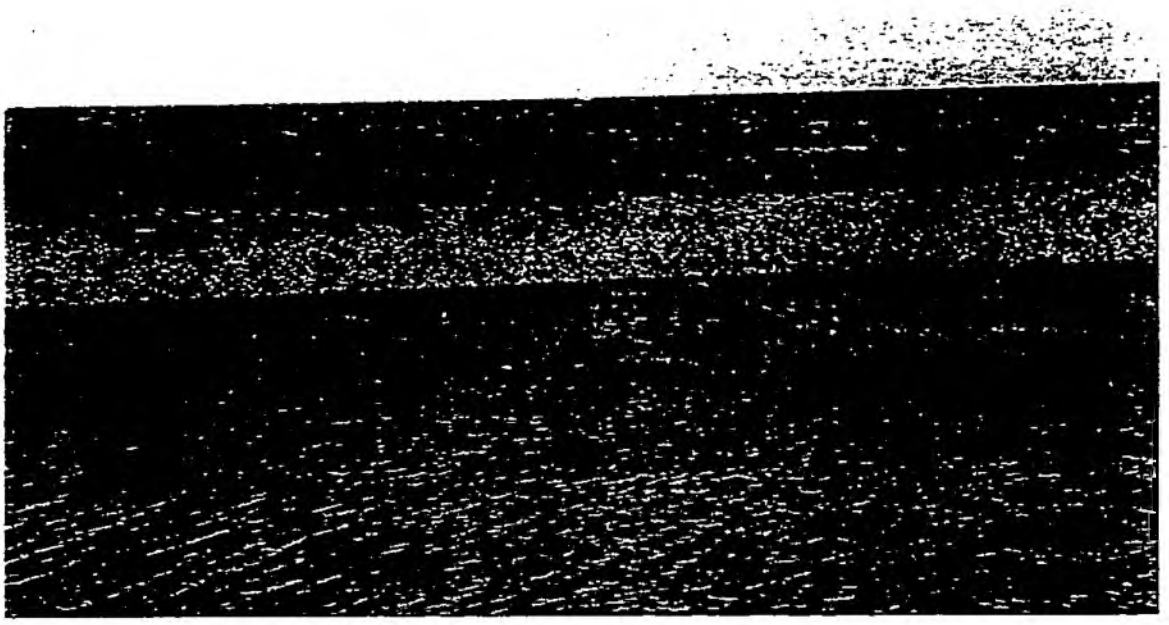


PHOTO 9. BIRDS ON THE BEACH CREST AT COLD HARBOUR

PHOTO 10. TYPICAL STRAND LINE DEPOSITS

APPENDIX C

LIST OF CONSULTEES

Appendix C

List of Consultees

English Nature (South-East Region: Kent Office)

English Nature: (Head Office: Peterborough)

Ministry of Agriculture, Fisheries and Food (Fisheries, Hastings)

Kent & Essex Sea Fisheries Committee

Seasalter Shellfish (Whitstable) Ltd.

Countryside Commission

Kent County Council (Planning)

Kent County Council (County Archaeologist)

Canterbury City Council

Thanet District Council

English Heritage

Local landowner - Mr Martin Tapp

Kent Trust for Nature Conservation

Ian Titley - British Museum

RSPB

Kent Ornithological Society (KOS)

Canterbury Archaeological Trust

The Trust for Thanet Archaeology

Kent Archaeological Rescue Unit

Minnis Bay Windsurfing Club

Minnis Bay Sailing Club

St Nicholas-at-Wade with Sarre Parish Council

Birchington Parish Council

Wantsum Angling Association

Nayland Boat Angling Club

Birchington Angling Sea Association

Plumpudding Island Equestrian Centre

APPENDIX D

COPIES OF CONSULTEES WRITTEN COMMENTS

Mr Brian Banks
English Nature
The Countryside Management Centre
Coldharbour Farm
Wye, ASHFORD, Kent, TN25 5DB

19th November 1993

Dear Brian ,

Coastal Defence Works - Reculver to Minnis Bay, North Kent

Thank you for your letter of 12th November 1993 regarding the above, your prompt response is very much appreciated. I note that you have no further comments to make on the proposals.

In respect of the comment in the second paragraph of your letter, I apologise for not making the situation entirely clear. In the Environmental Statement we have discussed in some detail English Nature's preference for the Managed Retreat above the other three options, for reasons of the considerable environmental benefits of the scheme in ecological terms, and the eventual decision not to proceed with it on the grounds of cost. Included in this section of the ES we have also noted that English Nature have only accepted Option 2 as an alternative, provided MAFF are in overall agreement with the engineering costs quoted for the Managed Retreat. There is also discussion of English Nature's views on the other options.

When considering Option 2, whilst the benefits for local wildlife and nature conservation interests may only be of small significance, on environmental grounds there are socio-economic benefits in protecting the adjoining agricultural land and the railway line from inundation and amenity benefits for local people and visitors using the existing frontage and Northern Seawall for a variety of leisure pursuits. It was for these reasons that we stated that Option 2 offers environmental benefits. I hope this helps to clarify any misunderstanding.

Once again many thanks for your assistance and co-operation. We will ensure that you are provided with a copy of the Environmental Statement as soon as it becomes available.

Yours sincerely,

Annette M Mills

ENGLISH NATURE

South-East Region: Kent Office

Nature Conservancy Council for England

The Countryside Management Centre
Coldharbour Farm, Wye, Ashford, Kent TN25 5DB
Telephone (0233) 812525 Fax (0233) 812520

Annette M Mills
Environmental Assessment Services
8A Cuckfield Road
HURSTPIERPOINT
West Sussex BN6 9RH

SM
Ref: TR/36-5-Con Plan CPW

12 November 1993

Dear Annette

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY, NORTH KENT

Thank you for your letter of 22 October 1993 requesting any further comments relating to ecological issues on this scheme. I have no further comments to make on these matters.

The only comment I would make relates to your first paragraph. You state that option 2 has been chosen on grounds of cost, engineering and environmental grounds. In fact it has no environmental benefits, and option 1 (natural retreat) is far superior on environmental grounds. The major issue which prevented this scheme was cost. My views on the scheme remain the same. We agreed to option 2 because of the high cost of option 1, and our decision to withdraw an objection to option 2 is conditional on MAFF being satisfied on the estimates of costs for these schemes.

Yours sincerely

Brian Banks.

Brian Banks
Conservation Officer
South & East Kent

Chris Powell,
Robert West & Partners
46 High Street
Orpington
Kent BR6 0SU

20/9/93 DP
180 CPP

1128/003

ENGLISH NATURE

South-East Region: Kent Office
Nature Conservancy Council for England
The Countryside Management Centre
Coldharbour Farm, Wye, Ashford, Kent TN25 5DB
Telephone (0233) 812525 Fax (0233) 812520

Further to our telephone call of 16.9.93 I am writing to confirm that I have no objection to the stockpiling & importation of rock material at the western end of the works area (near the North mouth outfall) prior to March 1994.

With compliments

Brian Banks.
16.9.93.

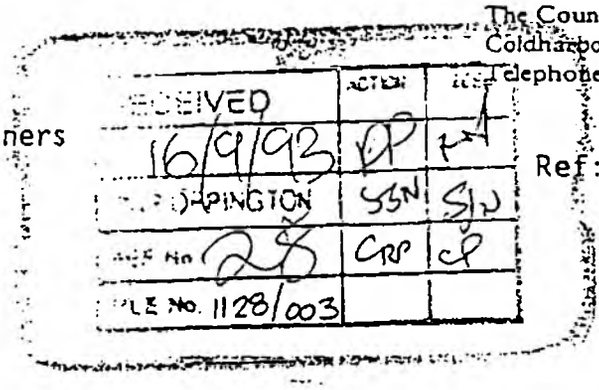
100% Recycled paper

ENGLISH NATURE

South-East Region: Kent Office

Nature Conservancy Council for England

The Countryside Management Centre
Coldharbour Farm, Wye, Ashford, Kent TN25 5DB
Telephone (0233) 812525 Fax (0233) 812520



Mr C Powell
Robert West & Partners
46 High Street
ORPINGTON
Kent BR6 0JQ

SM
Ref: TR/36-5-Con Plan CPW

14 September 1993

Dear Mr Powell

PHASING OF WORK ON THE RECULVER SEA DEFENCES
THANET COAST SITE OF SPECIAL SCIENTIFIC INTEREST

Thank you for meeting me at Wye on Tuesday 14 September at which we resolved the problems with phasing work around nesting terns and wintering waders. I am writing to confirm that the following work programme would be acceptable:

1. January/February 1994. Start and complete work on the North Mouth outfall.

2. March/April 1994. Start and complete work on the Brooks and Coldharbour outfalls. (These are closer to the wader roosts which should not be disturbed in January/February when the greatest numbers of birds will be using them).

3. April-24 May. Work may progress with the stock piling of rocks, and on the groynes running from number 9, eastwards, as appropriate.

4. June-July. Work is restricted to the western groynes (numbered 1-8). Work should start on groyne number 1 first, working eastwards. It would be a good idea to ask your local tern expert to check where the terns are nesting by early July. This might necessitate curtailing work in and around groyne number 8 if terns are nesting there. Alternatively if, for some reason the terns abandon the area in 1994 you could progress more rapidly with the work.

5. August-October. The remainder of the work is completed.

I hope this is an accurate record of our meeting. My comments in my previous letter regarding our approval being subject to MAFF agreeing the estimates for the costs of the various sea defence options remain unchanged.

Yours sincerely

Brian Banks

Brian Banks
Conservation Officer
South & East Kent

ENGLISH NATURE

English Nature
Northminster House, Peterborough PE1 1UA
Telephone (0733) 340345 Fax (0733) 68834

Annette M Mills
Environmental Assessment Services Ltd
8A Cuckfield Road
Hurstpeir Point
West Sussex
BN6 9RU

29 November 1993

Dear Annette

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY, NORTH KENT

Thank you for consulting English Nature again over these works.

I can confirm that your interpretation of the geological significance of the area is correct and that there has been no change in the situation since our June site meeting.

I would however point out that in order to maintain the current situation along the coast to the west of the scheme we would wish to see that present rates of longshore drift are maintained or enhanced.

A consideration of this potential fit of this option with a shoreline management strategy for the north Kent process cell, currently being initiated by the Kent Coastal Group, would be most useful.

Yours sincerely

R. Leafe.

Richard Leafe
Coastal Geomorphologist
Earth Science Branch

Kent and Essex Sea Fisheries Committee **County Hall Maidstone Kent ME14 1XQ**

Clerk of the Committee: ~~Richard Hemmings~~

Mrs Annette M Mills
Environmental Assessment
Services Limited
8a Cuckfield Road
Hurstpierpoint
West Sussex BN6 9RU

Tel: Maidstone (0622) 671411
Direct dial: 694270
Extension:
Ask for: Miss Murphy
Our ref: A/SF 7G/19
Your ref:
Date: 17 November 1993

Dear Mrs Mills

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY, NORTH KENT

Thank you for your letter dated 28 October 1993 regarding the proposed coastal defence works between Reculver and Minnis Bay.

Having studied the preferred option, it would appear that, provided the work is carried out with care and that no waste or short-dumped material is left on the seaward side of the sea wall, the scheme itself should not affect fishing interests.

There may be a minimal effect on some fishermen should the materials be transported to the site by sea since bargemasters and other operatives may require an exclusion zone on the seaward side of the workings. However, fishing activity close inshore in this area at the present time is quite small.

The main concern of the fishing industry with regard to this scheme relates to problems which may arise with short-dumping of rocks if it is decided that materials will be transported to the site by sea. Problems of this sort have occurred at other sites in the District where coastal defence works have taken place, and the Committee is of the opinion that the sea area in question should be monitored both before and after the work takes place and that final payment to contractors should not be made before all parties are satisfied that the seabed is free of any imported rock. Experience has shown that monitoring by trial trawl surveys on their own are not satisfactory and it is felt that diving and side scan sonar surveys should also be included in the monitoring of any offshore site that is used.

I hope that these concerns can be taken into account when preparing the Environmental Statement.

Yours sincerely

Sheila Murphy

Clerk of the Committee

SEASALTER SHELLFISH (WHITSTABLE) LIMITED

FAX NOS:

WHITSTABLE (0227) 264829
WALNEY (0229) 470500
RECULVER (0227) 740518

DIRECTORS:

J.C.BAYES, B.Sc.
E.J. KIRKALDIE, (Co.Sec.)

Registered Office:-
THE HARBOUR, WHITSTABLE, KENT
CT5 1AB

TELEPHONE: (0227)
OYSTER ORDERS 272003
SEED AND ADMIN 262003
AFTER HOURS 275077

HATCHERIES

RECULVER (0227) 363359
WALNEY (0229) 474158

Environmental Assesment Services Ltd
8a Cuckfield Road
HURSTPIERPOINT
W Sussex
BN6 9RU

For the att Annette Mills

2nd November 1993

Dear Miss Mills

Coastal Defence Works

With reply to your letter of 28th October. I would like to raise 2 points. The first which I trust will be minor. I have already indicated that I am pleased to note that you propose a new access route away from the Roman Wall. Could I ask that it be made large enough to carry a full size articulated truck or a low loader carying earth moving plant and that adequate clearance be given if there are to be overhead wires.

The second matter is of considerable concern. We have a 6" steel intake pipe bringing in water for our hatchery and oyster nursery. During the winter when run off is high and when the Hillboro' Sewage Treatment plant is at less than optimal performance and when we arehandling the most delicate phase of the oysters life, the larvae,we have to exercise great caution to avoid bringing in discharge water with our new sea water.

We do this by pumping on the rising tide from mid tide until one hour after high tide. I have no doubt that if the groynes do what they are supposed to do then this little ploy won't work. I imagine the groyne would have a tendancy to impound the outfall water in the vicinity of our intake.

Three solutions occur to me. -

1) To extend the existing pipe out past the seaward end of the groynes. This would have the disadvantage of increased drag on what is already a rather long suction line.

.....Continued...

V.A.T. No. 445 1945 41
Registered in England No. 2065181

2) Move the intake to the west of groyne 3.

3) Bury the intake pipe within groyne 3 in which case it might be possible to install a power supply to this point and install a submersible pump in a perforated manhole or similar.

I am not sure which would prove easiest to deal with and would appreciate your comments.

Yours sincerely

J C BAYES - Managing Director
SEASALTER SHELLFISH (WHITSTABLE) LTD

Enc.

NATIONAL RIVERS AUTHORITY

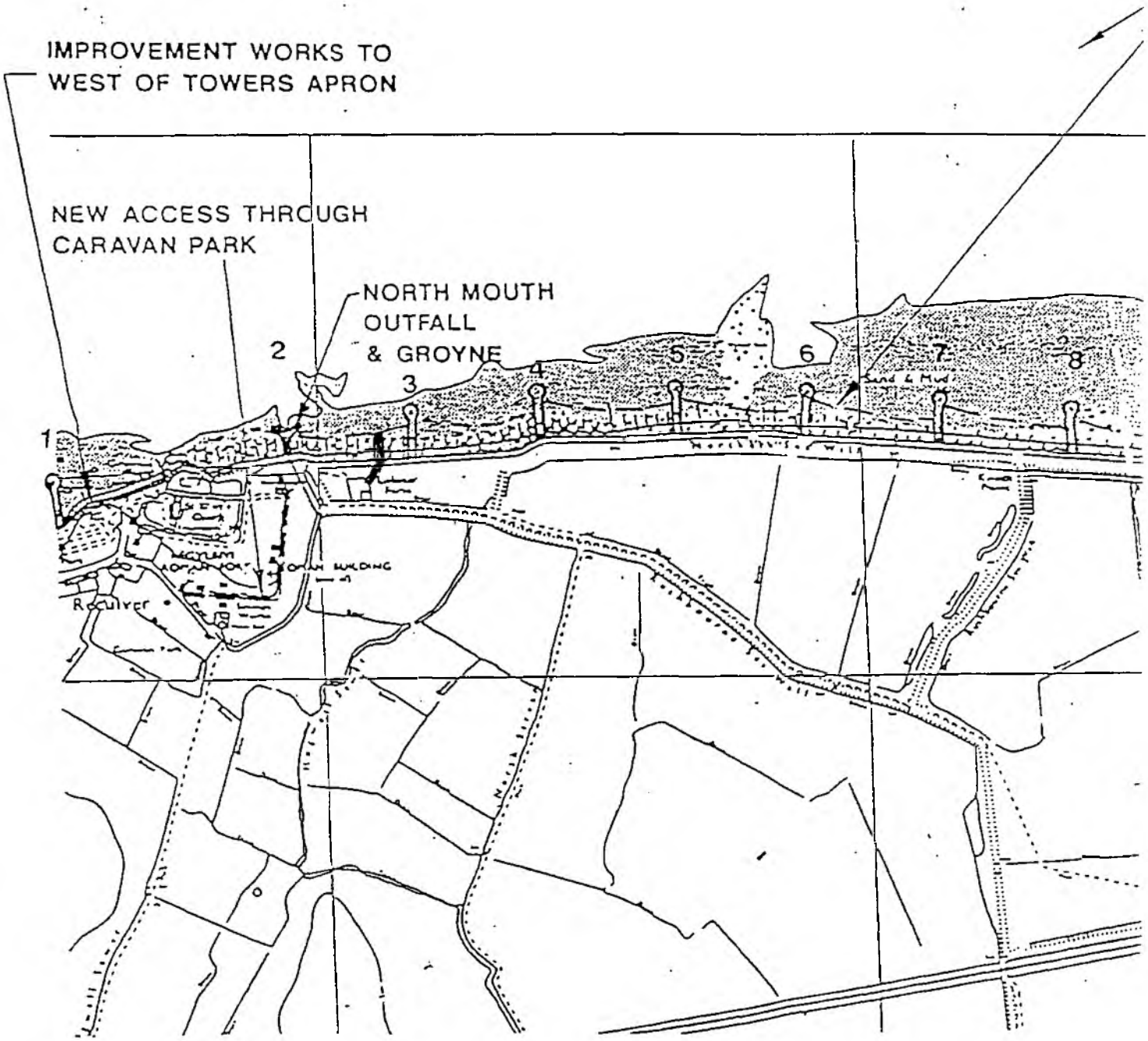
Environmental
Assessment Services Limited

8A Duckfield Road Hurstpierpoint
West Sussex BN6 9RU
Tel Hurstpierpoint (0273) 833817

Proposed Coastal Defence Works
Reculver to Minnis Bay, North Kent

Environmental Assessment

Consultation, October 1993



South East Regional Office
4th Floor, 71 Kingsway
London WC2B 6ST
Telephone: 071-831 3510
Fax: 071-831 1439

Our ref.
Your ref.
Date 30 November 1993

Annette M Mills
Environmental Assessment Services Limited
8A Cuckfield Road
Hurstpierpoint
West Sussex
BN6 9RU

COUNTRYSIDE COMMISSION

Dear Madam

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY, NORTH KENT

Thank you for sending us a copy of this planning application.

The nature of this proposal is not considered to meet the criteria within the Commission's Planning Statement and therefore we shall not get involved in this case. I enclose a copy of the Statement for your information;

This response should not be interpreted as implying support for or objection to the proposal;

yours faithfully

CHRIS BURKE
Countryside Officer

CB301193

COUNTRYSIDE COMMISSION

COUNTRYSIDE PLANNING STATEMENT

THE ROLE OF THE COUNTRYSIDE COMMISSION IN THE TOWN AND COUNTRY PLANNING SYSTEM

The town and country planning system has a key role to play in shaping the future of rural England. The Commission is convinced of the need for a strong and effective planning system and robust planning policies, in order to ensure the conservation and enhancement of the countryside and to enable the public to enjoy it.

We have undertaken a major review of our involvement in the town and country planning system to ensure that the resources available to us for planning work are used to best effect. As part of that review, the views of all local authorities and other interests in planning matters were sought to help us to identify priorities.

In the light of the review, we have redefined our priorities, concentrating on those activities where we believe we can make the most useful contribution to rural planning.

The Commission has no executive role in the planning system. Our aim, therefore, is to influence decision makers at all levels of planning through the provision of information and advice on policy matters to enable the planning system to make its full contribution to the evolution of a sustainable countryside. Our publication *Planning for a greener countryside* (CCP 264) provides the policy framework.

This statement sets out how the Commission now intends to deploy its resources to achieve this aim.

National work

At the parliamentary level, we shall:

- advise ministers and parliamentarians on countryside planning issues and on the need for planning legislation;
- continue to contribute to parliamentary select committee work through written and oral evidence.

At the national level, we shall:

- seek to influence government planning policy guidance;
- strive to do so through closer liaison with government departments earlier in the preparation process, working jointly with other government agencies where appropriate;
- develop the Commission's own national level planning advice by continuing to prepare advice on key topics and issues;
- publish our advice in ways that make it more accessible to users;
- work closely with other national organisations in securing robust planning policies and practice.

Regional and local work

In the past, the Commission has put much effort into advising on individual development plans and planning applications. This effort will be redirected to broader advice at a regional or sub-regional level. Such advice will be prepared from a national perspective and adapted by the Commission's Regional Offices. It will form a basis for regular seminars and meetings with planning partners.

In this way, planning authorities and others will become aware of our main messages at an early stage. Each Regional Office will have a member of staff leading this work. Thus, we shall now be promoting our views in a different way, for subsequent consideration by local planning authorities as they develop their plans and reach development control decisions. We see this as a two-way process. We will be listening to our planning partners' thoughts on emerging issues and problems in order to inform our advice and policy work, both regionally and nationally.

In future, in order to ensure an effective countryside policy framework at the regional scale, in our work at the regional planning level we shall:

- continue to advise local authority regional conferences in the preparation of their advice to the Secretary of State for the Environment;
- concentrate effort on influencing Regional Planning Guidance.

Our development plan work will:

- focus on countryside policy at a regional or sub-regional level, moving away from the consideration of individual plans;
- address individual development plans only where their policies would:
  - set a national precedent for an emerging issue; or
  - have a major impact on an important national Commission initiative; or
  - have a fundamental effect on the intrinsic character of a National Park or equivalent area, Area of Outstanding Natural Beauty, or Heritage Coast.

Our development control casework* will:

- focus on countryside policy at a regional or sub-regional level and,as with development plans, move away from individual casework;
- consider cases in detail only where the proposal would:
  - set a national precedent where national government guidance is lacking; or
  - have a major impact on an important national Commission initiative; or
  - have a fundamental effect on the intrinsic character of a National Park or equivalent area, Area of Outstanding Natural Beauty, or Heritage Coast.

We stress that absence of comment or direct involvement by the Commission in individual plans or proposals does not imply a lack of interest. Nor, in itself, does it indicate either support for or objection to any plan or proposal.

**Development control casework covers all forms of development, including those authorised by procedures outside the town and country planning system. The criteria also apply to the Commission's involvement in roads schemes and environmental assessment casework.*

COUNTRYSIDE COMMISSION

John Dower House
Crescent Place, Cheltenham
Gloucestershire GL50 3RA
Telephone: 0242 521381
Fax: 0242 584270

CCP 415
November 1993

Holders of the new local authority *Countryside planning* file should insert this document into it.

Thanet District Council

Thanet Council Offices, P.O. Box 9, Cecil Street, Margate, Kent CT9 1XZ.
Telephone 0843 225511 Fax 0843 290906
Telex 966182 DX 30555 (Margate)

Date: 16 November 1993
Our ref: RTH/HW
Your ref:
Ask for: Mr Herron
Ext: 2002

PLANNING AND ARCHITECTURE
Chief Planning Officer: *R. T. Herron*

Dear Ms Mills

NATIONAL RIVERS AUTHORITY (SOUTHERN REGION)
NORTHERN SEAWALL (RECULVER) IMPROVEMENT WORKS
ENVIRONMENTAL STATEMENT

I refer to your letter of the 28 October inviting comments on the proposal for rock groynes in the Reculver and Minnis Bay area.

Firstly, the Council is of the view that the proposals for the rock groynes would require a specific grant of planning permission. Part of the submission for planning consent should be an Environmental Impact Statement. Amongst the issues which need to be addressed as part of the Environmental Impact Statement are the following:

1. Landscape Issues

The chosen option of rock groynes represent substantial new built defences to the existing seawall and will, therefore, constitute a major visual intrusion in this rather remote and undeveloped coastline. Development within such a coastline is controlled by Structure Plan Policy CC11 and Policy CL2 and SP19 of the emerging District Plan. The general thrust of these policies is to maintain the historic nature of the landscape and to protect the undeveloped nature of that part of the coastline. The Council considers that landscape impact should be given a high priority in the preparation of any EIS.

2. Tourism

The landscape and beach impacts have a direct link with tourism. The Council's Plan Strategy is to devise a hierarchy of policies and to retain a range of beach character types to appeal to a different range of visitors. This undeveloped area is one that requires special attention. In addition, the proposal has implications for other beaches within the area. Already, imported shingle to this area, intended to

Cont ...

Ms A Mills
Environmental Assessment Services Limited
8a Cuckfield Road
Hurstpierpoint
West Sussex
BN6 9RU

replenish existing defences, has caused problems in Minnis Bay as a result of transport along the coast by long shore drift. Already, substantial amounts of flint/shingle are being washed into Minnis Bay and are proving detrimental to the character of that beach. The Council has already received a number of complaints about this issue and it has been taken up directly with the National Rivers Authority. The proposal includes for the continued importation of shingle to that area and clearly, the Environmental Impact Statement needs to take account of this issue.

You will be aware that the Council has been conducting research through consultants, on the movement of sand within the coastal cell. Sand at the main beaches at Westgate, Margate and Cliftonville, depends upon the long shore movements from west to east. Any Environmental Impact Statement undertaken must consider whether the construction of groynes as suggested, will in any way interfere or disrupt the flow of sand either in the short term or on a longer term basis. Such disruption could have major implications for beach development in north Thanet.

3. Nature Conservation

The area is designated as an SSSI and proposed Special Protection Area/RAMSAR site. The designation arises from the habitat existing which is attractive to birds in this area. The creation of groynes and the interruption of the long shore drift may result in a completely different environment being created, which would have serious implications for the nature conservation interest on this coastline. SPA Regulations state that proposals should not result in the "...pollution, deterioration or disturbance of the nature conservation interest of the area ...". Significant disturbance of the SPA is a potential of the proposed scheme either on a temporary basis as a result of construction or alternatively on a permanent basis as a change in environment.

The Council would, of course, be happy to discuss any of these matters prior to the submission of planning applications, but would consider that all of these points should be addressed in some detail as part of an Environmental Impact Statement which would accompany any planning application made to Canterbury City Council and Thanet District Council.

Yours sincerely

Chief Planning and Technical Officer

ENVIRONMENTAL ASSESSMENT SERVICES LTD
8A, Cuckfield Road, Hurstpierpoint, West Sussex BN6 9RU, U.K.

TEL (0273) 833317 FAX (0273) 835480
+ 44 273 833317 (INT) + 44 273 835480

.....

F A X

.....

To: Chris Powell Esq., Fax No: 0689 831582 Date: 23/11/93
Robert West & Partners.

From: Malcolm McKemey Re: RECULVER N SEA WALL No. of pages: 3

.....

Further to our 'phone conversation this afternoon, please find attached a copy of the Thanet District Council letter of 16th November 1993 suggesting that planning consent is required for the proposed groynes.

Best regards.

ST. NICHOLAS COURT FARMS LTD.

ST. NICHOLAS-AT-WADE, BIRCHINGTON, KENT, CT7 0PT.

Telephones: Office: Thanet (0843) 847444
Potato Packhouse: 847269
Fax No. 847161
Vegetable Packhouse: 847309
Fax No.: 845623
Workshops: 847307
Estate Workshop: 842310

11th November 1993

Miss A M Mills
Environmental Assessment Services Limited
8A Cuckfield Road
Hurstpierpoint
West Sussex BN6 9RU

Dear Miss Mills,

Coastal Defence Works - Reculvers to Minnis Bay, North Kent

We note the proposal for Option 2 (Rock groynes and shingle feed) to be developed for coastal protection of the northern sea wall.

We have been concerned for some time that the sea shore has been changing in character since the Sea Defence Authority (K.R.A., S.W.A. and now N.R.A.) ceased to maintain the wooden groynes which once protected this whole length of coastline. Shingle feeding alone has not been enough. Sand has disappeared causing the sea bed level to drop and too much shingle has washed away.

We feel that the proposed scheme will go a long way to stop the current erosion, but are concerned about the excessive gap between groynes No. 9 and No. 10.

We hope that existing wooden groynes will not be interfered with during construction and that they will be left until the new system has stabilised and they naturally deteriorate.

Between groynes 9 and 10 the Coldharbour mud flats are protected by a few wooden groynes (green on enclosed plan) at the western end and an ever dwindling shingle wall along the sea shore. This is an area of significant environmental value to the SSSI and we feel that two further groynes, one at each end of the mud flats, will be necessary to build up shingle and preserve the area - particularly as the wooden groynes become time expired. We are convinced that groyne 9 will not protect the mud flats after the wooden groynes wear away.

Yours sincerely,

M.J.G. Tapp

Encl.

Regd. No. 618045 England. *Regd. Office:* St. Nicholas Court, Birchington, Kent.

Directors: A. R. Tapp, M.A., J. R. S. Tapp, M.A., M. J. G. Tapp, B.Sc.,
W. R. N. Tapp B.Sc. A.R.I.C.S.

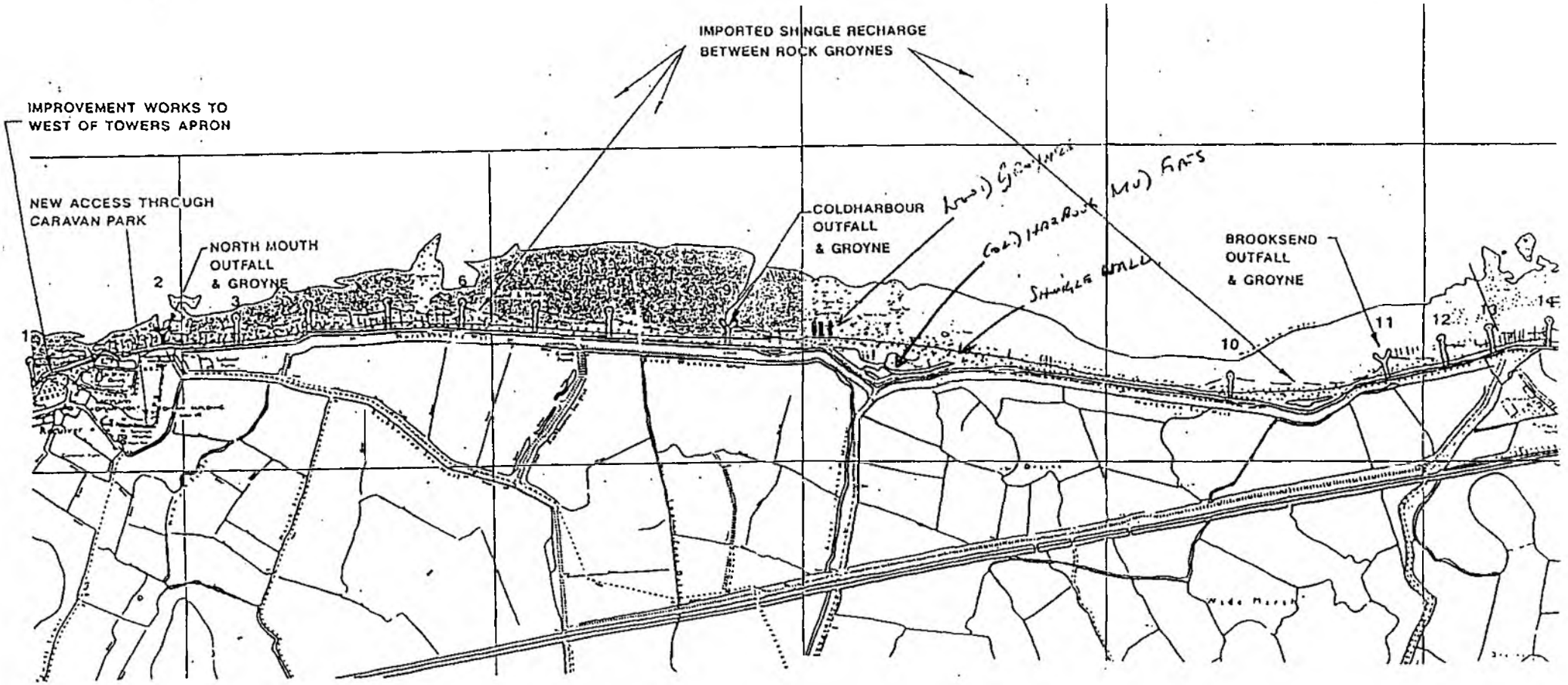
NATIONAL RIVERS AUTHORITY

Environmental Assessment Services Limited

Proposed Coastal Defence Works
Reculver to Minnis Bay, North Kent

Environmental Assessment

Consultation, October 1993



OPTION 2 : Rock Groynes

Our ref: PB203.cb/300600

22 November 1993

Kent Trust
FOR NATURE CONSERVATION

Tyland Barn, Sandling,
Maidstone, Kent ME14 3BD

Tel: (0622) 662012
Fax: (0622) 671390

Ms. Annette M. Mills
Environmental Assessment Services Limited
8A Cuckfield Road
Hurstpierpoint
West Sussex BN6 9RU

Dear Ms. Mills

Coastal Defence Works - Reculver to Minnis Bay

Thank you for your letter of 29th October.

We have not been involved in this study and I do not know details of the other three options. It is therefore difficult to comment on one scheme in relation to this overall context. Assuming that a scheme is necessary, an option using rock groynes is likely to be more environmentally sensitive than some other options.

I understand that a "do nothing" or managed retreat option was not considered. We are disappointed that such an option was not assessed in view of the emerging debate about agriculture policy, coastal change and future sea defence policy. I understand that EN are shortly to publish a report on coastal processes in the Thames Estuary as a whole. I hope that you have been able to discuss this report's findings with the authors.

We urge that this option be considered if it has not been so far.

Yours sincerely

Paul Buckley
Senior Conservation Officer

THE NATURAL HISTORY MUSEUM

ADVISORY SERVICES

CLIENT: Environmental Assessment Services Limited
8A Cuckfield Road Hurstpierpoint West Sussex BN6 9RU

CONTACT: Annette M Mills

ENQUIRY DATE: 26 November 1993 **REFERENCE:** Letter

RESPONSE FROM: Ian Tittley Contracts Division Tel/Fax: 071-938-9264

DATE: 1 December 1993 **OUR REFERENCE:** CEE-B1008

CHARGE: £60 + VAT **COST CENTRE:** SBD-Q134-CNI

ENQUIRY: National Rivers Authority (Southern Region)
Northern Sea-wall (Reculver) Improvement works
Environmental Statement - Plant and animal colonisation

RESPONSE:

The coastline of south eastern England comprises soft rock substrates which erode relative rapidly. To curtail erosion a variety of materials and structures have been used in coastal defence, these include concrete, brick and chalk. In addition harbours and have been appended to the coastline and a range of materials has been used in mole and breakwater construction; these include Portland Limestone (Margate, Ramsgate, Dover), Lower Greensand (Folkestone), and more recently granite and other hard rocks from Scandinavia and elsewhere (Herne Bay, Ramsgate). Groynes to stabilise beach material are commonly constructed of wood, sheet metal and occasionally concrete with aggregates.

All such introduced structures potentially provide artificial habitats for marine plants and animals and surfaces for colonisation. Not all structures and surfaces are necessarily colonised as external factors such as degree of wave-action, sand and shingle abrasion, shore level, aspect, and nutrients and pollutants in the sea can affect settlement by plants and animals.

Colonisation

The shape of a structure and the inherent physical features of the rock substrate will also affect colonisation by plants and animals (see review in Tittley, 1982). Micro-relief, porosity and colour will all influence settlement by juvenile stages. It has been shown that such juvenile/spore stages settle preferentially on rough surfaces, smooth glassy surfaces are not easily colonised. This is clearly seen on Thanet where broken flint has been used in sea-wall construction, the smooth, broken, surfaces remain largely uncolonised (Tittley, 1982). Muller (1964) and Luther (1976) demonstrated this experimentally.

Studies undertaken on sea-walls in the Netherlands revealed that (i) seaweeds (algae) spread to to higher sea-shore levels (relative to tide level) on limestone shores than basalt sea-shores (ii) greater quantities of certain seaweeds occur on limestone than on basalt (iii) seaweed species assemblages differ according to surface friability (iv) certain seaweed zones (bands of plants relative to tide level) are absent from harder rocks. Nienhuis (1969) concluded that porosity of the substrate and its rate of drying during the intertidal period was an important determining factor.

On the Isle of Thanet, Tittley & Shaw (1980) and Tittley (1982) compared seaweed growths on natural chalk cliffs with those on concrete and brick sea-walls, limestone harbour walls and flint surfaces. Differential colonisation was recorded, with algal zonation extending to higher shore levels on the more porous substrates such as chalk and brick; a wider range of species was present on porous surfaces and dominant species differed according to substrate. Plants appear to be more sensitive to substrate type than animals. Further information on colonisation of sea-walls, groynes and breakwaters is given in Clarke & Tittley (1980), Tittley (1985a,b,c).

Granite surfaces

Studies on granite groynes at Ostend (Belgium, Tittley 1982) revealed three main zones of green algae, *Prasiola stipitata* at High Water Level, *Blidingia minima* and *Enteromorpha intestinalis* at successively lower levels. The red seaweed *Porphyra umbilicalis* (Laverbread) occurred among the preceding zones. Similar zones of plants occurred on the granite harbour wall at Calais (France).

Brief appraisal of the new granite sea-walls at Herne Bay has revealed settlement by marine life and a succession of changes following pioneer colonisation. Further investigation of this nearby site would present a much clearer picture of what would be expected to colonise the proposed boulder groynes between Reculver and Minnis Bay.

New groynes

Introduction of additional rock types to proposed groyne structures will enhance the diversity of habitat. The nearest natural rocks are Eocene clays near Herne Bay and chalk on Thanet; neither would be practical from an engineering point of view since both erode rapidly. Limestones are harder and would provide an appropriate alternative to granite; however, such rocks vary considerably in hardness and a softer form should be considered. Consideration could also be given to the use of Lower Greensand rock (Ragstone). Large boulders should be used as smaller boulders may be removed by wave action. It is difficult to predict exactly which species will appear on the new rocks as many factors affect propagule survival, distribution and settlement. The relatively rare *Pleurocladia lacustris* (recorded previously on Margate Harbour Wall) might appear on limestone; the rare (in eastern England) fucoid *Pelvetia canaliculata* (present on Lower Greensand at Folkestone) might appear on Ragstone. Green algae will appear on all substrates but species differentially abundant on the various substrates (*Blidingia* on granite,

Enteromorpha on limestone). The large brown algae of the genus *Fucus* will appear on all substrata but more noticeably on more porous limestone occupying higher shore levels. Lower parts of the groynes will be colonised by a variety of smaller green, brown and red seaweeds as occurs on sea-walls elsewhere. The diversity of species may be greater on limestone. Clefts and gaps between boulders will provide an important damp and shaded habitat for plant and animal colonisation.

The suggestion of employing more than one type of rock to enhance the intertidal habitat has not been undertaken elsewhere and it remains difficult to predictively model settlement patterns of plants and animals on differing substrates. The present suggestion therefore involves experiment. Should it be undertaken it is suggested that the National Rivers Authority consider a small biological monitoring programme to follow the succession of settlement on different substrata. This would provide valuable information for future similar improvement works elsewhere.

References

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TITTLEY I. & SHAW K.M. 1980. Chapter 8. Numerical and field methods in the study of the marine flora of chalk cliffs In: *The shore environment, Vol.1. Methods* pp.213-240. Systematics Association Special Volume 17a.

THE ROYAL SOCIETY FOR THE PROTECTION OF BIRDS
8 CHURCH STREET · SHOREHAM-BY-SEA · WEST SUSSEX · BN43 5DQ · TEL: 0273 463642 · FAX: 0273 465368
SOUTH-EAST ENGLAND OFFICE

24th November 1993

Annette Mills
Environmental Assessment Services Ltd
8A Cuckfield Road
Hurstpierpoint
West Sussex
BN6 9RU

Dear Ms Mills,

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY, NORTH KENT

Thank you for your letter concerning the above-mentioned works. I apologise for the delay in my response.

We have discussed this scheme with English Nature and have seen the schedule that you have agreed with them for phasing the works. Considering the difficulty of accomodating works at times that will not disturb either wintering waders or nesting terns, we feel the schedule proposed is satisfactory and have no further comments to make.

Thank you for consulting the RSPB.

Yours sincerely,

pp A J Sinton

Rebecca Sinton
Conservation Officer
(South East England)

cc Brian Banks (EN)

We would additionally recommend that a detiled archaeological\palaeoenvironmental watching recording brief be maintained throught the period of groundworks for the instalation of new groynes.

Yours sincerely,

Paul Bennett.

Paul Bennett
Director

copy: Mr Bob Brinell, Canterbury City Council

TRUST FOR
THANET ARCHAEOLOGY

Crampton Tower Yard.High Street,
Broadstairs.Kent.CT10 2AB
Fax/Phone 0843 860209
Director;D.R.J.Perkins, M.Sc.M.I.F.A.

Ref: DRJP/RNM 1st November 1993

Environmental Assessment Services Ltd.,
8a Cuckfield Road,
Hurstpierpoint, BN6 9RU
for the attention of Mrs. Annette M.Mills.

Dear Mrs. Mills,

re: Coastal Defence work - Reculver to Minnis Bay.

Thank you for the map and drawings of the proposed Coastal Defence Scheme. The Trust's reaction to this is that excavations during the construction of rock groynes No's.11, 12, 13 and 14 might well encounter archaeological horizons as listed as j, k, and m in my report, see page 3, 'Gore End'.
We feel that an archaeological watching brief should be carried out during such work. Were a team to be engaged on this, the excavations for groynes 2 to 6 could also be inspected, as although no features were observed during the field survey, the trenching did reveal inundated horizons.
Yours sincerely,

Dave Perkins,
Director.

Dave Perkins

CIB KENT ARCHAEOLOGICAL RESCUE UNIT

Established 1971: To survey, excavate, record and publish archaeological sites threatened with destruction.
Director: Brian Philp, ACIS, MBIM, MIFA, FSA. - Secretary: Edna Mynott. - Hon. Treasurer: Colin Martin, FCCA.

Miss A.M. Mills,
Environmental Assessment Services Ltd.,
8A Cuckfield Road,
HURSTPIERPOINT,
West Sussex. BN6 9RU.

16th November 1993.

Dear Miss Mills,

SEA WALL IMPROVEMENTS - RECULVER

Many thanks for your letter of the 5th November which has had to wait for prioritory rescue-work on two sites in West Kent. I note that you wish to replace the existing road through the caravan site.

We should, of course, be pleased to assist you with this project, but all staff are employed on specific projects for which specific funds are provided. We have no general staff to deal with general queries and information.

Our records on Reculver were put into storage sometime ago when our lease expired in Dover Castle and everything had to be moved in our spare time! As a result the records and other material are inaccessible and I estimate it will take a member of staff two days to sort out the information you require, which might include a site visit. Please confirm that you are able to cover the costs of this work.

Yours sincerely,

B.J. PHILP.

East Kent Office : Roman Painted House, New Street, Dover CT17 9AJ. ☎ Dover 203279
West Kent Office : 5 Harvest Bank Road, West Wickham, Kent BR4 9DL ☎ 081-462-4737 (FAX 081-462-1446)

St. Nicholas~at~Wade and Sarre Parish Council

Our Ref: JMC/PLANNING

Your Ref:

Environmental Assessment Services Ltd.
8a, Cuckfield Rd.
Hurstpierpoint
West Sussex
BN6 9RU

17th. November 1993

Dear Ms. Mills,

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY, NORTH KENT

Thank you for your letter and enclosures of 29th. October, concerning the above. This matter was discussed by the Parish Council at its meeting on 16th. November. The Council has instructed me to convey the following comments :

1.PROPOSED ROCK GROYNES. Concern was expressed regarding the lack of groynes between Nos. 9 and 10, in the area of the Coldharbour mudflats. It was felt that this area would benefit from at least 2 additional groynes.

2.IMPORTED SHINGLE RECHARGE BETWEEN GROYNES. You are undoubtedly aware of the propensity of marine erosion in this area to transport shingle towards the Minnis Bay. Hopefully, the proposed groynes will mitigate this effect and the Parish Council hopes that the beach area can be safeguarded.

3.NESTING BIRDS. It was hoped that the proposed development will take account of the presence of birds during the breeding season.

Yours sincerely,

Judith McCormick.

Clerk to the Council.

Clerk to the Council: Judith McCormick B.A.; M.Sc., "Barnacles", 56, Ingoldsby Road, Minnis Bay, Birchington, Kent CT7 9PJ.
Telephone: 0843 46503.

MINNIS BAY SAILING CLUB

HENGIST ROAD, BIRCHINGTON, KENT-THANET (0843)41588

Environmental Assessment Services Ltd.,
8a, Cuckfield Road,
Hurstpierpoint,
West Sussex BN6 9RU.

30th November, 1993

For the attention of Annette Mills

Dear Madam,

Re: Coastal Defence Works - Reculver to Minnis Bay

Thank you for giving us the opportunity to see the recommendations for proposed works for coastal defence to be carried out by the National Rivers Authority.

I have brought the plans to the attention of our Committee, and the feeling was that groynes should have some kind of navigational marks at the ends so when they are covered with water it is clear to sailing boats there is an obstruction under the water.

Apologies for the delay in answering, but I had to wait for a Committee Meeting to consult everyone concerned, as the sailing season is over for this year.

Yours faithfully,

Malvina Watkins

Malvina Watkins

WANTSUM ANGLING ASSOCIATION

Secretary: J. Saunders, 16 Ursuline Drive, Westgate, Kent CT8 8HX
Telephone: Thanet (0843) 835688

22nd Nov 93

REF: Outfall of the River Wantsum into the sea at
Ordinance Survey-OS-Sheet I79 Ref-24.4-69.5

Dear Ms. Mills,

I have been given the task of out-lining our plight at the above location.

The river Wantsum has been down graded to a drain, and therefore any excess rain which falls from the Canterbury area wends it's way down the Sarre Penn where it joins the Wantsum at Sarre. Then on and under the Thanet Way A299, through our section and onward down to the sea.

The Wantsum is used as a holding area and is controlled by the Drainage Department. The water is usually kept high in the summer to allow use by farmers for irrigation of fields during excessive dry periods. In the winter it's kept low to allow field drainage, and to hold excess rain water from above Canterbury.

Our problem is loss of fish when the manually controlled paddle is wound up. Water gushes out at a rate of knots into the sea, and our fish with it. The river has been known to drop three feet in as many hours.

What we would like is a paddle that winds down, allowing water to flow over the top to the required level. Our fish being bottom fish would not be lost over the top.

Alternatively, if that is too expensive an opperation, an R.S.J. sunk either side of the river outfall, with boards slotted into them, which can be removed or locked into place as and when is necessary.

Kind regards.

R.J. Milham.

English Heritage
Historic Properties, South East
1 High Street Tonbridge Kent TN9 1SG Telephone 0732 778000 Fax 0732 778001

Ms A Mills
Environmental Assessment
Services Ltd
8A Cuckfield Road
Hurstpierpoint
W Sussex
BN6 9RU

Direct dial: 0732 778044

2 December 1993

Dear Ms Mills

RECULVER TOWERS, KENT - SEA DEFENCES:

Thank you for your letter of 28 October 1993 reporting progress on the consideration of options open to the National Rivers Authority for revisions to the sea defences local to this Scheduled Ancient Monument in English Heritage guardianship. Again, I am sorry to have taken some time to reply to this letter, but I have been seeking views from my colleagues and am able to offer our observations as follows.

It may be helpful to reiterate the comments we set out in our letter of 21 June 1993 in relation to Option 2: 'Installation of the rock groynes proposed appears likely to be less visually intrusive than the work proposed in Option 1. However, it is important to bear in mind that construction of rock groynes 1 and 2 may cause disruption to the archaeology of the site'. In addition to these comments, it is essential to note that we require further more detailed information in order to give comprehensive advice:

a) we require more details on the proposed improvements to the apron to the west of the Towers;

b) in relation to the proposed groynes, we would need more than the current sketch illustrations in order to comment meaningfully on their impact on the Monument.

You will probably appreciate that a specific shortcoming of the current presentation is the lack of Ordnance Survey Datum related levels - in the absence of such information we are unaware of any raising or lowering of the general beach surfaces which may be proposed in relation to installation of the groynes. Clearly, such modifications would act either to decrease or reduce the visual impact of the proposed groynes on the Monument and the setting of the Monument and we cannot give authoritative advice in its absence. We would also stress the risk of disturbance to the site's archaeology posed by construction of rock groynes 1 and 2 and note that this concern is clearly linked to the physical size and level of

these proposed features, at least the latter of which is currently unclear.

We hope that this advice helps you to advance your assessment of options. If we are supplied with more comprehensive information on the preferred option, we will be able to provide more detailed comments. Please contact me if any point is unclear.

Yours sincerely

ALAN JOHNSON
Aread Design & Works Manager (East)

cc: R C Cross
Ms J A Roebuck

Military Road
Canterbury
Kent CT1 1YW

Tel: (0227) 763763
Fax: (0227) 763727

CANTERBURY
CITY COUNCIL

DX5314

Date: 10.12.93
Your Ref:
Our Ref: F29/8 ICB/LAP

Environmental Assessment Services Ltd
8A Cuckfield Road
HURSTPIERPOINT
West Sussex
BN6 9RU

For the attention of Annette M Mills

Ask for: Ian Brown
Ext: 4947

Dear Sirs

COASTAL DEFENCE WORKS - RECULVER TO MINNIS BAY

Further to your letter of 28 October and your subsequent telephone conversations with Mr Brown, I would like to make the following points in relation to the environmental assessment you are preparing for the National Rivers Authority.

After consideration of four options, the National Rivers Authority propose a scheme consisting of 14 rock groynes, each of which extend out to sea, from the current sea wall, between 80 and 100 metres. These would be complemented with shingle nourishment of the beach. In addition the existing revetment and sea wall to the west of Reculver Towers would be reinforced with new toe protection and apron works.

1. **Environmental Statement**

The NRA have indicated their intention to produce a Statement assessing the proposed works. As their consultants you should be aware of the following policy background (1.1) for the statement and I would advise that the following matters (1.2) be included within this statement.

1.1 **Policy Background**

i. Nature Conservation - The coast affected by the scheme is a Site of Special Scientific Interest, recognised particularly for its birdlife. This area has an international importance which is recognised by its proposed designation as a Special Protection Area and Ramsar site.

ii. Landscape - The forthcoming deposit version of the Draft Canterbury District Local Plan recognises the value of the undeveloped coast at this point as part of a wider Wantsum Channel area. This sensitive landscape is to be conserved by a proposal in the plan to define it as an Area of High Landscape Value, being of strategic importance for Thanet, Canterbury and Dover District Councils. The beach landscape and adjacent marshland area provide the setting for the historic Reculver Towers. This issue is also being pursued in the Third Review of the Kent Structure Plan to define this area as a Special Landscape Area.

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iii. Archaeology - The Reculver Towers area is defined as a scheduled ancient monument. The extent of potential interest would extend seaward from the Towers, being the previous ancient occupation of the site.

iv. Recreation - This coast is also important for its recreation value. Canterbury City Council have established a Country Park on the area surrounding Reculver Towers and extending westwards towards Bishopstone. Access is also provided via the sea wall from Reculver eastwards towards Thanet.

v. Sea Defence - The movement of sediments in this area is a complicated issue and new sea defence works will impact on this. The effect on surrounding areas will therefore be of considerable importance in considering this scheme.

1.2 **Matters for Inclusion**

The environmental statement being prepared for this project should include the following:-

A. **Project alternatives** - The main alternatives which have been considered, ie the other three options and the reasons for choosing Option 2.

B. **Description of project** - The purpose and physical characteristics of the project and the main access and transport arrangements. This should be both during construction and when the sea defence system is in operation. This will include the type and quantity of materials to be used.

C. **Site description/environment** - This will include the important habitats and species in this area, particularly the protected species and habitats; the geology and geomorphology of this site; the shoreline processes; archaeological sites and features; description of landscape and topography - along the shore and the surrounding areas; recreational uses of the area. The above policy framework which I have outlined to you would need to be described in detail.

D. **Assessment of effects** -

1. Landscape - The assessment should give a full description and analysis of this scheme's impact on the setting of Reculver Towers and the undeveloped coast at this site. This should include visual representation taking account of the changing beach and tide levels.

/continued...

2. Archaeology - This area has considerable potential interest from an archaeological point of view. An assessment of this scheme, which includes the cutting of trenches to accommodate the foundation of the groynes, is a vital element of the assessment. Initial fieldwork is required, followed by detailed mapping and sampling of any exposed deposits.

3. Natural habitat - One of the main values of this area is in terms of the recognised international importance for birds. The assessment of this scheme should, therefore, fully investigate the changes which would take place as a result of the construction of these groynes. These may be alterations to habitats and the consequent effect on the major bird population at this point, including their feeding grounds and nesting habitat.

4. Coastal sediment processes - The effect the proposed works may have on the Council's coastline where it abuts your scheme. According to the Robert West & Partners' report on the project there is an annual sediment transport of about 5,000 cubic metres at Reculver Towers feeding to the west. Curtailment of this could lead to undermining of the Council's adjacent sea wall.

5. Recreation - This area has an important recreational value - access to the beach and wider coastal area and also country park and caravan sites at Reculver. The impact on this recreational value should be assessed both in terms of the final scheme and during the construction of the project.

6. Traffic - The impact of this scheme, particularly in terms of its construction phase.

7. Storage and handling of materials - Due to the significant quantities of materials being imported for the scheme, an assessment of the storage and handling, pending their use for construction of the groynes, should also be included.

E. **Mitigating measures** - This should include any potential measures to reduce the impact of the assessed impacts - including alterations to scale and location of the groynes; methods of construction; timing of construction; recording of archaeological sites.

2. Sea Defence

The Council's Sea Defence Section have held a preliminary discussion with Mr T Monnery from the NRA at which concern was expressed at the possible impact of the proposals on the City Council's sea defences. They were advised that the terminal groyne in the west had not yet been finalised, but once design is completed, details would be sent to the Council for consideration. At

/continued...

that time, it was agreed that a further meeting would be held to discuss any modifications that might be necessary in order to safeguard the Council's interests.

As agreed with Mr Monnery would you also please arrange to send a copy of the Appendices to the main report to the Council's Sea Defence Section.

3. **Planning permission** - As the consultants appointed by the National Rivers Authority I would be grateful if you could also resolve the point regarding the requirement of planning permission for this scheme. In response to our correspondence with the NRA, suggesting that permission would be required for the groynes, it was stated that these works are carried out without recourse to a planning consent. I would be grateful if you could confirm under which legislation or regulations this exception is given. In addition we have informed the National Rivers Authority that planning permission would be required for the access road through the adjacent caravan site and also for the storage and construction compound. It is also likely that Ancient Monument Consent will be required for these works due to the proximity and impact on the Reculver Towers Scheduled Ancient Monument. The need for planning consent will have a consequent effect on the timing of this project, which will need to be considered in your proposed phasing of the scheme.

4. **Timing of project** - Following on from this issue of planning consents and phasing of projects, I would be grateful if you would give an indication of the intended timing. I understand that the accessway and import of rock is proposed during this coming winter working period with the main construction period later next year. Given the constraints outlined above - initial planning applications, the proper evaluation of the environmental statement, further design work; the time schedule appears to be very tight. I would be grateful therefore if you would confirm the overall phasing of this project.

I hope you find this information useful and if you have any further queries, please contact Ian Brown in my department. I look forward to receiving your confirmation on planning applications and timing and also the environmental statement for this scheme.

Yours faithfully

Ian Brown
Senior Planner
for Director of Planning

V05SLENVSERV

CIB KENT ARCHAEOLOGICAL RESCUE UNIT

Established 1971: To survey, excavate, record and publish archaeological sites threatened with destruction.
Director: Brian Philp, ACIS, MBIM, MIFA, FSA. - Secretary: Edna Mynott. - Hon. Treasurer: Colin Martin, FCCA.

Annette Mills,
Environmental Assessment Services Ltd., 18.12.93

Dear Miss Mills,

Reculver: Sea Wall Improvement (Northern)

This is to report back following your letter of 26th November, 1993.

1. We have made two visits to Reculver to examine the area of your interest on the Council caravan site and to take measurements of the Oven area.
2. We have made exhaustive search for our early records of the area, but the main folder has not surfaced though details of the Oven have.
3. Happily, much of the test-hole information is still within my recall and I can make some helpful comments that should provide a very important guide.
4. In general the area outside the fort wall (here east and south) has been substantially reduced by various agents over the past 1500 years. This means that Roman ground-level has very largely gone and should not be encountered during your roadworks.
5. What remains to be considered are any cut-features, that is below the original Roman ground-level. Our work over a wide area only found the Oven and some far to the south of your line. In general it seems that the road-line will produce rather limited interest, though an occasional feature could survive or rather the lower section of it. Any works should show a general topsoil of 200-300 mm. mostly down onto undisturbed natural Beds.
6. World War II army activity has been noted during our extensive programme of work and there is some chance that slit-trenches could remain anywhere.
7. The plot of the Oven building is very largely correct (having checked it on the ground) and indeed the O.S. visited the site during the excavation and took measurements. There is no suggestion that other buildings exist in this area. The walls were located at a depth of about 300 mm.
8. We shall be continuing our excavations at Reculver over the next few weeks (not inside the Roman fort) and should be most happy to carry out the Watching Brief clearly needed on the extention of the road northwards, jointly with that. We could keep the costs minimal and clearly we have unique local knowledge, quite apart from being the most cost-effective and long-established Unit in S.E. England.
9. The road clearly lies outside the Scheduled area(always said to be 200 feet) and thus English Heritage should have no legal interest. If you need the boundary of this I think we could locate it.

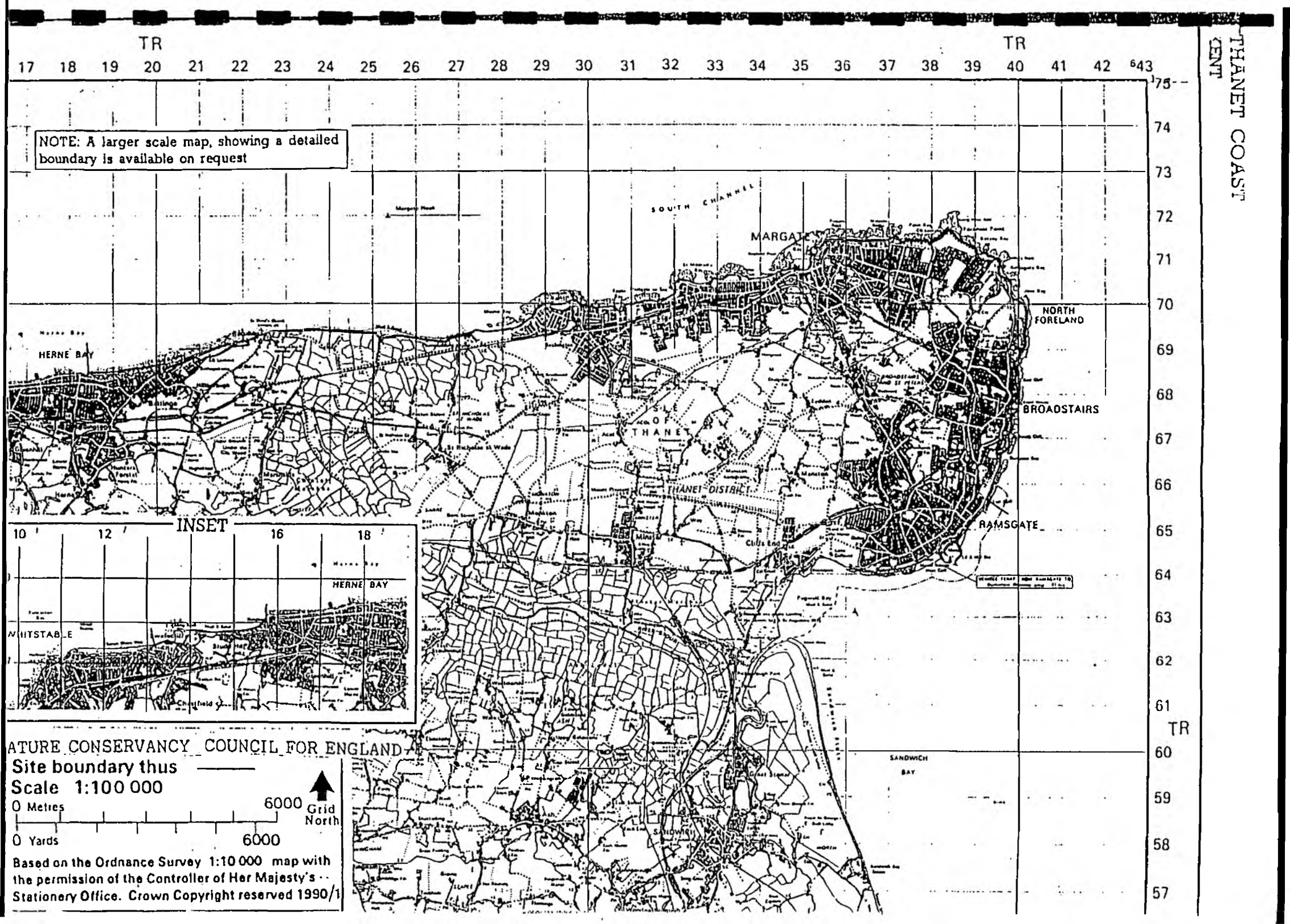
In great haste,
sincerely,

Brian Philp

East Kent Office : Roman Painted House, New Street, Dover CT17 9AJ. ☎ 0304-203279 (FAX 0304-225922.
West Kent Office : 5 Harvest Bank Road, West Wickham, Kent BR4 9DL ☎ 081-462-4737 (FAX 081-462-14-

APPENDIX E

COPY OF THANET COAST SSSI CITATION


THANET COAST
TR
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57
NOTE: A larger scale map, showing a detailed boundary is available on request
SOUTH CHANNEL
MARGATE
NORTH FORELAND
HERNE BAY
BROADSTAIRS
ISLE OF THANET
THANET DISTRICT
RAMSGATE
SANDWICH BAY
SANDWICH
INSET
10 12 16 18
HERNE BAY
WHITSTABLE
ATURE CONSERVANCY COUNCIL FOR ENGLAND
Site boundary thus
Scale 1:100 000
0 Metres 6000
0 Yards 6000
Grid North
Based on the Ordnance Survey 1:10 000 map with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved 1990/1

File Reference: TR/36-5

COUNTY: KENT

SITE NAME: **THANET COAST**

DISTRICT: CANTERBURY; THANET

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: Canterbury City Council; Thanet District Council

National Grid Reference: TR 132675-TR 394656 Area: 818.7 ha (2023.0 acres)

Ordnance Survey Sheet 1:50,000: 179 1:10,000: TR 16 NE, NW; TR 26 NE, NW; TR 36 NE, NW; TR 37 SE, SW

Date Notified (Under 1949 Act): 1981 (part)

Date Notified (Under 1981 Act): 1984 (part) 1987 (part) 1989 (part) Date of last Revision: 1990

Other Information: Thanet Coast amalgamates four SSSIs: Bishopstone Cliffs, Plumpudding Island and North Thanet Coast previously notified under the 1981 Act, and North Cliff Broadstairs notified under the 1949 Act. The site incorporates large extensions, and part is managed by Canterbury City Council as a Country Park. Parts of this site will also be noted in 'A Geological Conservation Review'.

Reasons for Notification

This site, extending almost uninterrupted from Swalecliffe to Ramsgate, comprises mainly unstable cliff and foreshore (including shingle, sand and mudflats), with smaller areas of saltmarsh, coastal lagoons, coastal gill woodland and cliff-top grassland. There are a number of biological, geological and geomorphological features of interest within the site.

Biological Interest

The Thanet Coast is particularly noted for its bird populations, supporting both internationally and nationally important numbers of wintering birds, with one species br ing in nationally important numbers. Associated with the various constituent habitats of the site are outstanding assemblages of both terrestrial and marine plant species, including communities of marine algae that are of limited occurrence elsewhere in the British Isles. Invertebrates are also of interest and there are recent records of three nationally rare** and one nationally scarce* species.

The ornithological interest of the Thanet Coast is centred on the large numbers of waders and wildfowl which use the area in winter and the many species of birds that feed and rest during the spring and autumn passage. Turnstones Arenaria interpres regularly overwinter in numbers of international importance, whilst sanderlings Calidris alba and ringed plovers Charadrius hiaticula and grey plovers Pluvialis squatarola are present in nationally important numbers. A colony of little terns Sterna albifrons, a species specially protected by law and listed on Schedule 1 of the 1981 Wildlife and Countryside Act, breed in nationally important numbers at Plumpudding Island.

The cliff section at Epple Bay is of considerable historic scientific interest, since it is the type locality for one genus and six species of algae. It forms part of the survey area where chalk cliff algal communities were first studied in Britain, and the remaining natural cliff exemplifies this type of vegetation. Botany Bay and White Ness exhibit a variety of geomorphological features such as stacks, promontories, caves and a tunnel and arch formation which are no longer common on Thanet, and which also support a variety of cliff algal communities. Of particular interest are the cave communities

of algae of the group Chrysophyceae; these communities are not known from the caves in the harder rocks of western Britain. The North Thanet cliff algal communities are complementary to those of the chalk cliffs at Pegwell Bay, within the Sandwich Bay and Hacklinge Marshes SSSI, the only other notable site for chalk cliff algal communities in south-east England.

The littoral and subtidal plant and animal communities of Kent are generally impoverished compared with other parts of Britain; this is principally attributed to the extremes of sea and air temperatures, the turbid sea water and the soft, unstable substrates which are prevalent. However, the foreshore at Fulsam Rock is clean and silt-free, and supports a diverse fauna on the lower shore especially in the laminarian zone, which has a well developed crevice fauna. The algal flora is well developed, and includes species which have not been recorded elsewhere in Kent, such as Chondria dasyphylla, Hecatonema maculans and Griffordia secunda.

The shingle substrate occupying part of the foreshore has given rise, in places, to a distinctive flora with species including yellow horned poppy Glaucium flavum, viper's bugloss Echium vulgare and the nationally scarce* plants sea kale Crambe maritima and sea pea Lathyrus japonica. The nationally rare** hogs fennel Peucedanum officinale has also been recorded from the shingle at Swalecliffe. Small areas of saltmarsh are dominated by ea purslane Halimione portulacoides with sea aster Aster tripolium and sea wormwood Artesmia maritima also present, whilst at Plumpudding Island the western coastal lagoon contains abundant growth of the nationally scarce* aquatic plant, spiral tassel-weed Ruppia cirrhosa.

The exposed cliffs themselves are of interest for terrestrial plants, supporting populations of the nationally rare** hoary stock Matthiola incana and sea stock Matthiola sinuata as well as the nationally scarce* wild cabbage Brassica oleracea and sea heath Frankenia laevis.

Bishopstone Glen is a short steep-sided valley cut through the clays and sands of Bishopstone and is the only feature of its kind on the North Kent Coast. The sheltered head of the Glen is dominated by ash Fraxinus excelsior and field maple Acer campestre woodland which is replaced further down the valley by hawthorn Crataegus monogyna and blackthorn Prunus spinosa scrub. Young smooth-leaved elm Ulmus minor is abundant throughout.

The exposed cliff top east of Bishopstone supports a large area of coastal grassland. It is mown for hay and contains a wide range of species including early hair grass Aira pr cox, barren fescue Vulpia bromoides, meadow vetchling Lathyrus pratensis, bulbous buttercup Ranunculus bulbosus and thrift Armeria maritima.

Within this site strips of grassland along the seawalls are dominated by couches Elymus species and fescues Festuca species. Other flowering plants include the nationally rare** hog's fennel, found along the seawall at Plumpudding Island, and some nationally scarce* species such as slender hare's ear Bupleurum tenuissimum and sea clover Trifolium scuamosum. Some of the more common species recorded include spiny restharrow Ononis spinosa and grass vetchling Lathyrus nissolia.

The drift line debris in the vicinity of Swalecliffe supports the only population of the nationally rare** isopod (woodlouse) Eluma purpurescens on mainland Britain, and the cliffs around Bishopstone support two nationally rare** digger wasps Ectemnius ruficornis and Alysson lunicornis. It is likely that further survey may reveal additional rare or scarce invertebrate species in the site. These particular cliffs also support one of the two largest sand martin Riparia riparia colonies in Kent.

Geological Interest

The section of coast between Beltinge and Reculver exposes the Thanet Formation, the Woolwich and Reading Beds Formation, the Oldhaven Formation and the London Clay Formation. It is the key on-land Palaeocene site in the London Basin, and is one of Britain's most important palaeobotanical localities.

The Thanet Beds contain a range of plant organs including as-yet-undescribed fruits and seeds. In addition, this section is the only locality to yield determined wood from the Woolwich Beds and one of only two sites to have yielded plant material from the Oldhaven Beds.

The clays here contain a substantial assemblage with two families, six genera and numerous species unique to this site in the London Clay flora. Three genera Palaeobruguier (mangrove), Shrubsolea (Rutaceae) and Jenkinsella (Ceridiphyllaceae) are unique to this site.

A rich invertebrate and vertebrate fossil fauna also occurs within the site and the section has been extensively studied over many years. The best exposures currently occur on the foreshore, and many of the best are towards the Spring tide and Low Water mark.

The stretch of coastline between Epple Bay and Ramsgate is the national reference locality for the Santonian stage of the Upper Cretaceous chalk in Britain.

The exposed sections at North Cliff together with the nearby Pegwell Bay complement the Reculver Warren and Dover to Kingsdown Cliffs SSSIs and include several stratigraphically important marker beds such as Bedwell's Columnar Band and Whitaker's Three Inch Band. The top parts of the Santonian stage are very fossiliferous and the Marsupites zone contains a distinctive and famous band of the pyramidal-shaped sea urchin Echinocorys.

The North Cliff is also important for Quaternary studies. It provides lithostratigraphic and biostratigraphic evidence for environmental changes during the Middle and late Devensian in SE England. The sequence of sediments exposed in the cliff overlies frost-disturbed chalk and comprises: 1) Middle Devensian Solifluction deposits; 2) Late Devensian loess and brickearths; 3) a series of Late-glacial Solifluction deposits separated by fossil soil horizons considered to represent the Bolling and Allerod Interstadials; 4) Postglacial hillwash.

Foreness Point is a key site for coastal geomorphology and an essential member of the suite of chalk coastal sites. It is a classic cliff-shore platform system and contains the most extensive intertidal chalk shore platform in Britain. It has been studied in greater detail than most other cliff-platform sites and demonstrates particularly well the links between cliff and platform erosion and beach development. Cliff recession, historically at a rate of 0.3m per year, contributes flint and chalk pebbles to the beaches, which also contain locally important accumulations of sand, much of it organic in origin. The cliffs and platform also show interesting relationships with bedrock structure.

The cliffs at Walpole Bay and Grenham Bay consist of Upper Chalk, cut by a swarm of closely-spaced, vertical extension joints, striking NW-SE. The joints, which are well-developed here, are oblique to the main Thanet fold trend (E-W). They are particularly good examples of fractures formed in the 'Late Cenozoic Stress Domain', that is, structures formed as a result of extension related to late Alpine plate collision.

*Nationally scarce species are those which occur in 16-100 10 km squares in Great Britain
**Nationally rare species are those which occur in 1-15 10 km squares in Great Britain.

1992.

A RESEARCH REPORT
PRODUCED BY THE TRUST FOR
THANET ARCHAEOLOGY

NOTES ON ARCHAEOLOGICAL SITES IN THE INTER-TIDAL ZONE BETWEEN MINNIS BAY AND RECULVER

AN ARCHAEOLOGICAL SURVEY REPORT AND LIST OF SITES IN THE INTER-TIDAL ZONE OF THE NORTH SHORE OF THANET

D.R.J.Perkins M.Sc. A.I.F.A.

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Archaeological Sites on the North Shore of Thanet

INTRODUCTION

This report was commissioned by Robert West Fowles and Partners in response to a request by Dr. John Williams, County Archaeologist for Kent, who had been informed that an environmental study was to be made of the Birchington - Reculver sea wall ahead of possible major engineering work by the National Rivers Authority. A number of ancient sites are known to exist under the sea wall and beach deposits north of it, these being the remains of settlements inundated by a combination of post-glacial rises in sea level and the sinking of the land. The writer, as director of the Trust for Thanet Archaeology, has direct knowledge of most of these sites, having either discovered them, or surveyed them in the recent past. The main body of this report consists of a list of the sites, followed by comments on their relative importance, and vulnerability.
As a first step, the writer accompanied Mr. C.R.Powell on a field survey held on Friday 28th and Saturday 29th of August, in which sondages were cut down through beach deposits to the underlying measures. No archaeological features were observed, but the information so gained has archaeological significance.

SOME OBSERVATIONS MADE DURING THE SURVEY

Location 1, 100 m. east of Reculver Towers:
Beneath about 0.30 m. of grey mud was a 'wave cut shelf' composed of the yellow-brown sandy silt of the Thanet Beds. A 'dogger', a sandstone boulder found in the lower strata of the Thanet Beds was exposed at a depth of about 1.5 m. This horizon is an un-disturbed sub-soil truncated by wave attrition. It could hold deep-cut features from the Roman Fortress.

Location 2, 200 m. east of Reculver:
Geology as Location 1. At this point the Thanet Beds may represent an inundated prehistoric land surface.

Location 3, 1000 m. east of Reculver:
Under about 0.30 m. of grey mud was blue-grey clay (alluvium) to a depth of 1.2 m., then a grey-black strata (peat?) for 0.50 m., then degraded Thanet Beds down to the limit of the cut at 3.0 m. This represents the north-west shore of the mouth of the one-time Wantsum sea channel.

Location 4, 2000 m. east of Reculver and approaching Coldharbour.
Blue-grey sandy clay to depth of 3.0 m. (maximum depth of cut). Mid-channel of north mouth of Wantsum.

Location 5, 4000 m. east of Reculver and opposite 'lagoon'.
Storm beach deposits down to 2.00 m., then blue-grey alluvial clay.

Location 6, 4500 m. east of Reculver, opposite remains of Gore End.
Peat down to 0.80 m., then blue-grey alluvial clay to 1.40 m., then water-logged coomb rock.

Location 7, 5000 m. east of Reculver, at Minnis Bay opposite old rifle butts. Sandy mud beach deposits to a depth of 0.30 m., then tabular chalk. A wave cut shelf of the Upper Chalk.

A LIST OF KNOWN ARCHAEOLOGICAL SITES

These are listed running west to east, and as shown and numbered on the map (Fig. 1).

Reculver (not shown on map):

This area is principally known for its Roman fortress (part lost to the sea), and the Early Medieval church that stands within it. Both earlier and later remains exist however. West of the fort, the eroding cliff of Thanet Beds sand cuts the fill of pits and ditches containing Late Bronze - Early Iron Age material. North of the fort in the inter-tidal zone an area of collapsed masonry has been observed by bait-diggers and bathers. These remains may be those of the inundated Medieval village of Reculver, fallen walls of the Roman fortress, or both.

Coldharbour:

This site appears to consist of the eroded fragment of an island once situated at the north mouth of the Wantsum Channel. From what remains preserved beneath the 'storm beach' of shingle, it would appear to have been formed by an up-fold of the Thanet Beds. The ancient horizons exposed by wave action on the shore include material similar to the Thanet Beds, also brickearth and areas of peat. A somewhat frustrating situation exists with regard to survey, in that deposits that are above mean high water mark are constantly being buried under hundreds of tons of dumped shingle (a sea defence). Those below high water mark form 'islands' that can only be examined for about ninety minutes in each tide. The sketch-map given as Fig. 2 illustrates the main features of the area.

Little is known of Coldharbour in historical times, its name (O.E. a shelter for travellers in bad weather), suggests settlement, perhaps a fishing hamlet. One local journal of c. 1720 complains that a good sized vessel could no longer be got through the Wantsum to the sea, since landowners at Coldharbour had allowed trees to grow across the stream. A dock was made there during the building of a new sea wall to replace that (built by Henry VIII) destroyed in the storm and floods of 1953. When examined by a T.f.T.A. survey team, some of the dock remains (timbers and bundles of faggots), gave the impression of considerably pre-dating the 1950s, and yielded pot sherds and pipe stems of the Georgian period.

The archaeological evidence is anecdotal:

a) While walking on the sea-wall in 1986, Mrs Ann Folwell (former Secretary of Thanet Archaeological Society), encountered a man equipped with a metal detector who had just left the Coldharbour beach deposits. He showed her four bronze objects that he had discovered. Two were socketed axes, a third was a looped spearhead, and the fourth was an unfamiliar object which she cannot now describe. The spearhead could be the one shown to Dr Stewart Needham at the British Museum the following year, and said to be 'from St Nicholas'.

b) Workers for Southern River Authority and their contractors have from time to time told the writer and others of discoveries made during the

course of work at Coldharbour. When the shingle of the artificially created 'storm beach' is being bulldozed back after a storm, the underlying Thanet Beds are sometimes disturbed. Human skeletal material has been found, and on one occasion, 'a lead coffin' (Roman?). The coffin was reportedly emptied, crushed flat, and sold for scrap!
Two wrecks are situated on the beach about 200 m to the east of Coldharbour. Both are the remains of wooden vessels, and are known as the 'Cement Barges' although both have 'V' hulls. The nearest wreck retains its stone ballast.

Gore End:
Three archaeological sites were discovered at Gore End in 1986 when a gale stripped the shingle storm beach exposing the underlying brickearth. The Sites at Gore End are close together, although disparate in type and period. They consist at 'j' of wave-truncated well-shafts filled with loam and exhibiting Medieval sherds. At 'k' of Romano-British horizons (brickearth cut by graves, one a 4th century inhumation). And at 'm' of remains of the lost village of Gore End'. The latter includes collapsed Georgian cottages, with the debris nicely stratified and topped-off with thatch!
Details of the Romano-British burial and other finds:
A Roman burial: Human skeletal material was discovered by Mrs A. Baldock of St. Nicholas, who informed the police. After examination at the Pathology Department at Margate General Hospital, the Coroner's Officer passed the remains to Thanet Archaeological Unit for further study. An excavation team from the Unit visited the site and found related material, the surface of the clay around the burial yielded fragments of terracotta, possibly tegulae.
The burial and associated material was exposed by wave action on the beach below the sea-wall west of Minnis Bay, O.S. ref. c. TR 27086934. Under normal conditions there is a shingle 'storm beach' at this point. Late summer gales had stripped the shingle to reveal grey alluvium and a light brown clay, the latter presumably part of the Thanet Beds. These Eocene deposits probably represent the last traces of Gore End, a peninsula that has been diminished by inundation since Roman times and subsequent erosion.
In the clay floor of the depression formed by the removal of the skeleton was found a rim shard from a Mortarium in red colour-coated New Forest Ware, c. Late 3rd - Early 4th Century. Since the shard is rather too big to be subject to worm action or to have passed down through the skeleton, it serves as a useful *terminus post quem*.
Although the evidence of the pot shard only means that the burial took place in *or after* the late Romano-British period, the north-south orientation of the grave is Pre-Christian. It is also unlikely that anyone would dig a grave to a depth below the water table. To a Roman however, the grave would be 12 feet above modern sea level, as the coast of south-east England has sunk by that amount since his day. The burial is therefore most probably Romano-British.

Minnis Bay:
There seem to be three sets if archaeological features at Minnis Bay:
Site 1, This is a Late Bronze Age site discovered and part excavated in 1939-40[2], see 'h' in Fig. 1.

Site 2, this is a series of eight pits containing Romano-British material. They were discovered at the same time as Site 1, and published[3] although unfortunately without a plan or location map.
Site 3, consisting of a pit of irregular shape (or group of pits cutting one-another), and containing well preserved environmental material, wattle, and Late Bronze Age sherds, see 'i' in Fig. 1. This feature was discovered and part investigated independently both by staff from Quex Park Museum (1960s?) and by Mr John Franklin (1982).
In 1988, and in order to discover what might remain of Site 1, a transect was cut running east-west across the bay between the wave-cut shelves. This revealed the following geological sequence (illustrated by Fig. 3):

i) A hard chalk surface under c. 30 cm of modern beach deposits for 27 m east until:
ii) A shallow deposit of London Clay (depth > 20 cm), over the chalk for c. 5 m east, then:
iii) Blue-grey alluvial silt of unknown depth for 22 m east (presumably the ancient creek bed), then:
iv) A shallow deposit of London Clay for c. 4 m east, then:
v) Blue-grey alluvial silt for c. 6 m, then:
vi) Brickearth of unknown depth for c. 22 m, then 10-20 cm deep over Coomb Rock for c. 6 m until:
vii) Hard chalk with deposits of Coomb Rock (the wave-cut shelf).

Between i) and vii), deposits ii) - vi) bore a covering of sand c. 5 - 15 cm deep. Throughout the area of vi) Brickearth could be seen protruding through the sand in many places. Whether this was the result of wave attrition or intense bait digging activity could not be determined. Since this is the site of the Late Bronze Age settlement, the exposed Brickearth was searched, yielding only small nodules of burnt flint.

COMMENTS ON THE ARCHAEOLOGICAL IMPLICATIONS

At each of the four sites listed above, any work that involved the disturbance of horizons preserved either under the 1950s sea wall, or under the flint pebble storm beaches, would be likely to expose and destroy archaeological features. These remains would probably consist of:
a) Prehistoric land surfaces with settlement remains inundated during the period 2000 - 500 BC.

b) Prehistoric, Roman, and Medieval land surfaces and remains part inundated at mean-tide level and preserved from wave attrition by sea wall and storm beaches.

c) Collapsed debris of Roman, Medieval, Tudor, and Georgian buildings beneath storm beach deposits, the result of cliff erosion. This could include fragments of the Reculver 'Saxon Shore Fort'.

Any such work in the four areas listed should be monitored as an 'active watching brief', features being sampled and recorded as exposed. Archaeological work in the inter-tidal zone is difficult, and techniques

for field research are at the stage of experimental development by, among other, English Heritage. Nevertheless, the importance of the remains that could be expected to be encountered makes a watching brief essential.

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NOTES:

1) Kent Archives Office (Ramsgate Public Library), U475, Z2/4.

2) Worsfold, F.H., PPS No. 2 (1943), 28 - 47.
The Minnis Bay site consist of an ancient horizon bearing settlement remains dating from the Late Bronze Age. These were exposed by a great north-easterly gale in February 1938 and were observed by a schoolboy, James Beck, who proceeded to record them. During which work he uncovered both prehistoric and Romano-British pottery, and a bronze hoard. During the 1960s there was some further exploration in which Neolithic material was found, see notes by N. Macpherson-Grant, Quex Park Museum archives

3) Powell-Cotton, P.H.G. and Pinfold, G.F., Arch. Cant. LI (1939), 191 - 203.

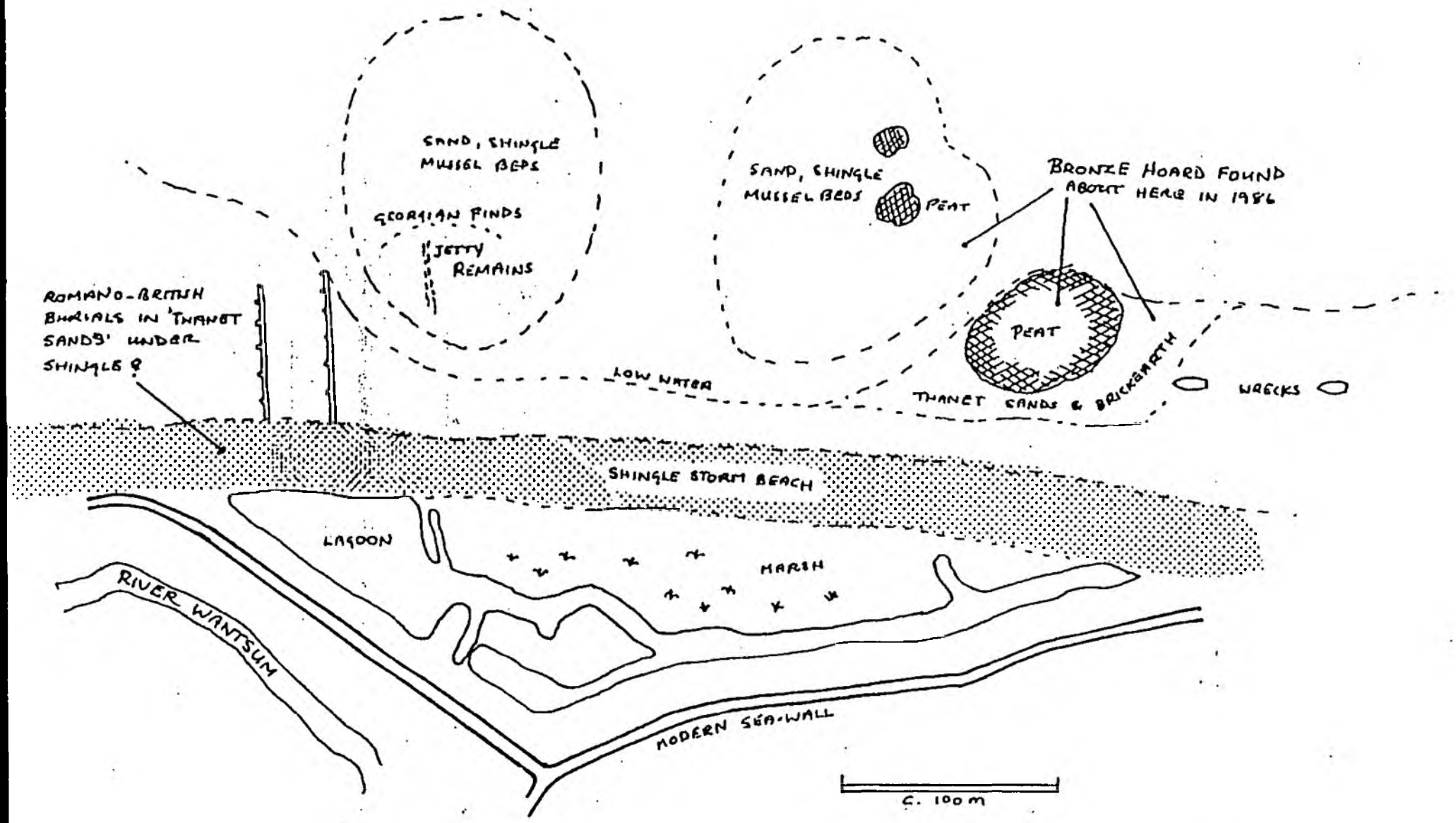

Fig 2. A ROUGH SKETCH-MAP SHOWING ANCIENT HORIZONS AT COLDHARBOUR

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