

POLICY ON COAST PROTECTION AND NEW COASTAL DEVELOPMENT



**THE POLICIES HEREIN WERE ENDORSED BY THE
SOUTH AUSTRALIAN GOVERNMENT
ON 21 MAY 1991**

**COAST PROTECTION BOARD
SOUTH AUSTRALIA**

FOREWORD

On behalf of the State Government I am pleased to be able to release this comprehensive and timely coast protection policy document.

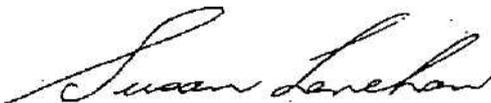
Partly as a result of previous lack of knowledge and foresight, coast protection is an unavoidable and ongoing cost to South Australian State and Local Government. Unless we plan carefully for the future, costs are likely to escalate, especially if the projected sea level rise occurs. As well as being costly, protection works such as seawalls usually affect the coastal environment adversely and can result in loss of public beaches. We need to plan thoughtfully to enable future generations of South Australians to enjoy the beaches we do today, and to avoid them paying for our mistakes.

We also need to ensure that new developments take account of their own coast protection costs and that the community does not end up subsidising these.

In recommending these policies to Government I was cognisant of the special difficulties associated with climate change and sea level rise and with the uncertainty about these. However, I am satisfied from advice I have received that sea level is already rising slowly and that the rate is more likely than not to increase within the next 30 to 50 years.

Because the potential consequences of not taking these changes into account may be far higher than the costs of doing so, I believe we must plan accordingly. The policies which the Board has recommended provide a prudent but cautious approach, which I support.

I would like to thank the Board, the Advisory Committee on Mean Sea Level and staff of the Department of Environment and Planning for preparing this document. I commend it to seaside Councils and all those who may be considering developing close to the coast.



Susan Lenehan

MINISTER FOR ENVIRONMENT AND PLANNING



CPB POLICY ON COAST PROTECTION AND NEW COASTAL DEVELOPMENT
including
HAZARD STANDARDS, SEA LEVEL RISE, AND PROTECTION
FUNDING

INTRODUCTION:

The purpose of this document is to provide a clear understanding of Coast Protection Board policy for development in areas which may be at risk due to coastal flooding or erosion. It gives special consideration to the question of sea level rise, and deals also with the respective roles and responsibilities of government and those wishing to build at the coast, and with funding for coast protection works. In general the policies here do not address broader coastal planning issues, such as nodal vs strip development or preservation of landscape values. These have been addressed in coastal Management Plans and have since been included in Council sections of the Development Plan.

In May 1991 the Premier and Cabinet endorsed the policies herein as South Australian Government policy. It is proposed that those policies with a direct bearing on new development be included in the Development Plan for the State. This is to be done through a Minister's Supplementary Development Plan to give the policies Statewide effect and subsequently by Council Supplementary Development Plans to establish local details such as set-back distances and minimum building heights in eroding or flood prone areas. This process has already commenced at both State and Council levels.

In preparing these policies the Board has recognised that the coast has a high value for development as well as for conservation and public enjoyment and that development should be encouraged, especially where it enables the coast to be better managed.

The main principle underlying the policies is that coastal development should pay its own way. It should not be a drain on present or future community resources and should not result in impaired beaches, other loss of coastal amenity, nor erosion of adjacent property.

The need for informed and wise coastal planning is not new - indeed the consequences of previous mistakes led to the establishment of the Coast Protection Board in 1972 and have resulted in State and Local Government and some property owners incurring large coast protection costs. The annual public cost of coast protection in South Australia is approximately \$2.5 million. The need for better planning has been recognised and several of the policies have been previously expressed in Management Plans under the Coast Protection Act. Some are already included in Council supplementary development plans. However, many areas are not adequately covered and recent knowledge, especially on the sea level question, warrants bringing the policies up to date and giving them more importance.

These policies are a refinement of ones which the then Minister for Environment and Planning endorsed for interim operation in 1988. Following consultation with Local Councils and other interested bodies, the earlier policy document was redrafted to take comment into account and also to take into account more recent information on climate change and sea level rise. Special regard has been paid to recommendations from the Advisory Committee on Mean Sea Level. The policies now cover development where flood protection is included as part of the project, include allowance for erosion due to sea level change and, for completeness, include established CPB funding policies. Local Government comment was sought on the revised document, and further minor changes were subsequently made.

Comment was generally supportive of the policies, and there was no disagreement with the hazard standards nor the recommended sea level allowances. Both the earlier (1988) and the more recent comment focussed on two issues which the policy intentionally does not address - State

Government funding assistance to Councils in a future sea level rise situation, and the provision of a legal indemnity to protect Councils when they apply technical advice from the Coast Protection Board or the Department.

The Board does not consider it appropriate to address climate change/sea level rise funding assistance to Councils at this time, because it may be 20 to 30 years before these have a significant effect, and because other special funding may become available. The Board recognises that climate change may require re-evaluation of State and Local Government coastal funding in due course. The funding policies set out in this document are current ones which have been applied for several years.

The legal liability question does not bear directly on the policies and is being addressed separately. Following comment from Councils and a subsequent legal opinion it is proposed to draft an amendment of the Coast Protection Act to provide Councils with indemnity when they make planning or building decisions in accord with expert advice provided by the Board or the Department of Environment and Planning. This would normally be expected to apply, but a formal indemnity would remove the risk to Councils of being found partly liable. A similar indemnity applies successfully in New South Wales on stormwater flooding.

Councils may find themselves in a situation where zoning and planning policies in the Development Plan preclude their applying the Board's advice, particularly on risk due to sea level rise. An indemnity is not appropriate in such situations. Councils will be encouraged to adapt their zoning and policies to the altered circumstances, to enable them to apply the Board's advice to future applications.

FLOODING AND SEA LEVEL RISE

On the question of sea level rise, the Board has taken advice from the Advisory Committee on Mean Sea Level and has also had regard to the 25 May 1990 report by the IPCC (Intergovernmental Panel on Climate Change) Working Group 1 (scientific aspects) report. On the evidence the Board is satisfied that sea level is presently rising at a rate of approx 1.5mm/year at most parts of the SA coast - the rate differs at a few locations because of local land subsidence or uplift. It is accepting that there will be a global warming due to increases in greenhouse gases and that this will result in more rapid rise in sea level. On the above advice the Board is recommending that a mid-range sea level rise of 0.3m by the year 2050 be adopted for most coastal planning and design. It should be noted that the 0.3m figure includes continuation of the present rate of rise and is not additional to it.

While sea level rise due to climate change is likely to continue beyond 2050, projections for the following 50 years to 2100 are less certain. The IPCC Science Working Group predicts a sea level rise of approx 0.65m (range 0.33m to 1.10m) for a 'business as usual' scenario (ie. assuming continued increases in greenhouse gases). The Board has accepted the Advisory Committee's recommendation that a 1m rise to 2100 be assumed for coastal policy, in the sense that this will only be applied for development which could not reasonably be protected against this greater rise. The small margin between the 1.0m and the 0.65m provides some allowance against the possibility of greater increases and also for the possibility of storms becoming more severe and causing higher extreme tides.

The Board will continue to follow scientific evidence and opinion on climate change and sea level rise, and the above allowances will be reviewed when more information becomes available.

The Board is of the view that in most coastal flooding applications the 100 year average return interval (ARI) standard is appropriate. This standard is commonly used for stormwater flooding. It is important to note that the 100 year ARI event could occur at any time in the future and has a 1%

chance (exceedance probability of 0.01) of occurring in any year. The Board considers the 100 year ARI standard should be applied additively with sea level rise - ie development should be safe against the 100 year event after the specified rise in mean sea level has occurred.

Coastal flooding may be either directly due to a storm tide or by a combination of this with stormwater backed up by the tide. It will therefore sometimes be appropriate to consider the coincidence of tidal and rainfall events and to estimate the combined water level probability.

The following policies apply -

1 Site and Building Levels

Except as set out in policy # 2 and elsewhere in this document, development should not be approved where building sites are lower than a height determined by adding 0.3m to the 100 year ARI water level and making a local adjustment (if appropriate) for land subsidence or uplift to the year 2050. For commercial or habitable buildings, floor levels should be no less than 0.25m above this minimum site level. Development should not be approved unless it is capable, by reasonably practical means, of being protected or raised to withstand a further 0.7m of sea level rise.

The 100 year ARI extreme water level, should be based on the best information available, usually recorded extremes from the closest tide gauges. It should take into account site specific factors such as wave set-up and run-up and stormwater heights during extreme tides. Similarly the best available information should be used for predicting land subsidence or uplift.

2 Flood Protected site and building levels

Where flood protection measures exist or are to be provided as part of a development, building sites should be no lower than the design flood level within the development taking into account the mitigating effect of the protection measures. Floor levels should be at least 0.25m above this level. The design flood level is to be determined taking into account 0.3m of sea level rise and, depending on the situation, either the 100 year ARI extreme tide in adjacent coastal waters together with stormwater and wave effects within the development, or the 100 year ARI stormwater event with due allowance for the effect of tidal surge on this.

Development which depends on measures such as levee banks, flood gates, valves, or stormwater pumping will need to demonstrate that there is a very low risk of failure of these devices and that they will be adequately maintained.

3 Sea Level Rise for Major Developments

For major coastal developments the Board recommends that in addition to policy #1, the full range of possible climate change and sea level effects be considered. The Board will encourage designs which enable later modification for further sea level rise. However it recognises that it may be appropriate in some instances not to provide these but rather to accept that there may be higher modification or rebuilding costs later.

Policies 16, 17 and 19 will also be especially relevant for major developments.

COASTAL RECESSION AND STORM EROSION

Unless specifically referred to as 'storm erosion' the term erosion is used here to also include recession of the coast, whether gradual or in larger amounts during storms.

Coastal erosion around the South Australian coast is, in many places, quite significant in planning time frames. In a few places the coast has receded by 100m or more over the past 100 or so years. More commonly recession rates are of the order of 10m to 50m per century. Some parts of the coast are stable and in a few places the coast is building seawards. There does, however, appear to be a small overall erosion trend of 10m to 20m on average over the past 100 years. This is probably due to the small sea level rise over this period. More severe erosion, such as at the Adelaide beaches, is invariably due to some special local factor.

Storm erosion can cause quite large changes on those sandy coasts which are inherently stable, though these would recover during subsequent calmer seasons. Depending on the location, dunal coasts may be eroded by up to 20m or 30m during a severe storm - this would apply for more exposed parts of the South Australian coast. More typically, storm erosion in a single year might be up to 10m. Coasts which are not subject to longer term recession are likely to recover over the subsequent few years.

Erosion estimates are usually based on historic rates of recession. The present coastline position is compared with previous ones measured from aerial photography and early surveys. The rate is then projected into the future taking into account any special factors which may result in a more rapid or slower rate. By providing a better understanding of the mechanisms at a site, coastal process studies can improve the accuracy of erosion estimates. However these studies can be expensive and are not always practical.

Accelerated sea level rise will generally cause an increase in the rate of recession, though would interact with local coastal processes in quite complex ways. While prediction methods are available, they have limitations. As a general guide sea level rise will cause sandy coasts to erode by approx 50 to 100 times the amount of rise, ie 15m to 30m for a 0.3m sea level rise. The height of dunes, slope of the beach, nature of the sediment and existing processes at the site will all affect the rate.

Climate change could also result in changes in wind and wave directions. Even small changes in these could affect the coastal alignment. While such changes cannot be predicted, they argue for a cautious approach on erosion estimates for climate change and sea level.

The recession/erosion policies are similar to the flooding ones in that they require development to be safe from the effects of a 0.3m sea level rise and to be capable of being protected against additional recession due to a further 0.7m of rise.

It is important to recognise that coast protection measures, especially groynes and seawalls, can have detrimental effects on beaches and nearby property. This is especially the case where a coastline is receding - as compared to one which is essentially stable but subject to occasional storm erosion. In the latter case a seawall can provide effective protection with only temporary loss of the beach. However, for a receding coastline, a seawall acts to relocate rather than prevent erosion. The natural process on such a coast is for material to be removed from the dune or cliff either to the nearshore region or along shore. Where a portion of the coast is protected by a seawall, the deficit will generally be made up by increased erosion of the adjacent coast and by loss of the beach. Adverse effects of groynes or breakwaters on adjacent coasts are usually more dramatic. Beach replenishment can provide a more satisfactory alternative, but can be very costly, and suitable sand is not always available. Seawalls of one type or another are usually proposed for private coast protection works.

Protection measures can also affect the coastal environment in other ways, for example by limiting tidal flows to mangrove and samphire areas or by obstructing natural migration of wetlands. Such impacts need to be taken into account when deciding coast protection strategy.

Policies No 4, 5 and 6 deal with the setback and the provision of future protection works. When considering those special situations where development may be approved subject to the provision of a sea wall or other protection at some future time, the Board and the planning authority will need to have regard to such matters as when the seawall should be provided and its design standard. Agreements would be expected to include these aspects, which would depend on circumstances at the site. Generally provision will need to be made for storm erosion between the 'trigger distance' being reached and construction being commenced and for space to construct the wall. Agreements may also need to take account of physical and other environmental impacts of the structure.

The following policies apply -

4 Setback for Erosion

Development should generally not occur on sand dunes nor close to soft, erodable coastal cliffs. Except where the development site is clearly safe against coastal recession and storm erosion, development should not be allowed unless appropriate studies have been carried out and demonstrate that the following criteria are satisfied. Alternatively the developer should include coast protection works and show that these would provide the required protection. In cases of doubt the Board will advise as to whether or not studies are required.

Development should be safe against coastal recession and storm erosion and the effect that a 0.3m rise in sea level would have on these. Also, development should not be approved unless it can be protected by practical measures against additional erosion that would be caused by a further 0.7m sea level rise.

Each situation will be different and will need to be considered on its separate merits. As a general guide, design and/or setbacks should take into account 100 years of erosion at a site (taking into account local coastal processes and assuming a sea level rise of 0.3m by the year 2050), and also taking account of storm erosion from a major storm or series of severe storms. For major developments, especially those establishing entire new communities, 200 years of recession should be considered, and also the effect of sea level rise on this over the longer period.

Consideration should also be given to whether an additional set-back is desirable to provide for public use after recession has occurred or to preserve the natural appearance of the coast.

5 Impact of Protection Works

Development should not be located where it will create or aggravate coastal erosion or if it will require coast protection works which will cause or aggravate coastal erosion. The Board will not recommend approval of private coast protection works where these would be likely to cause loss of public beach amenity, erosion of adjacent land owned by others, or other adverse effects on the coastal environment.

EXCEPTIONS AND SPECIAL SITUATIONS

While it is proposed that all coastal development be subject to the same hazard criteria, it may not always be appropriate to apply the foregoing policies. In some situations it may also be reasonable to allow owners to carry their own risk and future coast protection costs. There are however risks to future owners and to the State in this. The Government would almost certainly be called upon to assist in an emergency; notwithstanding previous agreements.

The following policies apply -

6 Responsibility accepted by owner

The Board will not oppose isolated single owner developments where it is satisfied that adequate arrangements have been made to ensure that any erosion or flooding damage to the development, provision of future protection works, or relocation or demolition of threatened structures will be the sole responsibility of the developer or future owners. The Board may also seek assurance that funding for such measures is guaranteed or, alternatively, that agreements provide a mechanism for recovery of public costs that may be incurred.

This would be subject to policy No 5 and that protection works would be likely to obtain approval at the appropriate time.

7 Existing protection works

The Board will not oppose development behind existing protection works where the Board's and the Local Council's intention is to maintain or upgrade these. The Board will recommend against approval where protection is provided by beach replenishment and the development would rely on continuation of this for its safety.

8 Existing coast protection need and infill development

The Board will not oppose development where there is already a need for protection of existing development, where this is likely to be provided by Local or State Government and where the new proposal would not add to this need, nor to the cost. This would include development behind esplanade roads or other public property where these are likely to be protected in the future. However it will not always be practical or cost effective to protect public foreshore property, and it may be undesirable to do so if this means losing the beach.

Each case will be considered on its merits and this policy may not apply where the new development represents a large increase in investment, or where protection may not be the optimum long term strategy.

9 Lesser criteria for some beach facilities

Lesser engineering criteria may be applied, as appropriate, to public amenity structures such as beach shelters, toilets, change sheds and car parks, some of which may need to be considered expendable. Investment in such structures should be minimised, or they should be relocatable.

10 Minor structures

Certain minor non-residential and non-commercial structures may not be required to meet the Board's coastal hazard standards. However the approving authority should ensure that the owners are aware of the risk of damage to the building and contents and accept all responsibility for loss, and that future owners would also be informed. Structures in this category might include garden sheds, boat sheds, carports, low cost swimming pools, and small jetties.

STUDIES AND INFORMATION

Insofar as staff resources and funding permits, the Board and the Dept of Environment & Planning will continue to carry out and commission studies into the more critical coastal issues in South Australia, and will continue to support Local Councils in similar studies. This information will be

made available to developers and the general public. Important examples are the establishment of the Advisory Committee on Mean Sea Level, assessment of likely effects of climate change, and assisting Councils with studies to evaluate the safety of coastal areas for present and future sea levels, and to assess protection options.

However site specific information is often not available, and may need to be obtained for a proposal. Depending on the circumstances, this might range from providing intended building levels and survey heights of the site to a comprehensive study including measurements or estimates of wave heights and extreme water levels, study of coastal processes, sea level rise impacts, engineering design and coast protection works, and an assessment of their effects.

With the exception of the few developments requiring Coast Protection 'prescribed works' approval, coastal development decisions are made either by Local Councils or the SA Planning Commission. Regulation 12 under the Planning Act enables these bodies to require developers to provide information relevant to the application. The Board will be relying on Councils and the SA Planning Commission to request that appropriate information be provided, as set out in policy No 13 hereunder.

The following policies apply -

11 Coast Protection Board Studies

The Board will carry out and commission studies into the more critical coastal hazard issues in South Australia and will support Local Councils in local studies. This information will be made available to developers and the general public.

12 Developers to provide information

Developers of coastal land at risk will be required to provide sufficient information to demonstrate that proposed developments will be safe from tidal inundation or coastal erosion or, for major proposals where there is some risk, that it is in the public interest for the development to proceed despite the risk. Where coast protection measures are to be included, the design and design criteria will be required, together with an assessment of the effect on the beach and adjacent coastline.

13 Development advice

The Board may make its own assessment of coastal hazards and coast protection proposed for a development and provide advice to the planning approval authority. For projects where the Minister has requested an Environmental Impact Statement, the Board will provide advice to the Minister.

PROTECTION RESPONSIBILITY AND FUNDING

One of the Board's duties, as set out in the Coast Protection Act, is to protect the coast from erosion, damage, deterioration, pollution and misuse. If read out of context, this suggests a greater responsibility and funding role than in fact applies. These duties, and especially the coast protection one, are mostly carried out jointly with and through Local Councils, and the Act provides for the Board to make grants to assist Councils in this. It also provides for the Board to carry out works and recover a portion of the cost from a Council, though this provision has never been used.

With the exception of replenishing the Adelaide beaches, most coast protection works are carried out by Councils or, in a few instances, privately. The Board provides Councils with grants of up to

80% of the cost of approved coast protection works and up to the same amount for storm damage repairs. The Board has assumed full responsibility for beach replenishment at Adelaide. This was necessary because the several seafront Councils benefit to varying degrees, because the cost and benefits cannot be apportioned, and because of the large scale of the projects and the co-ordination required. In order not to disadvantage country Councils, the Board also pays the full cost of protective beach replenishment in country areas, though these are handled as Council projects. Replenishment for purely recreational purposes attracts a lower grant level.

The Board's interpretation is that its funding is intended for situations which have arisen because of some previous mistake or lack of understanding about coastal processes. It does not consider that State Government funds should be available for protection of new development approved unwisely and against the Board's or Department's advice. The Board considers it beneficial to retain the nexus between authority for approving coastal development (usually with Councils) and responsibility for the consequences of decisions made.

The policy not to protect private property was affirmed by State Government in 1980, and has been applied since then. Although there will be exceptions, as noted in the policy, there can be little justification for the State to act as a free insurer of seafront property - to do so would encourage inappropriate development and unreasonable public expectations.

The following policies apply -

14 Coast Protection Grants - General

Subject to the availability of funds, the Board will provide Local Councils with grants toward approved coast protection works in accordance with the Coast Protection Act. Only in special cases will funds be approved for works which have become necessary as a result of a decision made against the Board's advice.

The Board will arrange and fully fund replenishment of the Adelaide beaches while this remains the Board and State Government's preferred coast protection strategy. For other parts of the State the Board will, at its discretion, provide Local Councils with grants to cover the full cost of Council beach replenishment projects. Replenishment which is solely to improve recreational beaches will be treated as a Local Council project regardless of the location. These projects will be given a lower priority for grants, which will be provided to cover part of the cost only.

15 Grants for flood embankments

Funding for flood embankments will be on a similar basis to other coast protection works, ie The Board will provide grants to Councils toward Council projects. The Board will not assist with the provision of outlets or other works associated with stormwater drainage, since these are eligible for other State Government funding assistance.

16 Undesirable Coastal Works

The Board will not recommend or provide funds toward coast protection works which would cause loss of public beach amenity or erosion of adjacent property.

17 Protection of Private Property

The Board will not protect private property nor provide Councils with funds for this purpose unless:

- there is an associated public benefit
- there is simultaneous protection of public property
- a large number of separately owned properties are at risk
- the erosion or flooding problem has been caused or aggravated by Government coastal works

18 Government Agency Works

The Board will provide advice but will not fund protection of coastal property and installations owned by other Government agencies.

Where Government installations (eg ports or drainage outlets) adversely affect the coast, such as by interrupting alongshore sediment movement, the agency responsible will be expected to arrange and fund remedial measures, such as sand bypassing.

19 Private Coast Protection Works

Ongoing coast protection costs for private development, such as for sand management or maintenance of seawalls, should be met out of funds generated by the development. The Board will not provide funds toward these except in exceptional circumstances.

For this and other policies herein, Local or State Government entrepreneurial developments or joint ventures between Government and private interests, will be regarded as private development.