

ASSESSMENT REPORT - NUMBER 10

CULLEN BAY MARINA ENVIRONMENTAL ASSESSMENT REPORT



MARCH 1988

ENVIRONMENT UNIT
CONSERVATION COMMISSION OF THE NORTHERN TERRITORY
DARWIN N.T.

88/0034

CULLEN BAY MARINA PROPOSAL

(DARWIN MARINE ESTATES)

A report on the assessment of potential
environment impacts

Environment Unit

Conservation Commission of the Northern Territory

March 1988

CONTENTS

	Page
Summary	1
1. Introduction	2
2. Procedural Schedule	2
3. The Proposal	4
4. Existing Environment	5
4.1 Natural Environment	5
4.2 Social and Built Environment	8
5. Project Assessment and Conclusions	9
6. Subsequent Events	12

Appendices

1. EIS Guidelines Darwin Marina Estate
2. Report on Review of Draft EIS
3. Issues Matrix
4. Report on Final EIS

1. Introduction

This report concerns a proposal to construct and operate a 300 berth, 600 resident marina/housing complex in Cullen Bay, Darwin.

The proposal is complex : it has elements on land and water, and includes attractions for the private resident, the businessperson, the tourist, the recreating public and the boat owner. The location is known to be within a region likely to be subjected to cyclones, and in a harbour with the currents, shifting substrates and engineering challenges associated with an 8 metre tide range.

Investigations of the proposal's potential environmental impacts, and the assessment of this investigation, have also been complex. The timing of the various steps of the assessment process is documented in Section 2, with detailed descriptions of the proposal itself to be found in Section 3. The current natural and social setting (Section 4) and the possible effects of the proposal on these (Section 5) are also described. Section 6 describes the course of events following acceptance of the Conservation Commission report on the proposal by the N.T. Government.

Various interim reports are included in full as Appendices. The purpose here is to allow the reader an accurate insight into the assessment path as issues were identified, investigated and resolved. The issue matrix at Appendix 3 is included to illustrate the value of this tool in sorting comments into a simple format.

2. Procedural Schedule

The initial meeting between the proponent and officers of the Environment Unit, Conservation Commission, took place on 6 March 1985. At this time the proponent was described as Darwin Marine Services (DMS), the principal being Mr Hans Vos of Hans Vos Planning Consultants.

A notice requiring a report under Clause 6 of the Environmental Assessment Administrative Procedures was subsequently issued by the Minister for Conservation, Mr Steve Hatton, to the proponent on 1 April 1985.

Following further contact from DMS, guidelines for the preparation of this report were issued by CCNT on 17 July, and the report itself was received on 28 January 1986. In the meantime the Department of Lands published notice of a proposal to re-zone the subject land and sea (on 8 January 1986), so that the DMS proposal would not contravene the existing area zoning.

SUMMARY

This report describes the environmental impact assessment of a proposal to build a 300 berth, 600 resident marina/housing complex at Cullen Bay, Darwin Harbour.

The proposal represents the largest private real estate development yet planned for the Darwin region, and its very size and multi-faceted nature has made assessment complex. At one stage, it was expected that the proposal would require its own legislation in order that its in-house management standards could be satisfactorily guaranteed; more recently however, it has become apparent that this step may not be necessary.

Public interest in the project has been lively from the beginning. Although media reports have concentrated on negative reactions, a groundswell of neutral interest has been discernible. Public meetings on the project have been well attended, although public response to the draft EIS was not particularly notable, and did not generally extend beyond vested or partisan interest.

The major assessment finding was that there was no reason, on environmental grounds, why the project should not proceed, provided it was carried out in accordance with the descriptions in the EIS, and provided the N.T. community was protected from a number of identified contingent liabilities through the negotiation of appropriate agreements with the proponent.

At a public meeting held to discuss the re-zoning proposal (17 February 1986), it was recommended, inter alia, that 'a full environmental impact study' be conducted before the re-zoning was decided. Approximately 200 people attended the meeting (N.T. News, 18 February 1986).

At its meeting of 6 March 1986, the Northern Territory Planning Authority re-zoned the subject land and sea to 'Special Purpose 1', thus creating an area for which DMS could legally apply. The NTPA took the unusual step of describing a number of aspects of the proposal that would require further explanation before any development application could be considered.

On 15 March 1986, following extensive perusal of the Clause 6 report by government advisory bodies, the Minister for Conservation agreed with CCNT advice and issued a notice to DMS requiring the preparation of a draft Environmental Impact Statement or EIS (as per Clause 8(2)a of the Environmental Assessment Administrative Procedures). EIS guidelines (Appendix 1) were issued to the proponent, subsequently referred to as Darwin Marina Estate (DME), on 3 April 1986.

As the proposal included a requirement for a small area of land vested with the Department of Defence, the Commonwealth Environment Protection (Impact of Proposals) Act could, in theory, have been applied in full. It was determined, after consultation, that the Commonwealth authorities would be satisfied to maintain a watching brief, provided they were kept fully informed of all progress. Appropriate arrangements were concluded between CCNT and the Commonwealth Department of Arts, Heritage and Environment on 3 March 1986.

The draft EIS was displayed and distributed to advisory bodies on 23 February 1987 after a period of delay during preparation. A public review period of 28 days was applied, by the close of which seven private and fifteen government bodies had provided submissions on the proposal. A copy of the CCNT report on the draft EIS forms Appendix 2.

On 30 April 1987, the new Minister for Conservation, Mr Hanrahan, asked DME to revise their draft EIS as requested in the report at Appendix 2. Copies of all submissions on the draft were also forwarded to DME and the Commonwealth authorities. DME's response, a supplement to Volumes I and II of the draft (and named Volume III), was received and distributed by CCNT on 3 July 1987.

A report on Volume III, and on the adequacy of the EIS as a whole, was forwarded to the Minister for Conservation from CCNT on 23 July 1987 and officially accepted by the Minister a week later. This report, copied at Appendix 4, contained recommendations for lease conditions, and on potential contingent liabilities. The Commonwealth

authorities indicated their concurrence with the CCNT findings on 25 August 1987, noting that "provided all the conditions specified in the assessment report are satisfied by the proponent, we accept the overall conclusion".

The following sections of this Assessment Report contain a broad proposal description and a commentary on its assessment. Subsequent events - the negotiation of lease conditions - are briefly referred to in Section 6.

3. The Proposal

The basic proposal is to develop Cullen Bay, a naturally quiet, horseshoe-shaped, Darwin Harbour inlet, into a marine-oriented residential, business and marine enclave. Features include a new (artificial) public beach to be built with 200,000m³ of sand from a nearby sandbar, a 1 km groyne, water level control gates, commercial berths, a ferry terminal, a 'fisherman's wharf' style restaurant and commercial area, chandlerys and providers, a mid-market resort hotel, a public park, condominium and townhouse type residential accommodation for approximately 600 persons, parking for approximately 300 casual cars and a fully serviced 300 berth (maximum) marina.

A location diagram and broad facilities plan follow as figures 1 and 2 respectively.

Volume I of the draft EIS adds as further description -

"A system of weirs and gates is planned to control the water level within an inner harbour such that it would be tidal above RL +3.75m Chart Datum but not allowed to fall below this level. This inner harbour basin would be dredged to an average level of RL +1.0m Chart Datum and consequently always have approximately 2.75m depth of water. Access to the ocean would be provided for about 60% of the time.

Within the basin mooring, facilities for both leisure and commercial vessels will be provided. Sufficient space is available for a 300 berth marina. The number of berths initially provided would be smaller and be expanded on demand.

An outer harbour and channel would be dredged to RL -3.0m CD to allow access at all stages of the tide for vessels with draught up to 2.5m. This outer harbour would provide shelter to vessels awaiting suitable tide conditions to enter the inner harbour."

For more detailed descriptions, readers are referred to the proposal EIS as follows:

Artificial beach - Vol I, 2.1.1; Vol II, 3.2
 Breakwater and groyne - Vol I, 2.1.2; Vol II 3.3
 Water level control gates - Vol I, 2.1.3; Vol II 3.4
 Internal walls - Vol I, 2.1.4; Vol II 3.5
 Marina and commercial berths - Vol I, 2.1.5; Vol II 3.6
 Resort Hotel - Vol I, 2.4; Vol III, 2.1
 Condominiums/townhouses - Vol III, 2.1, fig 2.4.3
 Roads/traffic movements - Vol III, 2.2, fig 2.2.4, fig 2.2.5, fig 2.2.7, fig 2.2.8, fig 2.2.9.1, fig 2.2.9.2
 Construction timetable - Vol III, fig 2.6.1
 Fill/excavation volumes - Vol III, 4.2
 Construction techniques - Vol I, 2.3; Vol II, 3.7

4. Existing Environment

4.1 Natural Environment

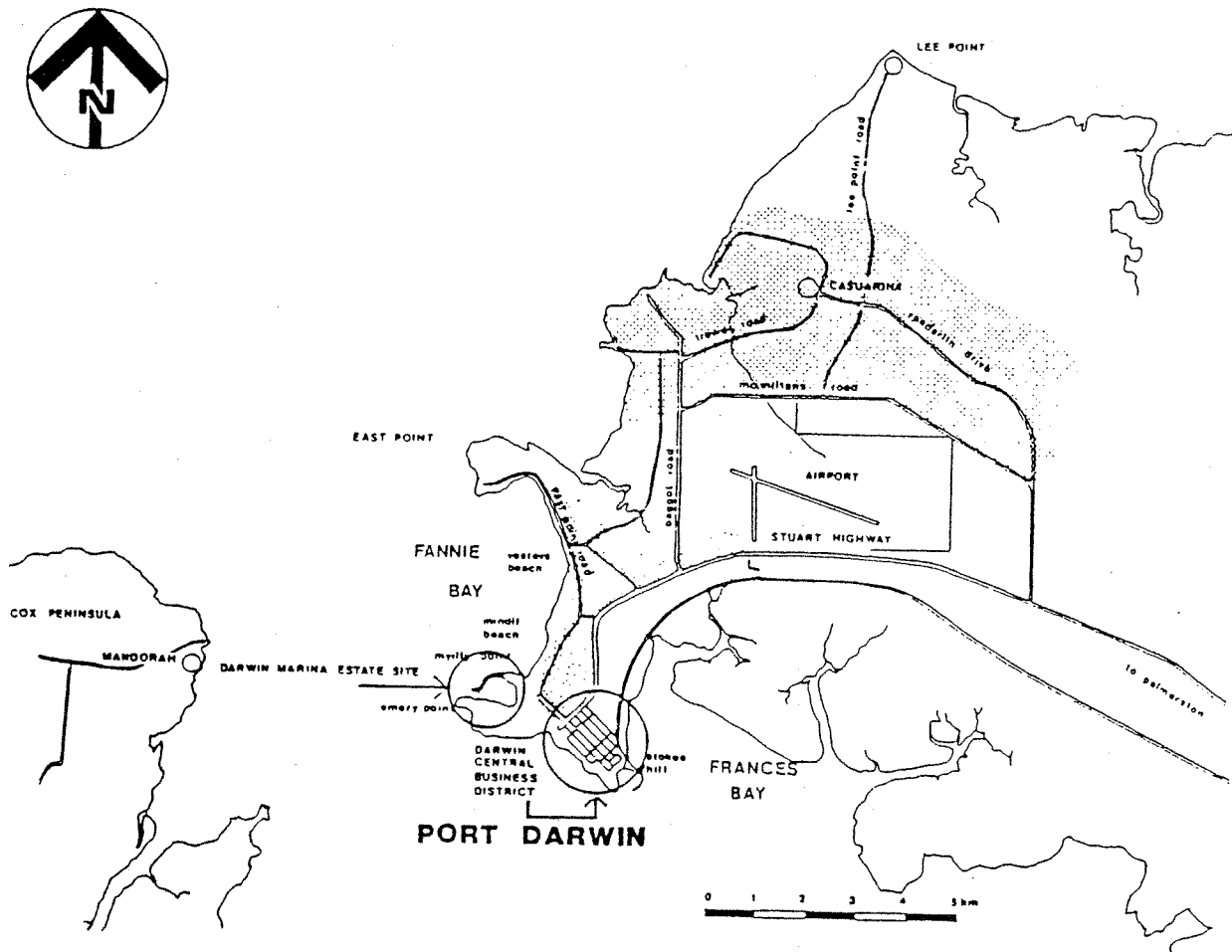
The EIS described the natural land environment as being a mix of native and introduced species, with the former being represented to greater advantage elsewhere in the region. The role of vegetation in stabilizing the erosive shallow stoney soils of the headland was noted.

1.3 ha of mixed Avicennia/Ceriops mangroves occur on the northern side of Cullen Bay with a stable sandy beach, backed by a ring of coconut palms, forming the top or eastward end of the bay horseshoe. Porcellanite rubble forms the majority of the southern shoreline.

A maximum amplitude of 7.8m applies to the semi-diurnal tides of Darwin Harbour generally, including the proposal site - the majority of the bay being exposed by big spring low tides. The Darwin tide has the following characteristics:

- . Highest Astronomical Tide = 7.9m above Chart Datum
- . Mean High Water Springs = 6.9m above Chart Datum
- . Mean High Water Neaps = 5.1m above Chart Datum
- . Mean Sea Level = 4.1m above Chart Datum
- . Mean Low Water Neaps = 3.2m above Chart Datum
- . Mean Low Water Springs = 1.4m above Chart Datum
- . Lowest Astronomical Tide = 0.1m above Chart Datum

Figure 1: **site and location**



(after Figure 1.1 of "Darwin Marina Estate Draft EIS and Planning Study", Volume 1)

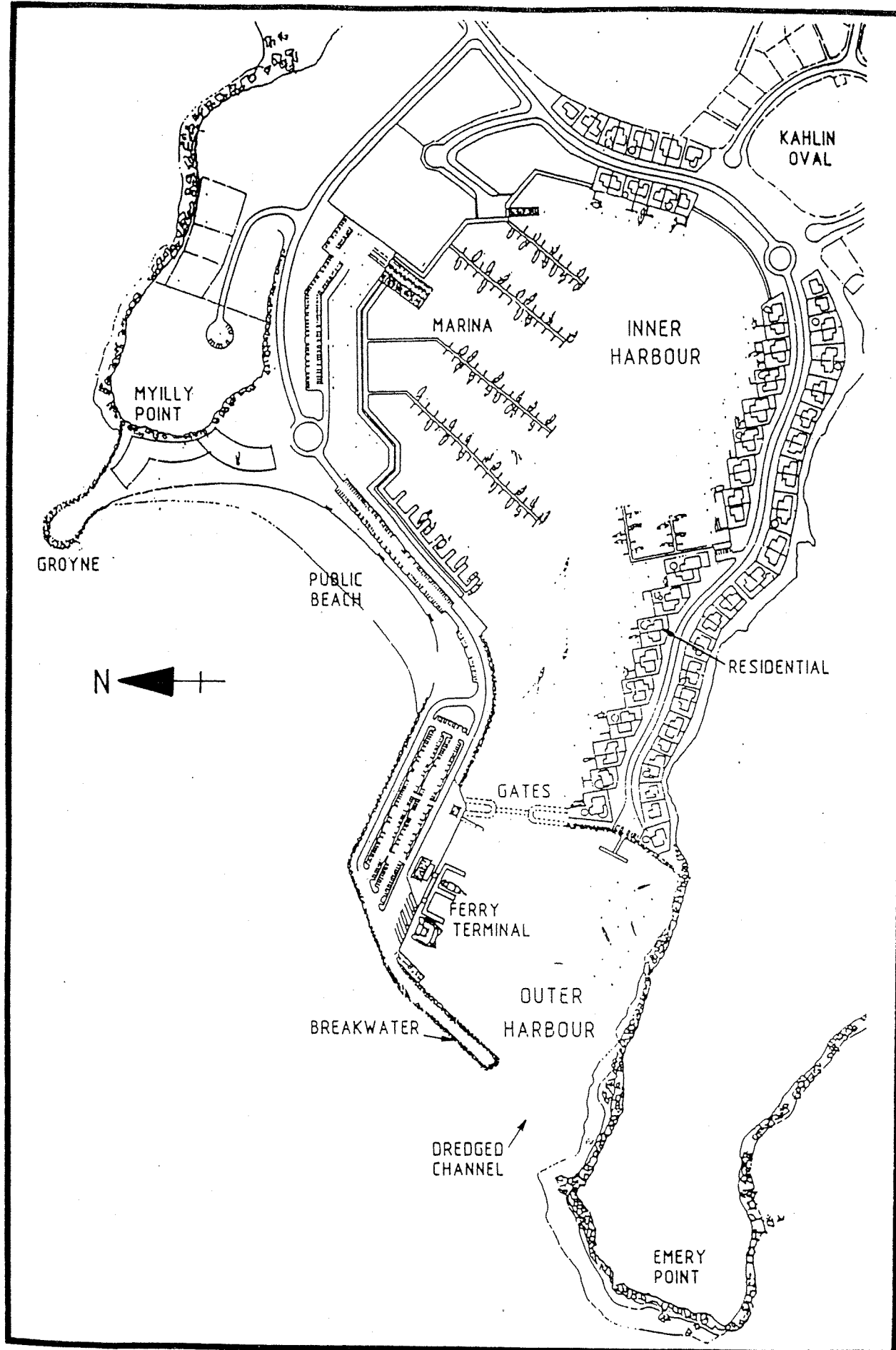


Figure 2:

GENERAL LAYOUT OF DEVELOPMENT

(after Figure 3.1 of "Darwin Marina Estate Draft EIS
and Planning Study", Volume II)

There is little current movement inside the bay, although a deep-water channel flowing NE-SW between the bay mouth and the adjacent sandbar produces currents in excess of 1.25m/sec (2.95 knots).

The propensity of the area for cyclones was recognised and Volume II of the EIS identified 1 in 100 year and 1 in 1000 year design water levels at RL +8.5m CD and RL +9.5m CD respectively. These levels did not include any allowance for wave set-up or surf beat, which add 1.0m to the levels mentioned above for exposed areas.

Wave climate was analysed in considerable detail by the proponent - the results were presented in Volume II as follows: ambient wave climate - including details of wave hindcasts, hindcast swell waves, hindcast sea waves, wave transformation, seabed friction, transformed wave climate, nearshore and nearshore local sea wave climate and nearshore swell wave climate - was described in section 2.5.1, and storm wave climate in 2.5.2.

An analysis of littoral sediment movement established that there was a minor north-south drift mechanism at work, that flood tides moved sediment out of Fannie Bay into the main harbour, and that under some ebb tide situations, sediment from the main harbour was depositing on the western (accreting) edge of the sandbar. The bar was estimated to be accreting at a rate of 50,000m³/yr.

Other climate characteristics - wind, temperature, humidity, rainfall, etc. - do not vary significantly from those of Darwin.

4.2 Social and Built Environments

The residential areas of Larrakeyah line the slopes overlooking Kahlin Oval and Cullen Beach. Traditionally, this area was, and still is, one of Darwin's more exclusive residential areas.

The peace and quiet of the area is ensured by the cul-de-sac nature of all the streets and the presence of a large oval - Kahlin Oval. The Cullen Bay waters are generally calm and little noise stems from either of the adjacent headlands - Emery and Myilly Points.

Much older associations with the area are held by Aborigines. Three sacred sites occur in a group on top of the Emery Point (Larrakeyah) headland. A further site, being the new burial site for some Aboriginal remains disinterred from the grounds of the nearby casino, is located on a small island in the creek on the northern side of Myilly Point.

Four significant examples of local architectural heritage occur in the vicinity of the proposal. The Northern Territory branch of the National Trust owns one of these and has a role in the preservation of the others.

None of the Aboriginal sacred sites or sites of European architectural heritage will be at risk from the proposal.

The local area zoning at the time of receipt of the draft EIS is shown on figure 3 (formerly figure 1.7 of the draft EIS Volume I).

5. Project Assessment and Conclusions

This project's assessment schedule has been previously referred to (see Section 2).

In fact the proposal did not commence with the preparation of a formal Preliminary Environmental Report (PER - a report required under Clause 6 of the Environmental Assessment Administrative Procedures), but rather with a planning and marketing document with some environmental content. This document was nonetheless accepted under the legislation, and used as a vehicle to identify issues and aspects of concern to the government community, prior to the Minister's decision to require an EIS.

Early Issues

Expert authorities within government identified their main concerns as follows:

Department of Health - no recognition by proponent of existing stormwater discharge points and attendant health risks, or of the propensity of nearby sewage riser pumps to break down and deposit raw material in the bay; good chance that inappropriate construction techniques will exacerbate mosquito breeding with the attendant health risks.

Aboriginal Sacred Sites Authority - concerned over possible disruption to burial island (refer 4.2), and to the sacred sites on top of Emery Point.

NT Museum of Arts and Sciences - recommended closer examination of dredging strategy, erosion rates for the new beach, dredging return period, effects on offshore sandbar, effects of suspended sediments on nearby reefs, changes in water circulation patterns.

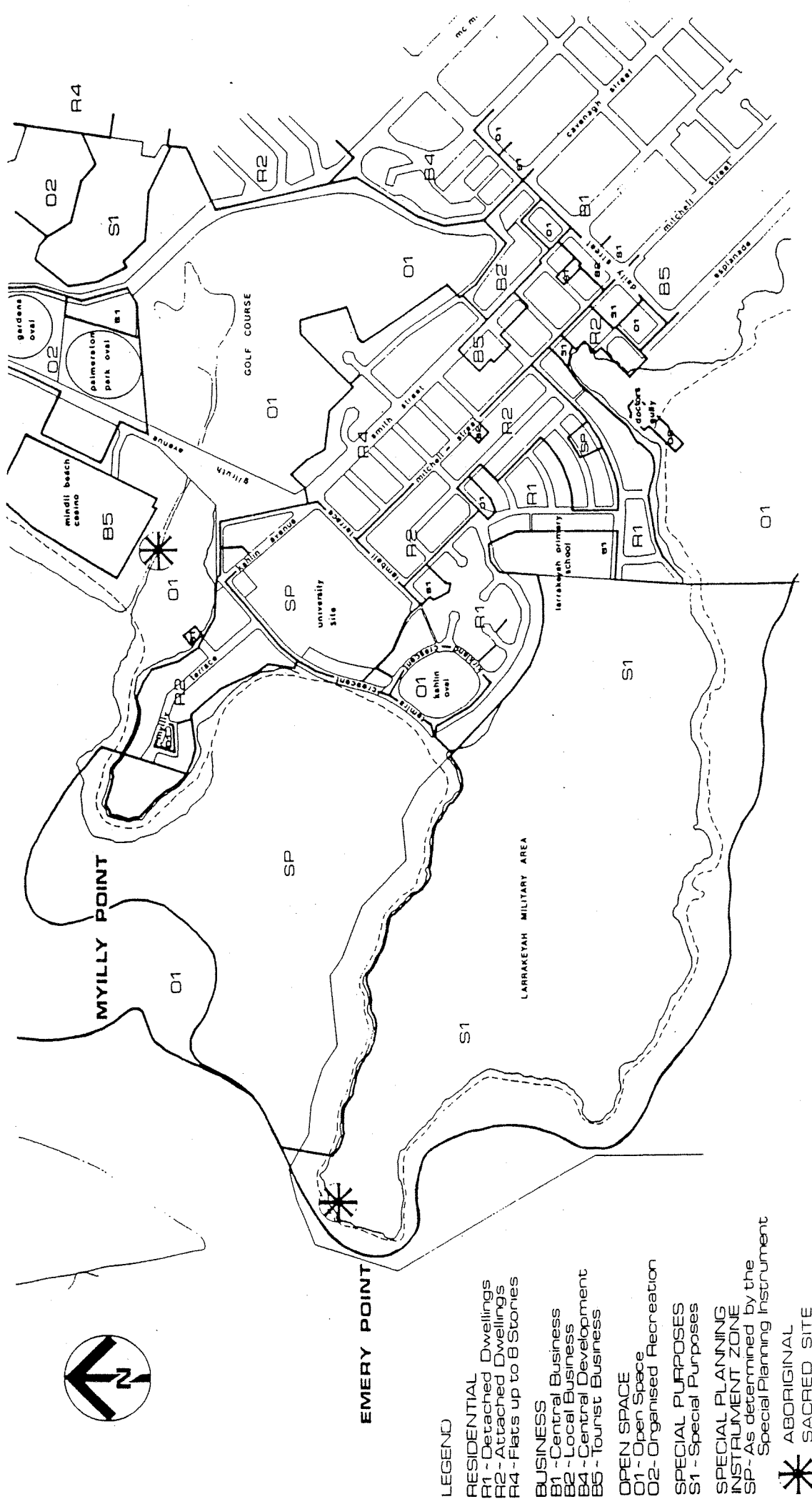


Figure 3: zoning plan

Department of Transport and Works - requested greater detail on breakwater and groyne construction and associated effects on water circulation, on dredging, dredging return period and responsibility for maintenance of depths, the destination of resuspended sediments and traffic numbers and movements.

Department of Lands - did not express any concerns of an environmental nature.

Darwin Port Authority - asked for closer consideration of the groyne and breakwater, and the effect and return period of dredging; queried the treatment of effluents if on-board living is approved.

Northern Territory Electricity Commission - recorded interest in the clarification of stormwater effects on bay water quality, behaviour and maintenance of the new beach, nature and extent of government involvement and responsibility, and on responsibility for paying for power reticulation.

Department of Ports and Fisheries - did not record any concerns over the proposal.

Department of Mines and Energy (Water Resources Division) - requested closer examination of sediment transport processes, geo-technical characteristics, dredging and landfill strategies, environmental safeguards and management structure.

Conservation Commission - considered further studies were required on basin water exchange rates, stormwater disposal (quality and quantity), effects on Fannie Bay water circulation and sediment movements, new beach stability, traffic patterns, sewage management and groyne and breakwater design. More detailed information was considered necessary on dredging (method and amounts), marina management, spoil disposal and control of sediment movement.

Draft EIS

Guidelines for draft EIS production were produced, using the issues identified in assessment of the PER as a basis. These EIS guidelines are attached as Appendix 1.

Circulation of the resultant draft EIS elicited seven private and fifteen government responses. Many responses had common elements, and the degree of commonality (taken to be a rough estimate of the comparative degree of concern) was determined using the issues matrix attached at Appendix 3.

Final EIS and Findings

After receipt of the resultant report (CCNT to Minister for Conservation, see Appendix 2) from the Minister for Conservation, the proponent issued Volume III of the EIS.

Volumes I-III were considered to form the final EIS together - as Volume III was merely a supplement to Volumes I and II, and was not comprehensible in isolation.

Government bodies who had input to the draft EIS were asked to consider the adequacy of combined documentation. Their responses were in turn collated into a report to the Minister for Conservation at Appendix 4.

In correspondence accompanying this report, CCNT made two basic assertions. Firstly, it was felt that, on the basis of the environmental impact assessment, there was no major constraint to the project proceeding. Secondly, there were a number of aspects of the proposal against which the government should obtain performance guarantees from the proponent, to protect the community from potential contingent liabilities. It was also noted that a number of minor aspects of the proposal needed attention to ameliorate possible impacts.

These findings were subsequently supported by the responsible Commonwealth authorities.

6. Subsequent Events

Subsequent to transmission of the report at Appendix 4 to the Minister for Lands (the Responsible Minister for the purposes of the Environmental Assessment Act), meetings were held with the team negotiating for the government with the proponent on such matters as lease and development agreement conditions.

Although the specific conditions drafted by the negotiating team remain confidential for the purposes of this report, it can be noted that some changes to the recommendations in the Appendix 3 report can be anticipated.

Two items will probably not appear in the environmental clauses of proposal agreements: the first, item 2.2.1 of Appendix 4, is proposed to be covered through controls on drainage within the lease area, as no directions with regard to areas outside the lease area are possible. The concern of item 2.2.1 will still be covered, however, as the draft lease condition will name Darwin City Council (DCC) as the approving authority, and that same body is responsible for maintaining the adjacent Kahlin Oval. DCC is thus hardly likely to approve a within-lease drainage plan that will cause problems to the neighbouring oval.

Item 2.2.4 of Appendix 4, relating to the prospect of short term sea level rise - from the 'Greenhouse Effect' or any other cause - cannot be worked into an acceptable condition and does not appear in the documentation drafted so far. [It is pointed out, however, that one of the important potential consequences of sea level rise would be to lessen the cyclone storm surge barrier effect of the sandbar. Any lessening of effectiveness of the sandbar would, when detected, trigger other protective agreement clauses, so that in effect, a major consequence of any sea level rise will be recognised by the parties concerned without specific reference clauses.]

Two general conditions will also apply: the first will require that any subsequent internal subdivisions and other activities within the lease area will be done as appropriate in accordance with the Environmental Assessment Act; the second will require that the project be implemented in accordance with the descriptions and undertakings contained in the EIS.

ENVIRONMENTAL IMPACT STATEMENT GUIDELINES DARWIN MARINA ESTATE

The following format is recommended:

Section 1

1.1 Title of proposal and name and address of proponent.

1.2 Summary.

1.3 Objectives of the proposal.

1.4 Background to the proposal.

Include such information as: the history of proposal formulation, background of the proponent(s), analysis of the need for each of the three basic elements and the present land tenure(s) of the proposal site.

1.5 Alternative sites.

Arguments should be presented here to show why the Cullen Bay site was chosen in favour of those preferred by various other previous marina proposals. The degree of influence of the resort hotel aspect on this decision should be clearly stated.

1.6 Existing environmental conditions.

This section should establish the surface, sub-surface and marine environments in both the natural and 'built' aspect:

1.6.1 Natural land environment.

Including a description of: existing vegetation over the site area and comments on the uniqueness or otherwise of this vegetation; soil types over the site, including comment on their erodability; marine sediment, including an analysis of surface particle sizes over the Bay area; topography, showing runoff routes; geology, showing foundation conditions over the land-based aspects of the proposal.

1.6.2 Marine environment.

Include a description of water circulation characteristics for Darwin Harbour during spring ebb and flow tides from Elliot Point to East Point, with detailed analyses of the sandbar area and Cullen Bay itself. Existing sediment

transport flows and amounts should be determined, with erosion/deposition cycles established for Fannie Bay during normal and cyclonic circumstances as far as possible. Wave climate to be determined for normal and cyclonic conditions. Include a description of the Cullen Bay marine fauna and note any marine features of special interest in the area extending from East Point out to the main harbour channel and around as far as the Stokes Hill wharf complex.

1.6.3 Social and 'built' environment.

Illustrate the location of the two sites of Aboriginal significance in the vicinity of the project site.

Illustrate existing service corridors, stormwater discharge points and zoning easements.

Describe current land-use of the area bounded by Gilruth Avenue and Temira Crescent in terms of; recreation, tourism, residential, commercial and industrial use.

Determine the presence of any heritage sites of this same area and describe the existing aesthetic climate.

Section 2

Proposal description (2.1), potential impacts (2.2) and environmental safeguards (2.3).

2.1 Proposal description.

2.1.1 Marina and related aspects including the ferry terminal, shore-based marine industry facilities, seawall, tidal gates and new beach.

2.1.1.1 Infrastructure requirements.

Determine the need for any temporary roads, workforce accommodation, materials compounds, power lines, water reticulation and sewerage facilities during construction.

Describe proposed road network, power, water and sewerage reticulation routes including stormwater and emergency sewage outfall locations.

2.1.1.2 Construction

Include a summary description describing the major elements and their construction schedule.

Describe the volume, source, transport and deposition methods for all sizes of fill including major seawall elements. Describe the volume, extractive mechanism and deposit site for spoil. Describe the construction workforce, the siting of their facilities and quantify the noise producing elements of the construction phase. Describe construction workforce management chain.

2.1.1.3 Visual appearance.

Using photographs and overlays and/or sketches portray the anticipated appearance of the facility.

2.1.1.4 Employment.

Number of permanent employment positions to be created both directly and through multiplier effects.

2.1.1.5 Management.

Describe operational management team and anticipated 'code of practice'.

2.1.2 Cullen Bay residential developments.

2.1.2.1 Infrastructure requirements.

Consider the need for any temporary roads, water and power supply, workforce accommodation, materials storage compounds, parking facilities.

2.1.2.2 Construction.

Include work schedules. Method, destination and quantities of spoil removal; volumes, sources and deposition method for fill. Describe construction management chain.

2.1.2.3 Visual appearance.

As for 2.1.1.3 and include notes on colours.

2.1.2.4 Services

Describe location and type of power reticulation (underground or aboveground), locate water supply corridors. Illustrate sewerage collection system including emergency overflow outlets. Locate stormwater outfalls. Describe improvements required to existing transport corridors.

2.1.3 Myilly Point Resort Hotel

2.1.3.1 Infrastructure Requirements

As for 2.1.2.1.

2.1.3.2 Construction.

As for 2.1.2.2.

2.1.3.3 Visual appearance.

As for 2.1.2.3.

2.1.3.4 Services.

As for 2.1.2.4.

2.2 Assessment of potential environmental impact.

2.2.1 Marina and related aspects including the ferry terminal, shore-based marine industry facilities, seawall, tidal gates and new beach.

2.2.1.1 Construction phase.

Consider potential impacts caused by dredging, clearing, excavation and filling. Address the possibilities of air, water and noise pollution and estimate traffic movements.

Particularly refer to the potential to detrimentally impact on significant Aboriginal sites, Fannie Bay water circulation and quality, the local populace and local recreational activities.

Discuss proposed hours of operation.

2.2.1.2 Operational phase.

Analyse potential long-term effects on

sediment movement patterns in Fannie Bay, particularly in Cullen Bay and along the foreshore.

Analyse and determine the extent of influence and likely effects of 1:100 and 1:1000 storm surge events, including wave set-up effects, on permanent structures and moored craft.

Address potential impacts to Cullen Bay water quality, from shore-based facilities and moored craft.

Discuss effects on existing residents in terms of aesthetic intrusion, the alienation of recreational pursuits and opportunities, and the increase in ambient noise.

2.2.2 Cullen Bay residential developments.

2.2.2.1 Construction phase.

Consider potential impacts to air and water quality, discuss noise and vibration production and estimate traffic movements.

Discuss potential impacts from excavation and filling, particularly on flora and fauna.

Discuss hours of operation.

2.2.2.2 Operational phase.

Consider impacts of residential influx on existing community infrastructure, particularly schools, road network, services etc.

Analyse 1:100 and 1:1000 year return period storm surge events, including wave set-up, and predict inundation levels and likely effects.

2.2.3 Myilly Point resort hotel.

2.2.3.1 Construction phase.

Discuss construction method of cliff base access road (Note' no interference to the Aboriginal burial site on Memorial Island can be tolerated without the prior consent of the

Aboriginal Sacred Sites Protection Authority).

Analyse potential impacts from clearing and filling operations. In particular, discuss likely impacts to air and water quality, including dust, noise and vibration production, and consider the visual impact of the construction phase.

Estimate vehicle movements, hours of operation and construction schedule.

2.2.3.2 Operational phase.

Discuss road bearing strengths, traffic and parking arrangements.

Address waste production and removal, including sewerage, putrescible and non-putrescible wastes.

Illustrate stormwater pathways.

Estimate the increase in ambient noise.

Analyse the effects of 1:100 and 1:1000 year return period storm surge events, including wave set-up.

Consider the potential for effects caused by wave reflection from new hardstand areas.

2.3 Environmental safeguards.

2.3.1 Marina and related aspects including the ferry terminal, shore-based marine industry facilities, seawall, tidal gates and new beach.

For each potential impact identified in 2.2.1 above, discuss proposed impact reduction strategies and list these as agreed undertakings at the end of the section.

Discuss management structure for marina operations and identify water quality control procedures.

2.3.2 Cullen Bay residential development.

As above (2.3.1) but related to subsection 2.2.2.

2.3.3 Myilly Point resort hotel.

As above (2.3.1) but related to subsection 2.2.3.

Section 3

Appendices

- 3.1 All sources of information in relation to information appearing in the EIS should be listed here.
- 3.2 Collate all impact reduction undertakings identified in sections 2.3 here.
- 3.3 Include copies of relevant documentation as appropriate (i.e. supportive correspondence to textual statements etc.)
- 3.4 Include all bulky tabulations, calculations, minor studies, etc., that are not appropriate for textual placement, here. If major studies are involved, a verbatim transcript of the studies' summary may be used instead.

CULLEN BAY MARINA

REPORT ON THE REVIEW OF THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

CONTENTS

1.	<u>Introduction</u>	1
2.	<u>Social & Aesthetic Effects</u>	
2.1	Population numbers and structure change	1
2.2	Traffic-flow volumes and emergency access	1
2.3	Change to existing flora & landscaping detail	3
2.4	Limits on recreational open space & access	4
2.5	Changes to social structure	4
2.6	Aesthetic changes	5
3.	<u>Marine Impacts</u>	
3.1	Management of marine & marine related aspects	6
3.2	Dredging effects - sandbar & Cullen Bay	7
3.3	Water quality criteria & monitoring	8
3.4	Cost to NT Government	9
3.5	Dredging return period	10
3.6	Cullen Bay marine fauna	11
3.7	Effects of mangrove removal	11
3.8	Beach replenishment	12
3.9	Installation & maintenance of navigation aids	13
4.	<u>Construction Phase Effects</u>	
4.1	Queries on storm surge level & sea level rise	14
4.2	Engineering/geomorphological studies incomplete	15
4.3	Employment & construction schedule	16
4.4	Construction phase turbidity levels	16
4.5	Sources of fill/destination of spoil	17
4.6	Construction phase impacts on nearby residents	18
5.	<u>Aboriginal Effects</u>	
5.1	Impacts on traditional Aboriginal areas & uses	19
6.	<u>Non-specific Comments</u>	
6.1	General role & responsibility of NT Government	19
6.2	Absence of economic analysis/project not justified	20
6.3	Alternatives poorly discussed	21
6.4	Effects on drainage of the Kahlin area generally	22
6.5	Need for re-zoning for hotel segment	23
6.6	Non-resolvable comments	23
7.	<u>Overview Comments</u>	24

CULLEN BAY MARINA DRAFT EISCOMMENTS SYNOPSIS AND RECOMMENDED PROPONENT RESPONSE1. Introduction

Comments have been received from seven private respondents and fifteen government institutions. These comments have had their common elements identified and these elements have subsequently been grouped together below.

Each element is discussed in terms of the number of times it was raised, the particular aspect concerned, and its overall importance. A recommended solution then follows.

2. Social and Aesthetic Effects2.1. Population numbers and structure changes

Identified by 16 Commentators

2.1.1. (Aspect of Concern)

With regard to the new permanent population, the comments were mostly slanted towards the capacity of existing facilities, such as local schools and public transport networks, to cope with the unspecified increase in numbers. The non-permanent population - tourists and casual day users - was the subject of queries about numbers, adequacy of car parking arrangements and negative changes to the socio-economic structure of the area.

2.1.2. Recommended solution

See Overview comment (1 & 2) on recommended social and traffic studies.

2.2. Traffic - flow, volumes and emergency access

Identified by 16 commentators

2.2.1. Aspect of concern

The most important point here is that the relevant re-zoning Determination by the Northern Territory Planning Authority (resulting in the Darwin Town Plan (Amendment No 93 1986) Planning Instrument) made the appropriate re-zoning conditional on the preparation of a Traffic Investigation Study which does not appear in the draft EIS. A number of comments also referred to the strategic difficulties that would be caused by the cul-de-sac nature of the western residential area in an emergency - the possible solution of a removable crash barrier at the end of Kahlin Crescent was raised, however it is felt that a complete investigation is necessary here.

2.2.2. Recommended Solution

A study of traffic numbers, movements and management is necessary. This study should include a review of the strategic vulnerability of the proposed layout in the event of emergency (see Overview comment 2)

2.3. Changes to existing flora and landscaping detail

Identified by 10 commentators

2.3.1. Aspect of concern

Respondents considered that the value of the existing vegetation, in terms of its uniqueness, diversity and appeal, had been understated by the proponent, and that every effort should be made to maintain as much of this as possible. It was further felt that neither the importance of artificial landscaping in the overall aesthetic quality of the development, nor the cost, have been appreciated by the proponent.

2.3.2. Recommended solution

A botanical statement (Overview comment 3) on the existing vegetation is indicated, as well as a revision of sections referring to landscaping. This revision should be based on a landscaping plan that discusses species selection for specific areas, plans for ongoing maintenance, and costs.

2.4. Limits on recreational open space and access

Identified by 9 commentators

2.4.1. Aspect of concern

Some respondents queried the effect of the development on existing local recreational facilities, such as Kahlin Oval, while others generally regretted the lack of recreational open space with which to cater for the new

population. Further comments concentrated on the restriction of access to the western side of the bay, through the residential zone.

Generally, this aspect of concern must be considered an important part of the environmental cost to the community if the project proceeds. This cost can be reduced through the adoption of the solution below.

2.4.2. Recommended Solution

Any requirement to restrict access to any part of the Cullen Bay foreshore should be clearly identified and justified by the proponent, with the guiding philosophy to be that access is open unless specifically denied. A deliberate emphasis in the revised EIS on locally available alternative recreational open space would help allay some of the expressed concern is recommended.

2.5. Changes to social structure

Identified by 7 commentators

2.5.1. Aspect of concern

Some local residents commented on the general downgrading of the area's existing appeal in terms of its social standing, or social climate, while others by contrast, regretted the creation of an exclusive enclave in cosmopolitan Darwin.

2.5.2. Recommended Solution

The proponent has gone to some lengths to minimize the permanent effects on the existing population - this should be discussed more precisely through revision of the appropriate sections. Concern with the creation of an exclusive enclave is arguably misplaced, and may be reduced through solution 2.4.2 above.

2.6. Aesthetic changes/increased noise etc

Identified by 6 commentators

2.6.1. Aspect of concern

Apart from the anticipated expression of general concern over the alienation of the existing tranquil scene, some respondents raised the prospect of severe intrusions through noise/dust, etc, during the construction phase.

Although the visual intrusiveness of the construction process is unavoidable, it is felt that some mitigation of various other construction-related effects is achievable, and the solution recommended below (2.6.2) is suggested with this in mind (see also section 4)

2.6.2. Recommended solution

The proponent should develop a code of practise for insertion into construction contracts as a standard condition. Such things as the hours of operation, access routes, public notice of particularly disruptive events (blasting, pile driving, etc), movement of employees off-site,

littering, pollution of the bay, unnecessary clearing and chains of command and responsibility should be included.

3. Marine Impacts

3.1. Management of Marina and marine related aspects

Identified by 21 commentators

3.1.1. Aspect of concern

This aspect caused more comment than any other, with the majority of respondents clearly uncertain of the management strategy that will be adopted. Common questions included such things as : who will employ the 'harbourmaster'? How will water quality criteria be determined and enforced? How will the effluent from the commercial enclave be monitored and controlled? Who will maintain the marine facilities (navaids, marina gates, moorings, reticulated services)? Who will maintain the proposed stinger net? etc. In addition, it has been postulated that existing regulatory legislation may not cope with the specialized circumstance of the concentrated marine activities this proposal involves.

3.1.2. Proposed solution

The proponent is recommended to identify the various marine related management/regulatory functions the proposal incorporates, and for each function, identify the management personnel or strategy to be adopted. This may appear in list form as an Appendix but should clearly referenced within the text.

With respect to the possible legislative shortcomings; it is recommended that the Coastal Management Committee's advice be sought on the adequacy of the existing regulatory legislation, and on matters that may require legislative amendment or new legislation.

3.2. Dredging effects - sandbar and Cullen Bay

Identified by 13 commentators

3.2.1. Aspect of concern

Comments were received calling attention to the need to monitor off-site effects from dredging (through raised turbidity), and questioning the findings of the draft EIS with respect to dredging the sandbar. It is also not clear just how the sandbar dredging would proceed.

The proposal emphasizes the storm surge protection afforded by the offshore sandbar. While these findings are not disputed in general terms, it is not clear that they would apply immediately after the dredging was completed - as the sandbar would be significantly slimmer. In addition, the lack of compaction of the sandbar has been noted, and the question raised as to why the material should compact and stabilize at its new site, when it has not done so under natural conditions.

3.2.2. Recommended solution

The proponent should describe the mode of dredging to be used (eg, cutter suction, bucket wheel, hydraulic suction, barge, floating or sunken pipe, etc), and discuss the amount and destination of the turbidity raised by the operation. Re-assurance that the effectiveness of the sandbar as a storm surge barrier will not be significantly diminished immediately post-dredging is also required. In addition, the proponent should provide a statement on the stabilizing time required for the new beach, and indicate the best estimate of any additional replenishment required in the short-term prior to achieving the initial stable state. If such estimates cannot be produced, a statement acknowledging this, but containing undertakings on the state of the new beach before responsibility is released by the developer should be supplied.

3.3. Water quality criteria and monitoring

Identified by 10 commentators

3.3.1. Aspect of concern

Awareness of the reduced circulation characteristics within Cullen Bay led to the observation that water quality may become a problem, and that the proponent had not adequately addressed this possibility. Further queries as to who would actually determine and monitor the acceptability of the bay water quality were received.

3.3.2. Recommended solution

Water Resources Division of Department of Mines and Energy currently monitors the water near a variety of potential contaminant sources in the Darwin area. It is recommended that the proponent liaise with the Division over a) the setting of water quality criteria for both construction and operation phases, b) the monitoring of these criteria, and c) reporting of the monitoring : the results of this liaison should appear in the final EIS, preferably in the form of a documented agreement.

3.4. Cost to Northern Territory Government

Identified by 8 commentators

3.4.1. Aspect of concern

The prospect of government involvement in the provision of some facilities, and the 'hidden' costs of on-going maintenance that might fall to the government by default, both raised comment.

The proponent was not asked to itemize initial government involvement in the guidelines prepared for the EIS, however it is fair to say that this deserves recognition.

3.4.2. Recommended solution

A precise statement itemizing those elements that the NT Government is providing, or is funding, is recommended. This applies for other areas, such as sewerage, power, etc, and the statement is more fully described in Overview Comment 4.

3.5. Dredging return period

Identified by 5 commentators

3.5.1. Aspect of concern

Marinas are notorious for silting up and requiring expensive and inconvenient re-dredging, at public expense, over time. This has been recognized by the proponent in Volume 2 of the draft EIS (Section 4 & 6). Comments received have indicated however, that concern still exists over this possibility, and that the relevant segment in Volume 2 has been overlooked.

3.5.2. Recommended solution

The proponent should clearly identify any difficulty that has existed in specifically predicting the situation over, say, a 5 or 10 year period and highlight the findings in Volume 2. In addition, it is recommended that an agreement be sought by the proponent, with government, that describes the responsibility for any re-dredging, including the approach channel, in terms of 'who pays', over a 20 year period (for example : up to five years, the proponent pays; after fifteen years the government pays; costs are shared, on a shifting basis, in the intervening years).

3.6. Cullen Bay marine fauna

Identified by 5 commentators

3.6.1. Aspect of Concern

It has been noted that the proponent has not investigated the existing marine fauna of Cullen Bay despite the fact that it will be almost completely replaced.

Although this is an unnecessarily alarming (to some respondents) omission, Conservation Commission investigations have shown that Cullen Bay is not known to harbour any unique or special marine fauna, flora, or habitat.

3.6.2. Recommended solution

The proponent should state the limitations to the marine ecology investigations and the reasons for this, and refer to the location of similar habitat regionally.

3.7. Effects of mangrove removal

Identified by 5 respondents

3.7.1. Aspect of concern

Greater public awareness of the value of mangroves has resulted in criticism of the proponent; it is felt by some respondents that due recognition of the destruction of the Cullen Bay mangroves is needed, and commentary provided on what effect this would have.

While public concern over mangroves is to be encouraged, in this instance the small area involved renders the Cullen Bay mangroves' contribution to productivity, atmospheric gas exchange and fish habitat insignificant in the regional context : the further important mangrove function of shoreline stabilizer will have no relevance to the developed shoreline of the final marina. The local water cleansing function, for which mangroves are renowned, could certainly benefit the development, however this function will be lost. It should be mentioned that one positive benefit, noted by the Department of Health, will be a reduction in the number of biting midges in the bay environs.

3.7.2. Recommended solution

The proponent should revise the relevant textual segment to place the size of the Cullen Bay mangrove area in a regional context, and to note the beneficial effect of their removal on biting midge numbers.

3.8. Beach replenishment

Identified by 5 commentators

3.8.1. Aspect of concern

The draft EIS states that beach replenishment works are not expected to be significant, while recognizing that some potential exists for erosion to occur. The absence of quantification for these statements has caused comment.

Government needs to know what liabilities it may incur when it assumes responsibility for the new beach in due course.

3.8.2. Recommended solution

The prospect of the entire beach being lost to storm surge before it can stabilize should be addressed. In addition the proponent should either quantify the rate of beach loss for an annual cycle, or explain why this cannot be done with any degree of confidence. Every effort should be made by the proponent to identify the on-going cost element that may be subsequently borne by government (see also 3.2.2)

3.9. Installation and maintenance of navigation aids

Identified by 2 commentators

3.9.1. Aspect of Concern

At present Cullen Bay, to the high water mark, falls within the jurisdiction of the Darwin Port Authority, however the Authority is not aware that it has any responsibility to provide nav aids (or any other service) to the proponent.

3.9.2. Recommended solution

The proponent should acknowledge that the provision of navigation and other safety aids is his responsibility, unless an agreement to the contrary, with the Port Authority, can be demonstrated. In any event, the advice of the Authority must be sought on the type and positioning of the necessary aids.

4. Construction phase effects

4.1. Queries on storm surge levels and sea level rise

Identified by 6 commentators

4.1.1. Aspect of concern

The proponent has demonstrated an awareness of the potential effects of storm surge by adopting the 100 year return period levels recommended in the Greater Darwin Storm Surge Study (GDSSS). The Bureau of Meteorology has brought attention to the fact that, without any additional safety factor, and assuming the GDSSS levels to be correct, the chance of these levels being exceeded in a 20 year period is 1 in 5; this represents a high risk. Comments have also been received drawing attention to the possible effects of the recently-proven phenomenon of sea-level rise.

Sea-level rise is agreed to be occurring by the scientific community (as one result of the 'greenhouse effect') however, the rate of rise remains uncertain. Current figures suggest that within a postulated 20 year life of the marina, the sea-level can be expected to rise by between 10-70 centimetres. If the upper figure proves correct, this would have a significant effect on the risk of storm surge damage to the facility.

4.1.2. Recommended solution

The United Nations and the World Meteorological Organization recommend that sea-level rise be taken into account for new coastal

developments. It is therefore recommended that the proponent liaise directly with the Bureau of Meteorology, and determine as closely as possible the levels that should be used so that the 100 year return period safety factor still applies in 20 years time. The results of this liaison should then appear in the final EIS.

4.2. Engineering/geological studies incomplete

Identified by 6 commentators

4.2.1. Aspect of concern

Respondents noted that, in essence, the load bearing strengths of the area's base rock has not been ascertained : in addition, caution was recommended when assuming any strength in the weathered surface rock.

As a general comment, it can be assumed that the existing code of building and structural standards will require that proper engineering investigations will have to occur prior to the start of construction. The necessary studies are identified by title in the draft EIS, however their absence at this time renders it difficult for the proponent to provide detailed estimates of fill and spoil amounts.

4.2.2. Recommended solution

On the assumption that the bearing strength studies and other related engineering and Bay substrate studies remain to be done, the range of possible methods of spoil disposal, other than use as fill elsewhere within the project,

should be identified - including the destination of any anaerobic muds that may require disposal. In addition the range of fill volumes and types should be identified, and their possible origins located.

4.3. Employment and construction schedule

Identified by 5 commentators

4.3.1. Aspect of concern

Respondents have mistakenly commented on the absence of estimated workforce numbers and a construction schedule. These data appear in section 2.3.2 and figure 2.11 of the draft document.

It is true that figure 2.11 does not give actual dates, however this is understandable given the absence of a firm starting time.

4.3.2. Recommended solution

Apart from amending figure 2.11 if a firm starting time can be postulated, this aspect requires no further attention.

4.4. Construction phase turbidity levels

Identified by 3 commentators

4.4.1. Aspect of concern

Familiarity with the aesthetic impact, and damage to marine fauna (particularly corals), caused by raised turbidity levels from other

local developments, has led respondents to query the potential for this to occur in the Cullen Bay environs.

Dredging the sandbar should not give rise to extremes of turbidity, as the material is relatively coarse grained, and would not be expected to remain in suspension for a significant length of time; the prospect of this material depositing on the nearby East Point Reef remains however, unknown.

The effects of dredging the inner Bay, in terms of turbidity, should not be noticed off-site as the inner Bay will be secured behind bunds. This does not apply to the outer Bay however, and dredging approach channels in this relatively fine material could give rise to considerable turbidity.

4.4.2. Recommended solution

In revising the draft EIS, the proponent should acknowledge the possibility of significant turbidity levels arising from the outer bay works. This should be accompanied by a programme to monitor the destination of this material, with particular reference to potential inundation of East Point reef, and Mindil and Vesty's beaches.

4.5. Sources of fill/destination of spoil

Identified by 3 commentators

4.5.1. Aspect of concern

Previously discussed within the scope of 4.2

4.5.2. Recommended solution : as for 4.2

4.6. Construction phase impacts on nearby residents

Identified by 2 commentators

4.6.1. Aspect of concern

General disaffection of the existing local residential community through noise, dust, unsightly construction areas, highly turbid Bay waters, etc.

It is felt that some degree of disruption is inevitable during the construction phase : it is noted however, that a construction phase of 3 years is rather more than a short-term inconvenience to a resident.

4.6.2. Recommended solution

The most intensive construction period will be during the seawall, jetty, dredging and reclamation/excavation works. After this period (18 months) construction will equate with a more or less typical housing project. This should be stressed by the proponent in the final EIS.

In addition, the final document should introduce a liaison channel through which disaffected residents could approach the developer with any outstanding difficulties (see also 2.6.2 of this report).

5. Aboriginal effects

5.1. Impacts on traditional Aboriginal areas and uses

Identified by 7 commentators

5.1.1. Aspect of concern

Significance of the area to Aboriginal people felt to be inadequately recognized. In addition, a buffer zone apparently agreed to after negotiations between the proponent and the Aboriginal Sacred Sites Authority (ASSA) is not shown.

5.1.2. Recommended solution.

The proponent must accurately determine, through traditional custodians, or their bona fide representatives, or the ASSA, the current use of the area by Aboriginals for food gathering or camping, and acknowledge how, if at all, this activity will be restricted or curtailed in any way (this applies also to the context of 2.4.2). In addition negotiations over any buffer zone for Aboriginal uses should be fully documented, and any commitment or undertaking either fully presented or at least outlined if some aspect of confidentiality applies.

6. Non-specific comments

6.1. General role and responsibility of NT Government

Identified by 7 commentators

6.1.1. Area of concern

Apart from questions specific to the government's role in marine aspects (section 3), respondents generally queried the level of involvement and responsibility of government for the overall project. Thus comments were received on the provision of domestic services, the cost of additional power, water and sewage reticulation, direct government financing of, eg, the ferry terminal, and the prospect of further contingent liabilities falling to the government.

It is certainly debatable whether an EIS is the correct forum for discussion of the government's financial involvement in a project : the issue has nevertheless been raised, and respondents can be at least partly re-assured through the solution below.

6.1.2. Recommended solution

The proponent should state, as precisely as possible, any aspect of the project that presumes some Northern Territory or Commonwealth government financial or manpower involvement. This could be considered with the responses required to the relevant solutions in Section 3 (see also Overview & Comment 4), and may require some interim negotiation with NT authorities (the comments by NTEC are a relevant example here).

6.2. Absence of economic analysis/project not justified

Identified by 7 commentators

6.2.1. Area of concern

While some commentators merely referred to the absence of any economic justification for the project (a "needs analysis" was requested in the draft EIS guidelines), others more specifically raised the prospect of the NT Government having to financially assist the proponent at some future time.

The prospect of contingent liability for the overall project falling to the NT government cannot be effectively analysed through the EIS process; those responsible for such analysis on the government's behalf, can justifiably expect however that the basic economic case for the project is presented by the proponent.

6.2.2. Recommended solution

While the need for a degree of confidentiality is acknowledge, it is recommended that the proponent present, in the revised EIS, sufficient market survey results, or other appropriate material (in addition to the required by 6.1.2), that will indicate to the government that the proposed financing strategy for the project, is likely to be successful.

NOTE: the capacity exists, within the Environmental Assessment legislation, for the proponent to negotiate confidentiality over this, or any other, aspect of the project with the Minister for Conservation.

6.3. Alternatives poorly discussed

Identified by 3 commentators

6.3.1. Area of concern

The site of Sadgroves Creek, and the 'no development' option, were raised as alternatives to the current proposal that were poorly discussed.

6.3.2. Recommended solution

The amount of mangrove removal and dredging required for a similar project at Sadgroves Creek can be fairly simply calculated by the proponent and should be inserted into Section 1.4 of the draft document. This section should also briefly discuss the no development option in terms of the results of any user surveys or market analyses that have been conducted.

6.4. Effects on drainage of the Kahlin area generally

Identified by 2 commentators

6.4.1. Area of concern

That the impermeable structures placed around the periphery of the project would block drainage flows from such areas as Kahlin Oval and environs.

6.4.2. Recommended solution

The proponent should note this possibility and acknowledge that it will be taken into account

during the engineering investigation and design phase.

6.5. Need for re-zoning for hotel segment of project

Identified by 2 commentators

6.5.1. Area of concern

Firstly the Myilly Point Park is incorrectly noted as being within the SP zone, when it is in fact within the Ø1 zone; more importantly, the proposed Myilly Point Hotel apparently cannot proceed under the current zoning (Ø2) and cannot be considered by the Planning Authority until such time as the area is rezoned.

6.5.2. Recommended solution

The proponent must seek to have the appropriate area re-zoned as necessary (again), to allow the hotel part of the proposal to proceed, and amend Fig 1.7 of the Draft EIS.

6.6. Non-resolvable comments

Three commentators generally regretted the potential environmental impacts of the project, but were not specific enough to allow any solution to be proposed.

Four comments were received regarding the price of the draft document which was felt to be excessive. It should be noted that the existing NT Environmental Assessment legislation gives no guidance on the pricing of draft EIS's - instruction to proponents on this aspect can therefore be advisory only.

While three commentators supplied the general statement that the draft EIS was unsatisfactory, six respondents specifically expressed their support.

7. Overview Comments

This report focuses on a number of revisions that should be undertaken before the EIS is submitted in final form: the revisions, plus the studies or statements referred in the preceding text and described in more details below, may be achieved through expansion of the existing volumes, or through the preparation of a third volume.

7.1. Social study:

This study should attempt to accurately describe the new permanent population of the precinct, and discuss the demand this population will have for school places and for public transport supply.

7.2. Traffic study:

The traffic caused by the permanent and casual population should be identified in terms of the number of movements at various locations within the proposal, entering and leaving the proposal boundaries, at various times of day. The prospect of heavy or large vehicles requiring access - yacht cranes, semi-trailers, tourists buses etc., should be reviewed, and the strategic vulnerability of the area, in terms of access for emergency purposes, analysed. Any

resultant changes to the proposal, as described in the draft EIS, should be clearly illustrated.

7.3. Botanical statement:

A precise botanical description of the cliff/slope vegetation that will be affected by the proposal is required. This description should include notes on any rare species encountered, and on the prevalence of the identified native species or associations regionally. Comments on the introduced species should also be included.

7.4. Government costs:

This statement is required in an attempt to specifically identify the financial implications of the project to the Government. The statement should describe the public sector funding required for the initial provision/diversion/removal of sewage, power and water reticulation, for ancillary components such as school places, public transport, additional traffic management facilities (road widening, new or expanded intersections, traffic lights, etc.), and for the ferry terminal.

Other references to Government involvement, such as are required by 3.2.2., 3.3.2., 3.5.2., 3.9.2., 5.1.2., 6.1.2., and 6.2.2. of this report, may be combined with the statement described above into a new section of the EIS.

ATTACHMENT

LIST OF COMMENTATORS
ON CULLEN BAY MARINA
DRAFT EIS

Department of Mines and Energy
Department of Lands and Housing
Bureau of Meteorology
NT Water Authority
NTEC
Fisheries Division, Department of Industries & Development
Museums and Art Galleries of the Northern Territory
Transport Division, Department of Transport and Works
F Perceval, Larrakeyah, NT
R K Barnes, Darwin, NT
Department of Home Affairs and Environment
R Furness, Kahlin, NT
Darwin Port Authority
Aboriginal Sacred Sites Authority
W J Fisher, Kahlin, NT
The Environment Centre
M Michie, Nakara, NT
J Whyte, Jingili, NT
Darwin City Council
Northern Territory Tourist Commission
Department of Health and Community Services

APPENDIX 3 : Issue collation matrix

COMMENT, QUESTION, OR CONCERN RAISED	RESPONDENT		NON-GOVERNMENT COMMENTS		GOVERNMENT COMMENTS		NT MUSEUM OF ARTS & SCIENCES		WATER AUTHORITY		ARTS HERITAGE ENVIRONMENT		DRAINAGE AUTHORITY		DRAINAGE CITY COUNCIL		NT TOURIST COMMISSION		DEPT. OF HEALTH		DEPT. OF TRANSPORT AND WORKS		NT ELECTRICITY COMMISSION		FISHERIES		BUREAU OF METEOROLOGY		DEPT. OF LANDS		DEPT. OF MINES AND ENERGY		CONSERVATION COMMISSION		TOTAL	
	RESIDENT A	RESIDENT B	RESIDENT C	RESIDENT D	RESIDENT E	RESIDENT F	RESIDENT G	RESIDENT H	RESIDENT I	RESIDENT J	RESIDENT K	RESIDENT L	RESIDENT M	RESIDENT N	RESIDENT O	RESIDENT P	RESIDENT Q	RESIDENT R	RESIDENT S	RESIDENT T	RESIDENT U	RESIDENT V	RESIDENT W	RESIDENT X	RESIDENT Y	RESIDENT Z	RESIDENT AA	RESIDENT AB	RESIDENT AC	RESIDENT AD	RESIDENT AE	RESIDENT AF	RESIDENT AG	RESIDENT AH	RESIDENT AI	RESIDENT AJ
DEMOGRAPHIC CHANGES																																				
ACCURACY OF NUMBER ESTIMATE																																				
NOT ENOUGH PLACES IN LOCAL SCHOOLS																																				
DANGERS OF LIMITED ALLEYS																																				
TRAFFIC NUMBERS?																																				
GENERAL ENVIRONMENTAL DAMAGE																																				
FLORA BELY IDENTIFIED																																				
LANDSCAPING PROBLEMS																																				
INC. PRESSURE ON RECREATION FACILITIES																																				
REDUCED RECREATIONAL OPEN SPACE																																				
AESTHETIC DISTURBANCE																																				
NOISE																																				
WATER QUALITY CRITERIA?																																				
MANAGEMENT RESPONSIBILITY																																				
EFFECTS OF SANDBAR DREDGING																																				
EFFECTS OF DREDGING																																				
CHANCES TO LOSE CLASS STRUCTURE																																				
COST TO TAXPAYER?																																				
BASIN DREDGE RETURN PERIOD?																																				
DAMAGE TO MARINE FAUNA																																				
EFFECTS OF MANGROVE REMOVAL																																				
BEACH REPLENISHING STRATEGY?																																				
ACCURACY OF STORM SLUG FIGURES?																																				
ACCURACY OF GEOLOGIC ASSUMPTIONS																																				
STUDIES NOT COMPLETE																																				
EMPLOYMENT WORKFORCE SOURCES OF FILL / SOIL DESTINATION?																																				
IMPACTS ON TRADITIONAL ABORIGINAL																																				
LEVEL OF GOV'T INVOLVEMENT?																																				
PROJECT NOT JUSTIFIED																																				
ECONOMICS?																																				
ALTERNATIVES FOR DISCUSS WILL HAVE OVERALL DRAINAGE																																				
PRICE TO GO																																				
GENERALLY UNSATISFACTORY																																				

✓ = RAISED
 BY TWO
 DIVISIONS
 REFERS TO
 REPORT AT
 APPENDIX 1

CULLEN BAY MARINA PROPOSAL
DARWIN MARINA ESTATES PTY LTD

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CONTENTS

1. Introduction
2. Matters for attention
 - 2.1 Matters to be resolved prior to consideration by the Northern Territory Planning Authority
 - 2.1.1 Access points to Emery Point walkway
 - 2.1.2 Right angle bend behind Lot 3948
 - 2.1.3 Parking Bay shortfall
 - 2.1.4 Adequacy of pavement width
 - 2.1.5 Development on public land
 - 2.2 Potential contingencies for NT Government
 - 2.2.1 Drainage problems - Kahlin Oval
 - 2.2.2 Local residents remaining opposed
 - 2.2.3 Effects of cyclone on sandbar
 - 2.2.4 Sea-level rise
 - 2.2.5 Contamination of basin water by sewage
 - 2.2.6 Handling of unusable spoil
 - 2.2.7 Maintenance dredging
 - 2.2.8 Use of Body Corporate Fund for certain undertakings
3. Proponent responsibility
 - 3.1 Emergency crash barrier
 - 3.2 Maintenance of the 'new beach'
 - 3.3 Construction phase turbidity
 - 3.4 Marina management

CULLEN BAY MARINA

ASSESSMENT OF ENVIRONMENTAL EFFECTS

1. Introduction

This report is based on the following documentation:

- . Cullen Bay Marina, Draft EIS, Volumes 1,2
- . Comments on Vol 1 and 2 by advisory bodies and members of the public
- . Conservation Commission report on Volumes 1 and 2
- . Cullen Bay Marina, 'Draft' EIS, Volume 3
- . Comments on Volume 3 by advisory bodies

Section 2 of this report itemises the matters of remaining concern over the proposal, and, where appropriate, discusses possible ramifications to the NT, and suggestions for how these may best be reduced.

Section 3 refers to matters identified specifically as being the responsibility of the proponent, and over which the government is advised to hold some form of guarantee (such as lease conditions, specific legislation or specific agreement).

2. Matters for attention

There are twenty-three aspects of the proposal that either require further attention from the proponent (2.1) or which could, in the future give rise to unplanned demands on government (2.2).

2.1 Matters to be resolved prior to consideration by the Northern Territory Planning Authority

The following items are those which the NTPA would justifiably query if the proposal went forward in its current state. They are not necessarily in any order of importance.

2.1.1 Access points to Emery Point walkway

It has been queried whether one access point at the start and one access point approximately halfway down the Emery Point walkway are sufficient for either public amenity or emergency access and egress.

2.1.2 Right angle bend behind Lot 3948 (University)

This bend, shown in fig. 2.2.3, has been identified by the Department of Lands and Housing as requiring a larger radius to maintain traffic flow.

2.1.3 Parking bay shortfall

This shortfall, variously estimated up to a maximum of 1300, has been identified by both the Darwin City Council and the Department of Transport and Works. The proponent's referral to the arrangements alleged in the case of the Sheraton Hotel are not relevant. Justification of car-parking space allowance will be required by the NTPA.

2.1.4 Adequacy of pavement width

The 7 m proposed pavement width of the southern service road has been characterised by the Department of Transport and Works as 'not adequate for normal serviceability of the areas which will involve parking on the road and the movement of boats or trailers'. Pavement widths from 8 m - 11 m should be considered for adoption.

2.1.5 Development on public land

Ambiguity by the proponent has led to the perception by some authorities, particularly Darwin City Council, that there may be encroachment by the developer onto public lands at Myilly Point and Kahlin Oval. For example, the statements 'The existing areas of Kahlin Oval will be developed ...' and 'The development of Myilly Point Park and the public beach both virtually non-existent would become available to the public' are at best misleading and subjective. Clearly development cannot occur outside the designated Special Purpose Zone without NTPA approval.

2.2 Potential contingencies for NT Government

These items are recommended for inclusion in leasing arrangements between the government and the proponent. They are either matters for which the proponent's appreciation has been low, or matters that would incur significant financial penalties if they occurred.

2.2.1 Drainage problems - Kahlin Oval

2.2.1.1 Description of problem

The possibility exists that drainage problems may arise on Kahlin Oval and adjacent areas. The proponent, while preferring to route this runoff around the basin to the open harbour, has acknowledged that the lack of slope available may pre-empt this option and require the less attractive option'... of drainage into the immediate basin environs. Any reticence on this issue by the proponent would affect the usability of the Oval areas.

2.2.1.2 Recommended government stance

All drainage works to be at the proponent's expense, and to the ongoing satisfaction of Darwin City Council.

2.2.2 Local residents remaining opposed

2.2.2.1 Description of the problem

The proponent confidently maintains that effects on local residents will be almost totally beneficial. The Larrakeyah populace, containing some influential members, has expressed an alternative viewpoint to some advisory bodies. The problem for the government may be reflected as one of ongoing adverse public reaction.

2.2.2.2 Recommended government stance

NTPA hearing to be public and to be advertised, by letter drop to Larrakeyah residents by proponent.

2.2.3 Effects of cyclone on sandbar

2.2.3.1 Description of problem

Some advisory bodies have felt that the proponent has not recognised the possible effect a cyclone would have on the sandbar, and consequently, the new beach and the inner residential area. The methodology of Volume 2 (that treated the sandbar as a solid object of fixed shape) is not debated, however concern has been expressed that the dynamic nature of the sandbar has not been sufficiently examined, and that too great a degree of reliance has been placed on the Greater Darwin Storm Surge Study.

It should be noted that the precise behaviour of the sandbar cannot be determined without monitoring through a variety of climatic events (basically a suite of cyclone/storm events and recovery periods). As the occurrence of these events cannot be predicted, then neither can the length of any required monitoring program. 2.2.3.2 has been designed to protect the government in the event that the behaviour of the sandbar places the development at greater risk than has been predicted.

2.2.3.2 Recommended government stance

After dredging has been completed, the proponent should survey the sandbar, and twice yearly for a minimum of five years after dredging completion, monitor the two criteria that determine its effectiveness as a cyclone barrier, i.e. its height and width. The proponent should be directed to consult with his marine engineering adviser to determine the location of the most appropriate measuring points. The results of both the initial survey and the subsequent height and width measurements should be lodged with the Department of Lands, together with an annual explanatory statement which reviews the continued effectiveness of the bar as a cyclone protection structure.

Any site alterations (such as height of seawall) required as a result of any unexpected changes to the sandbar are to be at the proponent's expense, including any necessary alterations to government structures such as the ferry terminal. Such a requirement may have to be the subject of insurance undertakings by the Body Corporate of the marine residents.

2.2.4 Sea-level rise

2.2.4.1 Description of problem

The proponent has dismissed the prospect of sea level rise as being a matter of little consequence. It is established that sea level rise is not a matter for debate - the query remains over the rate of rise, for which the current best estimate is from between 0.2 and 1.4 m steadily over the next 30-50 years. Any rise much above the most conservative rate estimate would significantly effect the safety of this project if it cannot react to the change.

It is expected that national recognition of the sea level rise phenomenon, and consequent recommendations for construction codes and public policy, will occur by the end of 1987 as a result of the conferences mentioned by the proponent in Volume 3.

2.2.4.2 Recommended government stance

Any changes to the proposal required to cater for the effects of sea-level rise will be at the government's direction and the proponents expense. The need for height adjustments to be the subject of review, prior to initial completion of construction, by the approving authority, who may take cognisance of the position statement by the Institute of Engineers' National Committee on Coastal and Ocean Engineering anticipated early in 1988.

2.2.5 Contamination of basin water by sewage

2.2.5.1 Description of Problem

There is potential for sewage to enter the marine inner basin through pump station failure. While provision for stand-by pumps is made, this is not supplemented by emergency power availability: thus cyclone induced power failure, for example could lead to raw sewage in the basin compounding any existing health problems.

This potential difficulty is not to be confused with the general water quality provisions of section 3.4.

2.2.5.2 Recommended government stance

The proponent to devise a solution incorporating either emergency power provision or gravity drainage, that will eliminate the possibility of raw sewage entering the inner basin through sewage pump failure.

2.2.6 Handling of unusable spoil

2.2.6.1 Description of problem

While every effort will be made to use all dredged spoil within the project boundaries, some volume of material may be unusable. The disposal of this spoil, most particularly if it includes any anaerobic marine muds, must be carefully controlled to avoid unnecessary impacts to disposal areas.

2.2.6.2 Recommended government stance

The proponent is not to dispose of any spoil beyond the development site confines without the prior written approval of the Director of Conservation.

2.2.7 Maintenance dredging

2.2.7.1 Description of problem

The proponent anticipates that the need for maintenance dredging of the basin and approaches will be low. Experience suggests that, while this

prediction may be accurate, government is well advised to achieve an agreed maintenance formula.

2.2.7.2 Recommended government stance

- a) Basin and approach channel to be surveyed on initial completion to the satisfaction of the Department of Transport and Works.
- b) Maintenance dredging on the basin, or approach channel, to be conducted in a manner approved by the Darwin Port Authority and funded in perpetuity by the Body Corporate Fund.

2.2.8 Use of Body Corporate Fund for certain undertakings

2.2.8.1 Description of problem

Various undertakings will require release of funds from the Body Corporate Fund - a management fund supplied by residents. The government needs a guarantee that, as appropriate, the Fund is available and utilised.

2.2.8.2 Recommended government stance

Default by contributors should be an offence against the Lease over the project, and should be insured against by the proponent. In addition the administrator of the Body Corporate Fund should be required to make the contents of the Fund available, subject to direction by the Minister for Lands and Housing.

3. Proponent responsibility

Advisory body review had identified the following matters as being the responsibility of the proponent, and over which the government is advised to hold an appropriate performance guarantee.

3.1 Emergency crash barrier

Both erection and replacement of the emergency access crash barrier at the bottom of Temira Crescent is to be at the proponent's expense.

3.2 Maintenance of the 'new beach'

The 'new beach' profile is to be monitored annually for at least 7 years at the proponent's expense and to the satisfaction of Darwin City Council (DCC). Maintenance/replenishment to be the proponent's responsibility, subject to DCC discretion and satisfaction 'and to normal environmental impact assessment provisions'. This responsibility to apply for a period of at least 7 years, or until DCC is satisfied that a sufficient degree of stability has been achieved for them to assume responsibility (without incurring maintenance expenses disproportionate to other Darwin beach maintenance programs), whichever is the shorter period.

3.3 Construction phase turbidity

The proponent predicts that turbidity caused by construction activities will be entrained in the current stream passing through the channel between Emery Point and the sandbar, and that any effects will be consequently negligible. Any significant departure from this prediction may effect the amenity of Fannie Bay.

The proponent should recognise that review of dredging operations will be carried out as appropriate by government, and that directions with regard to discharge procedures and hours of operation may result.

3.4 Marina management

In addition to matters considered elsewhere in this report the development's management will be responsible within the project site for:

- . the installation and maintenance of navigation aids and moorings to the satisfaction of the Darwin Port Authority;
- . the securing and removal of floating debris and rubbish;
- . maintenance of basin water quality to the satisfaction of the responsible authorities, including the Department of Health and the Power and Water Authority;

- . establishment of an emergency contingency plan, to the satisfaction of the NT Emergency Service, to describe procedures in the event of cyclones and major fuel spillage, and the maintenance of this plan;
- . maintenance of the breakwater to the satisfaction of the Darwin Port Authority;
- . provision of a preferred landscaping plan to the Conservation Commission, for review and advice prior to implementation;
- . the maintenance of any stinger net, installed as part of the new beach, until the Darwin City Council accepts responsibility of the new beach.