CHAPTER 4

ENVIRONMENTAL IMPACTS OF PORT HINCHINBROOK

4.1 Concerns about inadequacies in the environmental impact assessment *procedures* at Port Hinchinbrook must be clearly distinguished from concerns about actual detrimental environmental *impacts*. A number of witnesses in the inquiry agreed that the lack of a thorough upfront environmental impact statement was regrettable, but claimed that the various controls under the Deed of Agreement are satisfactorily preventing environmental harm.[1] Environment groups, by contrast, say that the lack of a thorough upfront environmental impact statement was regrettable, and claim that the various controls under the Deed of Agreement are *not* preventing harm.

4.2 Potential environmental impacts of Port Hinchinbrook may be summarised as:

- possible effects on the marine biota from acid runoff (including possible mobilisation of heavy metals);
- impact on seagrass beds from dredging, removal of mangroves, and changes to the foreshore;
- impact on dugongs from possible decline in seagrass (which is their food) and from likely increase in boatstrike resulting from increased boating in the area;
- impact of a large waterfront development on the aesthetic and wilderness values of the Hinchinbrook Channel;
- impact of increased tourism in the area on the wilderness values of the neighbouring island national parks.

4.3 Many submissions simply spoke of 'impacts'. It was often unclear whether they were speaking of certain future impacts of known severity; certain future impacts of uncertain severity; possible impacts, the likelihood of which is unknown but which, if they occur, cannot be avoided; impacts certain unless some avoiding action is taken, but capable of being avoided; and so on. Many submissions, implicitly, were describing every impact that *might* occur - an approach perfectly in keeping with the precautionary principle, but which does imply some further discussion of probabilities and possibilities for mitigation. Some submissions (especially from the scientists) were on the lines 'such-and-such harm is avoidable if properly managed, but I don't think it is being properly managed.'[2] An undesirable event may be very likely, but not

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1 For example, Great Barrier Reef Marine Park Authority, Submission 157a, p 1.

2 For example, Prof. I White, Evidence 10 August 1998, p 258; Dr G Bowman, Evidence 10 August 1998, p 278.

severe in its effects, or not very likely, but severe if it does occur. These nuances should affect the appropriate management response to the risks involved.

Impacts of acid sulfate soil

4.4 'Potential acid sulfate soil' (PASS) is found widely in low-lying coastal areas. Lying below the watertable beyond the reach of air the soil is inert, but if disturbed by earthworks it reacts with air ('actual acid sulfate soil'), producing sulfuric acid. The acid moves through the soil acidifying groundwater and eventually surface waters. The acid can have various detrimental effects: reducing farm productivity; corroding metal or concrete such as building footings; preventing growth of lawns and gardens; killing or diseasing fish and sea plants. The acid can mobilise heavy metals in the soil, allowing them to enter the food chain. Once disturbed, the soil may continue producing acid for many years. More details are in APPENDIX 6.

4.5 Acid sulfate soils also contribute to the greenhouse effect. According to CSIRO, 'Carbon emissions from drained acid sulfate soils are likely to have made a significant contribution to Australia's carbon emissions over the past 20 to 30 years and have been underestimated.'[3]

4.6 Acid sulfate soils, though only recognised relatively recently in Australia, are now acknowledged as a serious environmental issue.[4] For example, at one degraded site at East Trinity Inlet near Cairns, where acid sulfate soils were drained for canegrowing about 20 years ago, recent field investigations indicate that on average the equivalent of 4 million litres of concentrated sulfuric acid have been produced each year, together with 2,500 tonnes per annum of iron and aluminium concentrations in leachate that are 700 times higher than the maximum levels ANZECC guidelines recommend.[5]

4.7 The 1994 Deed of Agreement made no mention of managing acid sulfate soils at Port Hinchinbrook. According to the Queensland government 'approvals for the project were in place prior to identification of acid sulfate soil as an issue':

> 'The [1994] Environmental Review Report noted that, based on available information, acid sulfate soil should not be a problem at the site. This is supported by Professor White's statement (Prof. White evidence 10/8/98

3 Hicks W S, Bowman G M & Fitzpatrick R W, *East Trinity Acid Sulfate Soils - Part 1: Environmental Hazards*, CSIRO Land & Water Technical Report 14/99, April 1999, p 17,34. Acid sulfate soils are rich in organic carbon, which reacts with oxygen from the air to give off carbon dioxide. This is additional to the reaction of iron sulfide with oxygen to give off sulfuric acid.

4 'In the Netherlands they [acid sulfate soils] were discovered 276 years ago. The first detailed work in Australia was only done 30 years ago and interest really only started in 1987 when massive fish kills occurred on the Tweed River. Since that time, we have developed research expertise and professional practice in the consulting industry on using and managing acid sulfate soils.' Prof. I White, Evidence 10 August 1998, p 246.

5 CSIRO, Submission 111, p 442. See also Hicks W S, Bowman G M & Fitzpatrick R W, *East Trinity Acid Sulfate Soils - Part 1: Environmental Hazards*, CSIRO Land & Water Technical Report 14/99, April 1999.

> p250) that "in 1993 when we held the first national conference on acid sulfate soils it was considered that acid sulfate soils were a New South Wales problem, that they did not exist in Queensland." Acid sulfate was not identified as a problem until work was carried out on site by CSIRO (Bowman 1995) …' (Qld Department of Premier and Cabinet, further information 21 April 1999, p 704)

4.8 The Queensland government's 1994 Environmental Review Report had said that 'previous excavation on the site should have exposed the presence of any acid sulphate soils in the area to be excavated.' As for managing acid sulfate soils -

> 'The developer's proposal to monitor pH levels to identify acid sulphate soils and take appropriate action should any potential problems be encountered, is considered adequate under these circumstances.' (Qld Dept of Environment and Heritage, *Environmental Review Report - Port Hinchinbrook*, May 1994, p 16)

4.9 On the other hand, the Valentine report (August 1994), predating the Deed of Agreement, was aware of 'serious concerns' about acid sulfate soils in North Queensland:

> 'Serious concern has been expressed about the problems of acid sulphate soils and a recent conference drew attention to the problem in the Cardwell to Cairns coastal area (Acid Sulphate Soils Conference held in Coolangatta, June 1993) … A draft and unpublished report to the Queensland Department of Primary Industries outlines how acid-sulphate drainage may be contributing to low oxygen levels and fish abundances in flood-plain lagoons, in the Tully-Murray catchment, north of Cardwell … Although QDEH states "previous excavation [at Oyster Point] should have exposed the problem" this is doubtful because the problem was not assessed at that time …' (P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 39)

4.10 Valentine was sceptical of the ability of 'monitoring' to control any problem:

> 'It is highly unlikely a monitoring process can avoid the chemical reaction. It is most likely the evidence will be a fish kill. No details are given [in Cardno and Davies' March 1994 report commissioned by the developer] on how the monitoring will be carried out to avoid this end result or how they would mitigate any effects the monitoring identified. This is yet another example of the weakness of the "environmental impact assessment" process adopted.' (P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 39)

4.11 In evidence to this inquiry the developer said that the Queensland government had assured him there was no acid sulfate problem at Port Hinchinbrook:

> 'At a meeting of those who were formulating the Deed, the Queensland Government's senior representative handling this matter told me that there was no acid sulfate problem at Port Hinchinbrook. He later gave me a report

> by academics at the James Cook University to support that there was no acid sulfate problem at Port Hinchinbrook.' (K Williams, Cardwell Properties P/L, Evidence 24 August 1998, p 328)

4.12 There must have been some misunderstanding about this, either by the unnamed Queensland official or by Mr Williams. In fact the report concerned (which Mr Williams sent to the Committee) is a descriptive study of soil conditions sampled in certain stands of damaged mangroves along the Queensland coast (including Oyster Point). By no stretch of the imagination could it support a conclusion that there was no potential acid sulfate problem at Port Hinchinbrook, nor is it even particularly relevant to the question.[6]

4.13 In March 1995, engaged by the Commonwealth Department of Environment, Sport and Territories, CSIRO investigated the site. CSIRO found that 'both actual and potential acid sulfate soil conditions exist at the Port Hinchinbrook development site':

> 'The soils have been considerably disturbed by excavation and earthmoving activities and they are currently oxidising and acidifying … for some of the soil units investigated, including the spoil heaps, the production of acidified leachate has commenced, will continue for many years and will probably become more severe. Without a more detailed knowledge of the severity and total quantities of potential acid involved and the excavation/construction methods to be used it is not possible to specify the precise environmental consequences to the immediate surrounds of the site, including the Hinchinbrook Channel. However the situation is quite hazardous for organisms sensitive to acidified conditions or moderate to high levels of iron and aluminium in their environment. This would particularly apply to aquatic organisms in the intertidal zone and in estuarine water bodies receiving acid leachate from the development site …' (CSIRO (Dr G Bowman), *Preliminary Assessment of Acid Sulfate Soil Conditions Port Hinchinbrook Development Site Cardwell, North Queensland*, March 1995, p 20)

4.14 CSIRO recommended:

> '1. The development site should not be left in its current state. If the Port Hinchinbrook development does not proceed the site will require extensive remediation…
> 2. If the Port Hinchinbrook development does proceed a detailed acid sulfate soil management plan should be prepared…
> 3. Whether the Port Hinchinbrook development proceeds or not, the environmental effects of acidified leachate emanating from the site and

6 Kaly U L, Eugelink G & Robertson A L, 'Soil Conditions in Damaged North Queensland Mangroves', 1994; *Estuaries*, vol. 20 no. 2, June 1997, p 291-300. 'The methods used could only provide results on surface soil pH, and although chosen as an indicator of acid sulphate conditions were not appropriate for detecting potential acid sulphate soils. To do that would have required more detailed geochemical work on pyritic sediment layers deeper in the soil. Our paper should not therefore be used to argue that there is no possibility of acid sulphate soils or acidic groundwater at the Oyster Point site.' A Robertson, pers. comm. 27 May 1999. Further information p 735a.

> other existing and planned commercial developments along the Hinchinbrook Channel should be investigated to ensure that they are not impacting adversely on World Heritage values.' (CSIRO (Dr G Bowman), *Preliminary Assessment of Acid Sulfate Soil Conditions Port Hinchinbrook Development Site Cardwell, North Queensland*, March 1995, p 21; CSIRO, Submission 111, p 441)

The Acid Sulfate Management Plan

4.15 Presumably in response to these findings or generally in response to the greater awareness of acid sulfate soil problems since 1994, the August 1996 Deed of Variation included a new requirement for the Turbidity Control Plan to include 'detailed proposals for the management of acid sulphate soils', and a condition that water flowing from the land as a result of the company's construction activities should have a pH from 6 to 9 inclusive (ie it should not be acidic - which would be represented by pH numbers lower than 6) (clause 7.5).

4.16 The developer, through Sinclair Knight Merz, produced a draft Acid Sulfate Management Plan. In October 1996 GBRMPA sought peer review from CSIRO (Dr Bowman) and Prof. Ian White (who, according to the Australian Society of Soil Science, is a 'world renowned expert on acid sulfate soil').[7]

4.17 Prof. White concluded that it was not possible to assess the effectiveness of the plan since it contained very little of the required information. He said that among the 180-odd environmental impact statements dealing with acid sulfate soils that he had seen, he would rank this one in the lowest 30 per cent. 'The contrast between the Port Hinchinbrook acid sulfate soil management plan and recent plans elsewhere in Australia is marked … The plan was essentially a dotpoint list of fairly vague information ...' Prof. White listed 11 items of additional information required.[8]

4.18 Dr Bowman commented in summary: 'The Acid Sulfate Management Plan does not conform with recognised "best practice" ASS assessment and management protocols … no detailed investigation to delineate and quantify the extent of potential and actual acidity hazard … insufficient sampling and analyses to permit adequate hazard assessment or to establish ASS baseline conditions … However, with appropriate revision and the incorporation of recognised ASS best-practice techniques the deficiencies identified in this review could be overcome.'[9]

4.19 Cardwell Properties produced a revised draft dated 13 March 1997. This was not referred back to the original reviewers (Dr Bowman commented to this inquiry: 'It is a pity they did not get back to us about it; they could have got some valuable

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7 Australian Society of Soil Science Inc., Submission 126, p 566.

8 Prof. I White, Submission 127, p 572-3.

9 CSIRO (Dr G Bowman) to GBRMPA, 25 October 1996, *Peer Review of "Acid Sulfate Management Plan - Port Hinchinbrook"*, p 8.

information'[10]). Instead the revised draft was submitted to the Queensland Acid Sulfate Soils Investigation Team (QASSIT) in the Department of Natural Resources.[11] QASSIT commented, in summary:

> 'The lack of specific detail in the long-term plan is understandable to some degree given the many factors affecting progress of the development … The revised Acid Sulfate Management Plan submitted by the Company is a substantially improved plan, and if complied with, should result in negligible risk to World Heritage Areas.' (QASSIT, *An assessment of the revised 'Acid Sulfate Management Plan' 13/3/97*, March 1997, p 2: further information 1 April 1999, p 447ff)

4.20 On the other hand, Prof. White gave evidence to this inquiry that 'I have been informed by QASSIT colleagues in Qld Department of Natural Resources that the adopted management plan was changed in only minor details.'[12] Prof. White regrets that the opportunity to showcase best practice management of a world heritage area has been lost:

> 'The eyes of the world are on us when we do any development that could potentially impinge on a world heritage area. Australia has developed and is developing a significant industry [in] environmental management … There are significant consultancies and jobs out there for Australian industry in other parts of the world. I believe that, by not using best practice in such areas, we are sending a message out that our environmental management strategies are not up to scratch.' (Prof. I White, Evidence 10 August 1998, p 246)

4.21 Two years on, in evidence to this inquiry, QASSIT said that the final Acid Sulfate Management Plan (11 April 1997), although not best practice, was judged 'at the time' to be a practical alternative for a site which was in an advanced stage of development, with limited future options:

> 'QASSIT believe that the acid sulfate management plan (as finalised) was based on an inadequate assessment of the site … the plan was drafted after major earthworks had been finished based on earlier approved management plans … To enforce best practice on such a site would involve immense costs to undertake remediation with prospects of abandonment by the developer and possible compensation claims from governments. In the meantime, it is possible such abandonment would have left the site in an unmanaged state and a potential environmental disaster, a lose-lose situation for all parties. The 11 April plan, although not best management practice,

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10 Dr G Bowman, Evidence 10 August 1998, p 272.

11 QASSIT advised that, contrary to some claims in evidence, it is not the 'independent monitor for acid sulfate soils' (a position which does not exist in the Deed of Agreement) and has no formal role in monitoring Port Hinchinbrook pursuant to the Deed of Agreement. Rather QASSIT provides technical advice on specific issues as requested. QASSIT, Submission 163, p 2. Environment Australia, Submission 157, p 21. K Williams (Cardwell Properties P/L), Evidence 10 August 1998, p 310.

12 Prof. I White, Submission 127, p 573.

> was judged at the time to be a practical alternative for a site which was in an advanced stage of development, which limited future options.' (QASSIT, further information 1 April 1999, p 444)

4.22 This assessment is rather less flattering than QASSIT's 1997 opinion quoted in paragraph 4.19. QASSIT also has concerns about the long term fate and use of the site:

> 'Unless acidified PASS materials left at the site are thoroughly mixed with correct quantities of lime, then acidification of the surface and ground waters will be of long term concern for future uses and the on and near site environment. Concrete and steel structures can be subject to extremely rapid corrosion from acidified soil or water, reducing their life. This is of particular concern for the positioning of underground fuel tanks for the proposed service station site and other infrastructure and foundations.' (QASSIT, further information 1 April 1999, p 444)

4.23 Prof. White pointed out that in late 1996 major earthworks started before the Acid Sulfate Management Plan was approved, suggesting that the parties to the Deed were not taking it seriously.[13] In this regard, the Committee notes that Senator Hill said on 27 November 1996:

> 'GBRMPA have advised that the Deed is not being complied with in that an Independent Monitor has not been appointed and certain works are occurring before the Turbidity Control Plan [which included the Acid Sulfate Management Plan] has been approved by the Commonwealth. Accordingly, I have written to Dr McPhail, Chairman of the GBRMPA, asking him to take appropriate action to ensure the Deed is complied with.' (the Hon. R Hill, Minister for the Environment, *Port Hinchinbrook*, press release 27 November 1996)

4.24 The Committee comments:

- The Acid Sulfate Management Plan even as finalised (11 April 1997) is still clearly far from best practice. On inspection the plan shows very little compliance with the recommendations of the 1996 peer reviewers, which corroborates Prof. White's criticisms.[14] We note the comments of QASSIT about the difficulties of enforcing best practice in the circumstances.
- The fact that site work resumed in late 1996 before approval of the plan, as Senator Hill noted, does suggest that someone (if not Senator Hill) was not taking it very seriously. The Committee notes a recent report on acid sulfate

13 Prof. I White, Submission 127, p 573, Evidence 10 August 1998, p 256.

14 Other acid sulfate experts who gave evidence relevant to acid sulfate management at Port Hinchinbrook were Prof. M Melville (Submission 150, Evidence 10 August 1998 p 222ff) and Mr J Sammut (Evidence 10 August 1998, p 222ff).

management of Port Hinchinbrook which mentions several breaches of the Acid Sulfate Management Plan.[15] We comment further at paragraph 4.37.

Evidence on acid leachate

4.25 In 1997 QASSIT said, 'The revised Acid Sulfate Management Plan submitted by the Company is a substantially improved plan, and if complied with, should result in negligible risk to World Heritage Areas.'[16] This still leaves the question of whether the plan has been complied with.

4.26 The North Queensland Conservation Council (among others) claimed that there have been many breaches of the Deed of Agreement relating to runoff more acidic than the permitted limit of pH 6. For example:

> 'During the 1996-97 wet season Department of Environment records show 39 discharges with a pH under 6.' (North Queensland Conservation Council, Submission 112, p 454)

4.27 The developer denied any breaches of the Deed.[17]

4.28 It is hard to reconcile this totally conflicting evidence. The Committee, among various further questions to certain witnesses, asked the key parties this question: 'Can you suggest any explanation for the totally contradictory claims of environmental groups and the developer concerning breaches of the Deed … does disagreement arise because of dispute over whether certain facts occurred, or because of dispute over whether acknowledged facts constitute a breach of the Deed?' Most of the claims about breaches of the Deed concerned alleged acid runoff.

4.29 The developer answered: 'The environmental groups who claim that I have breached the Deed are, to say the least, reckless with the truth …'[18] The developer also laid stress on the fact that he is responsible only for water flowing off the site because of his construction works, not for the state of creek water or rain water flowing across the site, which may be naturally acidic.[19]

4.30 The Queensland government passed over in silence the general question, but in response to the North Queensland Conservation Council's claim just quoted, said:

> 'The Environmental Site Supervisor noted on several occasions that pH values were outside the limits specified in section 7.1(e)(ii) of the Deed, however appropriate management measures recommended by the

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15 Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999. Further information p 853ff.

16 QASSIT, *An assessment of the revised 'Acid Sulfate Management Plan' 13/3/97* … March 1997, p2, in further information 1 April 1999, p 447ff.

17 Cardwell Properties P/L, Submission 83, Annexure A, p 2.

18 Cardwell Properties P/L, further information 9 February 1999, p 102.

19 K Williams (Cardwell Properties P/L), Evidence 10 August 1998, p 310, 24 August 1998, p 331.

> Environmental Site Supervisor were undertaken by the Company to rectify the problem. The Environmental Site Supervisor also commented that "an assessment of activities on site and monitoring carried out has not provided any evidence to indicate that adverse environmental impacts on areas immediately adjacent to the site have occurred but that surface water flowing from the site has exceeded the parameters detailed in section 7.1 (e) of the Deed of Agreement.' (Qld Dept of Premier and Cabinet, further information 21 April 1999, p 705)

4.31 Environment Australia agreed with the developer's claim that he has never breached the Deed in relation to acid run-off. On the general question, Environment Australia believed that the dispute was due to confusion over the definition of 'receiving waters' in the Deed. The question is whether the Deed requires runoff to be neutral on entering the Hinchinbrook Channel or on entering the main canal (former course of Stoney Creek) from the acid sulfate treatment pond, about 500 metres upstream. According to Environment Australia:

> 'The parties to the Deed agreed that the definition of 'receiving waters' under the Deed had originally intended to mean water entering Hinchinbrook Channel … there had been some instances when water exiting the acid sulphate treatment pond into the flooded canal had been of a pH below the parameters required in the original Deed for site discharges entering the 'receiving waters'. Scientific advice obtained by GBRMPA was that it was an acceptable practice to buffer acid discharges into the canal with alkaline seawater providing neutral pH was achieved before the water exited the canal into Hinchinbrook Channel. This was always achieved.' (Environment Australia, further information 25 March 1999, p 419-420)

4.32 Prof. Saenger, the Independent Monitor appointed under the Deed of Agreement, corroborated this. He also described an occasion of heavy rain when acidic surface drainage 'from some of the old peat and spoil heaps' entered the 100m-long outlet drain from the acid sulfate treatment pond to the main canal, thus acidifying the water entering the canal, where the environmental site supervisor measured it. This is presumably the relevance of the developer's insistence that he is not responsible for the acidity of surface runoff from rainwater.[20]

4.33 The North Queensland Conservation Council (NQCC) believed that dispute is due to both facts and interpretation of whether certain facts constitute a breach of the Deed.[21] On the business of defining 'receiving waters', the NQCC commented:

> 'Our appraisal of the monitoring regime was that it was set up and amended in such a way that acid discharges would be neutralised before reaching the chosen monitoring points. Hence Professor Saenger's remarks at the bottom of p402 [of the proof transcript of evidence, 8 December 1998; p401 of the

20 Prof. P Saenger, Evidence 8 December 1998, p 401. See also Environment Australia, Submission 157, p 749-50.

21 North Queensland Conservation Council, further information March 1999, p 135.

> final transcript], providing an excellent example of how little the Deed is worth: if the monitoring results don't stack up, shift the monitoring locations!' (North Queensland Conservation Council, further information March 1999, p 130)

4.34 The Committee considers that the uncertainty over measuring points probably explains most of the contradictions in evidence over breaches of the Deed relating to acid runoff. We are not confident that it explains all of them, and we cannot suggest any other explanation with confidence.

4.35 The general tenor of evidence from the scientists was that acid sulfate soils could and should be of little concern if managed properly - but they had doubts about whether they are in fact being managed properly. For example, Dr Bowman:

> 'In the balance of things, my opinion would be that Port Hinchinbrook, if it was managed adequately, would not have very substantial impact off site - if it was managed properly. I am not confident, in fact I am fairly sure that it has not been managed properly.' (Dr G Bowman, Evidence 10 August 1998, p 278)

4.36 The Committee heard evidence about an occasion in March 1998 when part of a bund wall retaining a dredge spoil pond collapsed, spilling dredge spoil mud over Crown land that lies between the dredge spoil pond and Hinchinbrook Channel, and killing some trees.[22] There was some dispute over how the accident happened and how much mud was spilt.[23] Environment Australia considered that 'the spill is unlikely to have had a significant impact on the World Heritage property.'[24] This of course is a comment about the effects on the Hinchinbrook Channel, which is the focus of Environment Australia's submission, since World Heritage protection is strictly the Commonwealth's only responsibility in this matter. It does not comment on the effects on the Crown land that was actually inundated. The land is lowland melaleuca forest - an 'ecosystem of concern' - proposed to become national park.[25]

4.37 All the above evidence dates from 1998. The Queensland Acid Sulfate Soils Investigation Team (QASSIT) inspected the Port Hinchinbrook site in January 1999. The Australian Democrats believe that the report of this inspection gives grounds for concern about the competence of acid sulfate management at Port Hinchinbrook, and that it tends to confirm the fears of the scientists mentioned above. The report stressed the difficulty of estimating environmental impacts of acid sulfate soils given the lack

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22 The dredge spoil pond is on lot 17. The Crown land is lot 33. See Figure 5.

23 K Williams (Cardwell Properties P/L), Evidence to Senate ECITA References Committee Commonwealth Environment Powers inquiry, 24 April 1998, p 241.

24 Environment Australia, Submission 157, p 752.

25 'proposed to become national park': the Hon. R Welford, Minister for Heritage and Minister for Natural Resources, to North Queensland Conservation Council, 1 April 1999. Further information 21 April 1999, p 658-9.

of basic data about the geology and hydrology of the site.[26] It described several breaches (or 'apparent' breaches) of the Acid Sulfate Management Plan.[27] It expressed concerns about the concentration of heavy metals in some samples of runoff. It concluded generally:

> 'Based on the limited monitoring information supplied by Professor Peter Saenger and the Environmental Protection Agency, currently there is no clear evidence that the Port Hinchinbrook site is a serious threat to World Heritage property to date. However, there is ongoing evidence of some leaking of acid, iron and probably aluminium from pond wall seepage and various spoil heaps (including Tekin spoil on Unoccupied State Land (USL)) onto the thin strip of USL adjacent to the World Heritage Area.' (Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999, p 7,20-21. Further information p 864,877-878.)

4.38 Subsequent to QASSIT's March 1999 report the Queensland Department of State Development commissioned further reports on the situation from AGC Woodward Clyde Pty Ltd. These reports, although they make a few perfunctory references to environmental impacts, are primarily focussed on showing whether the site is safe for building.[28] They conclude that it is. They acknowledge certain acid sulfate hot spots (most significantly, a service station and tennis court site near the north west corner of the property) and recommend remedial measures. They acknowledge certain breaches of the Acid Sulfate Management Plan.[29]

4.39 Senator Hill advised that the developer has agreed in writing to undertake the required remedial work.[30]

Evidence on environmental harm from acid leachate

4.40 'Acid runoff' must be clearly distinguished from 'environmental harm caused by acid runoff'. The latter is much harder to measure. It involves isolating cause and

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26 '… data from site visits together with limited soil data [from] Cardwell Properties is substantially less that QASSIT would normally expect to be available to make informed comments on the site for a development of this type and size.' Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999, p5; further information p 862.

27 Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999: p 7: marina excavation spoil dumped untreated as above ground fill; p 10: certain pumping facilities not in place; p 11: release of acidic water from dredge spoil ponds into Unallocated State Land to the east; p 15: additional ASS spoil dumped east of the burial pit. Further information p 853ff.

28 Topics are the stability of slopes (particularly around the marina), and the acidity of foundation soils.

29 Further information, p 915ff: AGC Woodward Clyde Pty Ltd, *Port Hinchinbrook Eastern Precinct - Site Environmental Audit*, 9 August 1999; *Port Hinchinbrook Site Environmental Audit for Acid Sulfate Soil Potential - Phase 2*, 6 August 1999, p 5-1.

30 The Hon. R Hill, Minister for the Environment and Heritage, further information 12 August 1998, p 852.

effect among incremental changes to complex ecosystems subject to many influences. As Dr Reichelt explained:

> '… we tend to look at the small changes in the system and we are not very good at understanding the cumulative effects and the big changes, so what you end up with is very well qualified ecologists who have been spending their lives working on these systems saying to people such as you, "All we can really tell you is that if you take away all of this particular part of the system it'll be different. You may not have the fish there or the seagrasses or the dugongs. If you take away another two per cent, we can't tell you whether that is critical or not."' (Dr R Reichelt, Australian Institute of Marine Science, Evidence 31 July 1998, p 128)

4.41 According to Dr Bowman:

> 'We [CSIRO] have looked at what is coming out of these sites and what is being discharged. We have not really looked at where it goes, how it disperses or what its impact is.' (Dr G Bowman (CSIRO), Evidence 10 August 1998, p 282)

4.42 There was little clear evidence one way or the other on whether acid runoff has caused environmental harm or - more significantly - whether it will in the longer term. According to the North Queensland Conservation Council, 'Prawns died in the acid runoff south of Stoney Creek. Black-lipped oysters on the foreshore … have all died.'[31] Mr Sammut (an acid sulfate expert), commented generally:

> '… acid sulfate soils can cause fish kills, trigger a number of fish diseases and cause degradation to estuarine systems … acid plays a role in the actual induction of [red spot disease] … [Red spot disease] is present within Hinchinbrook Channel. I cannot confirm with you whether that is the result of any acid discharges coming off the Cardwell property, but certainly it is present.' (Mr J Sammut, Evidence 10 August 1998, p 222,228-9)

4.43 The developer and the authorities, on the other hand, argue that there has not been acid runoff - or if there has, it has not resulted in environmental harm.[32]

4.44 Of course, not observing environmental harm is a very different thing from being confident that it has not occurred and will not occur - particularly in the longer term. As well, even when some environmental change is observed, it may be hard to prove cause and effect. The precautionary principle should apply: in the absence of clear knowledge about the robustness of natural systems, the prudent course is to avoid interfering with them as far as possible. This is the very reason why, in environmental management, lacking clear measures of the desired outcome ('no environmental harm'), we fall back on outputs that *are* measurable (such as 'no acid

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31 North Queensland Conservation Council, further information March 1999, p 136.

32 For example, Qld Dept of Premier and Cabinet, further information 21 April 1999, p 705; Environment Australia, further information 25 March 1999, p418-9.

runoff'). Since the very purpose of the output condition is to compensate for uncertainty, the Committee does not think it is adequate to excuse breaches by saying that no harm has been observed.

4.45 The Committee notes that acid may harm not only the natural environment but also constructions such as building footings, underground fuel tanks, lawns and gardens. We assume this type of harm would be more easily measurable. Prof. White commented:

> 'The spreading of untreated acid sulfate soil material and the use of unconsolidated sediments as fill constitute significant problems for approval for dwelling and infrastructure construction … approval to build on such sites could attract future litigation for damages.' (Prof. I White, further information 12 August 1999, p 1007)

4.46 Two particular points of dispute in the evidence concerned the appropriateness of neutralising acid runoff with seawater (which is naturally alkaline), and the risks of environmental damage from heavy metals mobilised by acid.

4.47 The developer, supported by Professor Saenger (the Independent Monitor appointed under the Deed of Agreement), argued that buffering acid with seawater is an acceptable way of neutralising acid:[33]

> 'Neutralisation of acidity by sea water has no downstream ecological effect except perhaps in that immediate mixing zone.' (Prof. P Saenger, Evidence 8 December 1998, p 402)

4.48 Others disagreed. Using seawater to neutralise acid depletes the alkalinity of the seawater, and the Committee was told that alkalinity is essential to many aquatic organisms.[34] CSIRO noted in its 1995 report that 'the use of seawater to neutralise acid leachate from ASS is not accepted by regulatory authorities in some jurisdictions.'[35] QASSIT said that 'the acceptance of buffering with seawater is contentious' and 'the extent of potential environmental risk to biota is largely speculative …'

> 'On the other hand, uncontrolled discharge of acidic water from disturbed ASS sites has been shown to cause significant environmental impacts on marine species and habitats. The issue requires further research … Therefore until adequate research has been undertaken on the biological effects of seawater neutralisation, QASSIT are of the opinion that the precautionary principle needs to apply, ie. direct discharge is not acceptable in new developments … The key concerns about seawater buffering are the sensitivity of receiving waters to acid runoff and the volumes and

33 K Williams (Cardwell Properties P/L), Evidence 10 August 1998, p 309.

34 J Sammut, Evidence 10 August 1998, p 230.

35 CSIRO (Dr G Bowman) to GBRMPA, 25 October 1996, *Peer Review of "Acid Sulfate Management Plan - Port Hinchinbrook"*, p 3.

> composition of acidic runoff. Each site will have a unique situation …' (QASSIT, further information 1 April 1999, p 438)

4.49 The related point of dispute concerned the risk of damage to the environment from toxic heavy metals mobilised by acid. Acid dissolves heavy metals in the soil and transports them to the sea, where they are precipitated as the acid is neutralised. The metal can enter the foodchain and can smother seagrass and the gills of fish and crustaceans.

4.50 QASSIT commented generally:

> 'Dissolved iron is a major product of acid sulfate soils disturbance … [it] can smother sea grasses, thereby reducing their capacity to photosynthesize … [it] may also affect the habitat of mud dwelling organisms amongst the mangroves. Mangroves in general do not seem to be greatly affected in the short term by iron, but may decline or die over time as a result of other ASS impacts such as extreme episodic acidification and aluminium toxicity. It should be emphasised that little research has been [done] in these areas.' (QASSIT, further information 1 April 1999, p 439)

4.51 The evidence on whether there are risks from heavy metals at Oyster Point was conflicting. Prof. Saenger thought that there is no risk because there is no source heavy metals in the area - no 'garbage dumps or old car bodies or shipwrecks or chemical effluent.'[36] The North Queensland Conservation Council calls this 'wishful thinking … There is a history of early tin mining, orchards, rubber and tobacco farming in the general vicinity … A scientific response would have rested on actual tests and specific historical details, and would not have assumed that there were no metals present because no-one had looked for them.'[37]

4.52 Mr Sammut and Dr Morris were concerned about risks from heavy metals.[38] Dr Morris described research he had done at Oyster Point finding 'raised heavy metal levels in the seagrass at the mouth of Stoney Creek [which] indicates a local source of contamination.' Dr Morris also claimed that he has in effect been cold-shouldered by GBRMPA, implicitly because GBRMPA found his results unwelcome.[39] GBRMPA replied that it has asked Dr Morris to submit his research for peer review in the normal way and the invitation is still open.[40]

4.53 Dr Coles said:

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36 Prof. P Saenger, Evidence 8 December 1998, p 405.

37 North Queensland Conservation Council, further information March 1999, p 132.

38 J Sammut, Evidence 10 August 1998, p 230; V Young (The Wilderness Society), Evidence 10 August 1998, p 205; Dr R Morris, further information 14 February 1999, p 78ff.

39 Dr R Morris, further information 14 February 1999, p 80ff.

40 Dr I McPhail (GBRMPA), Evidence 24 August 1998, p 389.

> 'As I understand the issues, heavy metals are mobilised into a reactive form by low pH. As soon as this material meets the sea the pH rises and the heavy metals flock and settle out in a stable form that is eventually diluted by seawater and is unlikely to have significant effect. Biota in the channel may be affected.' (Dr R Coles, further information 23 March 1999, p 413)

4.54 The Australian Institute of Marine Science stated: '… the risk of significant mobilisation of heavy metals and deleterious effects on biota is minimal in the Oyster Point area as a result of the Port Hinchinbrook development …'

> 'Unless there is evidence of a source of metals in the area (e.g. a rubbish tip), there is no reason to suspect that metal concentrations within sediments, soils and waters of the marina development would be greatly different from those in other areas of Hinchinbrook Channel. Most metals would be in particulate form or adsorbed onto clay and silt particles rendering them relatively inert to directly interfere with physiological processes of most aquatic organisms. We are not aware of any data from the development on abnormal concentrations of metals considered most toxic, such as cadmium, lead or mercury.' (Australian Institute of Marine Science, further information 23 February 1999, p 115)

4.55 It is unclear whether the last sentence is intended to mean that AIMS is confident there are no abnormal concentrations. As noted in paragraph 4.44, absence of evidence is not necessarily evidence of absence.

4.56 QASSIT's March 1999 report noted acid runoff from the March 1998 spill site into the adjacent Unallocated State Land, with levels of iron, manganese and aluminium which '… all substantially exceed background runoff water values by factors of up to a hundred fold.'[41]

4.57 The comment at paragraph 4.40 applies to heavy metals as to acid runoff more generally: measuring a certain discharge is a very different thing from being confident about what its environmental effects will be. In general, QASSIT commented:

> 'Discharging large quantities of iron into waterways has been under some scrutiny recently, due to a possible association of toxic cyanobacteria (*Lyngbya sp.*) blooms with iron rich oceanic waters from acid sulfate disturbances in Southern Queensland … the precautionary principle should apply …' (Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999, p 7. Further information p 864)

4.58 In relation to the March 1998 spill site just mentioned, QASSIT stated: '… the spill material and associated leachate are unlikely to pose a serious threat to the World

41 Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999, p 10. Further information p 867.

Heritage Property because of the modest volumes of acid potentially involved in any one acid event.'[42]

4.59 However, QASSIT also emphasised that there has been little research in these areas.[43]

4.60 Of course, all these potential problems are only at issue if there *is* acid runoff, which the developer and the authorities (in evidence pre-dating QASSIT's March 1999 report) denied.

Comment

4.61 The Committee comments:

- As already noted, it is clear that the Acid Sulfate Management Plan for Port Hinchinbrook, even as finalised, is very far from best practice. It is regrettable that the opportunity was lost to showcase Australian best practice management of a World Heritage Area.
- QASSIT's March 1999 report on acid sulfate conditions notes several breaches of the Acid Sulfate Management Plan. It tends to bear out the fears of environment groups and some scientists that while acid sulfate soils at Port Hinchinbrook could have been managed properly, in fact they may not have been managed properly.
- The evidence on actual environmental harm arising from acid sulfate soils at Port Hinchinbrook (whether present or future) is disputed. The Committee notes with concern that acid sulfate soils, once disturbed, can continue to produce acid for many years. We note that acid can damage buildings and other structures as well as the natural environment.
- Lack of baseline data and lack of research on potential impacts was a common theme in the evidence. The precautionary principle applies: in the absence of clear knowledge about impacts we should be especially cautious about interfering with natural systems.
- In this regard, we note that several expert witnesses regretted the fact that CSIRO has scaled down its research into acid sulfate soils. For example, Prof. Melville:

> 'I was very disappointed to learn recently that this, the most prestigious scientific organisation in Australia [CSIRO], has again had to decide against further research on acid sulfate soils. I also believe that another Commonwealth organisation, AGSO, has also ceased its research concerning acid sulfate soils.' (Prof. I Melville, Submission 150, p 696)

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42 Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999, p 11. Further information p 868.

43 QASSIT, further information 1 April 1999, p 439.

4.62 In view of the widespread nature and potential seriousness of acid sulfate problems, this seems regrettable. The Committee believes that a national approach to acid sulfate research would be appropriate.

Recommendation 5

The Committee recommends that a full assessment of acid sulfate soils at the Port Hinchinbrook development should be undertaken and a comprehensive acid sulfate abatement plan should be developed.

The Committee recommends further that if the developer is found to be in breach of the Acid Sulfate Management Plan the Commonwealth, as a party to the Deed of Agreement, should act to ensure that the developer complies with the first part of this recommendation and remedies any breaches.

Recommendation 6

The Committee recommends that the Commonwealth should allocate special funds to the CSIRO to conduct both general research on acid sulfate soils and a special project that would expedite acid sulfate soil mapping around Australia.

Impacts on seagrass and dugongs

Background

4.63 Seagrass beds lie offshore north and south of Oyster Point. Hinchinbrook Channel has the third highest seagrass biomass along the coast between Cairns and Bowen. The seagrass is essential food for dugongs and sea turtles and is important habitat for the juveniles of a number of prawn species.[44]

4.64 Dugongs are sea-dwelling mammals which grow up to three metres long. They are one of only four living species of sea cow (Sirenia) - as well as the dugong, three species of manatee are found in the Atlantic. Their closest relative on land is the elephant. Dugongs are found from East Africa to Vanuatu in coastal and island waters between 26 degrees north and south of the equator. It is believed that a significant proportion of the world's dugongs live in northern Australian waters from Moreton Bay in the east to Shark Bay in the west. Dugongs have high biodiversity value as being the only species in the Family Dugongidae and one of only four species in the Order Sirenia, all of which are listed as vulnerable to extinction by the World Conservation Union. Dugongs were specifically highlighted as one of the World Heritage values of the Great Barrier Reef World Heritage Area.[45]

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44 P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 18.

45 Cooperative Research Centre for the Ecologically Sustainable Development of the Great Barrier Reef, *Dugongs in the Great Barrier Reef - the current state of research*, August 1998. P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 19. H Marsh

4.65 Dugongs are listed as 'vulnerable' in Queensland (*Nature Conservation Act 1992*) and are listed as vulnerable to extinction in the IUCN Red List of Threatened Species and under schedule 2 of the Bonn Convention.[46] Dugongs are vulnerable because of their low rate of reproduction and because their shallow inshore habitats bring them into contact with human activities. Because dugongs are long living (over 70 years) and slow breeding (one calf each three to five years), the rate of population change is very sensitive to changes in survivorship. Even a slight rate of unnatural death resulting from human activities can cause a chronic decline in a dugong population.[47]

4.66 Aerial surveys show that in the eight years to 1994 dugong populations in the southern Great Barrier Reef region south of Cooktown fell by about 50 per cent - in some areas by over 80 per cent. Anecdotal evidence suggests that the decline has been going on for decades. For such a slow breeding species this decline is a matter of great concern. The reasons for the decline are complex and include loss of habitat, accidental drowning in both commercial and illegal gill nets and in shark nets, and traditional hunting by Aboriginal people (there is now no hunting permitted south of Cooktown). The relative importance of the various impacts is uncertain but research suggests that incidental mortality in nets is a significant part of the problem. 'Hunting, modern farming practices, increasing boat traffic, sewage outlets into seagrass beds, and land clearing causing a change in the composition of river run-off [affecting seagrass beds] must all be taken into account.'[48]

4.67 Surveys suggest that in the southern Great Barrier Reef region the only important dugong population that has *not* declined is that between Cape Cleveland (near Townsville) and Dunk Island, including Hinchinbrook Island (with the proviso

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et al, *The Status of the Dugong in the Southern Great Barrier Reef Marine Park*, GBRMPA research paper no. 41, 1996, p 1.

46 Cooperative Research Centre for the Ecologically Sustainable Development of the Great Barrier Reef, *Dugongs in the Great Barrier Reef - the current state of research*, August 1998. *Bonn Convention on the Conservation of Migratory Species of Wild Animals*, 23 June 1979. Dugongs are not listed under the Commonwealth *Endangered Species Act 1992* - a point which some supporters of Port Hinchinbrook stressed. Prof. Marsh comments: 'The classification of species as 'endangered', 'vulnerable to extinction' etc. is technically complex and depends on the legislation which applies in the relevant political jurisdiction … These considerations were not central to the decision to establish Dugong Protection Areas between Hinchinbrook Island and Hervey Bay in January 1998. These Areas were established in an effort to halt the decline of the dugong in the southern Great Barrier Reef World Heritage Area and Hervey Bay.' Prof. H Marsh, notes tabled at public hearing, Townsville 31 July 1999. Cardwell Chamber of Commerce, Submission 123, p 537. Cardwell Properties P/L, Submission 83, annexure A1.

47 P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 18; Prof. H Marsh, Submission 125, p 557; H Marsh, Breen B & Morissette N, *Shoalwater Bay Queensland: a report on the importance of the marine environment of Shoalwater Bay with particular reference to mangroves, seagrasses, sea turtles, shorebirds, dugongs and dolphins*, James Cook University, 1992. Cooperative Research Centre for the Ecologically Sustainable Development of the Great Barrier Reef, *Dugongs in the Great Barrier Reef - the current state of research*, August 1998.

48 Prof. H Marsh, Submission 125, p 552,557. Cooperative Research Centre for the Ecologically Sustainable Development of the Great Barrier Reef, *Dugongs in the Great Barrier Reef - the current state of research*, August 1998.

that at the more local level survey data are statistically less reliable because of the smaller sample size).[49] In the Hinchinbrook area the most important dugong habitat is Missionary Bay on the north side of Hinchinbrook Island, but dugongs certainly do use the Hinchinbrook Channel and the area around Oyster Point.[50]

4.68 Submissions on the impact of Port Hinchinbrook on dugongs feared an increase in collisions between boats and dugongs as boating in the area increases. To date boatstrike has not been a serious cause of death in Queensland, though collisions do occur - for example, in 1996 a Queensland Department of Environment patrol boat accidentally struck and killed a dugong in the Missionary Bay area of Hinchinbrook Island.[51] Boatstrike *is* a serious cause of death of manatees (a similar species) in Florida, where there is a strong correlation between increase in boating traffic and increase in boatstrike deaths. This suggests that the low occurrence of boatstrike deaths in Queensland is mainly due to the relatively low level of boating activity by comparison with Florida. As well, Queensland dugongs tend to occur in more open water environments than Florida manatees - but Hinchinbrook Channel is an exception, being much more similar to manatee habitat than most dugong habitats are. These points suggest that boatstrike is *potentially* much more of a problem in the Hinchinbrook Channel than in most other parts of Queensland.[52]

4.69 In August 1997 the Commonwealth and Queensland governments in a 'Dugong Communiqué' announced measures aiming to arrest the decline of dugongs in the southern Great Barrier Reef. They established a two-tiered system of Dugong Protection Areas (sometimes called 'sanctuaries'; in force from 12 January 1998), in which gill netting is banned or greatly restricted (Dugong Protection Area A) or subject to lesser controls designed to reduce the probability that a tangled dugong will drown (Dugong Protection Area B). The sea around Hinchinbrook Island, including the Hinchinbrook Channel, is a Dugong Protection Area A (see Figure 9). The governments acknowledged the need to address other threats to the dugong including

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49 'The [aerial] surveys are designed to measure trends at this [Dunk Island-Bundaberg] regional scale and interpretation at a more localised scale must be cautious. Accepting this limitation, the surveys suggest that the decline has mainly occurred south of Townsville and that dugong numbers have not declined in the Hinchinbrook region since the mid-1980s.' Prof. H Marsh, Submission 125, p 552. 1986-7 and 1992 surveys were from Cooktown to the southern boundary of the GBRMP near Bundaberg. In the 1994 survey the sector from Cooktown to Dunk Island was omitted since it has little dugong habitat and few animals had been seen. H Marsh et al, *The Status of the Dugong in the Southern Great Barrier Reef Marine Park*, GBRMPA research paper no. 41, 1996, p 5-6.

50 Dr A Preen, Evidence to Senate ECITA References Committee Commonwealth Environment Powers inquiry, 24 April 1998, p206. Prof. H Marsh, Submission 125, p 552-3, Evidence 31 July 1998, p 173.

51 P Illidge, *Recommended operational guidelines for QDE vessels in waterways in the Hinchinbrook Island area*, 30 August 1996.

52 Prof. H Marsh, Submission 125, p 552, 557. H Marsh et al, *The Status of the Dugong in the Southern Great Barrier Reef Marine Park*, GBRMPA research paper no. 41, 1996. Dr A Preen, Evidence to Senate ECITA References Committee Commonwealth Environment Powers inquiry, 24 April 1998, p207.

'Indigenous take, sharknetting, speed boats, and illegal hunting as well as steps to protect seagrass.'[53]

4.70 The Hinchinbrook Dugong Protection Area A supports about 15 per cent of the dugongs in the southern Great Barrier Reef region.[54]

4.71 Dugong expert Prof. Helene Marsh comments that the success of the dugong sanctuaries depends on conserving habitat *within* the sanctuaries, to discourage dugongs from moving away to places where they would be more at risk (research shows that dugongs do travel widely - for example, from the Hinchinbrook region to south of Cleveland Bay). In this regard the Hinchinbrook area is relatively important:

> 'It will be particularly important to conserve dugong habitat in the DPA:As, especially the two DPA:As (Hinchinbrook and Shoalwater Bay) which together not only support more than 40 per cent of the dugongs in the region but are the only two areas in which gill-netting has been banned from adjacent rivers and creeks (which are used by dugongs). The long term effectiveness of the Hinchinbrook DPA:A which supports about 15 per cent of dugongs in the southern Great Barrier Reef region will depend on the capacity to control the boat traffic associated with resort and marina developments … Some of the other DPA:As are unlikely to be effective in the long term. For example, it will be very difficult to maintain dugong habitat quality in Cleveland Bay, the port for Townsville, the large city in tropical Australia.'[55]

4.72 On the other hand, Cardwell Chamber of Commerce seems to think that because the dugong population in the Hinchinbrook area is stable (by contrast with the population of the southern reef as a whole), there is *less* cause for concern in the Hinchinbrook area, and the Hinchinbrook area is being unfairly singled out for the sacrifices needed to protect dugongs:

> 'There has been no suggestion by conservation groups that their recommendations for compulsory vessel speed limits for all commercial and recreational vessels in the Hinchinbrook area should also be applied to the Cleveland Bay Dugong Protection Area.' (Cardwell Chamber of Commerce, Submission 123, p 538)

4.73 This suggests the need for public education on the issue. Prof Marsh:

> 'That strategy [of dugong protection areas] is only going to work if the habitat in the Hinchinbrook area remains attractive to dugongs - if it remains a five-star dugong area … I would see both management of habitat and

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53 Great Barrier Reef Ministerial Council, *Dugong Communique*, 14 August 1997; reproduced in Environment Australia, Submission 157, attachment I.

54 Prof. H Marsh, Submission 125, p 553.

55 Prof. H Marsh, Submission 125, p 552-3,557ff.

management of boat speeds as central to that.' (Prof. H Marsh, Evidence 31 July 1998, p 167)

4.74 Cardwell Chamber of Commerce also pointed out that the dugong population in the Great Barrier Reef north of Cooktown (when compared with the southern reef) is large and stable.[56] 'Marsh and Saalfield (1991) estimated that the Torres Strait region could support an unselective harvest of at least 300 to 700 dugongs per year. Over the past five years [by contrast] there have been only four recorded dugong deaths in the Hinchinbrook Area.' The implicit argument is that the abundance of dugongs further north makes the state of dugongs in the southern reef, or (by extension) in the Hinchinbrook area, less of a concern. If large numbers of dugongs are hunted in Torres Strait, why should we worry about a few deaths at Hinchinbrook?[57]

4.75 In answer Prof. Marsh comments:

- Australian dugong populations show genetic variations, which suggest limits on dugongs from different areas interbreeding. This suggests that if dugongs disappear from one area (such as the southern reef) they are unlikely to recolonise it quickly, in spite of the much greater number of dugongs further north.
- Whether this is a matter of concern depends on one's objective for the conservation of the dugong. 'If the objective of management is **to maintain dugong numbers throughout their range in Australia especially in the Great Barrier Reef World Heritage Area**, then minimising deaths and maintaining dugong habitat in the Hinchinbrook region is crucial.'[58]

4.76 The Committee considers that the objective of dugong conservation should indeed be to maintain dugongs throughout their natural range. This is the aim of the Dugong Protection Areas established by the Commonwealth and Queensland governments. It is not acceptable conservation policy to contemplate the extinction of the dugong over perhaps 1200 kilometres of coastal Queensland simply because there

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56 Aerial surveys suggest, in the Torres Strait, a stable population of at least 30,000; in the northern reef, a stable population of at least 10,000; in the southern reef (Dunk Island to Bundaberg) a population declining from at least 3,500 in 1986 to at least 1,700 in 1994. Estimates are 'at least' because aerial surveys under-count by a proportion which is uncertain. However the surveys do reliably show percentage changes in population over time because they are done in a standard way. Cooperative Research Centre for the Ecologically Sustainable Development of the Great Barrier Reef, *Dugongs in the Great Barrier Reef - the current state of research*, August 1998. Prof. H Marsh, notes tabled at public hearing, Townsville 31 July 1998.

57 Cardwell Chamber of Commerce, Submission 123, p 537. Similarly Cardwell Properties P/L, Submission 83, annexure A1: 'Vulnerable species may sound ominous but in fact it only requires that attempts must be made to maintain the species throughout its entire range but it does not mean that it must be maintained in every location.'

58 Prof. H Marsh, notes tabled at public hearing, Townsville 31 July 1998. Prof. Marsh estimates that the present rate of indigenous hunting in the Torres Strait is not sustainable '… but a [long-term] decline will be difficult to prove statistically until it is very large.'

are plenty of dugongs elsewhere - especially when the area concerned is a World Heritage Area. Accordingly, the abundance of dugongs in the northern reef region and Torres Strait is no cause for complacency about the serious decline of dugongs in the southern reef region.

4.77 In evidence the Queensland government described interim management arrangements for dugong conservation in the Hinchinbrook area which were agreed by Commonwealth and State environment ministers on 16 April 1998. The interim arrangements 'provide for':

- a series of voluntary vessel transit lanes and go slow areas within the Hinchinbrook Dugong Protection Area;
- a program to educate the public on the risk of boatstrike, the recommended transit lanes and the recommended speed limits (25 knots in transit lanes, 10 knots in important feeding areas outside transit lanes);
- monitoring 'to gauge adoption of recommended vessel transit lane use.'[59]

4.78 Following a meeting of the Great Barrier Reef Ministerial Council on 30 July 1999, Senator Hill, Commonwealth Minister for the Environment and Heritage, described dugong protection measures which 'are being pursued', including:

- further restrictions on commercial fishing in Dugong Protection Areas;
- co-operative agreements with indigenous communities to control indigenous hunting;
- a 40 knot speed limit in the Hinchinbrook Channel.[60] [The speed limit is now 40 knots but with exemptions for water ski races.[61]]

4.79 On the matter of controlling on-land activities which threaten dugong habitats (such as sewage or agricultural runoff affecting seagrass beds), the ministers endorsed their officials' recommendations to 'request Queensland' to pursue legislative protection of riparian zones and wetlands; to implement integrated catchment management strategies; and to progress codes of management from voluntary to mandatory.[62]

4.80 The Committee notes these measures with approval in principle. However we have some concern that two years after the *Dugong Communiqué*, these measures are still being described as 'provided for' or 'are being pursued' or 'request Queensland

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59 Queensland Department of Premier and Cabinet, further information 21 April 1999, p 706-7.

60 The Hon. R Hill, Minister for the Environment and Heritage, *New measures announced to protect dugong*, media release 5 August 1999.

61 Queensland Department of Premier and Cabinet, further information 21 April 1999, p 706.

62 Great Barrier Reef Marine Park Authority, further information August 1999, p 1013.

…' These phrases suggest good intentions but, to date, not much concrete achievement.

4.81 It is essential that the Commonwealth and Queensland governments should follow through the 1998 controls on gill-netting with appropriate management of the other threats acknowledged in their *Dugong Communiqué*, such as boat speed limits and damage to seagrass habitat. It would be poor management to allow the initiative on gill-netting to be negated by insufficient action on these other matters.

Recommendation 7

The Committee recommends that, notwithstanding the difficulties, the Commonwealth and Queensland governments should expedite action to control threats to dugongs in the southern Great Barrier Reef region, including the reviewing of the use of gill nets in areas frequented by dugongs.

Impacts on seagrass

4.82 Opponents of Port Hinchinbrook were concerned that removal of foreshore mangroves would expose the shore to erosion during storms, and that the 'artificial beach' which the developer built in one spot in December 1997 would erode. Their concern is that eroded material would tend to smother regrowth mangroves and seagrass beds (the Deed of Agreement obliges the developer to allow mangroves to regrow in certain areas 'to assist further in stabilising the foreshore').[63]

4.83 GBRMPA commented in 1994: '… despite removal of this larger stand [of foreshore mangroves] in 1988/89, the offshore seagrass beds still remain intact.'[64] In evidence to this inquiry the developer said that regular surveys of the beach since 1996 show that there has been no erosion.[65] Environment Australia said that the sand placed on the foreshore in December 1997 has been driven inland by the weather, and has caused no damage to World Heritage values.[66] The Independent Monitor, Professor Saenger, said that 'the waves … will tend to wash it back up the beach, which is where the natural beach line is, and to the north.'[67] He added:

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63 Depending on the point of view of different witnesses, the 'artificial beach' was also called 'a test site to measure the effectiveness of foreshore stabilisation techniques' (which is required by the Deed of Agreement) or 'dumping material on the foreshore'. It extended outside the developer's property and covered some regrowth mangroves (contrary to the Deed), and in evidence there was some argument about whether it was allowed by the Deed. GBRMPA disputed with the developer about it at the time. Environment Australia, Submission 157, p 25-26, Evidence 24 August 1998, p 374; North Queensland Conservation Council, further information 11 March 1999, p 14; *Deed of Variation* August 1996, clause 7.10 & schedule 3, Beach and Foreshore Management Plan.

64 GBRMPA to D Kay (DEST), 14 November 1994, in Cardwell Properties P/L, Submission 83b, attachment 4.

65 K Williams (Cardwell Properties P/L), Evidence 10 August 1998, p 308.

66 Environment Australia, Submission 157, p 751.

67 Prof. P Saenger, Evidence 8 December 1998, p 410.

> 'In August 1996 a system of 12 transect lines was established by AUSLIG for detailed topographic surveys and these transects have been re-surveyed by Rowlands Surveys Pty Ltd on an annual basis since. Although the upper beach profiles have altered slightly as a result of sand placement, no significant changes have occurred on the lower beach, the mudflats or in the mangroves. Furthermore, the placement of an experimental sand site by the developer clearly showed that sand moved up the beach as well as to the north.
>
> 'Because there has been no significant erosion, it follows that seagrass smothering by beach- and mudflat-derived sediments cannot have occurred to date. There is a low longer term risk that may result from a major storm event in the future. There is also a small risk that some seagrass smothering may occur because of changed sedimentation due to altered circulation patterns due to the access channel. Such changes are likely to be small and offset by seasonal changes in seagrass growth and recruitment.' (Prof. P Saenger, further information March 1999, p 297-8)

4.84 Seagrass expert Dr Rob Coles has been involved in five surveys of seagrass in the area from September 1994 to December 1997.[68] He commented:

> 'Seagrass surveys identified little immediate damage to seagrasses from the dredging exercise. However, on the last survey (November 1998) there was some evidence of seagrass loss and increased sedimentation. It is likely that this was a natural seasonable variation as other areas nearby registered similar changes.' (Dr R Coles, further information 23 March 1999, p 411)

4.85 Dr Coles noted that tropical seagrasses (by contrast with temperate seagrasses, where most research has been concentrated) are naturally very variable from year to year and, therefore, long-term research is necessary to isolate unnatural changes; but 'Unfortunately, there is no agreed plan for ongoing funding for the seagrass work at Port Hinchinbrook so any long-term changes will not be known.'[69]

4.86 The North Queensland Conservation Council (NQCC) argued that 'although long-shore drift is the principal mode of sand movement, it would be a brave scientist who would guarantee that some of it has not moved across the low water mark of the Hinchinbrook Passage and hence into the World Heritage Area …'[70] The NQCC supplied July 1997 photographs allegedly showing erosion of material placed on the foreshore, saying:

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68 R J Coles et al, *Distribution of Seagrasses at Oyster Point, Cardwell - a reconnaissance survey, September 1994*, Qld Dept of Primary Industries; R J Coles et al, *Distribution and Abundance of Seagrasses at Oyster Point, Cardwell, Spring (November) 1995 & Winter (August) 1996*, Qld Dept of Primary Industries; W J Lee Long et al, *Baseline Survey of Hinchinbrook Region Seagrasses - October (Spring) 1996*, GBRMPA; W J Lee Long et al, *Oyster Point Post-Dredging Seagrass Distribution, December 1997*, Qld Dept of Primary Industries.

69 Dr R Coles, further information 23 March, p 411.

70 North Queensland Conservation Council, further information March 1999, p 138.

> 'The photos show the pattern of deposition of the material used as fill. It is clearly spreading seawards down the foreshore, over the eroding sediments of the denuded mangrove habitat. The developer claims that nothing finished up on the seagrass beds. We find this unbelievable … What happens to the darker materials, the silts, the fines, that are dumped; that are no longer evidence in the appearance of the artificial beach? Silts and fines do not behave like beach sand. They become suspended by wave action for long periods of time, unlike beach sand which settles quickly. They travel with the water column they are in and settle out over time - onto the seagrass areas, for instance.' (North Queensland Conservation Council, further information 11 March 1999, p 248-9)

4.87 The Committee does not have the expertise to reconcile this conflicting evidence.

Impacts on dugongs

4.88 According to Prof. Marsh, the possible impacts of Port Hinchinbrook on dugongs are threefold:

- Direct loss of seagrass habitat near the development site (seagrass is the main food of dugongs). Any disturbance is expected to be localised and short term.
- Reduction in the fecundity of dugongs due to general deterioration in their habitat - for example, being disturbed by boats or being denied optimal access to their feeding grounds. In the Hinchinbrook area some seagrass beds are only accessible at high tide, and this would presumably be the time of maximum boat traffic.[71] Prof. Marsh could not estimate the severity of this risk.[72]
- Death by boatstrike resulting from increased boat traffic in the area. As noted in paragraph 4.68, this is a serious risk. 'If a population of 100 dugongs use the channel per year even one fatality per year is likely to be unsustainable on top of the other impacts.' It is well established that the speed of boats rather than their size is the most important risk factor.[73] Prof. Marsh believes that a Boat Traffic Management Plan is essential to complement the existing Dugong Sanctuary.

4.89 Dr Preen commented:

> 'The impact of this resort on dugongs will occur within a 20-kilometre radius of the site; there is just no question about that. It will occur over many years. It is going to build up slowly so it is not going to be in the next year that it is going to get worse and worse, and the impact of course will be felt forever or for a very long time.' (Dr A Preen, Evidence to Senate

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71 Dr A Preen, Evidence to Senate ECITA References Committee Commonwealth Environment Powers inquiry, 24 April 1998, p 206.

72 Prof. H Marsh, Submission 125, p 559ff.

73 'It is easier for animals to get out of the way of big, slow-going boats than it is for very small, fast boats.' Prof. H Marsh, Evidence 31 July 1998, p 166.

ECITA References Committee Commonwealth Environment Powers inquiry, 24 April 1998, p 207)

4.90 It seems there are differences of opinion on boat speed limits. The Committee notes that the present 40-knot speed limit in the Hinchinbrook Channel allows exemptions for races (by permit). We note the recommendation of officials to the Great Barrier Reef Ministerial Council (30 July 1999) that the Council should '… *again request* the Queensland Department of Transport to ensure that vessel speed limits in Hinchinbrook Channel are restricted to a maximum of 40 knots and that this include boat races …' [emphasis added] In any case, it is difficult to see why the Ministerial Council proposes a 40 knot speed limit for the Channel, if the recommended speed limit in transit lanes is 25 knots.[74]

4.91 Cardwell Chamber of Commerce said: 'The management strategies of confining high speed vessels to narrow deep water transit lanes and zoning slow and no go vessel areas have been successfully implemented [in Florida] …'[75] Mr Tanzer of GBRMPA said: 'In the major thoroughfare part of the channel there is room for flexibility. You do not want a situation where boats have to crawl along in areas dugongs often do not seem to frequent.'[76] On the other hand Prof. Marsh believes that speed limits should be imposed on *all* boats using the channel, since '… dugongs are at risk from boat strikes while travelling as well as feeding. As we have no data on how travelling dugongs use the Hinchinbrook Channel, it is not valid to assume that dugongs will not be hit by boats traversing the [central] shipping channel.'[77]

4.92 In the Committee's view it is obvious that Port Hinchinbrook will greatly increase boat traffic in the area, increasing the risk to dugongs. Given that this regrettable situation is now unavoidable, it is essential to control boat traffic and boat speeds so as to minimise the risk. The Committee agrees that boat speed limits should be based on appropriate research, within the aim of ensuring that Hinchinbrook region remains a 'five-star dugong area.'[78] Public education is needed to explain why this is necessary even though Hinchinbrook dugongs seem to be relatively well-off already. We agree that high speed races in the Hinchinbrook Channel should not be allowed.

4.93 Comments from paragraph 4.117 on the difficulties of regulating environmentally detrimental human behaviour (as opposed to controlling environmentally detrimental natural processes) are also relevant.

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74 Queensland Department of Premier and Cabinet, further information 21 April 1999, p 706-7. Great Barrier Reef Marine Park Authority, further information August 1999, p 1013.

75 Cardwell Chamber of Commerce, Submission 123, p 540.

76 J Tanzer (GBRMPA), Evidence 31 July 1998, p 151.

77 Prof. H Marsh, Submission 125, p 561.

78 Prof. H Marsh, Evidence 31 July 1998, p 167.

Impacts on other species

4.94 There were general concerns in evidence about possible impacts of the development on a number of other species, such as the endangered mahogany glider, the vulnerable irrawaddy dolphin, endangered sea turtles, the Torres Strait pigeon and the vulnerable beach stone curlew (a pair of which were nesting on the Oyster Point foreshore before being disturbed by earthworks).[79] Environment groups were also concerned about the developer's application to lease lowland melaleuca forest - an 'ecosystem of concern' and habitat of the mahogany glider - in lot 33 Unallocated State Land lying between the developer's property south of Stoney Creek and the coast; but this application has since been refused[80].

4.95 In relation to these species there was no information on how great the risk of impact is and, if the risked impact comes to pass, how serious the impact would be. The North Queensland Conservation Council (NQCC), when the Committee asked what proportion of the mahogany glider's habitat was affected by the development, said:

> 'No answer is possible, as the bare survival needs of the Mahogany Glider (listed as *endangered* under the *Nature Conservation Act* (Qld)) have not been ascertained. The Queensland Governments have mishandled the Mahogany Glider Rescue Plan, making habitat designations that mainly avoided privately held freehold rather than ascertaining the entire range and habitat of the glider first.' (North Queensland Conservation Council, further information March 1999, p 136)

4.96 Neither the NQCC nor the Queensland government knew of any research relevant to estimating how serious is the risk to the glider posed by this development. The government commented, 'Most of the current development site was previously cleared by Tekin and hence there is virtually none of the site subject to mahogany glider habitat.' The NQCC claimed that 'some land listed as *potential* habitat [of the glider] was cleared by Cardwell Properties, and the clearing of the trees (whether food trees or not) clearly prevented gliders from safely traversing the area as a route to the land listed as *critical habitat* that lies south of Stoney Creek.'[81]

4.97 In the Committee's view the precautionary principle should apply. The NQCC points out that to allow a development on the basis that it only affects a small proportion of a habitat would submit a species to death by a thousand cuts: 'It takes an

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79 For example, Wildlife Preservation Society of Queensland, Submission 121, p 494ff; Cairns & Far North Environment Centre, Submission 50, p 147; M Moorhouse (North Queensland Conservation Society), Evidence 31 July 1998, p 195; North Queensland Conservation Society, further information 8 October 1998, p 40. See also P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 20ff.

80 The Hon. R Welford, Minister for Heritage and Minister for Natural Resources, to North Queensland Conservation Council, 1 April 1999. Further information 21 April 1999, p 658-9.

81 North Queensland Conservation Council, further information March 1999, p 137; Qld Dept of Premier and Cabinet, further information 21 April 1999, p 708.

impoverished mentality to attempt to justify acts potentially destructive of a species by claiming that one specific act was not the fatal last one.'[82] Of course, for decision-makers who have to balance conflicting development and conservation interests, applying the precautionary principle still leaves difficult questions of how much risk is acceptable and how cautious they should be. In the case of endangered species it is clear that an extremely conservative approach is warranted.

Aesthetic impacts on the wilderness area

4.98 Hinchinbrook Island and the Hinchinbrook Channel are renowned for their scenic beauty. The 1994 Valentine Report quotes various academic and official sources: 'The views of Hinchinbrook Island and Channel from many sites in the Cardwell Range are of exceptional natural beauty …'; '… magnificent views [from Mt Bowen on Hinchinbrook Island] of the white sandy beaches and the Pacific Ocean to the east, the unique almost parallel tidal channel of the mangrove systems of Missionary Bay to the north, and the winding channels of the mangroves of Hinchinbrook Channel to the west …'[83]

4.99 The Draft Management Plan for Hinchinbrook Island National Park, both in the 1994 version and today, recognises the 'exceptional natural and scenic values' of the area, and speaks of 'the distinctive and spectacular, rugged skyline of Hinchinbrook Island and the calm waters and twisting, mangrove-fringed waterways of the Channel which can be seen from several local vantage points.' It proposes that 'obtrusive facilities or developments such as floating hotels, permanently (or semi-permanently) moored vessel or pontoons …' should not be permitted in the national park.[84]

4.100 The Queensland government's 1994 Environmental Review Report (ERR) on Port Hinchinbrook noted that 'The Hinchinbrook Channel represents a unique passage landscape. There are only four major passage systems in Queensland (and Australia), each occurring in different climatic zones and representative of different environments.' Having said this the ERR, in keeping with its brief to consider 'mainly those elements of the project for which approvals are not currently held', omitted all further mention of the possible impact of the development on aesthetic values, apart from a two line comment that to preserve the landscape vista of the Hinchinbrook Channel will require restriction of building heights.[85]

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82 North Queensland Conservation Council, further information March 1999, p 137.

83 P Valentine, *Hinchinbrook Area World Heritage Values and the Oyster Point Proposal*, August 1994, p 16-17.

84 Qld Department of Environment, *Hinchinbrook Island National Park - draft management plan*, August 1996, pp 6,18.

85 Queensland Department of Environment and Heritage, *Environmental Review Report - Port Hinchinbrook*, May 1994, p 1,4,26.

4.101 Port Hinchinbrook, near the northern end of the largely unspoilt landscape of the Hinchinbrook Channel, and about 2 kilometres south of central Cardwell, replaces fringing mangroves with about 1 kilometre of waterfront housing.

4.102 The aesthetic impact of this was a concern to many opponents of the development. For many it was obviously a strong emotional driver of their opposition, even if they did not stress it in their submissions, presumably feeling obliged to give higher billing to the more objective ecological impacts. For example:

> '… a translocated slice of the Gold Coast …' (Wildlife Preservation Society of Queensland, Townsville Branch, Submission 97, p 398)

> '… planted coconut palms and an artificial beach … A landscape alien and inappropriate to the area.' (Prof. F Talbot, Submission 128, p 582)

> 'Even one blemish is enough to destroy the visual beauty that people come to see.' (S Chandler, Submission 28, p 72)

4.103 The lack of documentation of aesthetic values has not helped. Prof. Marsh comments that 'the level of knowledge regarding aesthetic attributes of the Great Barrier Reef World Heritage Area is particularly poor':

> 'The lack of methodologies, and the limited understanding of what constitutes aesthetic value have hampered the documentation of these qualities. Although not formally articulated, I believe that this was a major concern of many of the opponents of the Port Hinchinbrook development. Many people thought that building 'Hamilton Island at Oyster Point' threatened the World Heritage values of the area, but because the aesthetic values of the World Heritage Area were not documented, it was hard to articulate objections based on threats to aesthetic qualities.' (Prof. H Marsh, Submission 125, p 555)

4.104 A particular matter of concern for objectors was the change from the 1994 Masterplan (admittedly 'indicative only'), which showed integrated, landscaped cluster housing separated from the high water mark by a 40 metre wide zone of apparently communal open space, to the 1997 Masterplan with private house lots to the high water mark. It is reasonable to expect that the latter may have a greater impact on views of the resort from the channel and Hinchinbrook Island.

> 'Now, instead of an esplanade along the high watermark, the esplanade has gone. Instead of 50-something houses - they were not even a row of houses; they were actually groups of cottages mixed up with resort buildings - we now have wall-to-wall houses for a kilometre right on the edge of the high watermark without an esplanade.' (M Moorhouse, North Queensland Conservation Council, Evidence 31 July 1998, p197)[86]

86 The much-mentioned 'esplanade' seems to refer to the 40m-wide zone of apparently communal waterfront open space, shown on the 1994 Masterplan. As far as the Committee is aware the word

4.105 This absolute waterfront development contrasts with Cardwell, which has a strip of more or less wooded public space of varying width backing the beach along the length of the town. As the Port Hinchinbrook waterfront lots are presumably being marketed for their sea views, we cannot expect to see screening plantings springing up in their front yards.

4.106 Supporters of the Port Hinchinbrook development stressed that it is right next to Cardwell, which is hardly a wilderness:

> 'The triangle bounded by Oyster Point, Hecate Point and Meunga Creek is certainly not wilderness. There are already dozens of boats in that area, many of them have permanent moorings in front of Cardwell, so even on the grounds of visual amenity, there is no justification for restricting the use of this northern triangle.' (M Prior, Cardwell Air Charter, Evidence 30 July 1998, p 103)

4.107 In August 1996 the Australian Heritage Commission advised Senator Hill that the location of the resort was of 'low wilderness quality', but that nevertheless a development of this order would involve 'significant change to this previously undeveloped landscape.'[87] Senator Hill, in his reasons for granting consent under the *World Heritage Properties Conservation Act 1983*, said:

> 'To the extent that the establishment of the resort might impact on the aesthetic qualities or natural beauty of the adjacent areas including Hinchinbrook Channel and Hinchinbrook Island, I found that such impact would be insignificant having regard to a) the already degraded condition of the resort site; b) the previous extensive clearing of mangroves; and c) the restrictions imposed by the Deed on the height of the resort buildings.' (Environment Australia, Submission 157, attachment K, p 9)[88]

4.108 Aesthetic opinions, more than most, are inherently subjective. This was very clear from the opposing views that the parties held about the same phenomena. Opponents deplored the 'Gold Coast style' waterfront development and the 'incongruous row of imported palms'.[89] The developer said:

> 'The loop road [behind the waterfront blocks] is all high-quality asphalt. All the landscaping on that road has been done with foxtail palms, which are native to north Queensland.' (K Williams, Cardwell Properties P/L,

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'esplanade' does not occur in any of the primary sources describing this land, and the Committee has no evidence on what the intended treatment of this land was. The developer stresses that 'reference to the original Tekin plans [by Cummings and Burns, 1987] will show clearly that there was no boulevard along the foreshore.' Cardwell Properties P/L, Submission 83A, p 4. See Figures 6, 7 & 8.

87 Australian Heritage Commission to Senator Hill, 9 August 1996, attachment, p 1.

88 Under the Deed of Agreement 'The Company must not construct any accommodation buildings on the Development Site with more than 2 levels of accommodation and one level of car park.' (clause 20.2)

89 North Queensland Conservation Council, further information 11 March 1999, p 258.

> Evidence to Senate ECITA References Committee Commonwealth Environment Powers Inquiry, 24 April 1998, p 240)

4.109 The Chair of the Committee comments that :

- Aesthetic values may be more subjective and less easily measurable than some other values, but they are no less important for that. 'Natural beauty' is a most significant element of people's attitudes to the natural environment - indeed, it was the main driver of the early (19th century) national park movement. It is not acceptable to discount aesthetic values simply because they do not lend themselves to scientific measurement.
- Aesthetic impacts, even more than most impacts, were never properly considered in assessing the development proposal - whether in 1988, 1994 or 1996. The difficulty of assessing aesthetic impacts may explain but does not excuse this omission.
- The development is clearly detrimental to the aesthetic and wilderness values of the area. How serious a detriment is a matter of opinion - and on this matter more than most opinions are inherently subjective.

Impacts of increased tourism

4.110 Environmental groups fear that Port Hinchinbrook will exacerbate long term pressures to allow increased tourism in the nearby island national parks (Hinchinbrook Island, Brook Islands and Goold Island).[90] Likely impacts of this include disturbance to wildlife, track hardening and degradation around campsites, and loss of the 'wilderness experience' which people come for:

> '…the wilderness bit is lost if a wide range of impacts are allowed. If there are too many people on foot, you lose the sense of isolation that it is possible to get. If there are too many in boats, again you lose the beauty of sitting there, watching the sunset and feeling that it is just yours to see for that one particular moment.' (P Sutton, Wildlife Preservation Society of Queensland (Hinchinbrook Branch) Evidence 30 July 1998, p 114)

4.111 These risks are well accepted and documented. The Hinchinbrook Island National Park Draft Management Plan acknowledges the fragility of the island's environment and the need to control visitation for the common good:

> 'The unique natural attributes which attract visitors to Hinchinbrook Island are often susceptible to pressures from overuse and the maintenance of these values will pose problems for managers.' (Queensland Department of Environment & Heritage, *Hinchinbrook Island National Park Draft Management Plan*, August 1996, p 19)

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90 For example, Cairns and Far North Environment Centre, Submission 50, p 148; Wildlife Preservation Society of Queensland (Townsville Branch), Submission 79a, p 296.

4.112 The Thorsborne trail on the east side of Hinchinbrook Island is already being used 'to near capacity' and a permit system operates to ration use.[91] The Draft Management Plan proposes to continue limits on visitor numbers and commercial use of the island.

4.113 Supporters of the development argue, in effect, that managing the island national parks is not the responsibility of Port Hinchinbrook - if in future the authorities want to control visitation, nothing stops them. The developer argues that in any case his commercial interests lie in encouraging people to stay in the resort:

> 'I support the Thorsborne Trail 100 per cent. I never want to see any of my guests over there because it is going to take them out of my resort for four or five days and that is not the idea of building a resort. So I am not really encouraging my guests to go and walk on the Thorsborne Trail.' (K Williams, Cardwell Properties P/L, Evidence 10 August 1998, p 305)

4.114 Senator Hill, in his 1996 consent, acknowledged the risk of impacts from increased tourism in the area, but believed that the risk would be 'adequately addressed' by the proposed Cardwell/Hinchinbrook Regional Coastal Management Plan (which would be the first under the Queensland *Coastal Protection and Management Act 1995*). At the same time he concluded a Memorandum of Understanding with the Queensland government aimed at expediting the Plan.[92] Opponents of Port Hinchinbrook are unhappy with what they call 'delegating responsibility' in this way.[93] They are concerned about the slow progress of making the Regional Coastal Management Plan and fear that it will be dominated by 'development interests in the local community who view World Heritage with considerable suspicion and fear.'[94] More comment on the Regional Coastal Management Plan is in chapter 5.

4.115 More generally, environmental groups doubt that national park management will be able to resist the pressures that will arise:

> 'There can be little confidence that existing controls on numbers, and monitoring of both private and commercial use of the Channel and islands, can be maintained in the face of the expected huge increase in numbers of people using the area and the demands of the resort operators and associated commercial interests.' (Wildlife Preservation Society of Queensland (Townsville Branch), Submission 97, p 399)

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91 Queensland Department of Environment & Heritage, *Hinchinbrook Island National Park Draft Management Plan*, August 1996, p 20.

92 Environment Australia, Submission 157, p 752 & attachment K (statement of reasons for consent under *World Heritage Properties Conservation Act 1983*), p 8.

93 Cairns & Far North Environment Centre, Submission 50, p 144,149; Queensland Conservation Council, Submission 117, p 476; Environmental Defender's Office Ltd, Submission 144, p 662.

94 D Haigh, Submission 57, p 185.

4.116 The Chair of the Committee comments:

- Possible longer-term impacts from increased visitation, like aesthetic impacts, have been particularly badly considered in the development approval process for Port Hinchinbrook.
- It is already acknowledged in the national park draft management plans that pressure of visitation is a problem for managing the island national parks. It seems reasonable to assume that building a 2,000 bed resort at Port Hinchinbrook will increase the pressure.
- It is naïve to dismiss the issue by saying that this is not the responsibility of Port Hinchinbrook, on the grounds that if the authorities want to limit visitation, they can do so whenever they like at the stroke of a pen. Even in this inquiry there was obvious conflict between those who attach more importance to preserving the wilderness experience, and those who attach more importance to opening up the islands to more visitors (more comment is in chapter 5). The political pressure to accommodate increased visitation will be ongoing.

4.117 In particular, the Australian Democrats reject the implication that environmental impacts relating to human behavioural responses are of less concern than impacts relating to natural processes because - in theory - they can be controlled by regulation at the stroke of a pen. Impacts of human behaviour changing in response to development are just as important and can be just as intractable as impacts concerning natural processes. Refusing a development application in order to pre-empt some unwanted behaviour down the track is just as legitimate as refusing it in order to prevent erosion or pollution.

4.118 In all cases we must consider the risks involved and the difficulties of mitigation. Whether an impact is a natural event (such as 'acid runoff') or a human event (such as 'pressure of increased tourism'), and whether possible mitigation is an engineering feat or simply making a regulation, is beside the point. Arguably, trying to influence people's behaviour by regulation is often much harder politically than trying to influence natural processes by feats of engineering.

4.119 Accordingly, it is not adequate for Environment Australia (for example), to dismiss the issue by saying, 'the location of a large integrated resort facility such as Port Hinchinbrook in an area that has not previously been exposed to large scale mass tourism is likely to require careful regulation of relevant activities to ensure no unacceptable impacts on the surrounding area.'[95] Such comments ignore the obvious possibility that 'ensuring no unacceptable impacts' by regulation may prove impossible.

4.120 This conclusion also applies to risks to dugongs from boatstrike. It would obviously be irresponsible to approve a development that increased the risk on the

95 Environment Australia, Submission 157, p 757.

grounds that boating could - in theory - be controlled. An approval decision must balance the desired benefits of the development against the risk that controlling the boats later would prove impractical or politically impossible.

> 'Practically, it would be very difficult to impose a requirement that, say no more than 20 power boats may use the Hinchinbrook Channel at any one time, given that a 234 boat marina and a two lane public boat ramp would have been built. The viability of the proposal would be put at risk. This demonstrates the fundamental nature of the issues that required assessment prior to construction being approved.' (Environmental Defender's Office Ltd, Submission 144, p 662)

Conclusions on environmental impacts of Port Hinchinbrook

4.121

- In spite of the frequent promises of the authorities, the Committee considers that environmental management of Port Hinchinbrook has been very far from 'best practice'. The credibility gap between the promises and the reality has been a major cause of public mistrust of the authorities' handling of the development.
- Acid sulfate soils need to be managed properly. The Australian Democrats share the fears of most involved scientists that in fact they have not been managed properly. QASSIT's March 1999 report of its January 1999 inspection tends to support this view.[96] The Acid Sulfate Management Plan is far from best practice, and has been breached in several ways.
- Possible impacts from mobilisation of heavy metals in acid leachate are disputed and we cannot reconcile the evidence. In view of the limited scientific knowledge of the impacts of mobilised heavy metals, the precautionary principle should apply.
- Contrary to the fears of environmental groups, surveys since 1994 have shown no detrimental effects on seagrass. However we note Dr Coles' proviso that tropical seagrasses are naturally very variable from year to year and, therefore, long-term research is necessary to isolate unnatural changes.[97]
- The Committee agrees with Prof. Marsh and others that there is a serious risk to dugongs from increased boat traffic caused by the development, and that a properly researched Boat Traffic Management Plan is essential to protect them.
- Harm to other endangered or vulnerable species mentioned in evidence is possible on the face of it but, in the absence of information about the total range and population of these species, the evidence gives no basis for saying how

96 Queensland Acid Sulfate Soils Investigation Team, *A Report of the Acid Sulfate Soil Situation, Port Hinchinbrook Development Site*, March 1999. Further information p 853ff.

97 Dr R Coles, further information 23 March, p 411.

likely harm is or how serious it would be. The precautionary principle should apply.

- In the Australian Democrats' view, the aesthetic impact of the development on the unspoilt natural landscape of the Hinchinbrook Channel is obviously detrimental. How serious the detriment is, is a matter of opinion - and on this matter more than most opinions are inherently subjective.
- The development will undoubtedly create pressure for increased tourism in the surrounding island national parks, and if this is not controlled long-term detriment to the wilderness values of the area is very likely. Now that Port Hinchinbrook is well under construction the authorities are right to turn their minds to planning the appropriate controls. The Australian Democrats hope that the appropriate controls will be effective but, given the political pressures involved, we cannot be confident of it - especially in the longer term. We reject the argument that because these impacts can, in theory, be controlled at the stroke of a pen, it was reasonable to discount them when approving Port Hinchinbrook. Impacts from human behaviour changing in response to a development are just as important and can be just as intractable as impacts concerning natural processes, and are just as valid a reason for refusing a development in order to avoid the risk.
- Lack of research, particularly into longer-term impacts, was a common theme in submissions, especially from the relevant experts.

4.122 In relation to the last point, the Committee was struck by the potential negative effects that could result from the lack of research on the environmental impact of various land uses in areas adjacent to pristine waters and areas recognised for their great aesthetic values and their biological diversity. In the Committee's view, governments should recognise their responsibility in that regard and encourage scientific research and environmental impact studies by appropriate experts.

4.123 These conclusions are mixed. In evidence environment groups often assumed that if a thorough upfront Environmental Impact Statement (EIS) had been made, the development would 'obviously' have had to be refused. We cannot be sure of this - lack of information cuts both ways. But the precautionary principle should apply: lack of scientific certainty should not be used as a reason for allowing a development where there are threats of serious or irreversible environmental damage.

4.124 Perhaps an up-front EIS would have recommended refusal. The Committee is more confident that if approval had been contemplated aster an EIS, it would very likely have suggested conditions different from those of the present development (for example, a different-looking development to mitigate aesthetic impacts, or a smaller development to mitigate future pressure on the islands). Such conditions might have made the development economically unviable, but that is a separate question which is not relevant to environmental impact assessment.

4.125 In any case, decisions on development applications depend not only on the information revealed by environmental assessment, but also on value judgments about the relative weight that should be given to the bits of information and the relative weight that should be given to different interests. We repeat the main theme of this report: the purpose of upfront environmental impact assessment is simply to ensure that decisions on development applications are made on the best possible information. Where decisions involve balancing conflicting interests, the environmental assessment itself cannot objectively decide the question: balancing conflicting interests must remain a matter for the decision-maker taking into account all relevant factors and reflecting community values.

4.126 The purpose of environmental impact assessment is simply to ensure as far as possible that decisions are made with knowledge and foresight rather than with ignorance, so that developers and communities are not surprised further down the track by detrimental effects which they would have liked to avoid, had they thought about them in time. The Committee stresses again that environmental impact studies are not simply a matter of monitoring and mitigating effects of developments already committed, but must be done in advance in order to inform the decision on the development application.