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Response to the Productivity Commission's Draft Research Report "Industries in the Great Barrier Reef Catchment and Measures to Address Declining Water Quality" Released 20th November 2002

1. Introduction

This submission is made on behalf of Queensland's sugarcane growers by Queensland Cane Growers Organisation Ltd (CANEGROWERS). CANEGROWERS provides representation and services to the sugarcane growing industry with over 94% voluntary membership from approximately 5,500 mostly family farming enterprises. The cane growing industry is only one sector within a sugar industry that includes milling and refining. There is also a distilling industry with an emerging ethanol industry both dependent on cane growing.

In September this year CANEGROWERS provided the Productivity Commission with a submission to the enquiry titled, "Industries in the Great Barrier Reef Catchment and Measures to Address Declining Water Quality". This submission was based on the four terms of reference that are:

- Outline the economic and social importance of the main industries in the catchment at a local, regional, state and national level;
- Estimate the economic importance of the main industries in 2010 and 2020;
- Discuss the current management approaches of the main industries to activities affecting water quality; and
- Assess the costs and benefits of policies to address declining water quality.

On the 20th November the Productivity Commission released a draft research report. In this second submission from CANEGROWERS, we respond to some key issues raised in the draft research report in particular focusing on issues as they potentially affect future government policy relating to cane growing.

2. Threats to the Great Barrier Reef

The draft report categorises pollution arising from human activities as non-point source, point source or marine-based. Threats to the Great Barrier Reef can also be categorised as local, regional and global (R.M Carter, The Great Barrier Reef - Which threats are real and

how should we manage them? A Lecture at the Institute of Public Affairs, Melbourne, 21 August 2002). Local threats are typically associated with urban and tourism developments and activities and for example may include damage associated with boat anchorage and jetty development. Regional threats include crown-of-thorn starfish outbreaks and fears that increased sediment and nutrient runoff will damage large areas of the reef. Global threats include the effects of sea-level rise and sea-surface temperatures warming the latter potentially resulting in coral bleaching across the globe.

The Productivity Commission draft report is clearly pitched at the regional level with a focus as defined by the terms of reference on industries in GBR catchments and their potential impacts on water quality.

Interestingly global threats are not considered at all in the draft research report and local threats are dismissed as "red herrings" (Box 1. pg xxvii). The total focus on regional threats detracts from the completeness of the potential analysis. For example, what is the potential impact of sea-surface temperature warming and how effective is regulation at controlling local damage from tourism activities or sewerage discharge?

CANEGROWERS recommends that the final report place the current focus on regional threats to the GBR including the threat of water quality decline, in context with reference to global and also local threats.

The draft report states that, "the cumulative effect of all these (local threats) is tiny, compared to the effects of sediments, nutrients and agricultural chemicals, as described in this report… the above-mentioned sources are carefully monitored and controlled" (pg xxvii). How "tiny" are the impacts of the local threats and what is the level of resource commitment to their monitoring and control relative to the regional threats?

The activities listed by the Productivity Commission draft report as "red herrings" contain highly relevant activities that should be considered in any water quality impact investigation, in particular the use of household and garden sprays, fertiliser and herbicide use on golf courses, detergents from washing cars, unsewered areas of the GBR catchment, anti-fouling paints used on boat and ship hulls particularly in ports, and road construction. The Moreton Bay Catchment Partnership has found that the faeces of household pets contribute significantly to the nutrient loads arising from urban areas. To dismiss these activities as "red herrings" without first undertaking a transparent analysis of their relative impacts is not logical. These threats do affect water quality locally and if tourism is to be a major growth industry in the GBR catchment, then surely this industry, "Coastal Development", requires more prominence in the findings and policy recommendations from the Commission.

CANEGROWERS recommends that Box 1 and the phrase "Red Herrings on the Reef" be removed from the final report and the activities and impacts associated with coastal development be revisited and reconsidered.

3. Circumstantial Evidence for Water Quality Decline

The draft report by the Productivity Commission indicates that "there is no conclusive evidence yet of declining water quality within the GBR lagoon or of any resulting damage to

ecosystems…" but suggests there is circumstantial evidence for an impact, for example, from "historical photographs" (pg xxv). Yet the only published study of the historical photographic record that we are aware of concluded that there is no evidence to suggest damage to reef systems from human activity. However, incredibly this study is often quoted by Great Barrier Reef Marine Park Authority staff as evidence of an impact including in a presentation to the Landcare Council on 14th October 2002. It is apparent that the Productivity Commission officers have assumed that they can repeated what they have been told by GBRMPA staff, rather than reading the actually study and its conclusions.

This study by D. Wachenfeld, J. Oliver & K Davies titled "Long-term trends in the status of coral reef-flat benthos – The use of historical photographs", In *State of the Great Barrier Reef World Heritage Area Workshop*, Proceedings of a Technical Workshop, Townsville 1995, pg. 134-148, clearly states in its conclusion that,

"… from the results of the Historical Photographs Project so far, the number of locations that do not appear to have changed since the historical photographs were taken throws doubt on the proposition that the GBR is subject to broad scale decline".

Wachenfeld, Oliver and Davies (1995) conducted the "Historical Photographs Project" for the Great Barrier Reef Marine Park Authority. According to the authors "using comparisons between modern and historical photographs as a measure of reef-flat health is a coarse tool with several important limitations (such as only reef-flats near a recognisable landmark can be studied, non-randomness of original 'sampling', absence of quantitative data and incompleteness of the temporal record). These limitations must be considered when considering photographic comparisons." Based on the first of these limitations only, Wachenfeld, Oliver and Davies developed criteria for accepting photographs for use in the project, namely, each photograph had to depict coral reef substrate exposed above water and each photograph, or set of photographs, had to have a recognisable landmark to allow relocation of the site.

Table 1. Summary of observed change as noted by Wachenfeld et al., 1995 at reef flats using historical and present day photographs

Location of reef flat	**Description**	**Observed change**	**Recorded natural damage**
Daydream Island		None	
Hayman Island		Area of branching hard coral is less	
Bramston Reef	Mainland fringing reef near Bowen	Loss of *Acropora* spp, mud and algae, smaller faviid colonies	
Stone Island	2km from coast near Bowen	Loss of *Acropora*, fewer massive coral colonies, coral rubble and algae	Cyclone 1918
Magnetic Island – Geoffrey Bay		None	
Great Palm Island – Coolgaree Bay		None	
Orpheus Island –		None	

Little Pioneer Bay			
Fantome Island		None	
Fitzroy Island		Addition of soft corals to the area	Cyclone 1990
Green Island – north east		Loss of *Acropora* with only small colonies present, dominant organisms are soft corals	
Green Island – south east		None	
Double Island		Decrease in soft coral cover	
Michaelmas Reef		Loss of hard coral, dominated by alcyoniid soft corals	
Low Isles –three sites (seaward edge looking south, middle reef flat looking south, reef flat looking north east)		Only one site (north east) showed change with a loss of hard coral cover and dominance by alcyoniid soft corals	
Pickersgill Reef		None	

Wachenfeld, Oliver and Davies (1995) found that where evidence of change existed (Table 1), the change was a decrease in cover of branching hard coral and in increase in cover of alcyoniid soft coral and/or algae and/or coral rubble. The author concluded that because the sample size was small and limited (reef flat only) with bias towards the branching corals (due to their beauty and so interest to the historical photographer) and that the number of locations that do not appear to have changed since the historical photographs were taken throws doubt on the proposition that the GBR is subject to broad scale decline. The author did not attempt to ascertain the cause of change at some reefs as this was beyond the scope of the project. In summary this paper does not present data supporting impact from land based pollution on the Reef.

CANEGROWERS recommends that the final report be based on an analysis of the published studies pertaining to reef health rather than hearsay.

4. **Causes of water quality change – sugarcane cultivation**

The draft report contains a subsection titled “sugar cane cultivation” under a section titled “causes of water quality changes” (Section 2.3, p.27). This section contains some significant errors of fact beginning with the statement that “sugarcane tends to be grown in the Wet Tropics”. On a per hectare basis only 18% of the Queensland crop is grown in the Wet Tropics (Table 2). One of the largest single areas of cultivation is in the dry tropics, in the Burdekin catchment.

This section (pg. 27) suggests sugarcane is currently impacting on water quality in the reef lagoon. However, there is no evidence to suggest that there is a water quality problem in the GBR lagoon let alone from sugarcane production.

Table 2. Hectares Harvested by Region

Region	Hectares Harvested	% of total
Wet Tropics	80 322	19%
Herbert	56 877	15%
Burdekin	76 047	18%
Central	121 624	29%
Southern	74 370	19%
Total	421 641	

The statement "sugar cane cultivation potentially contributes about 25 per cent of the total load of nitrogen to the GBR" (pg 27) is misleading. Earlier in the draft research report it is acknowledged that the majority of nutrients in the GBR ecosystems are recycled within the GBR, with only about 5 % added annually from external sources (pg 21). Of the 5% added from external sources the "largest source" of nutrients to the GBR lagoon is considered to be terrestrial runoff (pg 21) with no data presented for other external sources. The figure of 25% thus presumably represents 25% of the 5% total external contribution of nutrients, or in other words, 1.25% of the total input of nutrients to the GBR. Expressing the information this way provides a less emotive and more realistic picture of nutrients and the GBR.

However, a more accurate value would be much less than 1.25% as Table 2.3 (pg 25) is mathematically incorrect. The percentage shares as listed total 100%, but this cannot be the case as data was not available for all sources of pollution. It is likely that "Cropping" and "Other Agriculture" have similar inputs if the data was available for correct computation of percentage shares.

It is also wrong to state that, " there is now sufficient evidence to indicate that delivery of nutrients to waterways draining cane land is higher than that of most other land uses" (pg 27). It is well know that on a per hectare basis nutrient delivery from sugarcane is significantly less than many land uses including banana cultivation and that on a per hectare basis unsewered residential areas contribute almost twice the total nitrogen load of other landuses including sugarcane (eg Walton, R.S & Hunter H.M 1997. Water quality modeling with HSPF in a Tropical Catchment. Proceedings of 24th Hydrology and Water Resources Symposium. Institute of Engineers. Canberra.)

It is also misleading to suggest higher levels of atrazine and diuron associated with sugarcane production. David Haynes' study titled "Pesticide and Herbicide Residues in Sediment and Seagrasses from the Great Barrier Reef World Heritage Area and Queensland coast, In the Marine Pollution Bulletin, Vol 41, pgs 279-287, is often cited as providing evidence of pesticide and herbicide contamination of the Great Barrier Reef from agriculture and, in particular, cane-growing. In the study, sediments and seagrass from 16 intertidal and 25 subtidal sites were analysed for pesticide and herbicide residue. At most sites, no chemical residue could be detected in both the intertidal and subtidal sediments. Low levels of the

herbicide diuron were found at the mouths of some rivers in the Wet Tropics and were detected in seagrass from the vicinity of Cairns, Cardwell, Townsville and Brisbane. Sugarcane is not grown near the sites that yielded the highest concentrations of diuron in the seagrasses. These areas have marinas, and diuron is an active ingredient in 30 registered formulations used on boat hulls and for anti-fouling slime control purposes. Haynes' study provides no evidence that would enable the reader to distinguish the likely source of the diuron, yet concludes that, 'contamination is associated with intensive agricultural land use (primarily sugarcane production).'

This section of the report claims there is "some evidence of other pollutants associated with sugarcane cultivation … (as) the likely cause of some of the increase in heavy metal concentration in Hinchinbrook Channel and Missionary Bay" citing an unpublished report from the CRC Reef. The industry is unaware of the basis for such a claim. The same unpublished report is extensively cited throughout the draft research report by the Productivity Commission. We suggest that the Productivity Commission would produce a more robust report if its officers sourced their information directly from the published scientific literature rather than from unpublished reviews by those in management positions.

CANEGROWERS recommends that the final report be based on an analysis of the published scientific literature pertaining to reef health rather than hearsay and claims made in unpublished reviews.

5. Discrepancies between unpublished reports and the published scientific literature

It is our view that the Commission has taken the easy option of selectively quoting from non peer-reviewed reports to support the popular belief that there could be a problem with water quality on the Great Barrier Reef in the future and that there may be circumstantial evidence now, rather than undertaking a thorough investigation of the published scientic literature to first define the current situation regarding water quality and the Great Barrier Reef.

One of the non-peer review reports cited by the Productivity Commission is the World Wide Fund for Nature Reef Report Card. The draft report from the Productivity Commission quotes this report as indicating that some near-shore reefs in the GBR lagoon are muddier and have less coral and more algae than 10 -20 years ago. This information needs to be balance against the published literature that clearly indicates an absence on the GBR shelf of either increased sediment input or increased turbidity. In fact the published research indicates that sediment input from land-based sources, even under flood conditions, is far less than that held in suspension by natural swell waves on more than 200 days per year in the naturally muddy inner shelf of the central GBR. This inner shelf region between Cairns and Bowen is naturally muddy because of sediment deposition that has occurred over many thousands of years. In contrast the middle and outer reef are sediment and nutrient starved and the extraordinary event that results in some land-based nutrient and sediment getting beyond the inner reef may be beneficial to these systems. This information is presented in Larcombe, P. and K.J. Woolfe, (1999), 'Increased sediment supply to the Great Barrier Reef will not increase sediment accumulation at most coral reefs', *Coral Reefs*, Vol 18, pgs 163-169 and also Larcombe, P., (2001) 'Holocene Great Barrier Reef: sedimentary controls and implications for environmental management', *Geological Society of Australia Special Publication*, Vol 21, pgs 281-294.

With respect to nutrients, we support the conclusions of the Productivity Commission that there has been no measurable change in the nutrient status of the waters of the Great Barrier Reef including the inner shelf. The reality is that water quality is good. There are no deteriorating trends regarding water quality in the inner, middle or outer reef. This data is presented in D.R. Wachenfeld, J. K. Oliver and J.I. Morrissey (1998), *State of the Great Barrier Reef World Heritage Area*, Great Barrier Reef Marine Park Authority and also M.J. Furnas, A.W. Mitchel and M. Skuza (1995) 'Nitrogen and phosphorous budgets for the central Great Barrier Reef shelf', *Great Barrier Reef Marine Park Authority Research Report.*

The health of corals can be reliably measured through coral cores that measure and compare calcification rates dating back to the 1400s. These studies have shown that during the last century (20^{th} century) calcification rates (i.e. coral growth rates) increased by an average of 4% across the reef system including corals of the inner shelf. This data is presented in Lough, J. M & Barnes, D.J. (2000), Environmental control on growth of the massive coral *Porites*, *Journal of Experimental Marine Biology and Ecology*, Vol 245 pgs 225-243.

In summary, the abstract from the most recent, peer-reviewed assessment of the *Status of Coral Reefs of Australasia: Australia and Papua New Guinea* by Maniwavie, Sweatman, Marshall & Munday in a book edited by Clive Wilkinson (*Status of the Coral Reefs of the World 2000* published by the Global Coral Reef Monitoring Network) states,

"Australia's coral reefs are well described and monitored, and are generally in good condition. These reefs have exceptionally high biodiversity, favoured by the massive size and diversity of habitats. This biodiversity is, in general, well studied. They are well protected from the relatively low level of human pressures resulting from a small population that is not dependent on reefs for subsistence. An extensive system of marine protected areas is being implemented, the best known of these is the Great Barrier Reef Marine Park (which is also a World Heritage Area). This is the largest marine protected area in the world and serves as a model for the establishment of many other similar multi-user areas. The monitoring programmes on the Great Barrier Reef (GBR) are also probably the largest and most extensive in the world and are used as models for other projects. These are amongst the best-studied coral reefs in the world with very high capacity in all areas of coral reef science, management and education. Large numbers of Crown-of-thorns starfish have damaged some regions of the GBR in the past, although recovery is good in most areas. A damaging outbreak is again threatening. Coral bleaching seriously affected a small part of the inner GBR in 1998 with relatively low levels of mortality generally confined to shallower areas (in depths <6 m), whereas there was extensive coral mortality on the offshore reefs on the NW Shelf off Western Australia at the same time."

Millions of taxpayer dollars have been spent over at least 3 decades to determine that damage has been inflicted on the Great Barrier Reef by sediments, nutrients and pesticides in land runoff. While this assertion continues to be supported by unpublished reports and media headlines the published literature suggests the reef is healthy.

CANEGROWERS recommends that the final report be based on an analysis of the published scientific literature pertaining to reef health rather than hearsay and claims made in unpublished reports.

6. Which reefs are most at risk?

The draft report from the Productivity Commission recommends that policy options should focus on areas of "greatest potential risk", naming the inner reefs from Port Douglas to Hinchinbrook and from the Whitsundays to Mackay as such areas. However, this area of greatest risk as identified by the Productivity Commission does not accord with the CRC Reef's Annual Report 2002 which states "discharges from the dry catchments carry most of the sediment and nutrients reaching the Reef".

Furthermore, government policy formulation on water quality in the GBR catchments has already determined that the Burdekin River and Fitzroy catchments are important in a national context, as demonstrated through the provision of significant National Action Plan For Salinity and Water Quality (NAPSWQ) funds to these two catchments. It seems incredible that the Commission's desk top compilation of the issue should have ignored this significant allocation of public funds to what may be the "wrong" catchments.

7. What monitoring and research for the future?

The Commission recommends further monitoring and research into water quality impacts to assist future policy decision-making.

CANEGROWERS recommends that the following set of principles guide government and industry in assessing the appropriateness of Great Barrier Reef research proposals to be conducted in partnership with industry: Assumptions made in proposals to be clearly stated and adequately justified; There is a balance of projects in the scientific disciples of geology (including sedimentology), oceanography (including climatology), marine and terrestrial biology and that there are appropriate linkages between such projects; Research outcomes will provide adequate data to inform decision making and contribute to planning certainty; The proposed project considers implications for existing farming systems and where appropriate has an extension component as part of the project design; Where possible, the proposed project builds on existing industry programs; and Regional differences are considered and where possible, regional solutions will be identified.

8. Economic and social importance of the main industries

Caution needs to be exercised with the interpretation and use of the information presented in Chapter 4 - *Economic and Social Importance of the Main Industries*. Data collected using different methodologies and from different time periods is presented in the same tables throughout this chapter and in Appendix E (eg. 1999-00, 2000-01 and 1996-97 in Table 4.4). Many of the problems have been noted by the Productivity Commission and include:

- Gross Value Added (GVA) as a measure of economic importance is a meaningful basis for comparison of economic importance across industries. However, GVA data is only available nationally i.e. not for the GBR catchments. Also GVA can result in an underestimate of the importance of an industry.
- The Productivity Commission has instead used Gross Value of Production (GVP) which can overestimate the importance of an industry for example data presented in Table 4.4 for meat, horticulture and seafood processing overstates their relative GVP due to the inclusion of plants outside the GBR catchment.

- It was not possible to calculate GVP using a consistent pricing methodology for all industries for example turnover has been used in Table 4.4 to approximate GVP for the mineral processing industry.
- There is a significant lack of data for sugar processing on a regional level (cited because of confidentiality reasons) with "turnover" used throughout Appendix E. The use of "turnover" in relation to GVP needs to be more clearly defined. The data that is presented for sugar processing at the regional level is from the 7-year old ABS 1996-97 Manufacturing Survey.

The Productivity Commission notes that the data only presents a snapshot in time and does not represent the economic importance of industries over time and the variability that can occur from year to year. In Appendix E an attempt to is made to show time series data through a series of graphs. However, there is no background explanation regarding the developments and /or fluctuations that have occurred in the different industries over time.

There seems to be a general lack of good quality data available from which the Productivity Commission can undertake a comparative study. We provide more up-to-date data on the Gross Value of Sugar Production in Table 1.

Table 1: Gross Value of Sugar Production

	1997	1998	1999	2000	2001
North Qld	$ 535,555,013	$ 476,567,343	$ 351,981,186	$ 283,899,383	$ 435,561,906
Burdekin	$ 439,039,240	$ 399,863,594	$ 340,259,830	$ 288,780,229	$ 371,330,322
Central Qld	$ 533,586,753	$ 497,409,066	$ 362,074,320	$ 237,076,752	$ 382,019,117
South Qld	$ 301,219,831	$ 275,154,414	$ 242,123,507	$ 191,470,564	$ 257,346,802
Queensland	$1,809,400,838	$1,648,994,417	$1,296,438,843	$1,001,226,929	$1,446,258,146

CANEGROWERS suggests that the limitations of the economic analysis be made more explicit in the final report.

9. Preliminary estimates of future economic importance

CANEGROWERS agrees with the generally positive outlook for the sugar industry longer term including with respect to a recovery in yields and the ability to make the productivity gains and cost savings necessary to maintain international competitiveness.

However, the use of the year 2001 as a baseline from which to make projections is not considered appropriate. The use of a single year does not provide an ability to smooth out extreme variability inherent between years. The last few years are a case in point for the sugar industry. The 2001 season was a year of relatively "good" prices ($31.44/tonne cane) whereas cane production (29.8Mt) was at a low level compared to much of that during the second half of the 1990's (38.1Mt in 1997). The 2002 season is shaping up to be a year where production (with the exception of the Southern area) is returning closer to average levels (35 Mt cane) but the estimated price is below the average trend line (estimated AUD $255 – $270 per tonne sugar which will equate to between $24 to $26 per tonne cane).

CANEGROWERS recommends that instead of using one year as a baseline from which to make projections, a five-year average be used to smooth out the variability that exists from year to year.

While the draft report uses in its base case a projection of international prices at US 6.6c/lb in 2010 and US 6.2c/lb by 2020, the Centre for International Economics, April 2002, in its report for the Independent Assessment of the Sugar Industry estimated that the nominal world price will hover around the 7 US c/lb for the next tens years given the absence of two factors – reduction in trade protection and appreciation of all other currencies relative to the US dollar. It would be useful to know the source upon which the draft report projections were made. Another factor to consider is the ethanol economy. In particular a considerable amount of sugarcane from around the world may well be diverted into ethanol which would have a positive effect on sugar prices.

CANEGROWERS recommends that an upward revision of the projected price assumptions used in the draft research report for sugar be considered for the final report.

CANEGROWERS believes that the forward projections for employment in the draft report, which translate into a 1% decline in industry employment per year are reasonable. It is unclear as to whether contractors and seasonal workers have been included in Table G5. Also regional employment projections do not account for changes in GVP by region.

CANEGROWERS recommends that an ABS definition of what comprised the farm level employment be included for clarity in relation to the employment projections.

10. Current Management Practices

CANEGROWERS finds the description of "current management practices" for the cane growing sector contained in the draft report (p.127 –136) to be misleading and incomplete. We draw the attention of the Commission to page 7 of our initial submission that states, " the industry has determined best management practices for the production of cane and these are summarised in the COMPASS self assessment workbook." These best management practices are the current recommendations and have been determined in consultation with government and industry.

While surveys of adoption rates of certain practices have from time to time been undertaken (for example, CRC Sugar, in 1998 as quoted in the draft report), the industry is now in a good position to, over the next few years, determine adoption rates of the industry's recommended best management practices through the COMPASS program.

CANEGROWERS has a voluntary code of practice for sustainable cane growing. The Code was developed in 1998 and is a schedule under the *Queensland Environment Protection Act 1994*. However, contrary to suggestions in the draft research report, the Code was never designed to be a tool to measure the adoption rate of best management practice by the industry. Rather the code effectively and succinctly outlines the industry's environmental policy and outlines to cane growers their environmental responsibilities. The 1998 document is currently being reviewed and a much longer and updated draft is being developed by the industry in consultation with the state government.

Complementing the Code, COMPASS potentially provides the industry with a framework for best management practice determination, delivery and extension. COMPASS provides coordination of effort and resources by both industry and government. It is the cornerstone of the sugarcane growing industry's best management practice program. Further components of the program are planned over the next 3 years, including monitoring and evaluation.

CANEGROWERS recommends that the Commission improve the description of COMPASS and include Table 3 from the initial CANEGROWERS submission to the Commission in the final report.

11. Prelude to an analysis of policy options

Managing water quality impacts in catchments containing sugar is something the cane growing industry is committed to continue advancing and, on behalf of Queensland's cane growers, we restate our commitment to minimising the impacts of farming practices on the waterways of the GBR catchment. Removing impediments to adoption of best management practices through a better policy framework is welcomed.

The Commission states in the report that a cost benefit analysis of policy options would be the ideal approach, but "with this issue, the non-market values are significant". "Therefore the Commission expects to focus on the effectiveness and cost effectiveness of various policy options in its final report. In other words, the emphasis would be on ranking different options, considered effective in reducing threat and preventing damage, based on their cost per unit of abatement of pollutant discharges." It then states that "To date, the Commission has found little information about the precise quantity of pollutant discharges associated with particular management practices."

We believe that this methodology adopted by the Commission to determine policy is flawed for the following reasons:

By looking at costs only, the Commission is leaving the determination of the "benefits" to someone else. Who will this be, what will their methodology for determining benefits be and how will the industry be involved in this determination?

By ranking costs based on their cost per unit of pollution abatement, the Commission is not considering how much pollution abatement is needed before environmental improvement is considered to have been sufficient. Where is the endpoint to the ranking? Who determines this? The Commission is admitting that it cannot determine improvement in environment, so in effect, all it can do is rank purely on cost.

The draft paper refers to distributional consequences of policy options and the cost of remaining with the status quo. If costs to industry and the community on this issue cannot be properly established, how will the Commission be able to determine the costs imposed on other industries by the various policy options, including the status quo?

If costs are to be placed on the sugar industry for managing what are potential risks to the GBR, then we suggest that costs should be placed on those activities of other industries which have been shown to definitely impact on the GBR including fishing and tourism (State

of the Great Barrier Reef, GBRMPA, 1998). In addition, government may be wiser to spend limited resources on addressing those activities that have been shown to definitely impact the GBR rather than those that might.

CANEGROWERS supports the draft report's conclusion that an approach to developing policy options needs to consider the uncertainty about how human activities affect the Reef. Policy options need to consider the pressure placed on an industry because of potential risk, something that is, by the Commission's own findings, difficult to assess in dollar terms. The Commission should consider only those policy options that do not negatively impact on an industry if there is no evidence in the first place of impact contribution. Win-win actions and research are fair policy options given the uncertainties.

The concept of focussing on areas and industries of greatest potential risk is unequitable particularly when it is stated that, "it is possible that it is a minority of producers across many industries that account for a disproportionate share of pollutants". Why should all members in a few industries be targeted and potentially disadvantaged? A more just proposal would be to look at the areas of management practices that provide greatest potential risk in all industries that operate in the GBR catchment.

The draft report makes mention that policy options will need to consider impediments to adoption of best management practices. CANEGROWERS supports this approach. Cost sharing arrangements such as the Rural Water Use Efficiency Initiative have proved highly successful in providing the incentive for growers to move to better practices.

CANEGROWERS recommends that policy options designed to improve best management practice uptake contain financial incentives components linked to best management practice frameworks such as COMPASS.

The draft report contains a table (Table 2, Overview, p xxx) which provides "examples of current management practices relevant to GBR water quality". Most of the listed practices are covered by COMPASS. Once again, it is important that the Commission consider reworking the information on COMPASS in the final report.

Policy that assists industry to implement best management practices should be favoured as detailed in Table 3.

Table 3. Recommended policy instruments relevant to sugarcane growing.

Water Quality concern[a]	**Potential harmful practice**[a]	**Potentially Beneficial Practice**[a]	**Recommended Policy Instrument**
*Sediment*s – Loss of Landcover	Land clearing	Keeping or planting natural vegetation	Covered in COMPASS – incentives for BMP adoption needed. Regional vegetation management plans in place and resourced for local implementation. Planting best coordinated locally with community support.

	Frequent and intensive crop cultivation	Minimum tillage	Covered in COMPASS – incentives for BMP adoption needed. Continue research and extension.
		Cover crops fallow periods	Covered in COMPASS –incentives for BMP adoption needed. Continue research and extension.
		Harvesting debris left as cover	Covered in COMPASS – incentives for BMP adoption needed.
		Buffer zone between activity and waterway	Covered in COMPASS – incentives for BMP adoption needed particularly for riparian landholders.
Sediments – Streambank Erosion	Cultivation close to waterways	Erosion control structures.	Covered in COMPASS – incentives for BMP adoption needed particularly for riparian landholders.
		Buffer zones between activity and waterways	Covered in COMPASS – incentives for BMP adoption needed particularly for riparian landholders.
Nutrients – Application of Fertilisers	Application beyond plant needs Application near waterways	Precision methods and scheduling application (eg soil tests, weather, irrigation timing)	Covered in COMPASS – incentives for BMP adoption needed. Incentives to adopt a product stewardship approach (to include fertiliser supply and distribution chain, fertiliser spreader contractors etc). Continue research and extension. Incentives for conducting soil tests and keeping records. Incentives for purchase of precision application equipment.
		Use of more benign fertilisers	"Benign" needs to be defined through life cycle assessment. Those found to be benign will then require field testing to establish nutritional value prior to industry recommendation.
Nutrients – Loss of riparian filters	Activity close to waterways	Buffer zones between activity and waterways	Covered in COMPASS – incentives for BMP adoption needed particularly for riparian landholders.
Pollutants – Application of herbicides and pesticides	Over application of chemicals	Weed and pest monitoring IPM	Covered in COMPASS – incentives for BMP adoption needed.

		Use of more benign chemicals	"Benign" needs to be defined through NRA process. Those designated as benign must still be effective for weeds and pest control within an IPM system. Better recognition of the value of pesticides and herbicides for modern agriculture is needed.
		Coordinating application with irrigation activities	Covered in COMPASS – Incentives for BMP adoption needed.
Pollution – Disturbing Acid Sulfate Soils	Poor site selection	Planning site selection Maintaining vegetation and ground cover	Covered in COMPASS – Incentives for BMP adoption needed. State ASS guidelines have been developed – promote their uptake. Mapping of PASS needs to be continued and expanded.
Loss of Filter Functions in Coastal Areas – Clearing and drainage of wetlands	Poor site selection	Withdrawing activity and rehabilitating wetlands	Compensation for owners of reclaimed wetland.
		Effective site selection	Mapping of wetlands needed. Covered in COMPASS – Incentives for BMP adoption needed.
		Protecting remaining filters	Mapping of wetlands needed. Covered in COMPASS – Incentives for BMP adoption. QDPI's Fish Habitat Code of Practice for the maintenance of cane drains already in place, could be extended with external funding.
Other - Irrigation	Over irrigating	Irrigation scheduling Use of more efficient irrigation systems	Covered in COMPASS – Incentives for BMP adoption needed. Continue incentive program established under Rural Water Use Efficiency Program.

[a] From Table 2 of draft report.

End.