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Proposals for 'environmental' allocations

Background

2.1 The fundamental issue is how to achieve sustainable water resources while satisfying consumptive demands. The submission from the Australian Bureau of Agricultural and Resource Economics (ABARE) expressed the issue this way:

> Maintaining sufficient water in rivers and streams that provide for irrigation uses as well as meeting the ecological needs of the riverine environments is a growing public policy issue … Many in rural and urban Australia see allocation of water between consumptive and environmental uses as a critical issue.[1]

2.2 The ABARE submission noted that allocation of water to the environment has become, by default, a government responsibility:

> Many of the benefits provided by environmental flows are not valued in a market, and are therefore unlikely to be provided by individuals or private entities seeking to make a profit. Hence, the COAG reforms committed Australian governments to allocating water to the environment.[2]

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1 Submission no, 94, p. 10.

2 Submission no. 94, p. 10.

2.3 Much of the evidence the Committee received on environmental issues concerned the specific question of so-called 'environmental flows', particularly in the context of the *Living Murray* process. Irrigators are particularly concerned at how the current debate about putting more water back into rivers could impact on their traditional access to water.

2.4 During the course of the Inquiry, the Committee came to the conclusion that there is too much focus on specific volumes of water. The Committee believes that recent consideration of specific amounts of additional flows (350, 750 or 1,500 GL) has confused the issue, which should be about what combination of measures will result in river health and sustainable rivers rather than trying to pick the right figure out of three options.

COAG and the environment

2.5 The 1994 Council of Australian Governments (COAG) Water Reform Framework was a significant development in water policy in Australia. The key objective was to achieve an efficient and sustainable water industry by establishing integrated and nationally-consistent approaches to water resource management throughout Australia.

2.6 COAG announced a new National Water Initiative (NWI) on 29 August 2003. On environmental matters, the Joint Communique on the NWI set two key environmental aims— 'returning over-allocated systems to sustainable allocation levels' and 'ensuring ecosystem health by implementing regimes to protect environmental assets at a whole-of-Basin, aquifer, or catchment scale'.

2.7 The NWI includes new funding of $500 million over five years to address what was said to be over-allocation of rivers in the Murray-Darling Basin. The Joint Communique said:

> Recognising the declining health of the River Murray system in particular, COAG noted that member jurisdictions of the Murray-Darling Basin have agreed to provide new funding of $500 million over five years to address water over-allocation in the Basin.[3]

3 Council of Australian Governments, Joint Communique, 29 August 2003.

Sustainable water resources

2.8 There is no doubt that the attention given to environmental issues in recent years has had a significant impact on the management of water resources. There is now a much stronger recognition by stakeholders of the need to take environmental issues into account when determining policies related to natural resource management.

2.9 Several State-based farmer organisations made submissions to the Committee and expressed strong support for the principles of sustainability. Farmers realise that, for their long-term viability, they must have continuing access to water of the required quantity and quality. For example, the submission from the Queensland Farmers Federation advised:

> QFF strongly supports and advocates sustainable farming practices, and recognises the need for protection of environmental values through the sustainable use of natural resources … Ensuring the sustainable use of Queensland's natural resources will maintain this viable industry into the future.[4]

2.10 The submission from the South Australian Farmers Federation listed three key priorities in regards to water, of which the environment came first. It said:

> Simply put, the South Australian Farmers Federation believes that water management in Australia must ensure the following:
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> - Environmental flows
> - The real value of water used in primary production is used to assess industries' viability; and
> - potable supplies which are of suitable quality and quantity[5]

2.11 Mr Fred Tromp, representing the Western Australian Department of Environment, told the Committee:

> I hope we all agree that there is a need to elevate water and environmental policies and programs at both Commonwealth and state levels if our Australian society is to enjoy existing benefits into the future. Without the recognition of environmental values in our health and governance systems, Australia would not maintain the present high quality of life which we enjoy.[6]

4 Submission no. 116, p. 3.

5 Submission no. 33, p. 1.

6 Transcript of evidence, p. 646.

2.12 The comments in the submission from Hydro Tasmania indicate how seriously environmental issues are taken:

> Hydro Tasmania takes its environmental responsibilities very seriously and has initiated a series of projects under the banner of its Aquatic Environment Program. Typical projects may be to:
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> - assess the impact of hydro dams on fish passage;
> - evaluate the environmental flow requirements in waterways affected by diversions;
> - monitor and assess the impacts of hydro operations on water quality;
> - investigate options to mitigate the impacts on hydro operations on threatened species; and
> - assess the impacts of pest species in hydro reservoirs or water ways.
>
> These projects are ongoing and provide an updated assessment of the environmental impacts of its activities on the environment and develop measures to address any significant adverse impacts since the schemes were originally built.[7]

2.13 The fundamental issue is how to achieve the right balance of water use between agriculture and the environment. Farmers have built businesses and communities, often over several generations, based on historic access to water. Their strong preference is that allocations to agriculture are not reduced—if additional water is required to improve river health, then that water should come from other sources.

2.14 While in recent years the environment has been recognised as a legitimate user of water in its own right, historically water in a river has been allocated first for consumptive use (domestic, industrial or agricultural) and the excess served biodiversity needs and flowed out to the ocean.

2.15 Some commentators, such as The Wentworth Group, are calling for the environment to have a 'prior right' to water. That is, that water for the environment should be the first to be allocated, followed by allocations to other users. They believe the river should come first on the basis that there must be a sustainable resource of good, clean, water before it can be allocated for use. Professor Peter Cullen, a member of the Wentworth Group, told the Committee:

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7 Submission no. 40, p. 9.

> … in a lot of the water allocations that have been happening over the last decade the security of existing irrigators was guaranteed and any residual was left for the environment. In no way did it provide enough for the environment, nor did it meet the COAG agreements of 1994 … [T]he environment was not another optional extra, another competing pressure. Unless you had some environmental security, you did not have a river at all … [and] unless you have a reasonably healthy environment, you cannot hang agriculture or town water supply off those rivers.[8]

2.16 On this question representatives of the National Farmers Federation suggested that stock and domestic use should have first priority access to water resources.[9]

2.17 There is now widespread recognition in Australia of the need to manage natural resources, including water, on a sustainable basis. Sustainable rivers are a fundamental prerequisite for the long-term well-being of rural communities and irrigated agriculture. To be sustainable, a river must be 'healthy'.

2.18 The question of what level of river flow ensures health and sustainability has great potential to impact on the future supply of water for rural industries, which is the focus of this Inquiry.

What determines river health?

2.19 The health of a river is determined by a combination of its flow regime, the condition of its catchment and floodplain lands and in-channel habitats, and its water quality and water temperature. These attributes must be considered holistically.

2.20 The actual volume of flow in a river is an essential component of river management, but is not sufficient in itself to ensure the health of a river.[10]

8 Transcript of evidence, p. 677.

9 Transcript of evidence, p. 690.

10 This definition is taken from the CRC for Freshwater Ecology report prepared for the MDBC "*Independent Report of the Expert Reference Panel on Environmental Flows and Water Quality Requirements for the Murray River System*", February 2002, p. 4.

What is a working river?

2.21 A working river is a river whose natural flow has been altered through human intervention (such as dams or weirs) and whose waters are used for consumptive purposes, for example for domestic, industrial or agricultural uses.

What is a healthy working river?

2.22 The concept of a 'healthy working river' has gained currency in recent years. It describes rivers whose waters are extracted by humans for various uses, but whose health is maintained to ensure its sustainability for future generations.

2.23 Dr John Whittington of the Cooperative Centre for Freshwater Ecology is an authority on this subject. His definition of a healthy working river is: "A healthy working river is a managed river in which there is a sustainable compromise, agreed to by the community, between the condition of the natural ecosystem and the level of human use".[11]

2.24 Dr Whittington believes that the more a river's waters are used for consumptive purposes the more its ecosystem services—such as the provision of clean water, nutrient cycling, sustaining river and coastal fisheries and providing an aesthetically appealing environment for tourism and recreation—are impacted.

2.25 One of the issues in achieving 'healthy working river' status is that the timeframes related to economic gain and river health can be quite different, as Dr Whittington highlights:

> Therein lies a major difficulty in determining the trade-off between economic production and river health - economic returns can be immediate, or at least in the lifetime of the current generation, whereas the consequences of a loss of river health and ecosystem services may take decades to impinge on the human community.[12]

11 Dr J Whittington, article titled '*Working Rivers*' published in Watershed, February 2002, a magazine of the CRC for Freshwater Ecology.

12 Dr J Whittington, article titled '*Working Rivers*' published in Watershed, February 2002, a magazine of the CRC for Freshwater Ecology.

2.26 When the Committee asked representatives of the National Farmers' Federation (NFF) for their definition of a 'healthy working river' Mr Ralph Leutton, a member of the NFF's Water Task Force, told the Committee that they are still searching for a meaningful definition of what the phrase means. He said:

> I do not think we can actually say what a healthy river is. We are all looking for a definition of a healthy working river. We have asked our scientists and our research corporations to give us the parameters of a healthy working river … We are looking for that answer.[13]

2.27 The Committee found it disturbing, but not surprising, that a key stakeholder such as the NFF is still not able to find a working definition of one of the fundamental concepts in the national debate on rural water.

2.28 The Committee believes that it is most important that all major stakeholders agree on the definition of terms such as 'sustainability', and 'healthy working river 'so that a proper, informed, debate can take place.

2.29 COAG's new National Water Initiative is an ideal opportunity to ensure that all the stakeholders understand and agree to the meaning of fundamental concepts such as 'healthy working river'. The Committee urges the Department of Prime Minister and Cabinet (which is coordinating the details of the NWI) to ensure that fundamental concepts of water resource management are clearly defined and that those definitions are fully understood and agreed by all stakeholders. The agreed definitions should also be communicated to the media and general public so that everyone understands the terminology and what is being said.

Recommendation 1

2.30 **The Committee recommends that the Commonwealth Government, through the Council of Australian Governments and in consultation with all key stakeholders, provides clear definitions of the fundamental concepts underlying water resource management.**

13 Transcript of evidence, p. 689.

What flow is required to achieve a healthy working river?

2.31 One question facing river managers and communities is: 'How much water does a river need to be healthy (or, if assessed to be in poor health, to become healthy again and to remain healthy?)'

2.32 Professor Gary Jones, Chief Executive of the CRC for Freshwater Ecology, has studied this issue over several years. He believes that a healthy working river retains an 'ecological character' that is generally accepted as being healthy.[14]

2.33 Professor Jones believes that water flows for a healthy working river must be considered at different geographic scales. Important factors are:

- flow volume
- flow distribution or pattern
- flow variability
- connectivity (within and between the river, floodplains, wetlands, forests and their component parts)
- flow-related water quality

2.34 Each of these attributes can be characterised by a number of hydrological indicators, which together provide a description of the flow regime of the river at a local scale and a whole-of-river scale.

2.35 Professor Jones and colleagues concluded that, if river habitat conditions and water quality are being well managed, a long term flow level of more than 67 percent of natural flow will give a high probability that a working river is healthy. When 50 percent of the natural flow is present the probability of a working river being healthy is moderate. Long term flow regimes of less than 50 percent-natural will mean that it is highly unlikely that a river will be capable of remaining healthy.

2.36 But Professor Jones cautions that these figures should be taken as a general guide only, with individual cases needing to be examined separately:

> This simple risk-based framework is a starting point - a rule of thumb - for consideration of environmental flows in any river valley. The validity of the framework should always be considered on a case

14 Prof G Jones, article titled '*Setting environmental flows to sustain a healthy working river*', published in Watershed, February 2002, a magazine of the CRC for Freshwater Ecology.

> by case basis using a combination of the best available scientific data and knowledge, and community experience and judgement.[15]

2.37 The Committee asked representatives of the National Farmers' Federation if they agreed with the estimate that a river needs at least 50 percent of its natural flow for long-term health. In reply it was suggested that more research was required before a definitive answer could be given.[16]

2.38 Dr Jennifer Marohasy from the Institute of Public Affairs, quoting from MDBC sources, estimates that 'in an average year, under current conditions, total inflow [into the River Murray] is 12,607 GL. About 24 percent of this water is lost from the system through evaporation and transmission, 34 percent is diverted, mostly for irrigation, and 41 per cent flows out to sea.'[17] Dr Marohasy also refers to an often quoted figure of 80 per cent diversions from the River Murray. The Committee notes other information provided by the MDBC which suggests that diversions from the River Murray in NSW are 81 per cent but that overall, diversions from the Murray-Darling system are only 46 per cent.[18] This shows that the system is not in the state of crisis some have suggested.

2.39 All stakeholders agree that rivers and aquifers must be used in a sustainable manner. Despite significant advances in scientific methodology, such as development of the Murray Flows Assessment Tool[19], there is still controversy among scientists about the actual state of the health of the River Murray.

2.40 The Committee believes that the question of what flow regime is required to produce a 'healthy working river' is of fundamental importance to the whole issue of sustainable water resource management. This is a complex issue and it is too simplistic to work on general 'rules-of-thumb'.

2.41 The Committee is also concerned at the extent to which the concepts of 'pristine' or 'natural condition' appear to drive the environmental debate. There have been enormous engineering developments in southern Australia in the last century which mean that 'natural condition' is an ideal which,

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15 Prof G Jones, article titled '*Setting environmental flows to sustain a healthy working river'*, published in Watershed, February 2002, a magazine of the CRC for Freshwater Ecology.

16 Transcript of evidence, p. 689.

17 Institute of Public Affairs backgrounder '*Myth & the Murray'*, December 2003, p. 27.

18 Table 2 in 'Murray-Darling Basin Water Resources Fact Sheet', MDBC web site accessed December 2004, reproduced in Appendix D of this report.

19 See para 2.103 for an explanation of the MFAT.

realistically, can never be re-created. And yet these terms are still used in relation to river health.

2.42 Rivers in southern Australia are characterised by high variability in water flow due to highly inconsistent rainfall patterns. Floods and droughts are common occurrences. Australia's ecosystems are adapted to highly variable and unpredictable river flow patterns.

2.43 The Committee noted that there are historical accounts of the River Murray ceasing to flow during periods of severe drought, and yet the ecosystems were able to survive and rebound when normal conditions returned.

2.44 The introduction of engineering developments, such as dams, weirs and locks, salt interception schemes, and dredging of the Murray mouth, have meant that those pre-development flow patterns have changed significantly and forever.

2.45 Dr Don Blackmore, Chief Executive of the Murray-Darling Basin Commission (MDBC) told the Committee that under natural conditions the River Murray would have stopped flowing at Albury during 2003 due to the severe drought. He continued:

> … So the river would have stopped. That is not a service any of us want. We do not want to go back to natural conditions. … It is a waste of time, in my judgment, even having a conversation about natural conditions. The argument is what is the benchmark in terms of environmental equity, what set of environmental services does our nation need, what is reasonable and how do we get to that?[20]

2.46 The controversy surrounding the science behind the Living Murray highlighted the urgent need for more work to be done on determining, to use Dr Blackmore's phrase, 'the set of environmental services our nation needs' for sustainable development. That vexed issue prompted the Committee to table an Interim Report which was presented to Parliament on 5 April 2004.[21]

2.47 The aim of the NWI "to return over-allocated systems to sustainable allocation levels" can only be pursued if we know what those sustainable levels are. The Committee believes that a priority of the NWI should be to determine exactly what is required to manage the major rivers in a sustainable manner. Those determinations should be expressed in plain-english so that all stakeholders, be they scientists, landholders, or the

20 Transcript of evidence, p. 413.

21 See Chapter 1, paras 1.37 – 1.42 for details of the interim report.

general public, can fully understand what is required and why. The science underlying these decisions has to be robust, transparent, and well-communicated. That research needs to be done before informed decisions can be made on the need for additional water flows.

Recommendation 2

2.48 **The Committee recommends that a top priority of the National Water Initiative should be to fund the scientific research based on physical data collection necessary to determine what level of water use is sustainable in each of Australia's major working rivers and aquifers.**

The concept of 'environmental flow'?

2.49 An 'environmental flow' is defined by the MDBC as 'any managed change in a river flow pattern intended to maintain or improve river health'.[22] However, the Committee found that the term 'environmental flows' is commonly used in a variety of contexts. Some commentators appear to use the term 'environmental flow' in the context of just a specific volume of water, while most scientists and water managers use it in the context of a range of management practices relating to flow regime (of which the actual volume of flow of water is an essential part), and water quality.

2.50 A report of the Victorian Parliament described environmental flows in the following terms:

> The needs of river systems for water are commonly described in terms of `environmental flows' … flow regime, temperature and water quality, as well as total water flow, is important to stream and wetland ecosystems. In general terms, the aim of an environmental flow … maintains or enhances biological diversity and water quality.[23]

22 MDBC website accessed October 2003, The Living Murray, *Frequently Asked Questions: What is an Environmental Flow*?

23 Environment and Natural Resources Committee of the Victorian Parliament, '*Report on the Inquiry into the allocation of water resources for agricultural and environmental purposes'*, tabled 21 November 2001, para. 3.141

2.51 Dr Blackmore of the MDBC told the Committee that this term can be confusing. He said:

> Do we have the balance right for sustaining our rivers? I do not like to use the words 'environmental flows' because it is a currency which is not all that useful. We are trying to make sure that the services we need from our rivers can be sustained and trying to determine what flows we need to do that.[24]

2.52 At the public hearing on 26 November 2003 the Committee reminded Dr Blackmore of his earlier statement, and asked if he could suggest a clearer way to describe what is meant by 'environmental flows'. He responded:

> I think it is a very difficult question … There are 4,000 or 5,000 gigalitres of water left in rivers now, which is an environmental flow. What we are doing is supplementing it with additional water to give an increased environmental dividend. So which part is the environmental flow? It is the package of things that deliver environmental outcomes … So I do not have an answer to that which I think is helpful at the moment.[25]

2.53 This exchange confirms the urgent need to get clear, accepted definitions of key terms so that everyone understands what is being said. This should be a key priority for the Department of the Prime Minister and Cabinet in developing the National Water Initiative (see Recommendation 1).

Is there a need for additional 'environmental flows'?

2.54 Rivers which are perceived to be in an unsustainable or unhealthy condition, due primarily to a high degree of development or overdevelopment, are usually regarded as needing additional environmental flows.

2.55 According to the National Land and Water Resources Audit, 30 percent of Australia's groundwater management units are either highly developed or overdeveloped when compared with their estimated sustainable yield.[26] In relation to surface water management areas, 26 per cent are either highly

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24 Transcript of evidence, p. 396.

25 Transcript of evidence, p. 739. Earlier in the public hearing Dr Blackmore said the three key elements of and environmental flows package were 'you have to deliver water, you have to deliver the works to maximise it and you have to deliver the intellectual capacity to make sure that your choices are right.' (Transcript p. 734).

26 National Land and Water Resources Audit report "*Australian Water Resources Assessment 2000*", June 2001, p.75. ' Highly developed' refers to over 70% of sustainable yield; 'overdeveloped' is over 100% of sustainable yield.

developed or overdeveloped when compared with sustainable flow regime requirements.[27]

2.56 The vast majority of aquifers and rivers which are classified as highly developed or overdeveloped are in areas where water resource development has been a viable option (such as in the Murray-Darling Basin).[28]

2.57 In 1995 the Murray-Darling Basin Ministerial Council (MDBMC) imposed a 'Cap' on water extraction in the Murra- Darling Basin to stop further deterioration in the health of Basin rivers.

2.58 Further scientific studies convinced the MDBMC that the River Murray needed increased environmental flows to improve its health and make it a sustainable resource. That was the trigger for the *Living Murray* Initiative.

2.59 The Committee questioned a number of scientists on the use of the term 'over-allocation'. The scientists agreed that 'allocation' and 'over-allocation' are concepts useful in resource management in terms of making water available for industrial and agricultural use, but these terms do not relate to environmental needs. Ecosystems are already adapted to highly variable and unpredictable flow patterns.

2.60 The Committee is very concerned at the conflicting conclusions reached by scientists on crucial questions such as what is the health of the River Murray, and whether additional flows are needed. Some scientists have questioned the methodologies used to assess river health, and the conclusions reached by bodies such as the MDBMC on the basis of that research. They have put a different interpretation on the scientific findings and have concluded that the River Murray is in reasonable health and that the case for additional environmental flows is not proven.

2.61 The Committee presented an interim report to highlight the urgent need to resolve these fundamental differences before decisions on additional environmental flows can be made with confidence.[29]

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27 National Land and Water Resources Audit report "*Australian Water Resources Assessment 2000*", June 2001, p.71. 'Highly developed' is over 70% of sustainable flow regime; 'overdeveloped' is over 100% of sustainable flow regime.

28 National Land and Water Resources Audit report "*Australian Water Resources Assessment 2000*", June 2001, p. iv.

29 Chapter 1, paras 1.32 – 1.37 give background to the interim report.

Where would water be sourced for additional flows?

2.62 If required, additional flows can be achieved through:

- Making the best use of water currently available to the environment;
- Saving water lost in channels and other distribution systems and redirecting it to the environment, and
- Reducing the amount of water removed from the river for human use, particularly irrigation.[30]

2.63 While it is difficult to gauge the amounts of water involved in the first option (*ie making the best use of water currently available to the environment*), this course of action is being actively pursued. In April 2002 the MDBMC agreed to an expenditure of $150 million over seven years to make infrastructure in the Basin more environmentally-friendly through the modification of dams, weirs and locks and other improvements.

2.64 With regard to the second option for sourcing water for the environment (*ie saving water lost in channels and other distribution systems and redirecting it to the environment*), improving the efficiency of water use both in distribution systems and on-farm can make more water available. But the costs involved, the volumes saved for consumptive use, and how much of the savings would be available for additional environmental flows, are issues which are still being debated.

2.65 Dr Blackmore advised the Committee "there will be another 20 percent improvement in irrigation efficiency over this decade … The issue is whether some of that efficiency dividend should go back into sustaining our rivers."[31]

2.66 Mr John Howe of Murrumbidgee Irrigation told the Committee that the easy and most productive improvements in water use efficiency have already been made. The way he phrased it was "the really low-hanging fruit is gone"[32], and he suggested that significant new savings will be more difficult to find.

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30 Prof G Jones, article titled "*Setting environmental flows to sustain a healthy working river*', published in Watershed, February 2002, a magazine of the CRC for Freshwater Ecology.

31 Transcript of evidence, p. 405.

32 Transcript of evidence, p. 513.

2.67 Dr Blackmore expressed the belief that there are likely to be attempts to find water savings by improving current delivery systems. While expensive, such an approach would have the added benefit of upgrading the efficiency of Australia's water infrastructure. He said:

> What I think will happen in any intervention is that if you are going to invest—following the Snowy paradigm—you will invest in savings first. Savings are generally more expensive than the market price, but they are probably an important investment in the future of Australia because you do not want systems that are grossly inefficient.[33]

2.68 Dr Blackmore provided an example of how 45,000 ML of water could be 'saved' on the Darling Anabranch by piping the system, and suggested that other similar projects could be undertaken which would produce additional water for environmental flows. He commented:

> Let us take the Darling Anabranch as an example. There is an area where about 50,000 megalitres go down the Darling Anabranch below Menindee and less than 5,000 megalitres are consumed. If you install plastic pipes, you have 45,000 megalitres. It will probably cost you about $800 a megalitre for that secure water. Those projects are available, but they will not get us fully to 1,500 gigalitres.[34]

2.69 This figure of $800/ML is within commercial parameters for traded water and this work should be given priority. Chapter 5 contains a detailed discussion of water use efficiency and how improvements in efficiency could impact on future supplies of rural water.

2.70 In relation to the third option for sourcing water for the environment (*ie reducing the amount of water removed from the river for human use, particularly irrigation*), some of the evidence received by the Committee suggested that, realistically, a significant proportion of any additional environmental flows would have to come from allocations to irrigators, as irrigation represents by far the largest single use of water.

33 Transcript of evidence, p.403.

34 Transcript of evidence, p.403.

2.71 Irrigators strongly favour the first two options over the third. Mr Lawrence Arthur, Chairman of Irrigators Inc., expressed this preference to the Committee at the public hearing in Deniliquin:

> The intention to improve the Murray Darling Basin river health needs to be achieved without impacting on water available for productive use, and consequently the wellbeing of communities like Deniliquin. We believe this can be achieved by infrastructure investment, operational efficiency improvements and ecological measures like riparian zone management.[35]

2.72 To take water from irrigation would involve a 're-balancing' of water use, particularly in overdeveloped rivers. For example, the submission from ABARE pointed out that:

> In most cases, an increase in environmental flows will have to be sourced from existing or potential irrigation uses. Governments can achieve this in several ways, including:
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> - Withdrawing water entitlements from irrigators;
> - Purchasing water entitlements in water markets; and
> - Retaining some or all of the water savings from improved irrigation efficiency, through, for example, reducing conveyance losses.[36]

2.73 Dr Blackmore told the Committee that he believes the debate about environmental flows should be seen as an opportunity by irrigators. He commented:

> At the moment the move towards environmental flows or the Living Murray and a healthy, working river is seen as a huge threat to the irrigation industry. I am trying to explain to people that, in my judgment, it is the greatest opportunity this industry will have in the next 20 years, provided that governments do what they have done so far in the Snowy debate and establish a relationship with the community, which means that they will bring resources along to manage their intervention with that community in a structured and stable way.[37]

35 Transcript of evidence, p. 499.

36 Submission no. 94, p. 10.

37 Transcript of evidence, p. 397.

2.74 The ABARE submission noted that increasing environmental flows at the expense of irrigation can generate external benefits which help to offset the value of foregone production. It advised:

> Increased environmental flows may dilute existing salt loads in a river system to the benefit of remaining irrigators. Further external benefits may be generated if a reduction in irrigation also reduces the level of salt exports to the river from surface and subsurface drainage. These benefits can be substantial. Heaney, Beare and Goesch (2002) report the scenario where these external benefits offset more than 40 percent of the value of foregone agricultural production.[38]

2.75 The ABARE submission went on to recommend that a trading system for water should factor in environmental impacts. It said:

> A direct implication is that institutional arrangements for water trade that do not account for the environmental impacts of trade will be an impediment to obtaining water for the environment at the lowest social opportunity cost.[39]

2.76 The complex issues of how and where to source additional water for the environment and how it should be managed are vital components of the new National Water Initiative announced by COAG on 29 August 2003. Details of the NWI are being drafted by five task forces working under the auspices of the Department of Prime Minister and Cabinet, in preparation for the next COAG meeting (scheduled for mid-2004). The Committee believes that all stakeholders must be fully consulted in the planning / drafting process of the NWI. The Committee does not believe that ABARE's position is sufficient and does not present a preferred option.

Is there a need for additional flows in the Murray-Darling Basin?

2.77 The vital importance of the Murray-Darling Basin to the national economy makes it imperative that the Basin's natural resources are managed on a sustainable basis. It is crucial that the rivers in the Basin are in 'healthy working rivers' condition, so that they can continue to contribute to the productive capacity of the region for future generations.

38 Submission no. 94, p. 11.

39 Submission no. 94, p. 11.

2.78 Dr Blackmore of the MDBC reminded the Committee of the significant position held by the Basin in water matters— "70 percent of the water consumed in Australia is consumed in the Basin".[40]

2.79 In June 1995 the Murray-Darling Basin Ministerial Council imposed an interim Cap (which became permanent in 1997) on diversions. The Cap was defined as the volume of water that would have been diverted, on average, under 1993-94 levels of development.

2.80 An independent review of the operation of the Cap was undertaken in 2001. The review found the Cap had stopped further environmental degradation in the Basin, but noted that the Cap (set arbitrarily at 1993-94 diversion levels), did not necessarily reflect a sustainable level of diversion. To determine the level of diversion which would result in a sustainable and healthy River Murray would require further study—which in turn led to the *Living Murray* Initiative.

2.81 At its meeting in March 2001 the Murray-Darling Basin Ministerial Council enunciated its vision— 'a healthy River Murray system, sustaining communities and preserving unique values.' To aid its deliberations the Council commissioned a scientific report on the condition of the rivers in the Basin.

2.82 The report for the Council was compiled by the CRC for Freshwater Ecology and the CSIRO's Division of Land and Water under the title '*Snapshot of the Murray Darling Basin river condition'*, September 2001.

2.83 The *Snapshot* reported evidence of degradation both on a whole-of-basin basis, and of the River Murray itself, including the Lower Darling.

2.84 A review of the *Snapshot* by the Independent Sustainable Rivers Audit Group (comprising 4 academics) found that the *Snapshot* provided 'a clear, unequivocal indication that the current general state of the ecological health of rivers in the Murray Darling Basin is less than what is required for ecological sustainability'.[41]

2.85 Mr Peter Cosier, Director of WWF and member of the Wentworth Group, told the Committee that 'the future of rural Australia is healthy river systems and healthy landscapes', and went on to make the following remarks about the River Murray:

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40 Transcript of evidence, p. 400.

41 '*Snapshot of the Murray Darling Basin river condition*' Report to the MDBC, September 2001, page 2. Accessed on the MDBC web site March 2004.

> The River Murray is a working river. What it needs to be is a healthy working river. It is not healthy. It is not healthy for two reasons: one is that key environmental assets, such as Ramsar sites and other wetlands of national significance, are not receiving the amount and quality of water they need to maintain river health; secondly, we are suffering the scourge of salinity, which is not the fault of irrigator communities; it is the fault of land clearing further up in catchments.[42]

2.86 Several witnesses at the public hearing in Deniliquin in July 2003 questioned the scientific findings on the health of the River Murray. An example is the following comment by Mr Hetherington of Murray Irrigation Ltd:

> I just want to mention this fact for the rest of the committee to read: in the last two weeks in forums in Canberra—there was one on Friday—MDBC figures were disclosed at that forum that the salinity has actually improved by 100 per cent in 20 years … since starting recording in 1978 of turbidity, phosphorous and nitrate, there has been no change. Can you believe that after reading the papers during the last few months? 'We're ruined, doom and gloom. It's dead. So salined you can't move.' By the way, I just want to mention the fact that those figures are at Morgan, the area where South Australia's water comes from.[43]

2.87 In fact, the Committee had questioned Dr Blackmore of the MDBC about salinity levels on 28 May 2003. He responded at that time:

> In the river down to Morgan the salinities everywhere have been lower than people would have experienced in living memory. There is almost no irrigator who is alive who would have seen salinities or turbidities at this level … (because) there is simply no drainage water. The ground water level is down because of the drought. All the water comes out of the Snowy and/or Dartmouth, which is pretty flash water.[44]

2.88 Earlier in that public hearing Dr Blackmore had described to the Committee the magnitude of the salt problem in the Basin and the engineering solutions attempted by the MDBC. Despite making good progress he expressed pessimism at the final result:

> We generate three to four million tonnes of salt in our system a year, which we have to either store within the landscape in the Basin or

42 Transcript of evidence, p. 680.

43 Transcript of evidence, p. 506.

44 Transcript of evidence, p. 406.

> dispose of somewhere … At the moment we are pumping 1,100 tonnes of salt away from the River Murray every day. We are investing another $67 or $68 million to pump another 900 tonnes to buy the next 15 years of salinity management so that we can get our catchment management in the Murrumbidgee system, the Goulburn system and the Namoi system in order. I do not think we can get there.[45]

2.89 In December 2003 the Institute of Public Affairs (IPA) published a 'backgrounder' compiled by Dr Jennifer Marohasy, head of its Environment Unit, titled '*Myth & the Murray – measuring the real state of the river environment*'. Dr Marohasy examined the available information on the condition of the River Murray and found that its condition was reasonable. She concluded that claims that the River Murray is degraded are greatly exaggerated.

How much water is being extracted from Basin rivers?

2.90 Evidence was received from witnesses about the proportion of water being extracted from rivers in the Murray-Darling Basin, which showed the existence of a range of different perceptions on this issue.

2.91 The MDBC submission provided the following comment on the amount of water being extracted from Basin rivers:

> In 1993 the Ministerial Council directed the Commission to carry out an audit of water use in the Basin. The audit report (MDBMC 1995) indicated that the median annual flow from the Basin to the sea had been reduced by over 70%, and that if the existing management regimes were maintained, average diversions would increase by a further 14.5% if all existing water entitlements were fully developed.[46]

2.92 At the public hearing on 31 July 2003 Mr Arthur of Irrigators Inc. questioned the amount of water being diverted. He said:

> One thing I would really like to bring to the fore is that we hear reports that the consumptive use of water from the river is 80 per cent of inflows. I want to put on the public record that this is an absolutely ridiculous figure … if we were using 80 per cent of inflows into the river it would certainly be an extraordinary thing. I

45 Transcript of evidence, p. 396.

46 Submission no. 144, p. 2. On 26 November 2003 the Committee approved a slight amendment to the wording in the original submission (see Transcript of evidence, p. 724.)

> have these reports from the MDBC and the Department of Land and Water Conservation that clearly refute those claims.[47]

2.93 Ms Jacqueline Knowles of the NSW Irrigators Council made a similar point during the public hearing in Sydney on 15 August 2003. she said:

> Often we see figures stating that the irrigators use 80 per cent of the water, but it is actually 80 per cent of the water that is extracted from New South Wales … For most systems the extraction is between 50 per cent and 65 per cent.[48]

2.94 In supporting these comments, Ms Michelle Ward, also representing the NSW Irrigators Council, gave the following estimate of water extracted in the rivers of northern NSW:

> Ours [rate of extraction] is actually low. Like a lot of the northern rivers, it starts at around 26 per cent or 28 per cent in the Macquarie and 40 per cent in the Border Rivers. That is 40 per cent of the total flow-in in the system.[49]

2.95 At the public hearing on 26 November 2003 Dr Blackmore tabled a new '*Murray Darling Basin Water Resources Fact Sheet'*. He said that, in view of the different figures which had been quoted during the Inquiry, the MDBC had compiled this Fact Sheet to clarify exactly how much water is being diverted. [50]

2.96 Table 2 of the MDBC Fact Sheet (reproduced in Appendix D) shows the percentage of average annual runoff which is extracted or diverted for use in the Murray-Darling system. The table shows large variations between individual rivers and between States, but that overall an average of 46 per cent of water in the rivers in the Murray-Darling Basin is diverted for use.

2.97 It is clear to the Committee that there is a considerable lack of agreement about how much water is being extracted from the Murray-Darling system, although annual diversions are published in the MDBC's Water Audit Monitoring Reports. To avoid such confusion the Committee believes that the MDBC should also publish the latest figures on extraction rates of water in Basin rivers in its Annual Report, expressed as a percentage of typical river flows.

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47 Transcript of evidence, p. 498.

48 Transcript of evidence, p. 576.

49 Transcript of evidence, p. 577.

50 Transcript of evidence, p. 724. A copy of the Fact Sheet is shown in Appendix D.

Recommendation 3

2.98 **The Committee recommends that Annual Reports of the Murray-Darling Basin Commission contain updated details of the extraction of water in Basin rivers, expressed as a percentage of typical river flows.**

The Living Murray Initiative

2.99 At its meeting in April 2002, the MDB Ministerial Council determined that the Basin rivers were not being used in a sustainable manner. To rectify this situation the Council adopted a strategy to improve the health of the River Murray which it called The *Living Murray* Initiative. The submission from the MDBC described the aims of the *Living Murray* Initiative as follows:

> … to improve environmental flows in the River Murray and achieve a better balance in water uses. Activities include major studies on the environmental, social and economic impacts of various environmental flow scenarios for the River Murray, development of policy options for recovery of water for the environment, and an extensive public education and consultation exercise.[51]

2.100 To make the Basin community and other stakeholders aware of the issues the MDBC released a discussion paper in July 2002 titled '*The Living Murray: a discussion paper on restoring the health of the River Murray*'. The *Living Murray* Initiative is not just about environmental flows. It also focuses on the need to develop a strong Basin water market as a basis for achieving the flows and facilitating adjustment processes. In turn, to work properly such a market will require clearly defined water access rights, trading and market arrangements , and exchange rates for inter-valley and interstate trade.[52]

2.101 To aid consideration of the impact different levels of additional water would have on the health of the River Murray, the Ministerial Council directed that a scientific study do a cost/benefit analysis for three 'reference points': 350, 750 and 1,500 GL of additional water per annum. However this approach only responds to two of the twenty two activities that the River Murray Scientific Panel identified as threatening river floodplain ecosystem health. The threat to river health also involved activities not related to the volume of river flows. Dr Lee Benson pointed out that the River Murray Scientific Panel itself concluded that increases in flow will not aid, or are not the best

51 Submission no. 144, p. 6.

52 Submission no. 160, p. 31.

way to address, many of the recognised in-river problems.[53] He also noted that there is a 'raft of non-flow and non-volumetric options which … will improve river and floodplain health …'[54]

2.102 Dr Benson pointed out that the Ministerial Council communiqué that announced a commitment to provide 500 GL of additional flows "… did not specifically mention non-flow actions at all and is strongly focused on how the committed volume might be obtained.'[55]

2.103 The committee agrees with Dr Benson's conclusion that if the ultimate aim is to secure sustainable environmental health, with minimum socio-economic impact then all potential impacts which can significantly assist should be included.[56] Clearly the approach adopted by the Ministerial Council in its directions to the Scientific Reference Panel (and subsequently in its communiqué) was deficient.

2.104 The Ministerial Council established three expert Panels to assist with the *Living Murray* initiative:

- an Independent Community Engagement Panel to provide advice on the appropriateness of the community consultation process;
- a Socio-Economic Reference Panel was established to advise on the socio-economic impact of the three environmental flow reference points; and
- a Scientific Reference Panel to look at the ecological impact of the three 'reference points'.

SRP Interim Report

2.105 The Interim Report of the Scientific Reference Panel (SRP) titled '*Ecological Assessment of Environmental Flow Reference Points for the River Murray System*' was released in October 2003 and provided an indication of the potential ecological benefits from additional flows based on the three 'reference points'. The final report is due in mid-2004.

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53 'The Science behind the Living Murray Initiative' by Ecology Management Pty Ltd, published by Murray Irrigation Limited, October 2003, p. x.

54 'The Science behind the Living Murray Initiative, Part 2' by Ecology Management Pty Ltd, published by Murray Irrigation Limited, February 2004, p. 57.

55 'The Science behind the Living Murray Initiative, Part 2' by Ecology Management Pty Ltd, published by Murray Irrigation Limited, February 2004, p. 57.

56 'The Science behind the Living Murray Initiative, Part 2' by Ecology Management Pty Ltd, published by Murray Irrigation Limited, February 2004, p. 59.

2.106 The ecological assessments were undertaken on a reach-by-reach basis as well as on a system-wide basis and examined likely impacts on six 'icon sites' identified by the Ministerial Council in April 2002—the Murray Mouth, Coorong and the Lower Lakes, Chowilla Floodplain, Gunbower / Perricoota, Barmah-Millewa, the River Murray Channel, and the Murray cod.

Scientific approach to the assessment – Murray Flow Assessment Tool

2.107 The SRP's ecological assessment of the environmental flow reference points for the River Murray system was based on the Murray Flow Assessment Tool (MFAT)[57]. Using this methodology, it was claimed in the Interim Report that estimates could be made of how native fish, waterbirds, wetlands, floodplain vegetation and algal blooms would respond to different flow scenarios, smarter operational rules, more focus on flow variability and connecting floodplains to the river, and to infrastructure works that make best use of the water available.

2.108 The SRP Interim Report noted that the assessment process will be continuously reviewed and that the MFAT results are indicative rather than prescriptive. It said:

> The SRP and REGs have developed a detailed review and critique of the assessment processes used, including the MFAT. The Murray Flow Assessment Tool (MFAT) is a 'decision support system' designed to help demonstrate in a reproducible and transparent manner the potential benefits of increased environmental flows. It focuses on changes to habitat condition, rather than population dynamics or recruitment. It is developmental, and outputs should be seen as indicative rather than prescriptive. Assessments made using the MFAT are a synthesis of opinion, in that the performance of the model is weighed against expert opinion (the process is circular in that regard).[58]

57 A detailed description of the development and scope of the Murray Flows Assessment Tool can be found in Chapter 3 of the Interim Report of the Scientific Reference Panel *'Ecological Assessment of Environmental Flow Reference Points for the River Murray System'*, October 2003.

58 Interim Report to the MDBC *'Ecological Assessment of Environmental Flow Reference Points for the River Murray System'*, October 2003, para. 51, p. 13.

2.109 Dr Roy Green, President of the MDBC, wrote in his Foreword to the Interim Report that the MFAT will be further refined. He said:

> In the short term, the interim report provides confidence that flows targeted at these significant ecological assets will provide local benefits. For the longer term the scientific reviewers have been clear in saying that while the MFAT is a valid decision-support tool, there is more developmental work before we can have an ecological model for river management.[59]

2.110 The assessment process was facilitated by the formation of eight Regional Evaluation Groups (REG) along the River Murray and two of its major tributaries, the Goulburn and Murrumbidgee Rivers. Each REG comprised scientific experts with specific local and regional ecological knowledge. A total of over 60 scientists contributed to the findings in the Interim Report.

2.111 At the public hearing on 28 May 2003 the Committee questioned the MDBC representatives about the benchmarks used for the MFAT calculations. Mr Kevin Goss, Deputy Chief Executive of the MDBC, replied:

> A very deliberate decision was taken to benchmark it at the cap and to benchmark it today … We have been very careful not to use natural conditions as some sort of goal or benchmark. It is accepted in all that we do that what is past is past and that we start from today or somewhere where we have the benchmarks, such as the cap on diversions of 1995.[60]

2.112 The Committee also sought assurance that personal value judgements of the scientists involved would not impact on the MFAT process. Dr Blackmore outlined the approach adopted by Professor Jones, the Chair of the SRP:

> Professor Gary Jones, the CEO of the Cooperative Research Centre for Freshwater Ecology, has a very strict rule that the science community cannot be advocates for the environment; they have to be advocates for objective science. They have an evidence trail for every bit of evidence, and you can follow it.[61]

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59 Foreword to the Interim Report to the MDBC '*Ecological Assessment of Environmental Flow Reference Points for the River Murray System*', October 2003.

60 Transcript of evidence, p. 410.

61 Transcript of evidence, p. 411.

2.113 In support of these comments, Mr Goss made the point that the MFAT had been rigorously constructed, with about 90 percent of its evidence base coming from data which has been published in recognised scientific journals. He said:

> At the end of the day, its [MFAT's] power is not in the answer it spits out. The power is in going back into it and applying sufficient scrutiny that all the assumptions and all the evidence pass certain tests and therefore there is a confidence in the options it is throwing up.[62]

Key Findings in the SRP Interim Report

2.114 The key findings in the SRP Interim Report can be summarised as follows:

- A further 350 GL environmental allocation, however operationalised, will provide little 'whole of river' ecological benefit.
- If fully optimised from an operational perspective, a further 750 GL may provide some whole of river ecological benefits.
- A further 1500 GL can provide considerable whole of river and local ecological habitat benefits.[63]

2.115 The Interim Report concluded:

> Based on a combination of MFAT analyses and scientific knowledge and experience, it is the considered opinion of the SRP that at the whole of river scale, the 1500 GL flow option alone (ie. without structural, operational and water quality improvements) will deliver, at best, a moderate improvement for the plant and animal communities assessed.
>
> However, combined with improved structural, operational and water quality management – including all options currently being assessed by the MDBC – there is a possibility that a further 1500 GL of environmental flow allocation, could deliver a healthy working River Murray system.[64]

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62 Transcript of evidence, p. 412.

63 A full description of the interim assessments is available in the Interim Report to the MDBC '*Ecological Assessment of Environmental Flow Reference Points for the River Murray System*', October 2003, p. 11-14.

64 Interim Report to the MDBC '*Ecological Assessment of Environmental Flow Reference Points for the River Murray System*', October 2003, para. 44 - 45, p. 12.

2.116 The Interim Report cautioned that any improvement in river health would take considerable time. In this regard it said:

> The decline in health of the riverine ecosystems along the River Murray has occurred gradually over more than 50-100 years. Likewise, any recovery in health will also occur over many decades, and might not be noticeable for many years after any allocation of extra water for the environment has been introduced.[65]

Minister's Reaction to the SRP Interim Report

2.117 While noting the finding that a well-managed additional 750 GL would produce good results, the Hon Warren Truss MP, Minister for Agriculture, Fisheries and Forestry welcomed the release of the Interim Report as an important part of the community consultation process about the *Living Murray*. He said:

> The report does not make recommendations. Rather, it provides scientific comment on the results of an examination of three amounts of water being returned to the Murray - 350, 750 & 1,500 GL … The (MDB Ministerial) Council also needs to get a better understanding of the social and economic effects of returning water to the environment before it makes any decision on recovering water … The Council is committed to consulting with stakeholders and the wider community before any final commitments are made regarding the Living Murray initiative. This interim report is an excellent addition to that process.[66]

Response of the MDB Ministerial Council to the SRP Interim Report

2.118 The Murray-Darling Basin Ministerial Council met on 14 November 2003 to consider developments in the *Living Murray* process. The Communique following this meeting announced a 'historic First Step decision to address the declining health of the River Murray system', by providing up to an additional 500 GL to give environmental benefits to six key ecological sites, namely:

- Barmah - Millewa Forest;
- Gunbower and Perricoota-Koondrook Forests;
- The Hattah Lakes;

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65 Interim Report to the MDBC '*Ecological Assessment of Environmental Flow Reference Points for the River Murray System'*, October 2003, para. 50, p. 13.

66 Press release by the Minister for Agriculture, Fisheries and Forestry, 15 October 2003.

- Chowilla Floodplain (including Lindsay-Wallpolla);
- The Murray Mouth, Coorong and Lower Lakes; and
- The River Murray channel.[67]

2.119 The Communiqué noted that funding would be made available under the $500 million set aside in COAG's new National Water Initiative to address what it refers to as over-allocation in Basin rivers. Additionally, the $150 million which the Ministerial Council had earmarked in 2002 for capital works would be re-focussed on infrastructure improvements related to these six icon sites.

2.120 Regarding the sourcing of the proposed additional 500 GL of water, the Communiqué noted:

> The water for this First Step will come from a matrix of options with a priority for on-farm initiatives, efficiency gains, infrastructure improvements and rationalisation, and market based approaches, and purchase of water from willing sellers, rather than by way of compulsory acquisition.[68]

2.121 At the public hearing on 26 November 2003 the Committee asked Dr Blackmore if 500 GL would be sufficient, given the finding in the SRP's Interim Report that 750 GL may provide some whole-of-river benefits and that 1,500 GL would provide considerably more benefits. Dr Blackmore replied that the 500 GL is a 'fantastic start' and that realistically it is probably as much as the MDBC could handle at this stage. Furthermore, the beneficial results of the additional 500 GL of environmental flows must be clearly demonstrated to stakeholders before next steps can be considered. He said:

> We can make a massive change with 500 gigalitres and the investment of capital. Our council is very considered in its response to this because they believe that this is a first-step decision. They will want to have evidence of what they have got out of that investment, as will the basin community. Can we make massive change? Absolutely … Is it enough? At the end of the day, in five years, we will sit down and ponder that. Hopefully, we will ponder it on the basis of having real life experience, real life monitoring … So my summary is that it is a fantastic start. It is about as big a bite as any of us can deliver.[69]

67 Murray Darling Basin Ministerial Council Communique, 14 November 2003, p. 1.

68 Murray Darling Basin Ministerial Council Communique, 14 November 2003, p. 2.

69 Transcript of evidence, pp. 733-4.

2.122 The Committee also asked Dr Blackmore where he thought the 500 GL could be sourced. He responded:

> My personal judgment … 300 to 350 gigalitres of water is recoverable by strategic investment. That is fixing up some of the baggage of the past, pipelining stock and domestic systems and so on and cleaning up some channel systems which are pretty untidy. That is constrained by how long it will take to do. … That leaves 150 gigalitres to stand in the market. We are currently trading on the annual market about 700 or 800 gigalitres and about 100 to 120 gigalitres on the permanent market. So that seems to be doable over five years if you design proper market instruments.[70]

2.123 Dr Blackmore then spoke about the need to plan with great care if the Government eventually enters the market to buy water for the environment. He said:

> My paranoia … is that right now, if we were to enter the market in a willy-nilly way and not as an intelligent purchaser, we could be a predator. We have deep pockets; governments have deep pockets … The worst thing that can happen, in my judgment, is that we end up driving the price of water up because of a lack of discipline in the way we enter the market. That might make a hell of a lot of people wealthier in the short term, but it means that our ability to adjust our industries using that instrument will be eroded. So we have to be very careful. I like what I see in the way that Adelaide entered the market recently when they hit their cap … So there are lots of ways to do it where, at the end of the day, you make people winners without distorting the market.[71]

2.124 The Communiqué specified that community consultation and involvement would be a key component in the implementation of the 'First Step'. Dr Blackmore acknowledged to the Committee that developing community trust is a crucial issue. He said:

> We have to make sure that we have arrangements which cement trust in the community because at the moment that is fractured, and it is fractured for a whole lot of reasons. I have to commend the Council of Australian Governments for trying to bring that back on track. It was pretty untidy until then. So what we have to do is work

70 Transcript of evidence, p. 735.

71 Transcript of evidence, p. 735.

> out how we will source water in ways that provide agricultural benefits and leave a better system out there.[72]

2.125 Dr Blackmore summed up his presentation to the Committee on 26 November 2003 on a very positive note. He said:

> We have got the largest experiment in environmental management the country has ever seen, which I think will challenge us all as it is implemented. But I think we have an opportunity now with the capital available from government to make everybody a winner. That is certainly what we are trying to achieve.[73]

Irrigator's response to the *Living Murray* Initiative

2.126 At the public hearing in Deniliquin in July 2003, Mr Hetherington advised the Committee that Murray Irrigation Ltd (MIL) had commissioned a review of the scientific information underpinning the *Living Murray* initiative. This review was undertaken by EM (Ecology Management) Pty Ltd, whose report titled '*The science behind the Living Murray Initiative*' was released by MIL on 31 October 2003.

2.127 The review examined the methodology, assumptions and findings of three reports most often quoted in *Living Murray* literature.[74] Amongst other findings, the EM review queried the scientific basis of the 'expert panel' approach, and asserted that there was too much focus on finding extra water and not enough on alternative solutions such as habitat restoration.

2.128 At the public hearing on 26 November 2003 the Committee asked Dr Blackmore for his reaction to the review undertaken by EM. He said that he 'rates the scientist [Dr Lee Benson] very highly' and agreed with some of Dr Benson's reservations of the expert panel methodology used in the past. However, Dr Blackmore noted that the Murray Flows Assessment Tool methodology used in the latest study (the SRP's Interim Report of October 2003) is much sounder. He said:

> … there have been over 67 scientists working on elements of it [MFAT] and there are 3,100 knowledge fields now in that report so that you can find where every bit of data came from … you can go

72 Transcript of evidence, p. 729.

73 Transcript of evidence, p. 730.

74 The three reports examined by EM were—*Report of the River Murray Scientific Panel on Environmental Flows* (June 2000); *Snapshot of the Murray Darling Basin River Condition* (September 2001); and *Independent Report of the Expert Reference Panel on Environmental Flows and Water Quality Requirements for the River Murray System* (February 2002).

> through every field, if you want to, and say, 'We don't believe this,' or 'There's not sufficient evidence in that,' or whatever.[75]

2.129 Murray Irrigation next commissioned EM to review the SRP Interim Report released in October 2003. That review, titled '*The science behind the Living Murray Initiative, Part 2*' was published in March 2004.

2.130 The two reviews conducted by EM raise a number of questions about the methodology used by the scientists, including the application of the Murray Flows Assessment Tool. Specific criticisms of the MFAT included:

- that MFAT primarily models flow related habitat, hence is very limited in its real world application, where more variables actually exist,
- that the outputs of MFAT cannot be validated in the real world so it has little application to target setting or adaptive management, and
- that MFAT is an expert opinion based model hence does not increase our data but simply formalises the expert panel process.[76]

The EM reviews also disagree with some of the conclusions reached in the four scientific reports studied.

2.131 The Committee urges the Scientific Reference Panel to take the opportunity in its final report, due in mid-2004, to address the key questions raised in EM's review of their Interim Report. There appear to be serious differences of opinion. It is vitally important that the *Living Murray* process is seen to be accountable and transparent. The questions raised in the EM reviews must be responded to, completely and honestly. Valid points made in the EM reviews should be acknowledged and adopted.

2.132 The Committee would like to state categorically that it is not opposed to increased flows. However, it believes that a robust methodology, based on sound physical data, must be devised to fully support future natural resource management in Australia. The Committee notes the comments of Dr Green that the MFAT would benefit from further development, and urges the MDBC to continue funding its development so that its full potential is realised.

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75 Transcript of evidence, p. 737.

76 'The Science behind the Living Murray Initiative, Part 2' by Ecology Management Pty Ltd, published by Murray Irrigation Limited, February 2004, p. ix.

2.133 The Committee is concerned at the apparent gaps in the scientific knowledge underpinning the *Living Murray*. The reasons for this concern are outlined in the Committee's interim report presented to the Federal Parliament on 5 April 2004.[77] The Committee believes that much better data and evidence is required to help COAG make decisions on the most efficient and effective ways to spend the $500 million it has set aside.

2.134 In the Committee's view the doubts about the science must be removed before far-reaching commitments to reallocate water from irrigators to the environment can be made with any level of confidence.

2.135 Any decision to allocate water to increased river flows will have a long term impact on rural industries and communities. Furthermore, the possible impacts upon the river itself are not clear, with suggestions that there could even be negative effects on the environment unless understanding and management are improved. Much better data is required before making any commitment to increase river flows.

2.136 The Committee's interim report recommends that the Australian Government urge the Murray–Darling Basin Ministerial Council to postpone plans to commit an additional 500 gigalitres in increased river flows to the River Murray until a comprehensive program of data collection and monitoring by independent scientists is completed; non-flow alternatives for environmental management are considered and reported upon more thoroughly; and a full and comprehensive audit is conducted focussed specifically on the Murray–Darling Basin's water resources and taking into account all new data found.

2.137 The interim report also recommends that the Australian Government ask the Murray–Darling Basin Ministerial Council to allocate sufficient funds out of the $500 million to the abovementioned tasks, prior to proceeding with the proposal to increase river flows.

2.138 The Committee believes that if, contrary to the recommendations in the Committee's interim report, the decision is still made to immediately allocate additional environmental flows to the River Murray such flows must be closely monitored and the impacts carefully measured to clearly show the outcomes. The communities which rely on this water for their livelihood, and indeed every Australian citizen, deserve nothing less.

77 Chapter 1, paras 1.32 – 1.37 contain details of the interim report.

2.139 The Committee would like to emphasise its belief that any decisions by COAG or the MDBMC on future additional flows must take into consideration all the environmental, social and economic impacts of such flows. The methodology and resulting scientific conclusions underpinning such decisions must be transparent and able to stand up to the closest scrutiny.