SOUTH AUSTRALIAN GOVERNMENT RESPONSE TO THE PRODUCTIVITY COMMISSION DISCUSSION DRAFT

"RURAL WATER USE AND THE ENVIRONMENT: THE ROLE OF MARKET MECHANISMS"

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Government of South Australia

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South Australian Government response to the Productivity Commission discussion draft report "Rural Water Use and the Environment: the Role of Market Mechanisms" 06WLB06254.

Structure of response

This response has been arranged into three parts:

Part A: INTRODUCTION – provides contextual background information

PART B: SOUTH AUSTRALIA'S RESPONSES TO SPECIFIC ISSUES - specific comments are arranged under the chapter headings in the draft Productivity Commission report so as to make clear the relevance of each comment.

INTRODUCTION

The South Australian Government welcomes the opportunity to respond to the Productivity Commission's draft report into the role that market mechanisms can play in improving rural water use and the environment.

South Australia has a long history of innovative water resources management, and supports investigations into market mechanisms as one of the many policy tools that have application in water resources management.

It should be noted that the use of market mechanisms in natural resources management is in its infancy, not least because tools to value ecosystem services are at a developmental stage. Investigations into the use of market mechanisms must be comprehensive and also be cognizant of the fact that these mechanisms may not necessarily be the most effective tool to reach desired good social, economic and environmental outcomes.

With these caveats South Australia supports investigations into the use of market mechanisms for water resource management. This support is identified by South Australia's commitment to multi-jurisdiction agreements including:

- the *National Water Initiative*, which has, amongst other elements, a strong commitment to establishing water markets and trading arrangements,
- The MDBMC *First Step* decision of *The Living Murray* initiative, which is reflected in South Australia's Strategic Plan 2004, considers market instruments as a possible means of increasing environmental flows in the Murray-Daring and tributaries to target levels of 500GL *per annum* by 2008, with a longer-term target to reach 1500GL *per annum* by 2018, and
- The Murray-Darling Basin Commission's *Interstate Water Trading Trial Project* demonstrated a strong commitment to testing market mechanisms. The revised MDBC Schedule E "Transferring Water Entitlements and Allocations" permits trade in allocations and entitlements throughout the entire southern connected Murray-Darling Basin.

Within South Australia the:

- statutory *State Natural Resources Management Plan 2006-2011* identifies the need to investigate the use of market mechanisms in relation to many natural resources and management issues,
- *Strategic Infrastructure Plan for SA* recognises market tools as a mechanism in the face of increasing pressure on long-term viability and sustainability of South Australia's water resources caused by past land and water management practices (caused by insufficient knowledge at the time), which will be strained further by population increases and projected reductions in rainfall as a result of climate change.
- South Australia's former Onkaparinga Catchment Water Management Board, now part of the Adelaide and Mt Lofty Ranges Natural Resource Management Board has hosted the auction pilot "Catchment Care" under the National

Action Plan on Salinity and Water Quality Market-Based Instruments Pilot Project as part of its commitment to investigate market mechanisms.

The nature of South Australia's water resources and the legislative and policy framework within which these resources are managed provide constructive contextual information for this document.

South Australia's water resources

South Australia has, relative to some jurisdictions, limited water resources and of different forms. Groundwater provides the major resource with major groundwater systems in the South East, Far North, and Murray Mallee. Smaller groundwater resources are important in other parts of the state for urban and irrigation uses. The sedimentary groundwater basins have more spatially uniform yields compared to the hard rock aquifers, but still have spatial variability in terms of yield and quality. The hard rock aquifers have a very high spatial variability.

South Australia has limited surface water resources with virtually all systems having either episodic or seasonal flows, i.e. high levels of spatial and temporal variability. The only permanent surface water resource of note is the River Murray, and its permanency is purely a function of its regulation, including the use of upstream storage capacity.

The nature of South Australia's water resources, while not unique, certainly provide additional complexities in the application of all policy instruments compared to large, permanent, regulated river systems. Certainly, the trade of water allocations in some of South Australia's water resources is complicated by hydrogeological boundaries, and spatial/temporal variability. This is not to imply that any instrument, including market mechanisms, cannot be applied. However caution must be applied in the application of results gained from very different types of water resources.

South Australia's natural resources management policy framework

The *Natural Resources Management Act 2004* (South Australia) replaced three previous pieces of resource management legislation – the *Animal & Plant Control Act 1986,* the *Soil Conservation and Landcare Act 1989* and the *Water Resources Act 1997*. The Act sets out an integrated system for the ecologically sustainable use, management and protection of natural resources. The Act establishes new institutional and planning arrangements, provides for new funding arrangements for NRM across the State, and includes a broad definition of natural resources. The Act establishes eight regional NRM boards covering the state. All boards must prepare regional NRM plans that are consistent with the State NRM Plan which sets the statewide policy framework for achieving the objects of the Act.

In terms of water resources, the Act essentially mirrors the *Water Resources Act 1997*. The key elements are providing for the 'prescription' of water resources, which then triggers the preparation of a water allocation plan by the regional NRM board.

Among other things, water allocation plans must:

- assess the water needs of dependent ecosystems located either within or downstream of the prescribed resource,
- set out how water will be allocated to licensees in the form of private property (separate to land),
- describe how water trading will apply in that area,
- provide for monitoring arrangements, and
- provide for sustainable allocation and use of the available water.

Water license conditions then reflect the policy within water allocation plans. Water allocation plans are developed within the context of the regional NRM Plan that has a wider scope, and so collectively these plans address a range of NRM issues. In the context of this document these issues include promoting greater water use efficiency, managing salinity, improving water quality and ecological outcomes, and water being used for highest value uses.

PART B: SOUTH AUSTRALIA'S RESPONSES TO SPECIFIC ISSUES

Chapter 2 Improving existing entitlements and allocation regimes

Current & previous achievements

South Australia recognises the importance of establishing the preconditions for market mechanisms:

- In 1965 the South Australian government called to a halt the issuing of any further irrigation licenses on the River Murray. This serves to establish boundaries on the market supply and hence impact the value of water licenses.
- Since the 1980s there has been water trading in the River Murray and parts of the South East of South Australia.
- In 1997, the South Australian government formally separated water entitlements from the land by legislation.
- Public investment in research and development in the 1980s through the *River Murray Salinity and Irrigation Program* paved the way for better water and salinity management such as employing market mechanisms.
- Through either the preparation (or revision) of water allocation plans, or through statewide initiatives a number of changes are currently underway including:

    - Converting area based allocations to volumetric measures;
    - Ensuring allocations are within suitable limits;
    - Reviewing policies that might impede water trading in the state.
    - Ensuring all licensed water extractions are metered

Simplifying water entitlements

Although South Australia has separated water rights from land it is currently investigating further unbundling of water entitlements and more precise definition of rights. This may lead to reductions in the transaction costs of water transfers and trades.

Accounting for return flows

In some areas of South Australia (South East, Mallee, parts of the Barossa) accounting has historically been on the basis of 'net entitlements' and has been based on crop water use requirements with no accounting for losses through the delivery systems. However, the drawback has been, that in these areas allocation has been described on an area basis with little control over the way the allocations are used. In accordance with COAG and NWI requirements there is a progressive move to conversion to volumetric allocations in these areas. In the South East, there is a move

towards accounting for return drainage as part of the water available for allocation, particularly for flood irrigation. Formal inclusion in the licensing system is expected to take effect in 2007-08.

Carryover Rules (Spatial and Temporal efficiency of use)

Carryover is both a policy and technical issue. Carryover is the provision to use water not used in this season the following season.

South Australian rivers are very different to many of the rivers in the eastern and northern states. They tend not to be regulated, they are typically seasonal or episodic, and do not have large storages that can be used to regulate the flow. The River Murray is the exception in that it is a large regulated river with large upstream storage capacity. There are some rivers within the Mount Lofty Ranges that do have storage capacity but these have a natural seasonal flow regime.

Environmental science indicates that aside from the over-allocation of water from river systems, another major contributing factor to declining ecological health in many Australian river systems is the lack of variability in flows, caused by river regulation. Carryover systems may have the potential to lead to further decline in the health of aquatic ecosystems, which would be an outcome at odds with national water policy.

It is important that the Productivity Commission recognise and identify that carryover systems may have additional negative environmental outcomes in many systems.

Within the Murray Darling, the situation is complex. Carryover is currently not an option as part of South Australian and Victorian licences. NSW licence holders are able to carry over unused water allocations into the next water year. Murrumbidgee Irrigation and Murray Irrigation licence holders are able to carryover unused allocations (up to 15% and 50% respectively).

South Australia would also need some form of water storage, or an access share in storage of significant volume (storage volume plus space plus losses). South Australia does not currently have access to significant storage volumes with the capacity for carryover. If storage space is shared in an existing Murray-Darling Basin storage (Hume or Dartmouth) the delivery time and losses become factors, as does some form of storage charge from the storage operator to the licence holder.

The water that is traded out of South Australia that becomes carryover water in New South Wales is almost exclusively temporary trade. The volume of this trade can be significant from a South Australian perspective and has the potential to impact on the MDBC cap on South Australian diversions.

Extending or increasing the amount of carryover directly reduces South Australian environmental flows, and has an impact on salinity dilution for downstream users. Evaporation losses from increased carryover volumes are direct losses to South Australian environmental flows. In theory, if carryover was taken to the extreme, South Australia could not expect to receive environmental flows above South

Australia's entitlement flow, and this would have significant negative impacts on River Murray ecological systems.

Unbundling delivery capacity within the River Murray

This section of the report appears to be mainly focused on the utility of 'delivery shares' to deal with 'within-district' congestion. However, water users on the Lower Murray (Sunraysia and South Australia) have immediate concerns about congestion on the main stem of the River Murray. This has been brought about by the expansion of irrigated horticulture and the consequent (on-going) increase in peak demand over the summer months.

Sunraysia has experienced net intra-state permanent trade of between 85 to 100 GL in the ten years 1995-2005 that has generated an estimated 15,000 ha of new irrigation. Since the start of the MDBC Intra-state Water Trade Pilot Project in 1998 up to December 2003 South Australia had a net increase of permanent entitlement of about 15 GL.

The increase in demand concentrated in the summer months, set in the context of the recent series of dry seasons, resulted in a situation in early 2006 where River Murray Water reported that the Lower Murray irrigation areas were within 300ML / d of the need to impose some system of rationing

Some irrigators in both Sunraysia and the South Australian Riverland perceive that the continued expansion of large-scale, corporate enterprises in the regions is exacerbating the delivery problem and putting established businesses at risk. It has been suggested that new irrigation development should mitigate its impact on existing water users in a similar manner to salinity impact mitigation.

Under current circumstances this risk cannot be mitigated by new or established water using enterprises. Following the salinity analogy, consideration could be given to either restrictive regulation or a market solution such as a cap and trade mechanism for delivery capacity. The rights of earlier compared to later developers will need to be considered within either scheme.

Without some explicit policy and regulation or market-based instrument there is a significant and imminent risk of supply restrictions and negative impacts on both irrigation and the environment along the Lower Murray.

Chapter 3 Reducing constraints on Trade

Definitions

An important outcome of this work should be the clarification and attempt to standardize the use of terminology. For instance, the terms 'trade' and 'transfer' are often interchanged as meaning the same; however there can be significant differences. Trade is only one function or process that can result in a transfer of a water allocation. There can be administrative reasons for a 'transfer'; there can be change of name of a licensee that can result in a transfer, or there may be informal or formal arrangements between business partners resulting in a transfer. The reasons for a 'transfer' may not necessarily be related to a trading environment.

Current initiatives

The Natural Resources Management (Transfer Of Water Licenses) Amendment Bill – Proclamation made on 30/05/06. (This amendment removed all stamp duty payments associated with the transfers of water licences in South Australia.)

South Australia is currently investigating the potential reduction of fees associated with top up transfers in periods of restriction on SA water licences.

Water Accounting, Benchmarking and Baseline Assessment

South Australia is actively working with the National Water Commission through the various National Water Initiative Working Groups to develop consistent benchmarks and water accounting practices across all jurisdictions and to clearly define baseline data on the current state of water resources.

South Australia is fully supportive of the need to identify the availability of, and interaction between, water resources and to develop water accounting systems that recognise and are able to account for:

- the whole water cycle in an integrated manner;
- all water access entitlements (including environmental entitlements); and
- transfers within a jurisdiction and across jurisdictions (where water resources are shared and where water markets are operating).

Robust and reliable water information and accounting practices are instrumental in supporting sound policy development and decision making for sustainable water resource planning, monitoring, trading, management and the recovery of water.

All water accounting systems currently operating in South Australia have been fully reviewed in a stocktake and analysis of existing water accounting practices undertaken by the National Water Initiative Water Accounting Expert Advisory Panel. Current water information has also been provided to the National Water Commission under the Baseline Assessment Project. Where appropriate, water

accounting systems/process development, enhancement or modification will be undertaken to meet the agreed water accounting, benchmarking and audit standards. South Australia will further develop appropriate water accounting and information systems to meet State and NWI imperatives.

Compatible register

South Australia also supports the need for compatible registers of water access entitlements across jurisdictions. The current South Australian register meets many of the requirements for compatibility but requires further development to meet all of the requirements. The lack of common products and terminology is an impediment to a nationally compatible register system and the National Water Commission is investigating this issue.

Many differences between South Australia and other jurisdictions should be resolved with the effective unbundling of water access entitlements to clearly differentiate between the share of the resource, the allocation assigned to that share and the physical use right that is to be undertaken. Significant modifications to the existing water access entitlement register will be required to manage, record and track fully unbundled water access entitlements. Again funding has been provided by the National Water Commission to complete the required work.

Groundwater management

South Australia is highly dependant upon groundwater; about half of its allocated water is groundwater. The Productivity Commission report over simplifies what constrains trade in groundwater management areas.

There are significant environmental constraints in transferring groundwater allocations; groundwater cannot be treated the same as a large managed river system. Groundwater lateral movement is generally of the order of a few metres to several hundred metres per year. This requires careful hydrogeological assessment for any potential transfer of an allocation. Care must be taken to ensure that concentrating extractions, or over extracting with poor allocation or transfer rules does not cause pumping interference or resource degradation for other water resource users, including the environment. To prevent adverse outcomes it is often necessary to manage unconfined aquifers in small management units, or by applying extraction rules and constraints, particularly in the case of confined aquifers.

Similarly, the interaction between unconfined ground water and surface water is dependant upon local technical factors. In some regions it may be possible to consider transfers on the basis of conjunctive use.

Whilst small groundwater management units, or separation of groundwater from surface water may appear as impediments to some trade and transfer of water allocations, they should not be considered as ‘constraining efficient trade’ if the decision is underpinned by a sound technical assessment and justification.

In South Australia we have a progressive move towards more integration in management between surface and groundwater systems in many areas. For example recently where we have commenced introducing regulatory frameworks for water resource management (known as prescription of a water in our legislative framework) both surface water and groundwater are being included, for example the Eastern and Western Mount Lofty Ranges. It is worth noting that in some parts of both of these areas there are already groundwater systems where use is regulated and now we are including surface water as well (Angas Bremer Prescribed Wells Area and McLaren Vale Prescribed Wells Area). However, in parts of these areas there will most likely always be difficulty in fully integrating management of both resources, as it is often difficult to quantify the interaction of the fractured rock aquifers with surface water flows.

It is also worth noting that historically most of our more significant resources (other than the River Murray) which have supported sustainable horticultural and agricultural development have been sedimentary groundwater systems and that in a number of these areas there is little in the way of significant useable surface water resources. For example, in the Mallee other than close to the River Murray, there is no surface water of any significance hence the emphasis has justifiably been on managing only the groundwater resource. Interaction between surface water and groundwater is a complex technical issue in the South East. There are few natural watercourses in the region and most surface water results from incomplete groundwater recharge. However these flows typically are recharged to groundwater further down gradient. Furthermore the storage of surface water is generally not practical due to geology.

Chapter 4 Other factors affecting farmers' decisions on water use and trade

A vital issue to consider is that the water market is not the only major driver of on-farm water use efficiencies in South Australia at this time. The major drivers responsible for rural adjustment and on-farm irrigation improvement are the:

- expansion of the horticultural industries, which has provided irrigators with certainty in their long-term investments and the opportunity to increase production by adopting more efficient practices.
- *River Murray Water Allocation Plan,* under the *Natural Resource Management Act 2004,* which specifies 85% water use efficiency for all irrigators.
- Commonwealth and state capital investment in the upgrading of supply infrastructure (i.e. move from open channels to piped, on demand supply) created opportunities for irrigators to move to more efficient technologies and included a requirement for improved on-farm efficiency.
- need to use water resources more effectively and efficiently due to the threat of reducing water supplies and degradation due to climate change.

Chapter 5 Externalities Assessment Criteria and Governance Issues

Environmental Management Framework

The Productivity Commission report identifies concerns with the use of catchment management authorities as environmental managers. The Commission's concerns centre on the ability of regions to access the skills, finances and resources it would need to actively manage water resources.

The *Natural Resource Management Act 2004* created regional institutional and planning arrangements drawing on 30 years of regional coordination and cooperation. The eight regional NRM boards are skills-based statutory bodies accountable to the Minister, with functions and powers set out in the Act. The boards have a more strategic role than that of the non-statutory INRM groups established as part of the Australian Governments NAP/NHT investment program. The boards must prepare and then implement regional NRM plans consistent with the statutory State NRM Plan. To implement regional plans boards have the ability to raise funds from a range of sources including NAP/NHT, MDBC and through land and water based levies.

The new statutory arrangements in combination with the experience and community capacity development that has already taken place in the State will serve to ensure that the skills, finances and resources for sound regional natural resources management is available.

The River Murray is the only water resource in South Australia where the role of an Environmental Manager is currently being developed. In that case the Environmental Manager will in fact be institutionally the Murray Darling NRM Board. The role of the Environmental Manager for the River Murray will be to transparently manage the distribution and account for environmental water provided to the Board from various sources.

Environmental Managers (effectively environmental flow managers) are not as relevant to other water resources within South Australia as environmental water provisions are made in different manner compared to the River Murray.

In South Australia, major infrastructure required for environmental outcomes, such as salinity interception schemes are most appropriately implemented through existing government arrangements due to the capital costs, the complexities of cost-sharing, and the level of accountability for procurement and construction. However, these projects are implemented with considerable consultation and input from regional natural resource management boards.

Chapter 6 Market Mechanisms for altered river flows

Trading seasonal allocations in the River Murray

Provision should be made for the environment to be a receiver of and a trader in seasonal water allocations.

Exit fees

The draft report specifically points out the $360 Central Irrigation Trust (CIT) exit fee and South Australia's stamp duty (P.69) as an impediment to trade. CIT has advised that its exit fee is set in line with the Murray-Darling Basin Commission's Principles for the Development of Access and Exit Fees. These exit fees are intended to cover the cost of maintaining infrastructure as water exits the Trust's license.

CIT will be submitting its own comment on the exit fees issue.

The Draft Discussion concludes (p. 69) that "exit fees result in welfare re-allocations (from irrigators to water utilities) and economic inefficiencies (known as deadweight losses)", and recommends that exit fees should be removed.

In terms of welfare re-allocations and potential social costs, information on the potential effects of a wide spread exit fee regime in the Southern Murray Darling Basin on irrigators and irrigation districts where no exit fee regime is in place appears warranted. For example:

- To what extent may the 50 per cent of River Murray irrigators in South Australia (who do not apply an exit fee regime), be under increased (distorted) pressure to trade water and adjust out of irrigated agriculture?
- To what extent, if any, may these irrigators expect increased water prices for permanent sales in such a trading environment?

The South Australian Government recognises that there are a number of existing mechanisms available under the NWI Agreement and to water utilities more directly to assist in avoiding the potential for stranded assets - if so desired.

- Under the NWI, the 4 per cent annual limit on permanent water trade from a valley limits water trade, adjustment and hence the potential for stranded assets.
- In response to the market signals associated with water trade from a valley, water authorities may rationalise existing infrastructure, alter plans for infrastructure replacement and/or revalue their infrastructure in the light of reduced demand.
- Water authorities may also make agreements for upfront payment of infrastructure in the future (eg though debt financing).

With respect to water trade limits, the Productivity Commission noted (p. 68) that "any benefits from reducing or removing these (water trade) limits will be minimal or negated, however, if they are simply replaced with other constraints, such as exit fees." Given that these water trade limits have already been agreed under the NWI, the South Australian Government is interested in the Productivity Commission views

on the efficacy of the additional imposition of exit fees in limiting water trade and adjustment, and the policy need for both instruments over any transitional period.

The critical role of direct negotiation between water authorities and irrigators for future infrastructure and the pricing of water delivery services is also recognised by the South Australian Government. As reported by the Productivity Commission, the Central Irrigation Trust imposes exit fees in South Australia. The South Australian Government currently has no direct regulatory oversight of the imposition of these exit fees. Any irrigator potentially damaged by the imposition of exit fees in this instance may take action through the ACCC under Section 49 of the Trade Practices Act.

As reported by the Productivity Commission (p. 69), the ACCC has been requested to develop a consistent inter-jurisdictional framework for the use and nature of exit fees and access fees. A copy of the 21 June 2006 correspondence from the Minister for Agriculture, Fisheries and Forestry to the ACCC was forwarded to the Treasurer. The South Australian Government encourages the Productivity Commission to brief the ACCC on its analysis and for the ACCC to take account of this in its deliberations.

Chapter 7 Market mechanisms to manage salinity

General comments

The report must recognize the River Murray salinity zoning policy, which has been effective as of 1 July 2005 in South Australia.

The report should recognise that salinity management in the River Murray region of South Australia is focussing on floodplain management as well as river and dryland salinity.

Specific comments

The following section documents comments and corrections in relation to specific parts of the report and are referenced by the table, page or section numbers in the report.

Table 7.1

This table does not recognise the importance of salinity impacts on floodplains, which is a key issue for the River Murray in South Australia.

This is caused by increased groundwater discharge results in rising groundwater tables and evapotranspiration, resulting in salinisation of floodplain areas. This contributes (combined with river regulation and lack of flooding) to die back of River Red Gum and Black Box communities on the floodplain, resulting in loss of amenity, habitat, tourism potential etc. It is not a water quality issue, more a habitat issue, but very much linked to river systems, therefore should not be not classified as dryland salinity. *(See: The Floodplain Risk Methodology (FRM): A suite of tools to rapidly assess at the regional scale the impacts of groundwater inflows and the benefits of improved inundation on the floodplains of the lower River Murray. Kate Holland, Ian Jolly, Ian Overton, Matt Miles, Linda Vears and Glen Walker. CSIRO Land and Water technical report 27-05, December 2005).*

Section 7.2: Policy Context Page 156: Point 2:

This point should read: " stabilise or mitigate its effects: prevent saline groundwater from entering rivers and floodplains or actively reduce groundwater tables to below critical levels on the floodplain"

Page 157: after box 7.2:

This section should read: "They can allow for expanded irrigation in those areas up to the interception and disposal capacity associated with the salt interception works**.** (They are still high impact locations, particularly if development results in increased groundwater discharge to the River beyond the pumping or disposal capacity of a scheme)".

Page 158: second paragraph

This section should read: "The South Australian Government noted that its salinity zoning policy includes an offset policy within the high salinity impact zone, where

irrigation development can occur in the high salinity impact zone, provided that the proponent undertakes actions that generate sufficient salinity credits to offset the debit associated with the proposed development. Generally, this will mean purchasing water from elsewhere within the high salinity impact zone in South Australia. There is no salinity credit trading among landholders along the River Murray within South Australia. The zoning policy operates strictly on an offset principle only."

Page 160: first paragraph under zoning:
The last sentence should read: "South Australia has a salinity zoning policy for the River Murray, which differentiates between high salinity impact, low salinity impact and salt interception zones. There are no charges associated with the policy at this stage. Irrigation development in the high salinity impact zone is subject to an offset requirement. Development in the salt interception zones is subject to available scheme capacity and development in the low salinity impact zone is subject to salinity credits available to South Australia on the MDB register".

Page 162:
The system operating in the Qualco-Sunlands Groundwater Control Trust in South Australia could be included as another example of successful management of groundwater recharge at a district scale.

The *Groundwater (Qualco-Sunlands) Control Act 2000* provides the legislative framework for the construction, operations maintenance and administration of a groundwater control and salt interception scheme. The legislation essentially allows for a banking system for scheme capacity to ensure that groundwater discharge from irrigation development within the district remains within the capacity of the scheme to manage the groundwater. Rights to access scheme capacity (called risk management allocations (RMAs) are held by landholders and attract a charge for operation, maintenance and replacement of the scheme. Without sufficient RMAs, the groundwater control trust will not allow additional water transfers for use into the district. Risk Management. The legislation provides a reward system for reducing adverse impacts of irrigation.

Box 7.4:
It setting targets at the district/catchment scale there is a need to consider potential impacts on downstream users as well as impacts on floodplains in that district/catchment.

Page 178/179
The report canvasses the option of salt loading during periods of high flow in the River Murray. There are a number of policy and technical issues to be resolved before this option could be fully considered.

Dumping salt into the River at periods of high flow carries a major risk of salt being deposited elsewhere downstream on the floodplain or in a wetland. Any flush of this

nature would require sufficient water to ensure that the salt is flushed to the sea that it does not remain in the river channel or in the lower lakes.

Providing the recommended emphasis remains on carefully co-ordinating these programs so that significant detrimental effects are not created downstream, flushing could be considered where the benefits outweigh the costs and it does not become an exercise in environmental cost shifting. The purchase of offsetting dilution flows as outlined in the report would assist in capturing the full cost of such flushing programs. Currently there is great difficulty in finding water for various recovery programs that sourcing enough water for an out of season flush may be a difficult task.

There would also be the major issue of the River Murray entitlement flow, Cap on diversions and the Morgan salinity figure that would need to resolved in view of the Murray-Darling Basin Agreement if such a course was undertaken.

Water use efficiency

New irrigation developments within the River Murray region must demonstrate a high level of water efficiency. The River Murray Water Allocation Plan requires irrigators need to meet an 85% water use efficiency target. This efficiency target in is designed to strike a balance between efficient irrigation and the amount of water needed to flush salt from the soil in the surrounds of the River Murray. The South Australian River Murray irrigation industry is piped, pumped and pressurized and therefore irrigation system losses are very small. The infrastructure assists in achieving high water efficiency. In fact, recent soil research tends to suggest a move to such efficiencies under irrigation may lead to deleterious soil structural changes, which may affect the long-term productivity of the affected area.

Salt Interception Schemes

Salt Interception schemes that target groundwater mounds under irrigation districts (e.g. Bookpurnong and Loxton) are targeting the drainage water from the specific irrigation areas located in the immediate vicinity. This is water that has been purchased by the irrigators and is already accounted for under the MDBC Cap on diversions. The salt interception schemes are intercepting this water rather than exclusively the existing ambient groundwater.

Water that is intercepted in this manner may have returned to the River Murray, however it still has to pass through the floodplains and is subject to flood plan processes and evaporation.

Complexity in the Entitlements Arrangements

The report discusses ‘entitlements’ with out adequate consideration of the range of entitlements that operate across the Murray Darling Basin. Any investigation of market mechanisms would need to be extensive to address how they would impact on the range of entitlements. Table 1.1 provides a summary of the existing complex range of entitlements in three states. [from Shi, T 2006, ‘Simplifying complexity: rationalising water entitlements in the Southern Connected River Murray System, Australia’, *Agricultural Water Management* (in press)].

Table 1.1 A summary of existing 22 entitlement categories and the feature of their attributes in three states

State	Entitlement category	Attributes				
		Supply reliability (%)	Entitlement tradability	Allocation tradability	Tenure (year)	Access priority [e]
NSW (8)	Domestic & stock access licence	100	0	0	∞	1
	Local water utility access licence	100	0	A*	20	1
	High security access licence [a]	>95/97	E***	A***	∞	1
	Environmental water access	100	0	0	∞	1
	General security access licence [a]	70 [d]	E**	A***	∞	2
	Supplementary water access	50 [d]	0	A*	2	3
	Conveyance access licence	50 [d]	0	A*	∞	2
	Indigenous cultural access licence	100	0	0	∞	1
Victoria (6)	Domestic & stock right	100	0	0	∞	1
	Town water supply	100	0	A*	∞	1
	Supply by agreement	100	0	A*	∞	1
	Water right [a]	96	E**	A***	∞	2
	Diversion licence [a]	70 [d]/96	E***	A***	5/15	2
	Sales water [a, b]	30-70	0	A**	1	3
SA (8)	Stock & domestic licence [c]	100	E***	A***	∞	1
	Country town water licence	100	0	A*	∞	1
	Industrial licence	100	0	0	∞	1
	Recreational & environmental	>97	0	0	∞	1
	Water taking licence [a]	>97	E***	A***	∞	1
	Wetlands licence	>97	0	0	2-5	1
	Water holding licence	>97	E***	A***	∞	1
	Metropolitan water licence	100	0	A*	∞	1

Note: E - entitlement, A - allocation, *** - tradable among states, ** - tradable within the state, * - tradable within the region, 0 - un-tradable, ∞ - perpetual.

a Assigned for irrigation purpose.

b Strictly speaking, sales water is not a formal entitlement. It is attached to water right or diversion licence and cannot be traded separately. Victorian legislation to be enacted from 1 July 2007 will unbundle sales water into a separate, legally recognised and independently tradable entitlement.

c Stock and domestic use in South Australia is a statutory right attached to land but can be declared a 'prescribed use' which then requires it to be licensed. This has occurred in the River Murray and the Northern Adelaide Plains, and in both regions the stock and domestic licences are not tradable.

d Figure is estimated and indicative of the average supply reliability.

e Access priority varies by state but generally environmental flows, industrial and town water supplies and basic landholder rights (i.e., stock and domestic and indigenous water rights) have priority over irrigation water supply.