

**Submission to the  
Economic Regulation Authority's  
Inquiry on Harvey Water Bulk  
Water Pricing**

13 November 2006



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# 1. Introduction

The Water Corporation owns and operates ten dams in the south west that are used in part to store water for Harvey Water. Table 1 provides the water allocations in these dams.

**Table 1. 2006/07 Allocation of Water by Dam (in Gigalitres)<sup>1</sup>**

	Harvey Water	Water Corporation	Other	Total
Stirling Dam	6	41		47
Harvey Dam	40	0		40
Wokalup Dam	10	0		10
Logue Brook Dam	11	0		11
<b>Total Harvey Irrigation District</b>	<b>66</b>	<b>41</b>		<b>107</b>
Waroona Dam	8	0		8
Drakes Brook Dam	2	0		2
Samson Brook Dam	4	5		9
Samson Brook Pipehead Dam	0	8		8
<b>Total Waroona Irrigation District</b>	<b>14</b>	<b>13</b>		<b>26</b>
<b>Wellington Dam / Burekup Weir</b>	<b>68</b>	<b>17</b>	<b>15</b>	<b>100</b>
<b>Total Harvey Water Allocation</b>	<b>148</b>	<b>71</b>	<b>15</b>	<b>234</b>

<sup>1</sup> Allocations are based on longer-term climate records and will need to be reviewed in the light of the current drying sequence

The Corporation recovers the full cost of operating and maintaining these dams, including a return on investment, through a combination of charges to Harvey Water and other customers, and from Community Service Obligation (CSO) payments from Government.

The Corporation currently charges Harvey Water based on the type of customer using the water:

- Irrigation farmers pay a price based on the “renewals cost” for water. This charge takes into account the operation and maintenance costs of the dams and their future replacement, but takes no account of recovering the past investment in constructing the dams. Renewals charges are the minimum charge that can be applied without requiring additional funding in the future from an external source.
- Harvey Water incurs a higher charge for non-irrigation water use. This charge is based on a calculation of the long-term opportunity cost of water for use in the Integrated Water Supply Scheme (IWSS). The opportunity cost calculation was done 12 years ago and does not factor in recent climate change. A similar calculation today would result in a much higher charge.

The higher charge for non-irrigation water reflects a State government decision to maintain consistency with the Water Corporation’s other major consumers. A reduction in price to lower bound renewals pricing would have provided non-irrigation customers with an artificial incentive to locate in the irrigation districts, rather than obtaining services from other schemes.

In addition to the above, Harvey Water has been charged 30% of the annualised cost of the Waroona dam safety upgrades.

Table 2 provides the volume used and the water storage payments by Harvey Water. Also shown are the payments to date by Harvey Water towards the Waroona dam safety upgrades.

**Table 2. Water Storage Payments and Volume Used<sup>1</sup>**

	Water Storage Payments:			Total	Volume Used <sup>4</sup> (gigalitres)
	Harvey Water	Non-allowable use <sup>2</sup>	Dam Safety Payment <sup>3</sup>		
<b>1996/97</b>	\$231,492.30	\$9,437.40	-	\$240,929.70	112
<b>1997/98</b>	\$235,003.00	\$2,410.00	-	\$237,413.00	114
<b>1998/99</b>	\$220,326.75	\$15,026.40	-	\$235,353.15	117
<b>1999/00</b>	\$242,843.50	\$41,095.90	-	\$283,939.40	110
<b>2000/01</b>	\$276,639.30	\$50,062.95	-	\$326,702.25	122
<b>2001/02</b>	\$241,326.30	\$51,126.90	-	\$292,453.20	98
<b>2002/03</b>	\$232,690.15	\$240,043.05	-	\$472,733.20	88
<b>2003/04</b>	\$258,257.59	\$129,333.75	-	\$387,591.34	100
<b>2004/05</b>	\$249,986.20	\$155,876.90	\$386,911.80	\$792,774.90	92
<b>2005/06</b>	\$247,281.55	\$126,751.60	\$414,691.20	\$788,724.35	86

1. 2005/06 amounts includes invoices sent late June 2006 and yet to be paid.
2. The Bulk Water Supply Agreement allows Harvey Water to supply water to third parties.
3. Includes GST.
4. Water consumed by Harvey Water only (excludes non-allowable use).

As Table 2 shows, the amount of revenue collected from non-irrigators has been increasing since 1996, reflecting higher volumes. The total volume consumed is relative small, with 1.7 gigalitres in 2005/06 compared to 86 gigalitres consumed by Harvey Water.

The CSO payment for the South West Irrigation districts includes:

- The shortfall between the renewals charge and full cost recovery (excluding dam safety);
- A contribution of 15% for non-consumptive beneficiaries (eg recreation); and
- A 70% contribution to the cost of the Waroona dam safety upgrades.

The CSO payments the Corporation has received under these arrangements is shown in Table 3.

**Table 3. CSO Paid to the Water Corporation for Water Storage to Harvey Water**

96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
\$2.3m	\$2.3m	\$2.4m	\$3.1m	\$3.1m	\$3.2m	\$3.3m	\$3.3m	\$4.3m	\$4.2m

Drainage services to the irrigation districts are also subsidised through a separate CSO payment.

## 2. Dam Safety Program

The Water Corporation is responsible, as owner, for the operation and maintenance of the South West irrigation dams. The Water Corporation has a duty of care to maintain dams to current community standards. Community standards in this case have been based on guidelines produced by the Australian National Committee on Large Dams (ANCOLD). These guidelines are accepted practice in most major dam owning organisations in Australia.

The need to undertake improvements to dam safety was recognised at the time of the establishment of the irrigation co-operatives. The Bulk Water Supply Agreement made provision for the bulk water price to be increased as a consequence of any dam safety upgrades.

Due to the uncertainty of the magnitude of these costs at the time, provision was made in the Bulk Water Supply Agreement for the irrigators to meet their share of these costs when they were incurred.

The preliminary estimate of the dam safety costs was around \$20 million in 1996. With further detailed assessment and cost inflation, the current estimated of the cost is now \$128 million.

In 2003, Marsden Jacob Associates reviewed the dam safety program on behalf of Harvey Water and the Water Corporation.<sup>1</sup> The review confirmed that the proposed dam safety program was required to meet ANCOLD guidelines.

A portfolio risk assessment was undertaken to prioritise the remedial works on all the Water Corporation's dams and a program of works was developed. Waroona Dam was identified as having the most adverse risk profile of the irrigation dams, and work has been completed to upgrade the spillway and to protect the core of its embankment from erosion. Expenditure is also required on Wellington, Stirling, Logue Brook, Samson and Drakes Brook dams.

The current timing of this expenditure is provided in Table 4 below.

**Table 4. South West Dam Safety Capital Costs Including Waroona Dam**

<b>Total</b>	<b>Pre 05/06</b>	<b>05/06</b>	<b>06/07</b>	<b>07/08</b>	<b>08/09</b>	<b>09/10</b>	<b>Post 09/10</b>
<b>\$127.8m</b>	\$25.4m	\$2.1m	\$3.0m	\$47.5m	\$27.5m	\$21.8m	\$0.5m

<sup>1</sup> Marsden Jacob Associates (2003), Review of Dam Safety Program Relating to South West Irrigation Dams: Final Report.

## 2. Water Trades

Some of the South West irrigation dams that have traditionally been used for irrigation have been long-identified as potential drinking water sources able to make a significant contribution to the IWSS that supplies the Perth metropolitan area. Perth's Water Future, published by the Water Authority in 1995, and the Harvey Basin Surface Water Allocation Plan, published by the Water and Rivers Commission in 1998, both acknowledge the significant potential of these resources for drinking water, while being mindful of the dams' importance to supply local irrigation needs, and as local and regional recreational and tourism resources.

In response to a dry sequence of years and the 2001 drought, Stirling Dam was developed in 2002, sooner than initially planned, by building the Harvey Dam for irrigation supply and a trunk main to transport the water to the IWSS.

In 2003, the pipehead dam at Samson was built to utilise available yield without impacting irrigation allocations. Beyond this, it was considered that the South West irrigation dams were fully allocated and further allocations for the IWSS could only be achieved through water trading.

A major issue in the development of these sources is the protection for drinking water quality. Recreation within the catchment and on the water bodies is a contamination risk contravening source protection policies. As part of the redevelopments at Stirling and Samson, Source Protection Plans were put in place.

The forested catchments at Samson, Logue Brook and Stirling Dams have the opportunity to provide good quality drinking water. These dams are the focus for water trading opportunities. In contrast, the catchments for Drakes Brook and Harvey irrigation dams are highly modified with farming, residential and recreational activities established. Waroona Dam has a forested catchment, but has long been a focus for water-skiing, marroning and fishing. There is considerable community value placed on the recreational amenity of water bodies and other catchment activities. The Water Corporation does not intend to use these irrigation sources for water supply without treatment and risk management, and has encouraged their use as recreation 'nodes'.

Harvey Water and the Water Corporation have negotiated a trade to transfer 17 gegalitres of allocation to the IWSS. This trade is based on the recovery of system losses by installing pipes in existing trapezoidal channels. This benefit will be progressively introduced to the IWSS. The piping project has been widely regarded as a win-win initiative for the South West contributing to a more efficient and reliable irrigation system.

The trade requires that a source protection plan is put in place for the Logue Brook Dam. It is expected that this plan will require that no recreation activities occur on the reservoir or within the two kilometres reservoir protection zone. Recreational activities within the catchment should also cease. Finalisation of this is currently subject to Ministerial determination. Ideally these activities should be consolidated at the irrigation dams.

Harvey, Waroona and Drakes Brook Dams have water quality risks arising from highly disturbed catchments, dwellings, crops, pastures, roads and recreation. Contaminants in these irrigation dams resulting from catchment activities could include turbidity, pathogens, fertiliser, fuel from speed boats etc. Water from these irrigation dams can not be simply ‘traded’ without careful management of water quality issues.

Due to the local and regional importance of recreation and tourism in the area, together with the already disturbed catchments at Harvey and Drakes Brook, it is unlikely that further restriction on activities on these irrigation dams will be acceptable. With these risks, water from these dams will require comprehensive treatment to comply with drinking water guidelines. To provide the desired level of water quality security from these sources, it is likely that water would also need to be passed through a second storage facility to keep the Corporation’s current position in relation to avoiding reliance on water treatment alone to manage water quality risks. Scheme configuration for a trade of this sort would be more complex, adding significantly to the cost of the water.

Subsequent to the current trade, there will be the possibility for the transfer of up to an extra 7 gegalitres from the drinking water dams including Logue, without expensive and complex treatment. If this second trade were to take place, the available allocations from the drinking water dams would be fully utilised.

There is also the issue of the future use of Wellington Dam. This dam has issues associates with salinity, towns located in the catchment and recreation. A large scale complex treatment plant is likely to be required, together with storage in a second dam before use to make this source secure for drinking water use. Large scale trading is likely to be required to provide the economies of scale to make this source viable.

Table 5 shows the expected changes in Harvey Water’s allocation in the South West Irrigation dams as a result of the negotiated water trades.

**Table 5. Harvey Water – Allocation of Water by Dam (in Gegalitres)**

	05/06	06/07	07/08	08/09	09/10
Stirling Dam	8	6	4	2	2
Harvey Weir	40	40	40	40	40
Wokalup Dam	10	10	10	10	10
Logue Brook Dam	11	11	9	8	6
<b>Total Harvey Irrigation District</b>	<b>68</b>	<b>66</b>	<b>63</b>	<b>59</b>	<b>57</b>
Waroona Dam	8	8	8	8	8
Drakes Brook Dam	2	2	2	2	2
Samson Brook Dam	6	4	2	2	2
<b>Total Waroona Irrigation District</b>	<b>16</b>	<b>14</b>	<b>11</b>	<b>11</b>	<b>11</b>
Wellington Dam	68	68	68	68	68
<b>Total Harvey Water Allocation</b>	<b>152</b>	<b>148</b>	<b>142</b>	<b>138</b>	<b>136</b>

### 3. Response to ERA Issues

**1. Should the Bulk Water Supply Agreement be based on the full cost method or the renewals costing method (as applied in the past) to recover the Corporation's costs of owning and operating dam infrastructure?**

The current circumstances are significantly different from when the water storage charges were calculated 12 years ago. At that time, irrigation was viewed as the only use for the water resources in the medium term. For example, Harvey Dam, which was completed in 2002, was then scheduled to be constructed in 2017. Water trading was not contemplated.

Climate change has increased water values. The current structure of the water storage charge has the potential to distort the price signals for water trading. The differential price structure for irrigation and non-irrigation use provides a disincentive for trading to non-irrigation customers. However, the Corporation would be concerned in terms of competitive neutrality if prices to non-irrigation customers were reduced, providing a subsidy to major consumers just because they chose to locate in an irrigation district.

The ERA should consider the extent to which the current pricing structure has the potential to distort water trading outcomes. This should be done in conjunction with consideration of maintaining consistency with charges to other major consumers.

**2. Are the ANCOLD Guidelines the appropriate guidelines to determining dam safety standards for the South West irrigation dams?**

ANCOLD guidelines are the only standards that prevail in Western Australia. The Water Corporation, and other dam owners, must therefore manage their dams in a manner that is consistent with the ANCOLD guidelines.

A number of people have expressed the view that the relative cost of risk reduction required under ANCOLD is greater than risk reduction expenditure in other parts of the economy. However, unless alternative safety regulations are put in place, the Corporation is required to continue to use the ANCOLD guidelines to determine the dam safety requirements for the South West dams.

**3. Do the ANCOLD Guidelines give rise to an economically optimal allocation of Government expenditure taking into account the need for Government to minimise the risk of fatality across all relevant Government services including road, rail and other transport services and areas of health and safety more generally?**

The Water Corporation is aware of studies that show a different level of expenditure on risk reduction that occurs in different sectors of the economy. However, ANCOLD guidelines apply for determining expenditure on dams.



It should also be noted that communities do not generally take a simple equivalent cost of life approach to safety expenditures. Consideration is given to factors such as the choice the individual has in exposing themselves to the risk and size of the potential loss of life.

**4. Are the current institutional arrangements for dam ownership and water rights in the South West irrigation district a barrier to achieving economically efficient levels of dam safety expenditure?**

If the ERA forms the view that complying with the ANCOLD guidelines result in “economically inefficient” levels of dam safety expenditure, the appropriate response would be to recommend the implementation of alternative dam safety regulations. This would allow the Government to make a policy decision on the appropriate levels of community safety.

Transferring ownership of the dams to the irrigators may artificially reduce the rate of expenditure to meet the ANCOLD guidelines due to Harvey Water’s limited financial capacity. Harvey Water would still be required to meet the same standards in the longer-term. However, consideration would need to be given to Harvey Water’s appropriate rate of expenditure given that the Water Corporation would then become a customer of dam storage services from Harvey Water, increasing their capacity to deliver the works.

Additionally, Harvey Water would need to deal with the dam safety issue from a lower knowledge base. Six of the irrigation dams are the highest dam safety risks in the Corporation’s portfolio of dams. Transferring ownership of the six highest risk dams in Western Australia to an owner with no experience in dam safety management would not be prudent.

The Corporation has a well established dam safety program to manage these dams. A team of experienced dam engineers manage the program and provide specialist advice to operating teams in each region that are responsible for dam safety surveillance, operation and maintenance. It takes time and experience to build up this capability and it would be unreasonable to expect Harvey Water to set this up from scratch.

While changes in dam ownership may indirectly change the level of dam safety expenditure, it would be inappropriate to undertake this action simply as a short-term measure to circumvent the need to implement changes in dam safety regulations. The Water Corporation would not support such a transfer.

**5. Would it benefit Western Australia to develop its own legislation for dam safety standards?**

The Water Corporation manages a large capital program with competing claims for limited funds. Currently, risk profiling assigns a high need to complete the Dam Safety Program across the State, and capital funding has been allocated to ensure

dams and other referable structures are upgraded to meet current ANCOLD guidelines.

If legislation could limit the Corporation's liability, the priority assigned to dam safety would fall, freeing up funds for other capital works with higher priority, potentially including those outside the Water Corporation. Whether Western Australia would benefit from such a reprioritisation is dependant on assessments being made that the current level of expenditure is too high.

**6. To what extent should dam safety be based on measures that are comparable throughout the economy?**

From a theoretical point of view, expenditure on risk reduction should be comparable through the economy. Such a comparison should include consideration of whether the levels of expenditure on other risk reduction measures are sufficient.

The Corporation would only support such an exercise being undertaken at a whole-of-Government level. The recent review undertaken by the Snowy Mountains Engineering Corporation<sup>2</sup> had limited success as it was constrained to looking at this issue in the context of dam safety alone.

**7. Who are the beneficiaries of the expenditure on maintaining and operating the South West irrigation dams?**

The beneficiaries of the South West irrigation dams are consumptive users (ie Harvey Water and the Water Corporation), and non-consumptive users such as recreation and flood mitigation. Expenditure on operating and maintaining the dams is for these beneficiaries.

If the dams were not there, downstream customers would not experience the risk associated with the dams being in place. Dam safety expenditure is, therefore, undertaken on behalf of those who benefit from the dams being in place.

Special consideration may be given where land use downstream from the dams has changed resulting in an increased consequence of failure, and upgrading is required to provide additional security. However, parallel examples are where the cost of odour reduction increases as development encroaches on wastewater treatment plants, or noise reduction curfews are imposed as development occurs near airports. The owners/customers of treatment plants and airports usually bear these added costs.

**8. How should the costs be allocated between Harvey Water and other beneficiaries?**

The Water Corporation supports an allocation process where an assessment is made of the value of the dams to non-consumptive beneficiaries, with the remainder of the costs being split on the basis of water allocations.

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<sup>2</sup> Snowy Mountains Engineering Corporation (2006), Evaluation of Alternative Management Strategies

Costs for this calculation should be calculated on the basis of full cost recovery. Any short-fall in pricing should be supported by an explicit CSO payment from the State Government.

The value of using some of the irrigation water for other uses (eg for the IWSS) is now potentially higher than the full cost recovery price. This underpins the need to use full cost recovery in this exercise and underpins the use of replacement cost asset valuations.

**9. Are there any elements of the expenditure on the dams which could be viewed as legacy costs?**

The renewals price in the original 1996 Bulk Water Supply Agreement assumed there were no legacy costs associated with the dams. Explicit payments were made for the assessed legacy cost of deferred maintenance associated with the channels, along with transition subsidies for distribution operations. Prices in the Bulk Water Supply Agreement were set to achieve lower bound pricing immediately.

**10. What other basis might be used to determine cost recovery?**

See Issue 11 below.

**11. How should the Authority take into account farmers' ability to pay for dam safety upgrades?**

During the examination of the price that Harvey Water should pay towards the dam safety works at Waroona Dam, a major issue was affordability.

The original intent was that the costs would be apportioned between the beneficiaries of the program. However, Marsden Jacob (2003) determined that such a cost allocation would be unaffordable for Harvey Water. Instead, they recommended payments that irrigators could afford based on the profitability of their dairy businesses, ie 25-35% of the Waroona Dam costs and 40-50% of the remainder of the program. However, potential water trading complicates this picture. Marsden Jacob did not take into account the value of the irrigator's water entitlements in calculating their ability to pay.

However, it should be noted that not all the irrigation water could be traded in the short to medium term due to water quality, source protection and IWSS demand issues. Some element of affordability should be considered to the extent that the continued operations of the Harvey Irrigation districts provide a net economic benefit to Western Australia. Marsden Jacobs (2003) suggests that there are alternate farming methods that may produce better profits and require substantially less water.

However, affordability should not influence the level of safety work undertaken. The appropriate safety standards are independent of the farmers' ability to pay.

**12. Does the value of water traded within the Harvey Water cooperative provide any guidance on the value of dam safety upgrades?**

The current water trading within the Harvey Water cooperative offers little guide to the value of the water. Farmers are restricted from trading to outside customers and, therefore, this market only reflects local and seasonal values.

**13. What principles should govern the structure of bulk water prices to Harvey Water?**

The current structure of the water storage charge between the fixed and volumetric component was determined to match Harvey Water's tariff structure to their customers. The objective of this structure was to minimise the risk to Harvey Water in the case where water sales fell due to low water demand or availability. This should be considered as a transition measure that is no longer required.

The services provided by the Corporation are largely fixed cost in nature. The structure of the water storage charge should, therefore, be predominantly fixed.

The call for a greater volumetric component to encourage water conservation is misdirected in this case. Water that is not consumed does not become available to other customers and either augments Harvey Water's future entitlements or results in storages overtopping. A greater volumetric charge would transfer volumetric risk to the Water Corporation and to the Government without a corresponding increase in revenue.

The potential for water trading is a greater incentive to encourage water use efficiency.

**14. Should the water storage charge to Harvey Water be the same as the charge to other users?**

This question is covered in the response to Issue 1, above.