

No. 5 Managing to diversion limits in inland unregulated rivers

Why are diversion limits needed?

Water diversions from rivers in NSW progressively increased throughout the last century, but most rapidly in the last 20 years or so. Growth in water diversions:

- ◆ takes more and more water away from the river and may threaten its environmental health;
- ◆ reduces water available to other legitimate businesses, and
- ◆ reduces flows from upstream river systems into downstream systems.

Concerns over these issues led to the introduction of embargoes on the issue of further licences for most purposes - initially for the regulated rivers (in the 1980s) and then for the unregulated rivers (in the early 1990s). The embargoes did not however prevent growth in water diversions through expansion of businesses within their existing licensed entitlements, or the trading of entitlements to new businesses.

In 1994, the Murray-Darling Basin Ministerial Council undertook an assessment of water diversions across the Basin. This found that the levels of diversions at that time were placing stress on both the environmental health of our river systems and the reliability of supply to water users; and that diversions were continuing to increase. In response, a diversion limit - the Murray-Darling Basin cap - was introduced in 1995.

The cap means that water diversions are limited to those that would occur had the water management rules and the level of development remained as they were in 1993/94.

The NSW regulated rivers in the Murray-Darling Basin have been subject to cap auditing and action for a number of years. The initial focus on the regulated rivers and the Barwon-Darling River was because they represent the majority of water use in inland NSW, and because the licences were already volume based and diversions were metered with good records of past use.

Now that licences on the unregulated rivers have been converted to a volume basis, and with meters to be progressively installed to measure use, cap levels and monitoring of diversions against cap can be applied on the unregulated rivers.

The Department of Land and Water Conservation will shortly be commencing the metering program in unregulated rivers starting with those for which initial water sharing plans are being prepared. The department anticipates that most pumps in the Murray-Darling Basin will be metered by mid 2004.

What areas will cap apply to?

The unregulated rivers within each broader river catchment are quite diverse in their flow characteristics, economic base, amount of inactive licences remaining and the rates of growth. Unregulated rivers within each broader river catchment will therefore be subdivided into groupings for cap management purposes. These will be:

- ◆ the combined tributaries upstream of the regulated river system headwater dams (Copeton, Wyangala etc);
- ◆ the combined tributaries feeding into the regulated river system downstream of the headwater dams;

- the combined unregulated sections and effluents downstream of regulated systems; and
- other combinations of sub-catchments.

The unregulated rivers cap will therefore be managed in a **diversion management unit** which combines a number of sub-catchments. Each diversion management unit will have a **cap diversion limit** which applies to the unit as a whole. This means that it will not be aligned to the individual water sharing plan for each water source, but will encompass groups of water sources.

The water management committees will be provided with the defined diversion management areas.

Principle 1

The cap on diversions in the unregulated rivers of the Murray-Darling Basin will be established on a volume base determined and managed for each defined diversion management unit.

How will cap diversion limits be determined?

The Murray-Darling Basin diversion cap is defined as the average yearly volume of water that would have been diverted under 1993/94 levels of development and management. In deriving the average yearly cap diversion volume, the fluctuations in water use that occurs with climate must be taken into account. This means that water use in any one year can be above or below this volume provided the average use remains at or below the cap level.

In volume terms, water use from the unregulated rivers is relatively small - generally less than 10% of the use from the regulated sections of rivers, or the Barwon Darling River in the far west.

Establishing cap for the unregulated rivers is extremely difficult. Irrigation on these rivers is very much climate influenced and totally dependent on often highly-variable run-of-river flows. While some irrigators have built on-farm storages to provide more certainty of supply, most irrigation is opportunistic in nature with established areas not always planted.

There are no reliable records of the development conditions in unregulated rivers in 1993/94, nor are there any accurate records of actual water usage during the 1990s. There is no metered use and no other recorded information available. Nor is it

possible to use computer models to determine the average yearly volume of diversions.

For these reasons, the cap volumes cannot be established in a similar way to the regulated rivers and the Barwon-Darling River. They will instead be assessed for each diversion management unit based on work undertaken for the volumetric conversion process for irrigation licences. As part of that process, licence holders were surveyed as to the area that they had irrigated over the six year period from 1993/94. This identified the areas irrigated each year. These areas have been examined and it is clear that there is no pattern of growth in irrigated area over the survey period in any of the river systems.

These areas can then be used with the conversion rates developed to establish licensed entitlements, to derive average levels of water use. Cap levels will therefore be based on this information calculated as an average of the yearly assessments over the survey period.

Details of the cap levels – the cap diversion limit – will be provided to the water management committees.

Principle 2

The assessment of cap diversion limits will be based on the survey results of the unregulated river water licences and will be calculated as an average of the yearly assessments over the 6-year survey period.

The cap figure will also need to include an allowance for those water users who have been licensed under the water amnesty and were irrigating around 1993/94.

Other licences such as town water and industrial licences are also being converted to a volume basis. For the priority water sources, this process will be completed in 2001. Once again an assessment of their 1993/94 levels of average use will be required for the cap. For example, in the case of towns which do not have records of past diversions, this will take into account the 1993/94 population statistics.

How will we tell if a cap diversion limit is being exceeded?

Once a **cap diversion limit** for each diversion management unit has been determined, this becomes the benchmark for auditing and reporting purposes.

However, licence holders are allowed to divert up to two times their licensed annual entitlement in any one year (subject to announced annual allocation levels as per principle 4), provided that the combined total of the licensed entitlement is not exceeded over a three year period. This provision was introduced in recognition of the high variable water use from the unregulated rivers as a result of climate and river flow variations. It will also allow water to be stored off-river to be available for use in dry periods. However, this will mean that in any one year, the total water use in a water management area is likely to exceed the cap diversion limit.

As well as the annual diversion limits, daily extraction limits are to be recommended by the Water Management Committees. These will be the means by which the pattern of flows will be protected (refer to *Policy Advice No 6: Water extraction volumes and daily flow shares in unregulated rivers*). These limits set aside a proportion of flow for environmental purposes. Licence holders will not be able to pump until a minimum flow level is reached and then they will have specified share of the flows above this level.

Total water diversions in a diversion management unit will be monitored by the DLWC to determine if real and sustained growth in diversions is occurring, rather than just yearly fluctuations that reflect climate or changes in water use patterns. Given the 3-year water use provisions that now apply, at the end of each year the *cap diversion limit* will be compared against the *average diversions over that year and the preceding two years*. If average use over the three years has not exceeded the average diversion limit then the existing management arrangements will continue.

When would a management response be triggered?

A response to exceeding cap will occur when the average diversions over the three year audit period exceeds the cap diversion limit by 5% or greater. This trigger will be large enough to reflect real growth, rather than short term fluctuations, but also small enough to not require a major adjustment by users. It is also a meaningful trigger in terms of accuracy of measurement – anything smaller would be impractical.

Principle 3

Adjustments should only be made when the three yearly average of diversions exceeds the cap diversion limit by 5% or greater.

If the trigger is not met, then no management response is required and existing management arrangements and the three year rolling audits continue.

What should the management response be?

Any adjustment should be to annual volumes not to daily flow shares. This is because changes to annual volumes will act as a brake on developed area, whereas restrictions on daily extractions may encourage increases in pump size and off-river storage development as individuals attempt to offset the effect of restrictions. This would ultimately reduce the reliability of supply and drive the systems towards a more “boom-bust” industry.

As is the case with regulated rivers, it will be possible to announce allocation restrictions in unregulated rivers if the cap diversion limit has been exceeded. For example, by announcing that only 90% of licensed annual entitlement will be available for the subsequent three years.

Principle 4

The response to any growth in diversions above the cap diversion limit will be by way of announced restrictions to the licensed annual entitlement.

When an adjustment is made, all licences (excepting town water and domestic and stock licences) in the diversion management unit should be adjusted by the same percentage, irrespective of whether they are active, inactive, irrigation or industrial. The volumetric conversion process has already reduced the entitlement of inactive licences relative to most active licences.

Principle 5

Every licence (excepting town water and domestic and stock licences) in the diversion management unit should be adjusted by the same percentage.

It is possible that downward adjustments to availability of entitlements could result in diversions moving to significantly below the target. In these circumstances it would be appropriate to adjust the allocation level upwards. However, this should be

done in a staged manner, returning to the level they were at immediately prior to the last audit that resulted in a reduction in allocation levels.

Principle 6

If the management strategy is resulting in diversions less than the cap diversion limit by 5% or more over the 3-year block, then the restriction on entitlements may be re-set upwards to the level they were last at.

How should the degree of response be determined?

The process of adjustment to be applied to deal with any increase in diversions above the diversion limit must be set out in the water sharing plan. The degree of adjustment should be proportional to the amount the target has been exceeded:

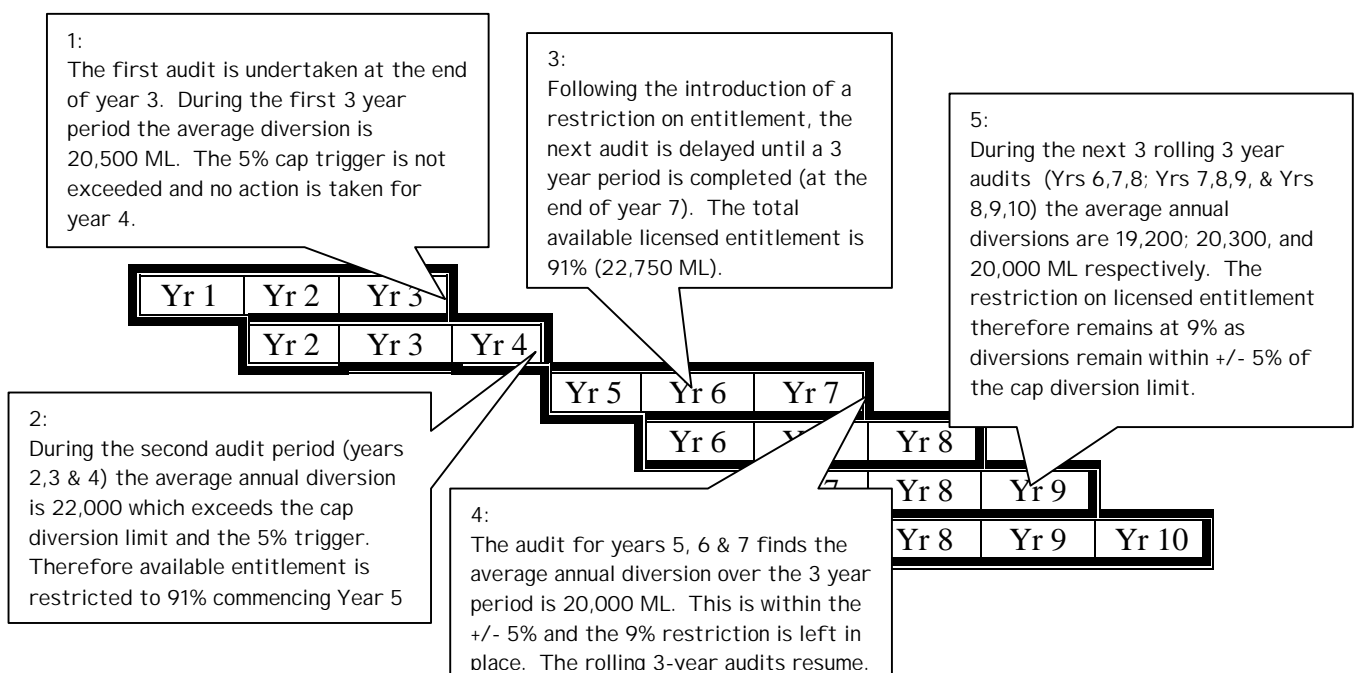
$$\text{Adjustment} = 1 - \left(\frac{\text{cap diversion limit}}{\text{actual average diversions}} \right)$$

(expressed in percentage terms)

For example, consider a system where the total licensed entitlements are 25,000 ML and the cap diversion limit is 20,000 ML. If the 3 year average diversion is 22,000 ML, then the growth is 2,000 ML, which exceeds the 5% trigger. The percentage adjustment in annual allocations would be calculated as:

$$1 - (20,000/22,000) = 9\%$$

Example diversion management unit where the total licensed entitlement is 25,000 ML, and the cap diversion limit = 20,000 ML. Water use monitoring is undertaken each year.



This would mean DLWC would advise relevant licence holders that only 91% of licensed annual entitlement will be available for the subsequent three years.

Principle 7

The degree of adjustment required should be proportional to the amount by which the limit has been exceeded.

When such an adjustment is made, there should be no further action for three years so as to allow water users to adjust and reductions in water use to be realised.

Principle 8

After an adjustment to entitlement is made, there should be no audit or further adjustment for three years.

How will assessments occur?

As irrigation needs vary from year to year, licensed water users will be able to extract up to twice their licensed annual entitlement (subject to announced allocation levels) in any one year, provided that the combined total over a three year period is not exceeded. This means that the monitoring, reporting and management cycle has to be on a three year rolling basis. This is illustrated in the following example.

Implications for water sharing plans

The Government will provide the Committee with details of the boundaries and the cap diversion limit for each diversion management unit and will undertake the annual reporting and auditing. The results of the audits will be published and made widely available.

The Government will also draft plan provisions that reflect cap diversion limit management as described in this paper.