

FACT SHEET

NO. 11

OFFSET PACKAGES TO DELIVER RELIABILITY OF SUPPLY



Produced by Goulburn - Murray Water

PURPOSE

An offset package is required to ensure reliability of supply to Broken system irrigators is maintained after the decommissioning of Lake Mokoan.

The offset package is a set of infrastructure and non-infrastructure measures, which reduce commitments on the system through a reduction in system water losses and transfer of demand to the Goulburn supply system.

The Victorian Government's commitment is to provide offsets which achieve at least an equivalent reliability of supply based on system modelling over a 114 year period of climate record. This modelling also assumes Lake Mokoan and Lake Nillahcootie operated for the entire period.

Modelling over 114 years is far more accurate compared to a shorter period taking into account all wet and dry years including extended drought periods which

occurred during the early 1940's.

The Government is investing in the long term sustainability of the Broken system irrigation area by creating a more modern and efficient irrigation system with the proposed offset package providing a reliability of supply of at least 91%.

RELIABILITY OF SUPPLY

Reliability of supply is expressed as the percentage of all years that full allocation is estimated to be provided. Hence, in this case, the offsets are expected to provide full (100%) allocation or better in 91 out of every 100 years.

Very conservative estimates of offset benefit have been factored into modeling, and further improvement beyond this is expected through the introduction of operational improvements as discussed later in this Fact Sheet.

The estimated reliability was derived using the Goulburn-Broken System water

resource allocation computer model, Goulburn Simulation Model (GSM). The model has been utilised by the Department of Sustainability & Environment and Goulburn-Murray Water for determining bulk entitlements for both the Goulburn and Broken River basins and is also being used for auditing the MDBC Cap in accordance with Murray-Darling Basin Commission requirements.

The assessed Broken System reliability of 91% is based on the Bulk Entitlement Conversion agreement on sharing of the water resource. VFF and irrigator representatives worked with DSE and G-MW in the development of this agreement, which is now legislated. In determining this share, recognition was given to the operating constraints existing at the time of negotiation.

The model applies operating rules to the systems storages and waterways, and simulates the last 114 years of climate conditions to predict what will happen when Lake Mokoan is taken from the system.

Number of years Allocation received (out of 114 years)	Allocation
100	170%
3	100 to 120%
3	80 to 100%
3	60 to 80%
1	40 to 60%
3	20 to 40%
1	less than 20%

Table 1. Modelled February Allocations for the current Broken System (determined by the GSM model, based on 114 years of record)

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OFFSET PACKAGE OPTIONS

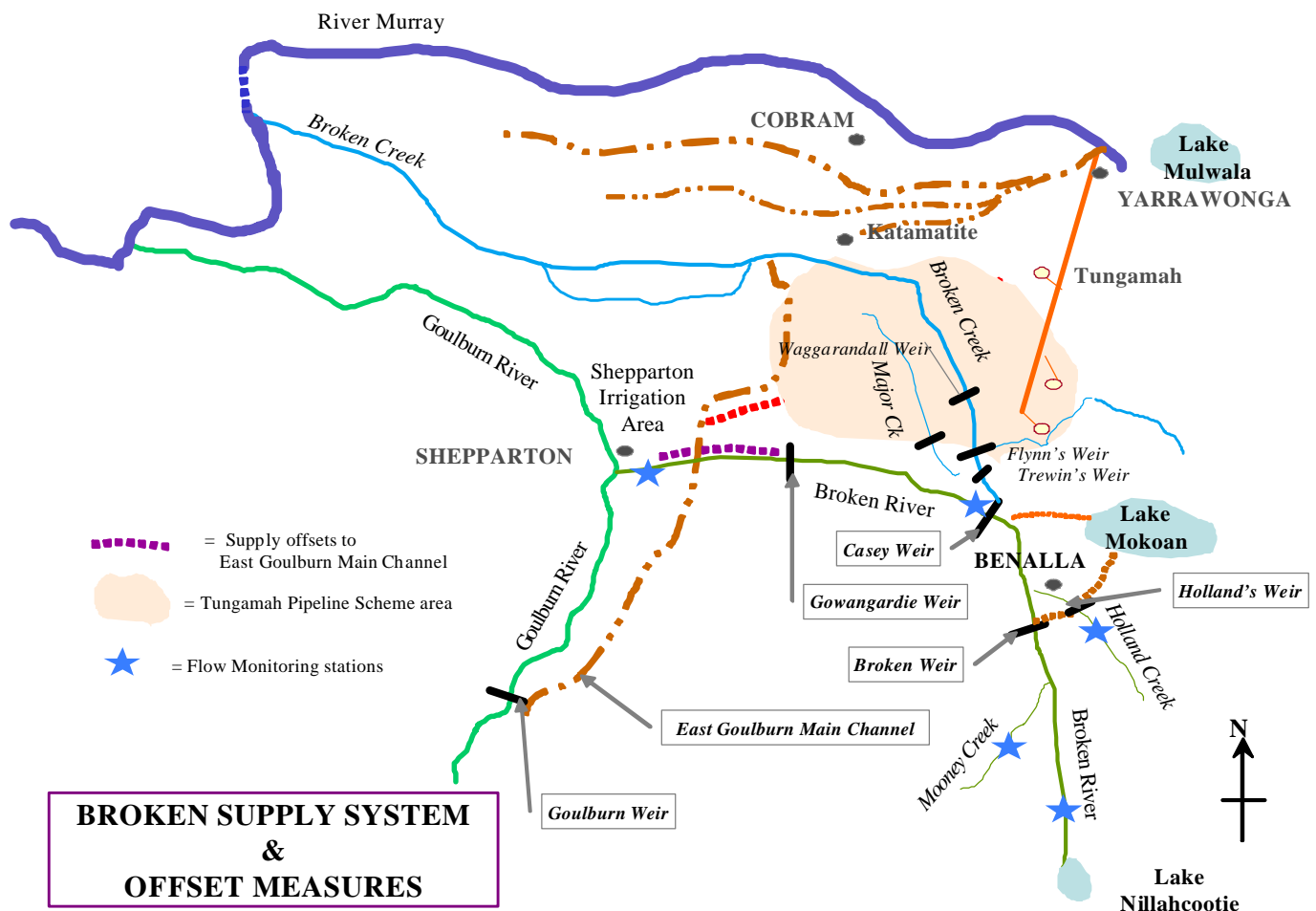
The Victorian Government White Paper identified the following set of possible offsets for the Mokoan Program. They included the Tungamah system piping with supply from the Goulburn System, channel automation on the Broken River and Creek, raising Lake Nillahcootie, supplying Broken diverters from the East Goulburn Main and pipelining the East Shepparton Water Works District.

In addition in excess of 30 other offsets were evaluated which were presented in a "scorecard". The scorecard was used to evaluate the offsets in terms of costs, effectiveness in achieving reliability of supply (measured in terms of water savings – ML/year), impact on total water savings and economic, social and environmental issues and risks.

From the scorecard, selected offsets were combined in "packages", in recognition that the net benefit in terms of water savings was best estimated through the GSM

modeling in this format. Approximately 15 offset packages were evaluated and refined to four. These four packages of offsets reflect the range of options available. The four packages are further divided in terms of cost into two groups characterised as either low cost/high Broken system entitlement purchase or high cost/low Broken system entitlement purchase. The four packages are presented in Attachment 1, with the locations of key components shown in Figure 1. A summary of the separate offset measures investigated but not included in the four offset packages are provided in Attachment 2.

Figure 1. Schematic diagram of the Broken System



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NO. II

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CORE OFFSETS

It is important to note that all the packages contain a “core” set of offsets. Comprising Offsets No. 1 to 8 in Attachment 1. This core set of offsets comprises:

- The Tungamah domestic and stock water supply system which provides water savings through elimination of a large volume of water losses generated in the existing creek and channel system plus the transfer of actual consumptive demand from the Broken system to either the Murray (the urban supply) or the Goulburn (the rural supply) systems;
- An existing entitlement purchase of 1000 ML through the purchase of a property (Burnbrae) and stripping of the water entitlement to that property.
- Supply Broken River diverters downstream of the EGM from the Goulburn System.
- Rain rejection storage (300 ML) utilising part of the existing Mokoan inlet channel.

Provision of remote control and monitoring of Lake Nillahcootie inflows and outflows, Broken River weirs (Broken, Hollands, Casey's), Broken Creek weirs (Flynn's, Trewin's, Waggarandall), monitoring of catchment streams Moorngag, Lima East Creek and Orrvale) and dynamic real-time monitoring of irrigation diversion flow meters (up to 100 major users).

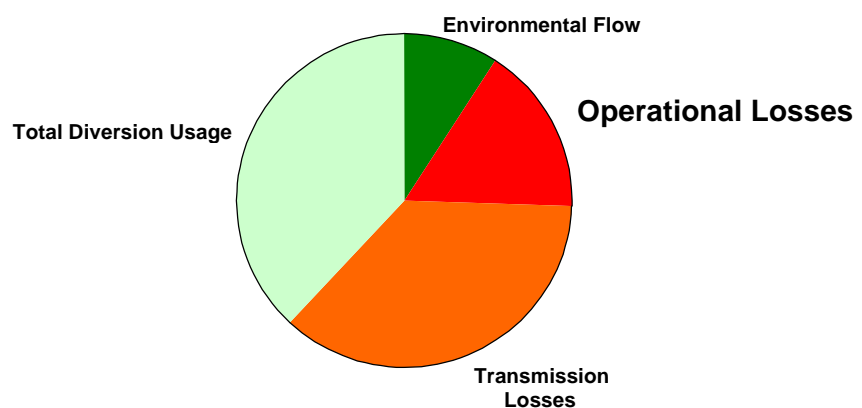
OPERATIONAL IMPROVEMENTS

All of the packages described in Attachment 1 also include an Operational Improvement Offset measure.

All offset packages will achieve considerable improvement in operational efficiency through reduction in system losses. However, the opportunity for further reduction in system losses has been recognised through the provision of remote control and monitoring of water supply and demand. Without confirming data, it is not possible to recognise any of this loss reduction potential. Figure 2 describes the components of the Broken System Water Resource. It is clear that water losses are major elements of this system.

Overall operational and transmission losses are estimated to average 30,000 ML and even a modest reduction in these losses will yield considerable additional

Figure 2. Components of the Broken System Water Resources



water savings which in turn can be translated into reliability improvement and possibly environmental flows. Hence, the introduction of the remote control and monitoring provides both the means to measure and achieve further loss reduction. Furthermore, a major

investigation is proposed to determine and quantify the opportunities for optimising operational rules to provide further loss reduction and therefore improve both reliability of supply to irrigators and environmental flows.