AUGUST 2006

FACT SHEET 8

NO.8

WETLAND EVAPORATION

Produced by *Goulburn-Murray Water*

EVAPORATION

Evaporation is the transfer of water from a liquid to a vapour state. The rate of evaporation is proportional to the surface area exposed, the temperature of the water and air, humidity and wind. When the volume evaporated from a water storage exceeds the volume of rainfall there is a net evaporation loss from the storage.

Figure 1 shows this at Lake Mokoan, on average Lake Mokoan receives 560 mm/year of rainfall but 1,260 mm/year is evaporated from the storage. Therefore a net evaporation loss of 700 mm/year occurs.

Evaporation is directly proportional to:

1) Surface area exposed and duration
2) Temperature of the water and air
3) Humidity
4) Wind

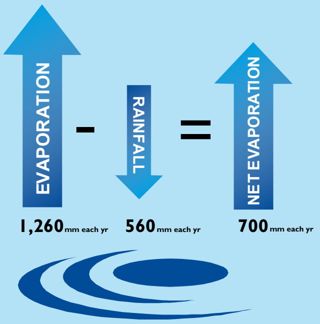

Figure 1

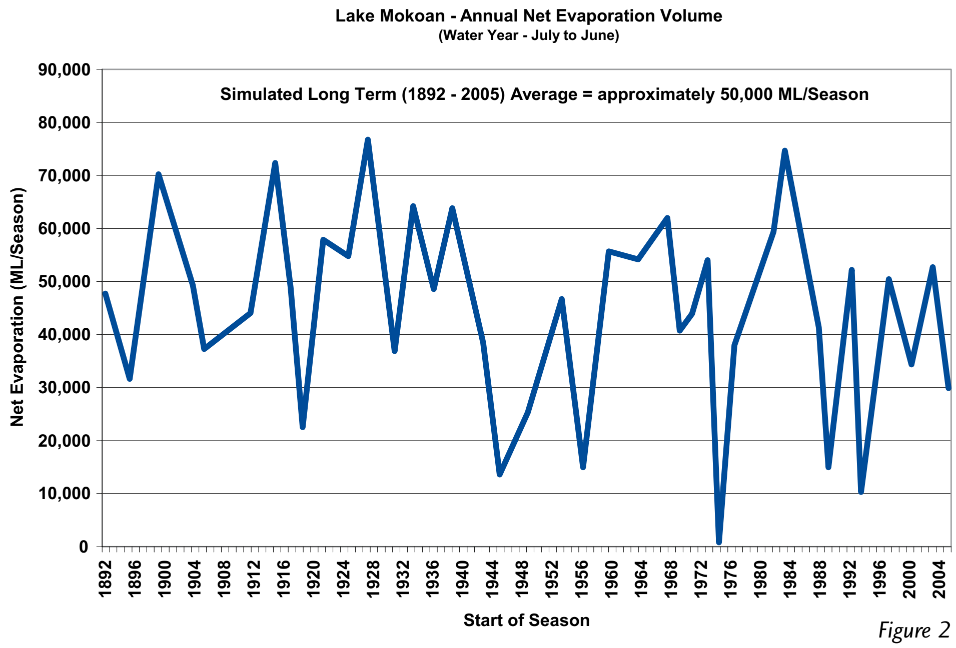

Figure 2

The volume of water lost from a storage is obtained by multiplying the net evaporation by the storage's surface area. Lake Mokoan is a flat, shallow storage whose sides have only a gradual slope. As a result it has a large surface area of 7,800 hectares when at its full supply capacity of 365,000 ML.

The surface area of Lake Mokoan varies over the year, generally peaking in late spring and then falling over the summer and early autumn. On average Lake Mokoan is expected to lose about 50,000 ML due to net evaporation annually. Annual net evaporation losses may vary from as little as 1,000 ML to as much of 81,000 ML. *Figure 2* plots the simulated volume of annual net evaporation loss for each irrigation season at Lake Mokoan.

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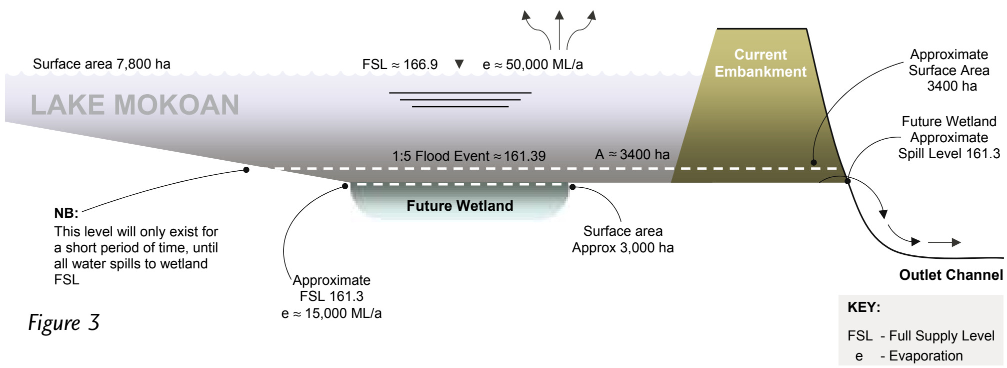

Figure 3

EVAPORATION IMPACTS AT LAKE BOGA

As part of the Lake Mokoan Return to Wetlands Project, Lake Boga is to be reintroduced into the supply system. Resource stored in Lake Boga will assist in meeting supply commitments in the Lower Murray during peak demand periods. Currently it is supplied either flood flows from the Avoca River or outfalls from the Torrumbary Irrigation Area due to rainfall rejections.

At full supply level Lake Boga has a surface area of around 940 hectares. Lake Boga has relatively steep sides so that an increase in water level does not result in a large increase in surface area. Due to this if the Lake is operated higher once returned to the supply system the volume of loss due to evaporation does not increase from current operations.

Lake Boga currently loses an average of 8,200 ML/year in evaporation. Under the proposed operation of Lake Boga, the average evaporation from Boga is expected to in fact decrease to approximately 7,900 ML/year. *(See Figure 4)*

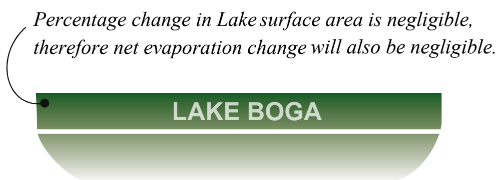

Figure 4

- Average historic lake level 68.843 m AHD
- Average historic lake surface area 908 ha
- Average historic lake evaporation 8,200 ML/year
- Average future lake level 68.583 m AHD
- Average future lake surface area 881 ha
- Average future lake evaporation 7,900 ML/year

WETLAND EVAPORATION

When full, the rehabilitated Mokoan wetlands will have a surface area of around 3,000 ha. The volume and therefore surface area of the wetlands will vary during the year depending on net evaporation, inflows and spills. On average it would be expected that 15,000 ML will evaporate from the wetlands annually.

Inflows from the local catchment when the wetlands are full will result in the water level temporarily increasing above the outlet level. This is due to the rate that water enters the wetlands being greater than the rate it can be passed through the outlet. This will cause an increase in surface area but only for a short period and will have negligible impacts on the total evaporation from the wetlands.

e.g. A 1:5 year inflow event into a full wetland will increase the wetland surface area to approximately 3,400 ha. Within 7 weeks, it is expected that 90% of the storm volume will have spilled into Stockyard Creek. Initially, there will be an additional 400 ha exposed from which evaporation can take place, however the wetland will be continually contracting during the 7 week period and the rate at which evaporation occurs will be heavily dependant on the weather during that time.

Above: Lake Mokoan embankment