



Taylor's Lake and Wimmera Inlet Channel Operating Rules

Taylor's Lake is an off-stream reservoir located 20 km south-east of Horsham. It is principally supplied from either the Burnt Creek Channel or the Wimmera Inlet Channel, but has a small natural catchment (Potters Creek).

Taylor's Lake has a major role in the water supply system as a source of supply for the Wimmera Mallee Pipeline (WMP) and for environmental water to the Wimmera River. It is of high recreational value due to its close proximity to Horsham and reliably holds water. Taylor's Lake has also assumed the role of supplying irrigation demands following completion of the WMP.

Water is typically harvested between July and October; however transfers from other parts of the water supply system can occur at any time of the year. Taylor's Lake is unique in that it is the only active reservoir able to receive water from any other part of the water supply system, including:

- > The Wimmera River via Huddleston's Weir and the Wimmera Inlet Channel;
- > Bellfield, Fyans and Lonsdale Reservoirs via Mt William Creek and the Wimmera Inlet Channel;
- > Wartook and Moora Moora Reservoirs via Distribution Heads and Burnt Creek; and
- > Rocklands and Toolondo Reservoirs via the Rocklands Outlet Channel.

Figure 1 shows the general layout of Taylor's Lake in relation to other nearby headworks assets.

Taylor's Lake has a current Full Supply Level (FSL) of 27,060 ML which is significantly less than its maximum capacity of 33,700 ML. This lower capacity (1.5 m lower than the maximum) has been adopted for dam safety reasons. There will be no diminished ability to supply all entitlement holder demands as a result of this reduced operating capacity.

Uncontrolled inflows to the lake from its own catchment can present a problem, as the ability to release these is limited to the outlet channel capacity of 400 ML/day. This ability is further constrained as the outfall from this channel to the Wimmera River cannot operate when the Wimmera River is in flood. Releases can therefore only be made before and after a flood event passes the outlet channel outfall.

Even with the revised FSL, the lake is still only able to temporarily absorb small inflows above this level (called surcharging) without potentially compromising the embankment integrity. Dam safety must be maintained by returning the lake to the FSL as soon as possible (within days).



Flood flows from the Wartook, Mackenzie and Burnt creek system can be directed to Taylors Lake. However, channel capacity constraints often mean much of the flood flow remains in the natural water courses. If Taylors Lake is already full during a flood event, flood flows can be directed to Pine Lake as an alternative. Pine Lake is no longer required by GWMWater for water supply purposes (refer to Pine Lake discussion paper).

Taylors Lake can often suffer from poor water quality associated with high levels of salinity, turbidity and nutrients. It is intended to minimise the harvesting of poor quality water by selectively taking water from the lower Mt William Creek and MacKenzie River (including Wartook) systems. Better quality water may also be taken from these systems and routed through Taylors to flush and dilute existing water in the lake. Decisions around these operations are dependent on seasonal conditions and the availability and location of water as well as the needs of all entitlement holders.

To assist in managing water levels during the inflow season, a variable operating level is proposed to be followed between the months of April and October inclusive shown in Figure 2. This target curve provides about 4,010 ML of initial air space in June and is progressively reduced to October, with the objective of having the reservoir full towards the end of the normal inflow period.

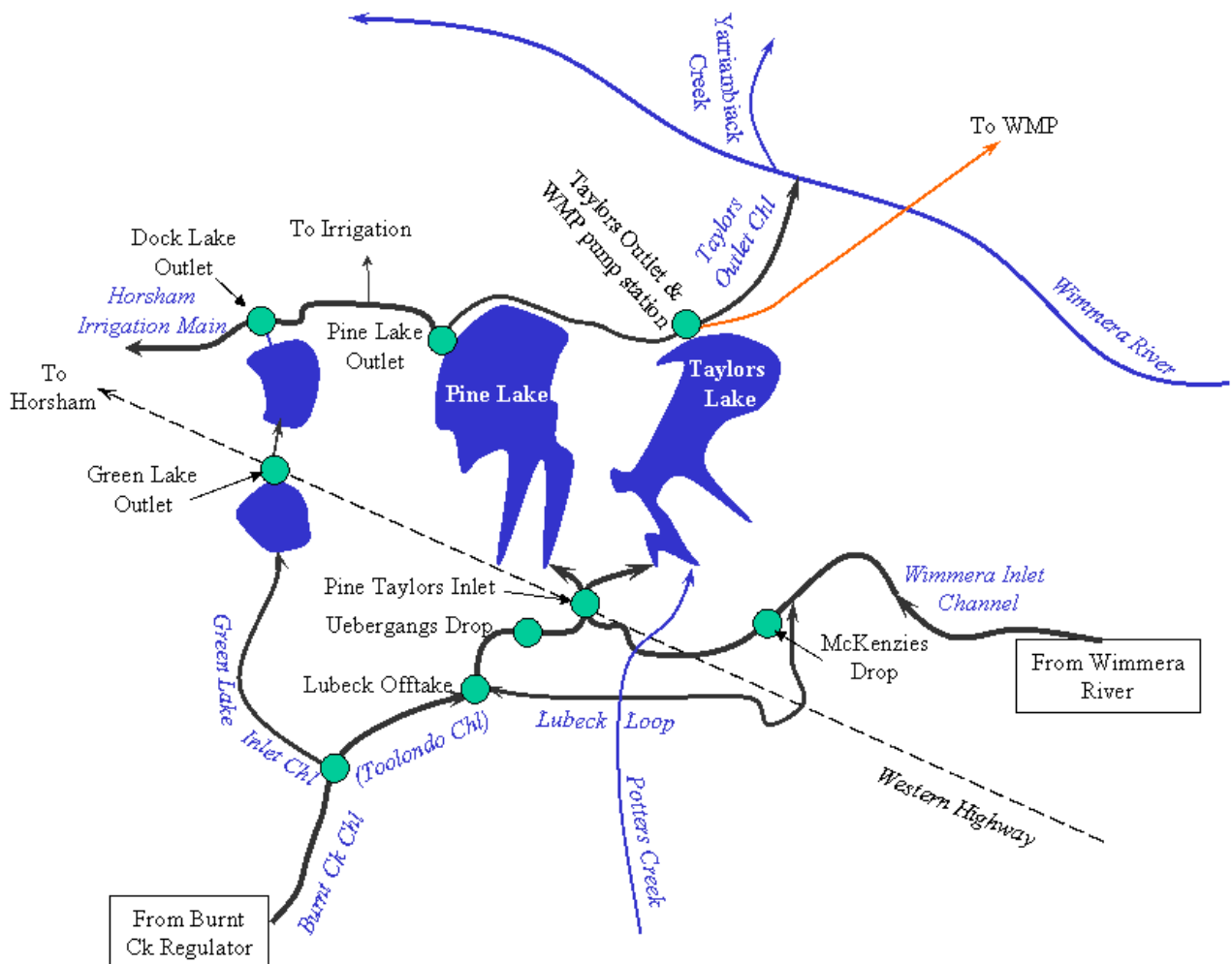


Figure 1: General layout of Taylors Lake

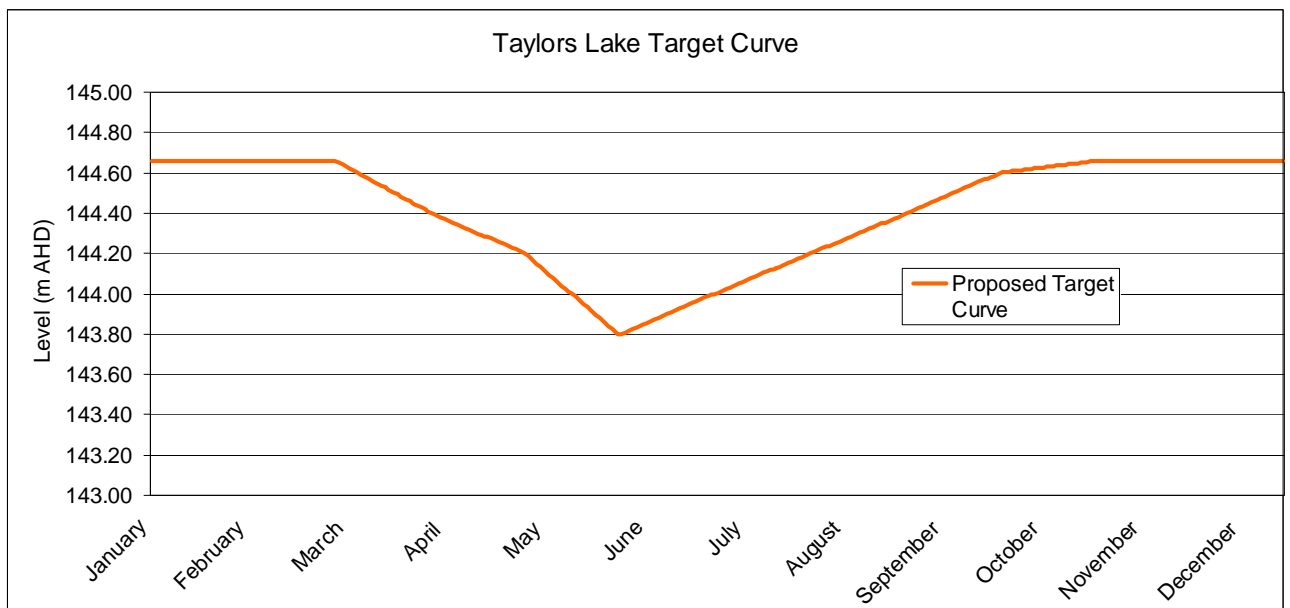


Figure 2: Proposed Taylors Lake Target Curve

Wimmera Inlet Channel

Operation of the Wimmera Inlet Channel (WIC) is directly associated with the operation of Taylors Lake, with the channel able to divert Wimmera River and Mt William Creek water into Taylors Lake. The channel commences at Huddleston's Weir, north of Dadswells Bridge, and is able to carry a maximum volume of up to 1,600 megalitres per day.

Wimmera River water is typically of poorer quality than found on either the MacKenzie River or Mt William Creek water and is therefore a lower priority to harvest.

Flows less than around 6,000 ML/day (as measured at Glenorchy) are able to be kept within the Wimmera River at Huddleston's Weir by closing the WIC inlet gates. Flows in excess of around 6,000 ML/day will overtop and bypass the inlet gate structure.

The channel is configured to redirect excess water back to the Wimmera River in a way that reflects what would be expected to occur naturally. Figure 3 shows the general layout of the WIC and associated waterways that it interacts with.

During small to moderate floods (between 5,000 to 15,000 ML/day as measured at Glenorchy), the WIC may be used to harvest Wimmera River water into either Taylors Lake or Pine Lake (if Taylors Lake is already full). Harvesting at full capacity relative to these size floods may have some effect in reducing flood peaks downstream. However, harvesting water during large flood events (greater than 15,000 ML/day) has negligible impact on reducing the severity of the flood peak due to the relatively small volume able to be taken through the Wimmera Inlet Channel and can pose significant risks to the safe operation of the WIC.

Taylors Lake can often suffer from poor quality water. In the future it is intended to minimise the harvesting of poor quality water, including during times of flood, by selectively taking water from the lower Mt William Creek and MacKenzie River (including Wartook) systems.

The harvesting or management of water explicitly for downstream flood mitigation purposes would only be done in consultation with the Wimmera Catchment Management Authority (the local Floodplain Management Authority) or Flood Incident Controller (SES) during a declared flood event (issued by the Bureau of Meteorology).

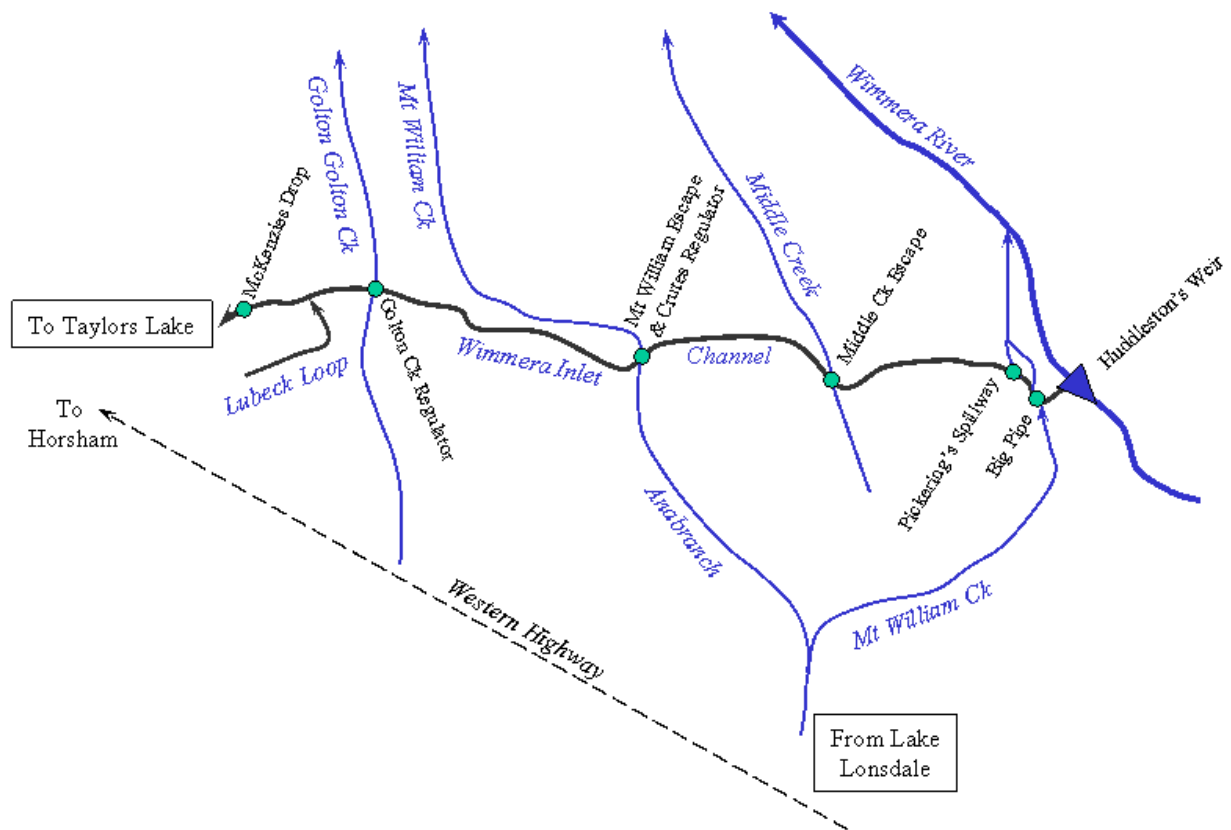


Figure 3: General layout of the Wimmera Inlet Channel.

Overview of January 2011 Flood Event

Taylors Lake commenced the January 2011 event at its FSL. For three days 250 ML/day was released to try and maintain this level to protect the embankment. These releases ceased due to the arrival of flood waters in the Wimmera River. Taylor Lake peaked at a level of 145.10 metres or 29,320 ML. Several hundred megalitres of uncontrolled inflows were received during the floods from Potters Creek and localised runoff. There was no spillage or damage caused to the embankment.

Once these flood waters had subsided, 50 ML/day was released for a period to bring the reservoir level back to the FSL. The release was kept below the capacity of the outlet to avoid putting any further flow stress on the River.

Taylors Lake Facts and Figures	
Full Supply Level	144.66 m AHD
Full Supply Volume	27,060 ML
Dead Storage	3,000 ML
Spillway Level	none
Spillway Length	none
Spillway Capacity	none
Inlet Channel Capacity	1,600 ML/d
Maximum Discharge	400 ML/d
Catchment Area	80.6 km ²
Surface Area when Full	740 ha
Major Tributary	Potters Creek
Average Annual Inflow	N/A

Current Operating Rules

- > To keep Taylors Lake at its Full Supply Level throughout the year.

Proposed Operating Rules

- > To keep Taylors Lake at its Full Supply Level throughout the year subject to the variable operating levels between the months of March and October inclusive as shown in the diagram. *
- > To use both the Wimmera Inlet Channel and Taylors Lake in managing flood flows for asset protection. *
- > To use the Wimmera Inlet Channel and Taylors Lake in managing flood flows under the direction of a flood incident controller, but only while the flood peak is passing the Huddleston's weir area and the flow is less than 15,000 ML/day.

Glossary

AHD – Australian Height Datum, used for altitude measurement. Zero is the mean sea level for the period 1966-68.

Freeboard - Height between normal maximum operating level and the top of the bank or spillway.

Full Supply Level - The normal maximum operating level of a reservoir behind a dam.

* – these rules are not subject to negotiation as they are necessary for water supply purposes.

Reference: Grampians headworks system fact sheet