Managing water from the Ord River

The Ord River is one of the most significant waterways in Australia. It provides for water to an iconic agricultural project, supports local tourism and sustains a unique Kimberley environment.

We are seeing the largest development of irrigated land in the Ord River area since the 1960s. The Ord-East Kimberley Irrigation Expansion Project plans to increase the size of the Ord irrigation area by 15,400 hectares in the short term in potential for further expansion beyond this in Western Australia and into the Northern Territory.

The WA Government signed an agreement with Kimberley Agricultural Investment (KAI) for development of the Goomig (7,400 ha) and Knox Plain (6,000 ha) expansion areas. An additional 2,000 ha will be developed within existing agricultural areas at the Packsaddle Plain and Ord East Banks.

There is potential to develop a further 9,020 ha in the medium term in the Carton Plain and Mantinea areas.

Two additional areas totalling 5,000 ha known as Cockrod sands have been identified for possible development. Up to 14,000 ha of land has also been identified for possible development in the Northern Territory.

How the system works

Water flows from south to north along the Ord River and is stored in Lake Argyle by the Ord River Dam, and in Lake Kununurra by the Kununurra Diversion Dam.

Irrigation is the primary consumptive use of water from Lake Argyle. The other main water benefit is for the lower releases from Lake Argyle.

Electricity generated (financial year average):
- 1,416 GWh: Lake Argyle
- 284 GWh: Knox Plain

Water abstractions:
- 796 GL/year: Ord surface water allocation plan
- 115 GL/year: irrigation development in the Northern Territory
- 80 GL/year: irrigation development in the Central Ord

Further information

The Ord surface water allocation plan is available on our website www.water.wa.gov.au.

Contact Information
For more information, contact the Kununurra Regional Office on 08 9166 4116 or at 57 Victoria Highway, Kununurra Western Australia 6743.

How is water allocation decided?

The priority set by government is for secure and reliable water supplies to maximise the irrigation potential of the region, while at the same time supporting hydro-electricity generation and sustaining a healthy downstream river environment.

The Department of Water is responsible for managing and licensing water from the Ord River under the Rights in Water and Irrigation Act 1954 (WA). Its Ord surface water allocation plan supports the government promises through water allocation limits which control the total volume of entitlements that can be issued, and water release rules and water sharing rules which are managed through licences.

The water release rules are particularly important during times of below-average storage and dry periods, and ensure the most effective water sharing.

The water release rules will be adjusted slightly to maintain a 95 per cent reliability of supply for each phase of irrigation development.

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Lake Argyle's capacity (to the full supply level) is 10,760 GL or 2.5 times the mean annual inflow. Overstorey water is retained in Lake Argyle for later use. The storage enables water to be captured highly variable runoff from the catchment each wet season and provide a reliable water supply to the Ord River Irrigation Area. The dam is designed to capture the very wet seasons, and temporarily store them above the full supply level for irrigation, environmental flows or increased entitlements to support agriculture.

Boating on Lake Argyle will not be affected by increased demands but boataccess on Lake Kununurra, especially close to the Ord River Dam, may change. Below the Kununurra Diversion Dam already parts of the river are not navigable.

Water for irrigation
Water for irrigation is either scheme-supplied to individual users. Up to 905 GL/year of water entitlements can be grazed from the existing infrastructure in the Ord area. Of this water, 860 GL/year is scheme-supplied to individual users. The Ord River Dam is designed to be expanded enough to provide in 95 out of 100 years under the mean annual inflow. Carefully managed, it is sufficient to provide a highly reliable water supply, even if inflows to the lake over three wet seasons are well below average.

Water releases for hydropower
The Ord River Dam schematic – Minimum operating level 50 m above sea level

Pacific Hydro Ltd owns and operate the Ord River Dam Power Station under a water supply agreement with the Water Corporation. The Department of Water sets water release rules so that water released for power each month does not reduce the reliability of water for irrigation in future years.

Since operation began, most of the water released from the dam has been for hydropower. The volumes released have been sufficient to meet Stage 1 irrigation demands, and are well in excess of the needs of the lower Ord River environment.

As lake levels decline due to low inflows or high power demand, monthly hydropower releases need to be reduced to maintain reliability of supply for irrigation. Power generation is tracked when stage levels fall. The spillway, a deep narrow channel cut through a rock saddle, is about seven kilometres from the dam wall. The spillway gradually discharges any flood water over the following dry season.

During periods of low inflows water is retained in storage to provide water for reliable irrigation supplies, hydropower demand and environmental demands. Water released for irrigation is a relatively small volume compared to hydropower, and releases solely for hydropower partly meet the lower Ord River environment requirements.

Water resources for the lower Ord River

The Ord River Dam has significantly changed the river environment. There are now year-round flows in the lower Ord River from the diversion dam to Mambu Island (68 km downstream), where tidal effects commence. This is in contrast with the dry-land conditions that occurred naturally before the dam was built.

Scientific studies, including a box flow test that have been used to work out how much water is needed to provide for habitat, fish movement and breeding, regeneration of vegetation, and dissolved oxygen. The environmental flow regime provides a range of flows important for maintaining these river health and ecological functions (see diagram below).

In most years, the environmental flows will be met by releases for hydropower and inflow from the catchment downstream of the Ord River Dam – particularly from the Kununurra. In some years top-up releases will be needed.

When storage is low, releases for environmental flows will be reduced, through restrictions described on the dam licence, to balance competing demands for water.