Testing the artesian aquifer of the West Canning Basin

The discoveries
The Department of Water has conducted the most comprehensive test ever of the artesian Wallal aquifer, in the West Canning Basin north-east of Port Hedland. Part of the $12.5 million Royalties for Regions funded Pilbara groundwater investigation, the test has significantly improved our understanding of this groundwater system.

We now know that the aquifer can discharge groundwater at up to 210 litres per second. Drawdown impacts and pressure reductions were measured up to 20 km from the test bore, and when we finished the aquifer test, water pressure across the test area recovered almost immediately.

These results tell us that the Wallal aquifer in the area is relatively homogeneous and highly transmissive. This means large volumes of water can be discharged quickly and over an extended period.

Groundwater quality remained fresh throughout the test, meaning that there is likely to be low variability of water quality in the aquifer.

These discoveries provide parameters for modelling long term usage impacts on the resource. This will help us to predict and carefully balance impacts to artesian pressure as more groundwater is taken out of the Wallal aquifer.

The test
During the 66-day program a team of our expert scientists closely monitored artesian flow and pressure around the clock at ten sites across the West Canning Basin investigation area.

The test was designed to simulate long-term use of the groundwater resource and results will now be combined with data from exploratory drilling and airborne electromagnetic surveys to build a comprehensive groundwater model of the system.
How do these discoveries benefit users in the West Canning Basin?

Groundwater from the Wallal aquifer is mainly used by local pastoralists for growing stock feed and by companies for iron ore mining operations. Most of this usage relies on the naturally pressurised groundwater to minimise costs of pumping.

Groundwater also has significant cultural and environmental value as it has been linked with the culturally significant (and Ramsar listed) wetlands of Eighty Mile Beach and the Mandora Marsh.

Our work will help unlock the future potential of the Wallal aquifer system by determining how much more groundwater the system can provide sustainably. Early estimates suggest the Wallal aquifer could provide future water supplies for Port Hedland, local communities, increased agriculture, mining or industry in the area.

By the numbers

10 sites
in total were monitored throughout the testing period

66 days
of around the clock monitoring and testing

7 bores
consisting of 6 monitoring and 1 production bore tested