

Important Information for the Water Allocation Plan for the Tindall Limestone Aquifer, Katherine – Katherine Railway Bridge/ Low Level Bridge Reporting Site

May 2017

The Water Allocation Plan for the Tindall Limestone Aquifer, Katherine specifies Extraction Limits for each licence security category based on the 1 November flows predicted for the Katherine River. The Plan references the river flow gauge at Katherine Railway Bridge.

River levels for Katherine are measured at the gauging station immediately downstream of the Katherine Railway Bridge. Historically, medium to high flow measurements (gaugings) have also been conducted near the Katherine Railway Bridge while low flow gaugings, which relate to dry season river heights, have been conducted 3.4 km downstream at the Low-Level bridge. This location is preferred as favourable river geometry permits more accurate low flow measurement.

There are a number of springs which contribute water to the Katherine River between the railway bridge and the low-level. During medium to high flow conditions the increase in flow between the two locations is negligible however during dry season low flow conditions the relative increase is notable.

Gaugings provide a measurement of flow for a given river height. Continuous measurement of flow is technically very complex but if multiple gaugings for a range of river heights are plotted, the relationship between river height and flow can be used to create a look-up (rating) table. The rating table allows us to convert continuously measured river height to flow. For this relationship to be accurate, the gaugings and river height need to be undertaken at the same location.

A data review in 2012 (DLRM 2012a & DLRM 2012b) recognised that low flow gaugings measured at the Low-Level Bridge were being attributed to river height at the Katherine Railway Bridge. The review separated these gaugings from those conducted at the Katherine Railway Bridge and a new water level sensor was installed at the Low-Level Bridge. New ratings were then developed for both locations.

Models that predict end of dry season flow, based on the previous wet season's rainfall, require long term continuous flow datasets. All water resource assessment modelling for the Tindall Limestone Aquifer, Katherine has used low flow gauging of flows at the Low-Level Bridge (e.g. URS, 2008 & Knapton, 2006, Knapton, 2011), however because of the historical naming convention, the water allocation plan which is based on the modelling work used the name Katherine Railway Bridge. Annual Announced Allocation reporting now refers to the Low-Level Bridge instead of the Katherine Railway Bridge.

Figure 2 shows the modelled natural flow and the measured flows at low-level crossing (G8140222) for the period 2009 to 2016. This graph demonstrates that the model predictions match the gauged flows very well during the late dry season. This gives confidence that the model can be used to predict late dry season flows and inform the decision about the maximum extraction volume that can be allocated for each water accounting year.

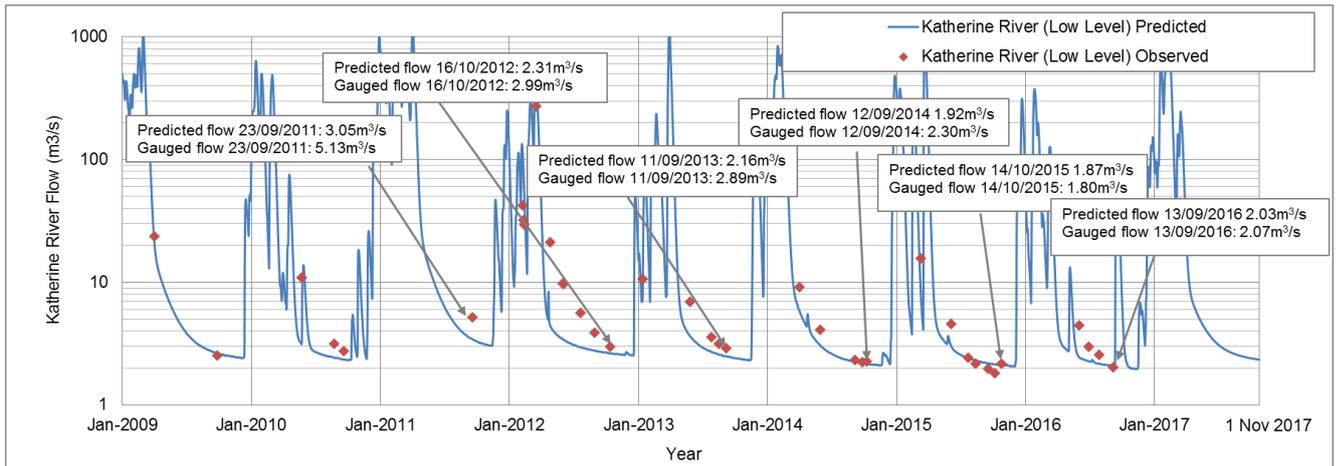
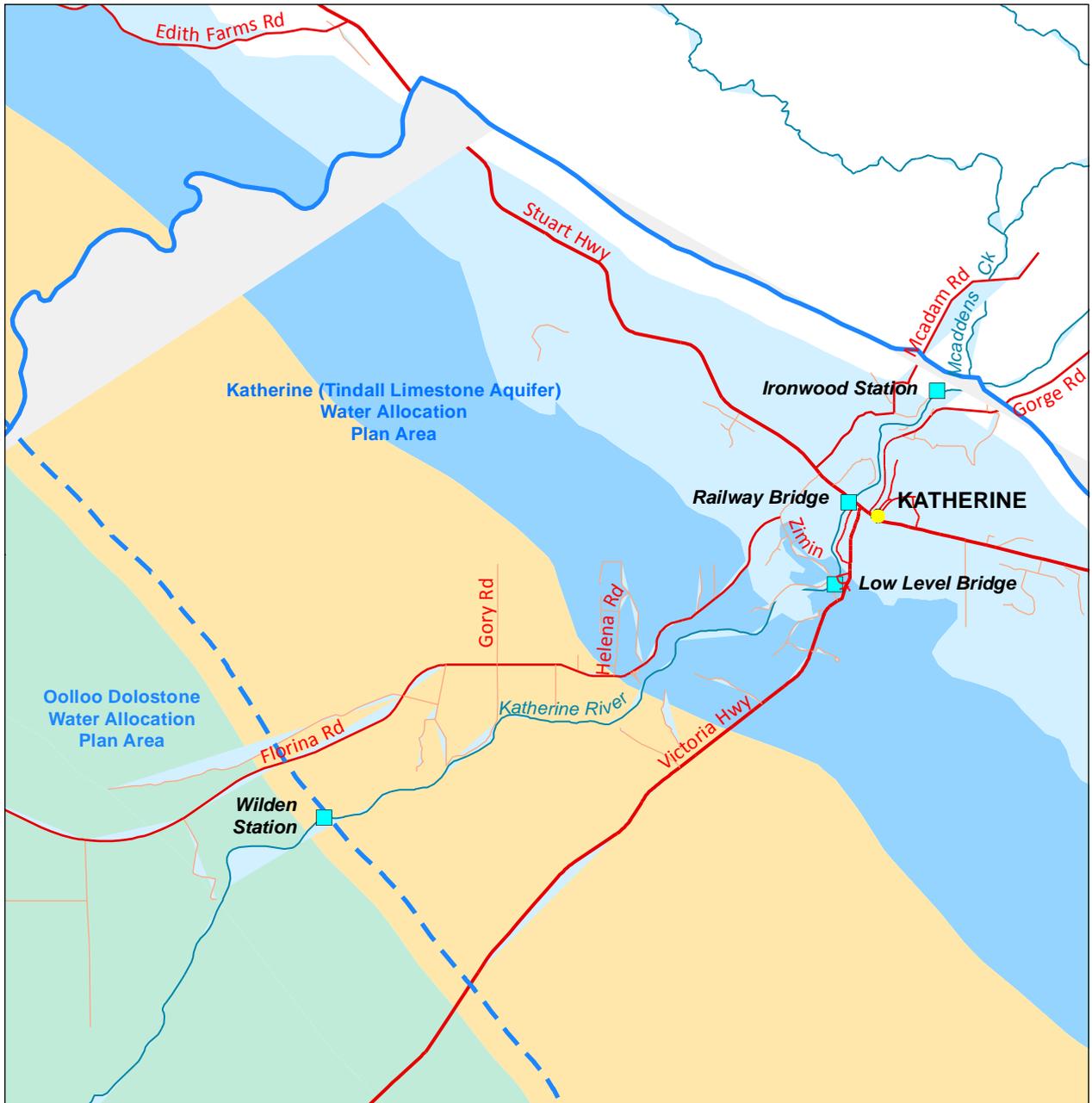


Figure 1 Predicted and Observed Katherine River Flows from January 2008 to December 2017.

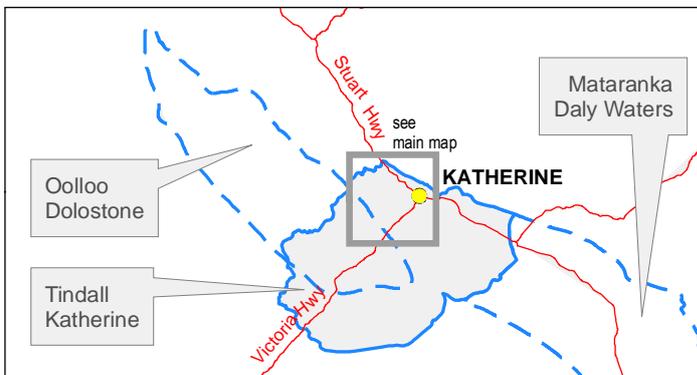
Recent studies have also improved our knowledge of the geology and hydrology within this stretch of the river. We are now able to confidently identify the downstream extent of groundwater contributions (springs and seepages) to the river from the Tindall aquifer. A new gauging station has been constructed at Wilden, 23 km downstream of the low-level crossing. Gaugings are being conducted to create a Wilden rating which will allow modelled flow to be reported at a location where all groundwater contributions to the river are accounted for. Once this occurs, future Water Allocation Planning for the Tindall Limestone Aquifer, Katherine is likely to reference Wilden instead of Low Level or the Katherine Railway Bridge. This will be considered in the scheduled renewal of the Water Allocation Plan in 2019.

Figure 2 (over page) is a map of the river gauging sites and aquifers underlying the Katherine River.

For further information, please contact the Water Resource Planner, Katherine (08 8973 8839).



Water Allocation Planning Areas



Map Legend

- River Gauging Station
- Water Allocation Plan Areas**
- Draft - Water Allocation Plan
- Declared - Water Allocation Plan Area
- Daly Basin Geological Formations**
- Tindall Limestone
- Tindall Limestone (150m bgl)
- Jinduckin Formation
- Ooloo Dolostone

Figure 2 Map of key river gauging stations on the Katherine River as well as the Tindall Limestone Aquifer, Katherine.

References

DLRM (2012a) Station Rating Review G8140001 Katherine River at Railway Bridge, Department of Land Resource Management, May 2012.

DLRM (2012b) Station Rating Review G8140222 Katherine River at Low Level, Department of Land Resource Management, November 2012.

Knapton (2006) Regional groundwater modelling of the Cambrian Limestone Aquifer System of the Wiso Basin, Georgina Basin and Daly Basin, Department of Natural Resources, Environment & the Arts, Technical Report No. 29/2006A.

Knapton (2011) Case Study – Recalibration of a coupled surface water – groundwater model to the low flows in the Daly River catchment, Department of Natural Resources, Environment & the Arts, Technical Report No. 13/2012D.

URS (2008) Integrated hydrologic modelling of the Daly River catchment and development of a water resource monitoring strategy, Report prepared for Department of Natural Resources, Environment and the Arts.