

Aquifer storage of water. (feasability study)

In the last 2 years we have had drought conditions in N/ Qld and NSW and consider there will be opportunities to efficiently use canal water to protect growers in dry times. An opportunity worth investigating is development of underground "no evaporation" storage of water in aquifers near Hughendon, Qld. Water stored in open dams in N/Qld normally evaporates at rate of approximately 21% pa. Enclosed is a photo of aquifer storage of water beside the Central Arizona Project Canal in USA. Their technique of gradually infiltrating canal water into aquifer storage 250 days per year works well when soil porosity rates and other factors such as subterranean water quality are OK. (ie no high salinity) Groundwater recharge rates indicated in the attached map of the Hughendon region are not quite at a suitable rate of infiltration yet, but from what we know of how long it takes for USA engineers to establish optimal water entry points, a more detailed study will confirm potential.

Tim Ransley a hydro-geologist at Geoscience Australia, reported storage estimates for this Gilbert River Formation Aquifer when working with the BRS in 2003. Based on established porosity data and measurements indicating its ground water was 70 m from the surface, he estimated this aquifer could potentially store up to 20,000 GL of water. Dr Rien Habermahl now retired from BRS, spent 42 yrs of his life working on GAB hydrogeology. He also sees potential for aquifer storage of water around the above region. Peter Dillon of CSIRO is a proven developer of inland recharge aquifers in SA, and in combination with ex BRS people he could help in developing a plan for this possible aquifer storage.

AQUIFER RECHARGE BESIDE CAP CANAL (ARIZONA USA)

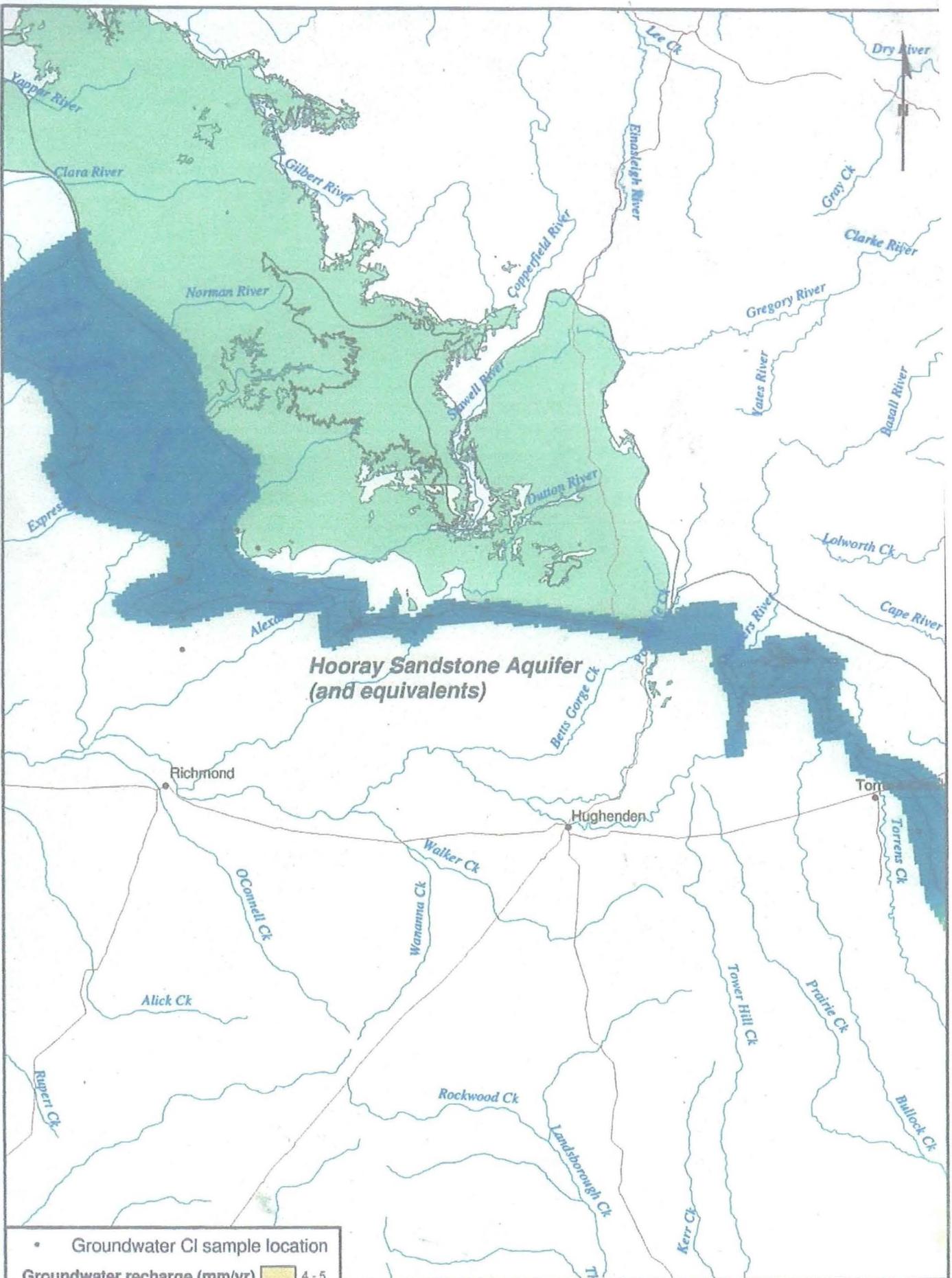
Project Elements Were Carefully Selected – 19 Basins



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Produced by Water Assessment Group,
NRS&M, Department of Natural Resources and Mines,
September, 2003.



•	Groundwater Cl sample location
Groundwater recharge (mm/yr)	
0 - 0.5	4 - 5
0.5 - 1	5 - 6
1 - 2	6 - 7
2 - 3	7 - 8
3 - 4	8 - 9
	9 - 10
	10+

Drainage, coastline and town data supplied courtesy of Australian Surveying and Land Information Group, Canberra, ACT (1999)



Recharge in the Great Artesian Basin Intake Beds, Qld
Figure 48f
 Recharge rates estimated by chloride mass balance (saturated zone) in the Gilbert River Formation aquifer - Torrens Creek to Richmond

Terry Bowring

From: [REDACTED]
Sent: Wednesday, 13 April 2011 1:48 PM
To: [REDACTED]
Subject: Storage estimates for Gilbert River Formation [SEC=UNCLASSIFIED]

Terry,

Based on published information, the likely porosity of the Gilbert River Formation is 10% - 30%. Using an effective porosity of 10% will provide a conservative estimate of the storage capacity of the aquifer in that part of the world.

In 2003 we measured the depth to water 70m from the ground surface.

Based on this, within an area of 1 square kilometre, the theoretical maximum storage capacity of the unsaturated portion of the aquifer would be in the order of 7000ML. In reality the volume of water that could be stored and later retrieved would somewhat be less than this, as a component of the stored water will remain due to capillary forces within the pore spaces of the aquifer.

The surface area of the unconfined portion of the Gilbert River aquifer ~ 60km NW and ~60km SE of lat 23deg long 143 is approximately 2900 square kilometres.

Extensive investigation would be required to determine the practical feasibility and the hydrochemical implications of storing water in the aquifer.

Regards

Tim Ransley

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