

Tindall Mataranka to Daly Waters Water Advisory Committee
Meeting Record 4

1 May 2018 – 10.00 am
Flinders NT Conference Room, Katherine

Members Present

Rebecca Mohr-Bell
Sarah Kerin
David Ciaravolo
Darrel Strahley
David Crook
Sharon Hillen
Steven Andrews
Kylie Gracey

Independent Chair
Department of Tourism and Culture
Amateur Fishermen's Association of the Northern Territory
Proxy for Quintis, Water Extraction Licence Holder
Aquatic Ecologist, CDU
Roper Gulf Regional Council
Proxy for Allister Andrews, Jawoyn Association
NT Cattlemen's Association

Via Teleconference
Vin Lange
Kane Younghusband

TopEnd Farm
Horticulturist, Water Extraction Licence holder (from 12.30pm)

Members Absent

Clair O'Brien
Helena Lardy
Jocelyn James
Kerry Roberts

Regenerative Agriculture
Jilkmिंगgan Community Aboriginal Association
Jilkmिंगgan Community Aboriginal Association
Jilkmिंगgan Community Aboriginal Association

Advisors Present

Tim Bond
Michelle Rodrigo
Des Yin Foo
Melissa Woltmann

Director Water Planning and Engagement, DENR
Water Planner, DENR
Director Water Assessment, DENR (from 2pm)
Hydrogeologist, Water Assessment, DENR (from 2pm)

Observers

Pru Ducey

DENR - Minutes

1. OPENING

Meeting opened at 10.15am

1.1. Apologies

Clair O'Brien Regenerative Agriculture
 Helena Lardy Jilkmिंगgan Community Aboriginal Association

2. MINUTES FROM MEETING 3

The Committee agreed the Minutes of Meeting 3 held in Mataranka on 22 March 2018 were a true and correct record.

❖ *Action - Planner to email members a copy of the presentations from Meeting 3 with the draft Minutes of Meeting 4*

3. BUSINESS ARISING FROM THE MINUTES

- Planner to email members a link to information on the 2017 Review of Water Extraction Licences in the NT – COMPLETED – emailed to members 27/3/2018
- Planner to email members a link to information on the Daly Basin Groundwater Resource Assessment–North Mataranka to Daly Waters Report - COMPLETED – emailed to members 27/3/2018
- Chair and Planner to draft and circulate a summary of key messages from WAC Meetings – COMPLETED – included in Minutes of Meeting 3

4. WATER RESOURCE VALUES WORKSHOP (PART II) (Planner)

At Meeting 3, the Water Values Workshop focussed on:

- who and what are all the key users of water in the Plan Area
- how key users benefit from having access to this water resource
- the resource conditions required to maintain these benefits

The next steps in the Values Workshop are:

1. To identify what changes (immediate and long term) might impact our ability to maintain these resource conditions and benefits.
2. Identify which of these changes we can influence through the Water Allocation Plan

Members split into two groups (Business/Industry and Social/Cultural/Environment), to identify future changes, and what can be done within the Plan to manage these changes.

See Appendix A (page 7) for record of the workshop sessions (**Note:** *if printing, please be aware these pages are A3 size*)

5. PLAN OBJECTIVES AND MANAGEMENT PRINCIPLES (Planner)

In 2011, a previous Water Advisory Committee developed four key objectives for a draft Water Allocation Plan.

Members worked in two groups to critically review the 2011 draft objectives and to amend and reset the objectives to accurately reflect the outputs of the Values Workshop (Appendix A) and other developments since they were first drafted in 2011, namely:

- extension of the Plan Area to Daly Waters
- changed representation on the WAC

- water management policy and legislative reforms
- ongoing improvements in hydrogeological knowledge of the aquifer
- changing community profile, water demand and licensed extractions
- improvements in the government's water licensing framework

The table below records the group discussions and suggested revisions to the 2011 draft objectives

<p>Draft Objective 1 <i>Preservation of the water quality, surface water flows and groundwater levels around Mataranka, including Roper River and Rainbow and Bitter springs, which provide environmental, Indigenous cultural and other instream public benefits.</i></p>
<p>Discussion points and revisions:</p> <ul style="list-style-type: none"> • Maintain healthy aquatic ecosystems and processes that support: <ul style="list-style-type: none"> - Environmental values – springs, rivers, stygo fauna - High flows, base flows and wet-dry transition - Resilience / sustainability / natural variability - Fishing, recreation, cultural, social, tourism • Remove place names – applies to whole plan area • Downstream environmental flows dependant on upstream wet and dry season flows • Protect environmental processes for their intrinsic value, not only for value to humans (cultural flows, recreation, social)
<p>Draft Objective 2 <i>Development of agriculture, sustainable commercial tourism, and other water consumptive industries that form a significant part of the Mataranka and surrounding area's economy.</i></p>
<p>Discussion points and revisions:</p> <ul style="list-style-type: none"> • Environmentally, socially and economically sustainable industry development (Qualifier: all extraction will have some impact) • Minimise administrative barriers (reduce red-tape) • Both under and over regulation are potentially damaging for development and the resource • Possible separation of 'stock' and 'domestic' i.e. either inside or outside of the commercial realm; represents very small portion of use • Tourism and fishing depend on water, but consume water differently to production industries • Providing equitable access to water for environmentally sustainable industries (consumptive beneficial uses)
<p>Draft Objective 3 <i>Provision of a water supply, with sufficient and reliable volume, for essential services to Mataranka and Jilkminggan as well as water for stock and domestic purposes to rural properties.</i></p>
<p>Discussion points and revisions:</p> <ul style="list-style-type: none"> • Provide sustainable access to community water supply – RS&D, community water supply, cultural • Provide flows downstream to support Ngukurr water supply • Essential services – potable standards; other civic/amenity use can be non-potable • Maintaining flows for downstream communities • Add a requirement for 'quality' water supply

<ul style="list-style-type: none"> • Replace specific town names with ‘towns and communities’
<p>Draft Objective 4 <i>Maintenance and support for traditional land use in the predominately Aboriginal owned land surrounding the Mataranka Water Plan Area through the protection of culturally significant water dependant sites as well as providing access to water for commercial development.</i></p>
<p>Discussion points and revisions:</p> <ul style="list-style-type: none"> • SWR is about economic development - may be better placed with Objective 2, or possibly become its own objective
<p>For all draft objectives</p>
<p>Discussion points and revisions:</p> <ul style="list-style-type: none"> • Remove geographic references • Hierarchy of objectives – 1, 3 & 4 should be met before 2 • Structure objectives around values • Objectives could be categorised by how water is allocated e.g. 80% environment, 20% consumptive, Stock and Domestic, SWR...

❖ *Action – Planner to draft revised objectives to reflect the points raised, and circulate to members as a discussion paper.*

6. WAC FEEDBACK ON DRAFT WATER POLICIES (Chair)

Draft policies for *Trading Licensed Water Entitlement* and *Management of Unused Water Entitlements* were provided to the WAC and discussed during Meeting #3 (March 2018).

The Committee agreed to form two sub committees to prepare formal feedback on each policy. Recommendations from the sub-committees will be reviewed at the next WAC meeting prior to submission to DENR.

❖ *Action – Chair to schedule 2 teleconferences via Doodle poll. Each teleconference will be for no more than 1 hour.*

❖ *Action – Planner to check for the most up to date draft of each policy and re-send to all members.*

7. TINDALL LIMESTONE AQUIFER AND THE BEETALOO SUB-BASIN (Melissa Woltmann, Des Yin Foo and Tim Bond, DENR Water Resource)

Melissa Woltmann, Hydrogeologist, provided a Hydrogeological Overview of the Cambrian Limestone Aquifer System for the Tindall Mataranka - Daly Waters Water Allocation Plan Area.

Presentation slides are at Appendix B (page 10).

A hard-copy of the slide presentation was provided to members during the meeting and distributed electronically to members with these minutes.

Additional information was given by Des Yin Foo, Director of Water Assessment

- Every gas well requires a one-off water use for drilling and fracking.
- More than likely the Tindall will be the source of water for Beetaloo sub-basin development
- Water quality – the good water i.e. low TDS (Total Dissolved Solids - the measure of mineral salts) is in the north near Katherine. A question was asked about how Katherine’s

water supply might be impacted by 'Fracking'. Des responded in saying that the town water supply is mostly derived from the river, which is fed from springs connected to a different (low TDS) groundwater source.

- Always need to have good regulation in place

Tim Bond, Director Water Planning and Engagement, presented the following summary of the elements of the Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (March 2018) which relate to water resource planning:

- Report makes 20 recommendations regarding water
- Beetaloo Sub-basin development scenario:
 - 1,000 to 1,200 hydraulically fractured shale gas wells (on approximately 150 well pads)
 - average water use of 2,500 ML/y (up to 5,000 ML/y at peak demand),
 - or a total of 20,000 to 60,000 ML of water over 25 years.
- Final Inquiry Recommendations

Three high-priority issues for water were identified from the risks assessed:

 1. unsustainable groundwater use;
 2. the contamination of groundwater with hydraulic fracturing fluids and wastewater from leaky wells or from on-site surface spills; and
 3. the effect of any water quantity and quality risks on either surface and/or groundwater dependent ecosystems (GDEs)
- Recommendations 7.5, 15.1, 15.2, 15.3

A Strategic Regional Environmental and Baseline Assessment (SREBA) be undertaken to provide more detailed information on the groundwater resources before any further production approvals are granted for any onshore shale gas activities.

 - Start with Beetaloo Sub-basin
 - Completed within 5 years of first exploration approval
 - Regulator to audit and oversee (new regulator)
- Recommendation 7.6

Risk to surface water supplies as 'low', and has recommended that the use of surface water resources for hydraulic fracturing should be prohibited.
- Recommendation 7.7
 - The Daly-Roper Water Control District boundary be extended south to include all of the Beetaloo Sub-basin
 - That WAPs be developed for each of the northern and southern regions of the Beetaloo Sub-basin
 - the new northern Sub-basin WAP provides for a water allocation rule that restricts the consumptive use to less than that which can be sustainably extracted without having adverse impacts on other users and the environment; and
 - the southern Sub-basin WAP prohibits water extraction for any onshore shale gas production until the nature and extent of the groundwater resource and recharge rates in that area are quantified.

Fact sheets as well as the full report are available at <https://hydraulicfracturing.nt.gov.au/>.

Members were invited to email the Chair or the Planner with specific questions, including on exclusion zones.

8. KEY MESSAGES FROM THIS MEETING

(Chair)

Yet to be drafted.

9. CALENDAR OF MEETINGS**(Chair)**

Proposed meeting schedule discussed.

Meeting Dates for the next three meetings confirmed as:

Meeting number	Date	Location
5	<i>22 June 2018</i>	<i>Mataranka</i>
6	<i>14 August 2018</i>	<i>Mataranka</i>
7	<i>2 October 2018</i>	<i>Katherine</i>

Noted that David Crook will be away for August, September and October

10. NEXT MEETING**(Chair)**

Friday 22 June 2018 in Mataranka

Meeting Closed 3.15pm

Appendix A – Values Workshop Part II - Outputs

Water USERS		BENEFITS derived from access to and use of water	Water resource CONDITIONS required to create these benefits	What CHANGES (immediate or longer term) are likely to impact these CONDITIONS?
Business/industry cluster	Growers of crops	- jobs/livelihoods	Resource conditions:	CHANGE 1.1 - Increased heavy industry activity IMPACT:
	Forestry growers	- more people=more services	- agriculture needs freshwater of < 1400 TDS (approx.)	- potential to impact quality of recharge water through contamination
	Fodder growers	- taxes	- clean water i.e. not contaminated	- Increased water use demand
	Cattle (& other livestock) stations	- community – keeps families in the region	Management conditions:	- Potential for loss or damage to clean & green image
	Road construction	- production of food & other raw materials	- security of volume	- Impact on groundwater levels
	Campgrounds & roadhouses	- national security	- ESY must be sustainable	- Impact on surface water flows and quality
	Gas/petroleum/mining	- multiplier effect to NT/Aust economy	- trust & confidence in regulations & regulators	- Increased social activity – recreation, volunteering, infrastructure
	Rural livelihoods (e.g. bushfood intensification)	- training & professional development	- transparent & efficient processes	- Improved infrastructure – roads, services, utilities
	National Parks	- reduction of anti-social behaviour	- access e.g. roads	- Risk that exclusion zones are not well planned
	Cement works (extraction & processing)	- biosecurity - weed & feral management	- longer term water licence – 10 years too short for investment	CHANGE 1.2 - Growing community perception that water is contaminated by heavy industry and fracking IMPACT:
	Small block enterprises	- active land management		- Community perception that contamination has or may occur is enough to damage the ‘clean & green’ image of Australian food. Even if development is well-managed, this community perception may persist.
	Commercial fishing/processing	- infrastructure		CHANGE 1.3 - Unexpected outcomes from implementation of new policies and water reforms IMPACT:
	Tourism operators	- value-adding to primary industries		- Two-tiered process for water allocation results in high demand for secure long-term licences
Meat processors			- Conflict between policies and use-it-or-lose-it diminishes investor confidence	
Aquaculture			- Risk of water brokers buying up water – policies should include protections against this.	
			- Uncertainty around renewal of licences diminishes investor confidence.	
			- Temporary trades need longer terms.	
			- Uncertainty around regulation of water for Rural Stock and Domestic uses undermines long-term investment in primary production. Even with a doubling of stock numbers, volumetric impact on water resource would be minimal.	
			CHANGE 1.4 - Increasing diversification of pastoral leases /non-pastoral uses IMPACT:	
			- Potential increase in clearing applications and CO2 emissions	
			- Increased water demand to support non-pastoral uses	
			CHANGE 1.5 - Agriculture expansion based on increased surface water storage and floodplain harvesting IMPACT:	
			- Economic opportunity through expansion of agriculture base e.g. different crops	
			- Water plans lag behind pace of development	
			- Development is ahead of knowledge about potential impact on environmental/cultural flows	
			CHANGE 1.6 - Ongoing (and expanding) tourism activity IMPACT:	
			- Hardening of upper Roper required to reduce impact in riverine zone	
			- Increased visitation to key NT destination	
			- Development of new swimming experiences	
			- Potential expansion of cultural tourism e.g. Aboriginal land access (Elsley) and business income	
			- Bitumen of Roper roads – access to new sites for recreational fishers	
			- Potential positive and negative impact on Aboriginal culture and native title	
			- Inadequate management of expanding trophy hunting industry e.g. disposal of carcasses in sensitive wetlands/creeks	

	Water USERS	BENEFITS derived from access to and use of water	Water resource CONDITIONS required to create these benefits	What CHANGES (immediate or longer term) are likely to impact these CONDITIONS?
Social & cultural cluster	Aboriginal people & cultural practices	<ul style="list-style-type: none"> - maintaining culture – health & well-being - maintain Dreaming in the Roper River - River is at the centre of life: hunting, fishing, plants depends on billabongs, wetlands, rivers, creeks, springs 	<ul style="list-style-type: none"> - drinking water quality needs to be maintained (WHO standards) – when the taste becomes unpleasant, people turn to alternative drinks e.g. soft drink, impacting community health - high lime impacts on hot water systems, pipes/taps - ecosystems should be intact and in good condition - infrastructure should be located away from cultural sites 	<p>CHANGE 2.1 - Climate change</p> <p>IMPACT:</p> <ul style="list-style-type: none"> - warmer temperatures in the region - drier conditions (possibly) - more variable and bigger extremes - higher evaporation / transpiration - higher water demand (force communities to rethink management of public open spaces – green vs brown spaces) - greater variability in: <ul style="list-style-type: none"> - river flows, recharge/discharge regime, species distribution/abundance, wildlife breeding patterns, weed distribution and management, feral abundances, fire regimes and management - commercial value of buffalo, pigs etc. - land use - crop types, management of soil and water <p>CHANGE 2.2 - Increasing energy costs and possible decreasing security of supply</p> <p>IMPACT:</p> <ul style="list-style-type: none"> - transition to other forms of energy - changed economics <p>CHANGE 2.3 - Increased total grazing pressure from combined wildlife, stock & ferals (wallaby, pig, buffalo, cattle, etc.)</p> <p>IMPACT:</p> <ul style="list-style-type: none"> • ferals are impacting water quality in rivers and wetlands • damage to riverine vegetation <p>CHANGE 2.4 - Nutrient enrichment of groundwater and surface water</p> <p>IMPACT:</p> <ul style="list-style-type: none"> • degradation of riverine ecosystem health • sub-optimal water quality for potable water supplies from Roper River and Rural Stock & Domestic bores <p>CHANGE 2.5 - Volume of discharge to the Roper</p> <p>IMPACT:</p> <ul style="list-style-type: none"> • impact on aquatic ecosystems that rely on environmental flows • impact on recreational fishing and commercial fisheries (mud crab, barra) <p>CHANGE 2.6 - Water monitoring program in the Plan area is under resourced i.e. loss of monitoring sites</p> <p>IMPACT:</p> <ul style="list-style-type: none"> - monitoring is unable to detect trends, or points when limits/thresholds of acceptable change are reached • undermines capacity to monitor trends in: <ul style="list-style-type: none"> - water quality (nutrients, E.coli, TDS) - quantity (flow, depth to groundwater) - ecosystem health - water use and availability • undermines ‘clean-green’ image for tourism, food & fisheries products, and the environment
	Rural living/lifestyles	<ul style="list-style-type: none"> - lifestyle benefits – space, environment, horse/chooks etc. - my own bore – minimal ‘regulation’ - environmental amenity - small business/hobby/cottage industries – wash down, small crops, market garden - rainwater – properties have space for large tanks/self sufficiency 	<ul style="list-style-type: none"> - cheap access to water – availability affected by depth, quality, flow and seasonality - septic tank separation 	
	Tourists	<ul style="list-style-type: none"> - Cultural tourism opportunities - Unique experience of visiting springs and rivers - Variety of tourist experiences - Access to local produce – markets 	<ul style="list-style-type: none"> - Tourists and non-visitors expect high water quality, crystal clear water - postcard imagery 	
	Non-visitors – ‘existence value’	<ul style="list-style-type: none"> - Gives broader community (e.g. city-dwellers) confidence and comfort that a plan is in place to protect the intrinsic values of the resource - NT brand supported – natural & wild - Resource has ‘existence value’/ intrinsic value to broader community 	<ul style="list-style-type: none"> - High quality water supporting quality local produce e.g. barra - Well-managed riparian vegetation 	
	Recreational fishing & boaties	<ul style="list-style-type: none"> - fresh food - recreation/lifestyle - well-being – out in nature - connection to environment - social and cultural link/heritage - tourism – economic benefit, 80% on accom/food 	<ul style="list-style-type: none"> - healthy fish stock – species & size - freshwater flows - healthy ecosystems - no barriers to movement 	
	Communities, small towns	<ul style="list-style-type: none"> - lifestyle - drinking water - economic centres: <ul style="list-style-type: none"> - services 	<ul style="list-style-type: none"> - volume of water - quality of water – drinking - irrigation of public spaces 	
	Expanding towns	<ul style="list-style-type: none"> - social/sporting - amenity supporting a district/region 	<ul style="list-style-type: none"> - Mataranka, Daly Waters, Larrimah septic systems are old systems – potential threat to other users and values 	
Natural Environment cluster	Sinkholes & soaks	<ul style="list-style-type: none"> - survival of riparian vegetation - mutual dependence – riparian veg supports water quality and streambank health - survival of waterbirds and fish - rivers provide connectivity between habitats and a food source - waters sustain habitat diversity - provides refuges in dry season - floodplains – water flows provide replenishment of sediments - influx of nutrients in wet season - turtles: <ul style="list-style-type: none"> • use springs for temperature control • movement between habitats • nesting sites (created by flows) - migratory birds – stop over/resting habitats 	<ul style="list-style-type: none"> - floodplain inundation during wet season - freshwater flows into estuary - perennial flow in the Roper - well-oxygenated water - high wet season flows - natural (as opposed to artificial) levels of connectivity - integrity of nutrient cycling processes - management of ferals - management of fire regimes - access to groundwater by vegetation (contact <i>Lindsay Hutley for info on groundwater dependency of large savannah trees</i>) 	
	Wetlands, swamps & floodplains			
	Estuarine ecosystems			
	Aquatic vegetation (water plants)			
	Carbon sequestering systems			
	Riparian vegetation			
	Wet-season rivers & creeks			
	Dry-season baseflow rivers & creeks			
	Large trees			

	Water USERS	BENEFITS derived from access to and use of water	Water resource CONDITIONS required to create these benefits	What CHANGES (immediate or longer term) are likely to impact these CONDITIONS?
	Local & migratory waterbirds – waders & riparian Fish & crustaceans e.g. mud crab, cherapin Turtles Other aquatic fauna Non-aquatic fauna – reptiles & other	<ul style="list-style-type: none"> - fish benefit from oxygenated water, influences population dynamics - benefits from rarity of cease-to-flow conditions in Roper 		<p>CHANGE 2.7 - SREBA (Strategic Regional Environmental Baseline Assessment - a requirement of Fracking Inquiry Report) to be undertaken over several years</p> <p>IMPACT:</p> <ul style="list-style-type: none"> • dramatically increase knowledge and understanding of environmental assets in the region • establish baseline for monitoring and acceptable limits to change <p>CHANGE 2.8 - Implementation of trade and unused water policies may alter the value of water</p> <p>IMPACT:</p> <ul style="list-style-type: none"> • value of water may increase • water utilisation optimised where availability is constrained • potential to price small business out of market

Hydrogeological Overview

The Cambrian Limestone Aquifer System for MTWAP

www.nt.gov.au



Contents

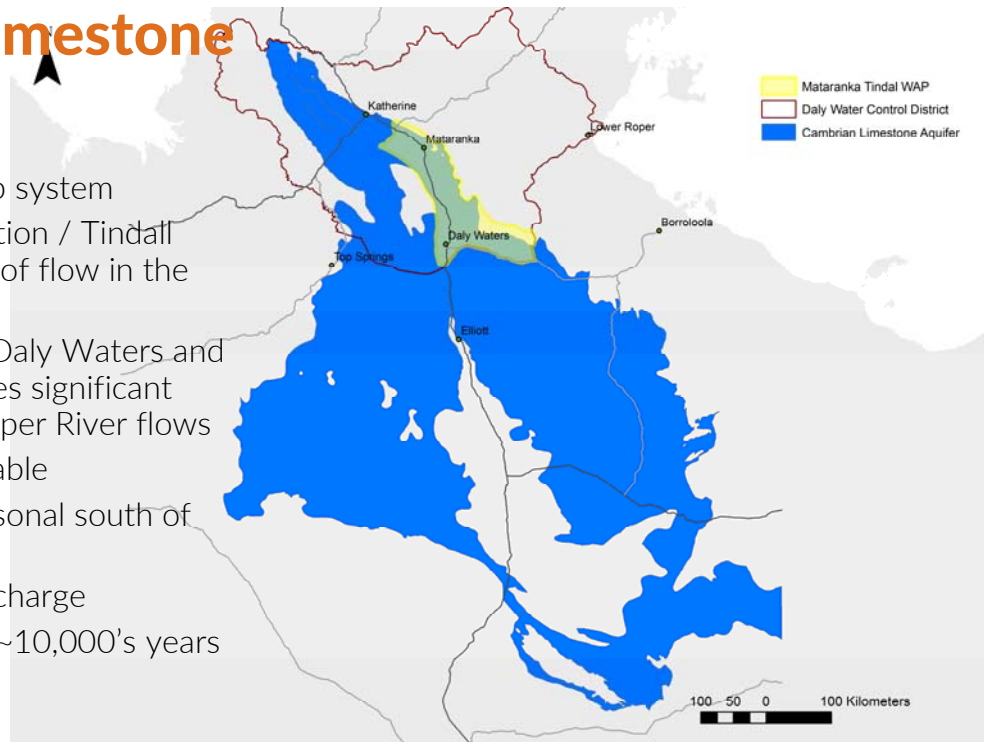
- » Hydrogeology overview for MTWAP
 - Stratigraphy, Groundwater Flow, TDS
 - Water Balance
 - Recharge estimation, usage and discharge
 - Fracking enquiry report

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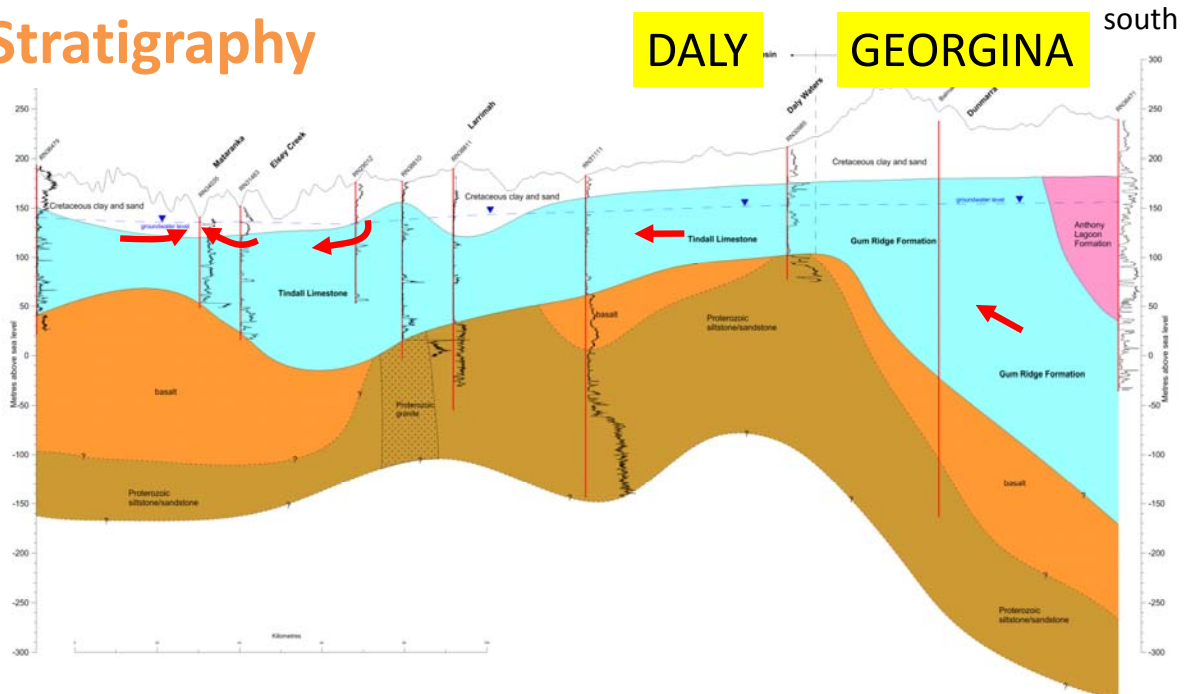


Cambrian Limestone Aquifer

- » Multi-layered deep system
- » Gum Ridge Formation / Tindall Limestone source of flow in the Roper River
- » Section between Daly Waters and Mataranka provides significant contribution to Roper River flows
- » Water quality variable
- » Recharge non-seasonal south of Daly Waters
- » Mountain front recharge
- » Groundwater age ~10,000's years in deep formation

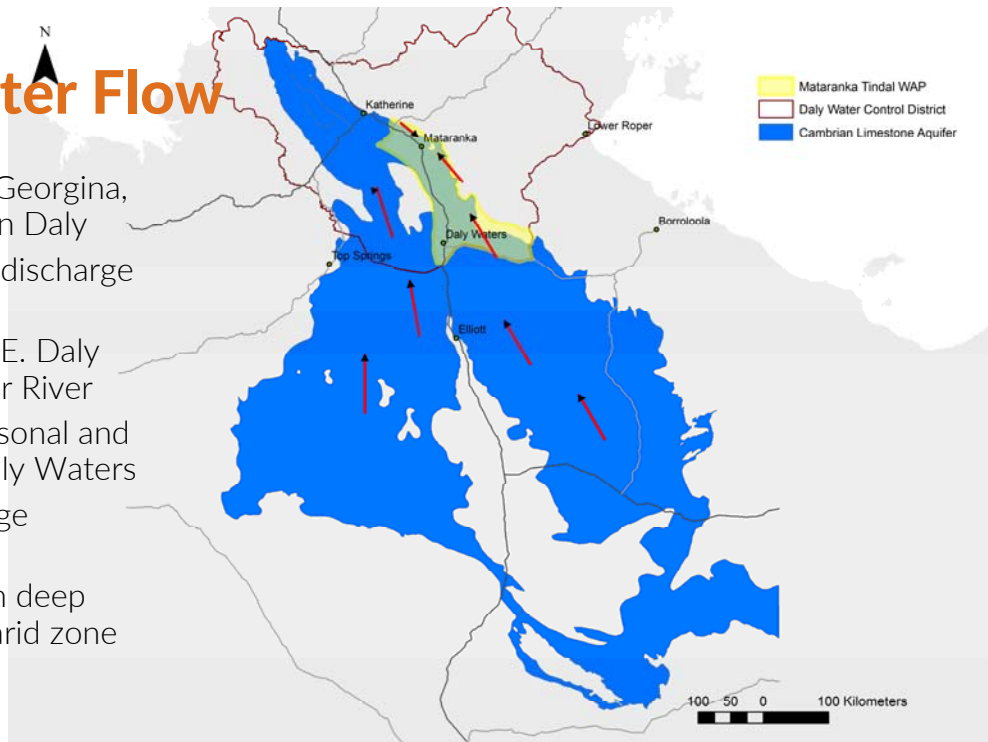


Stratigraphy



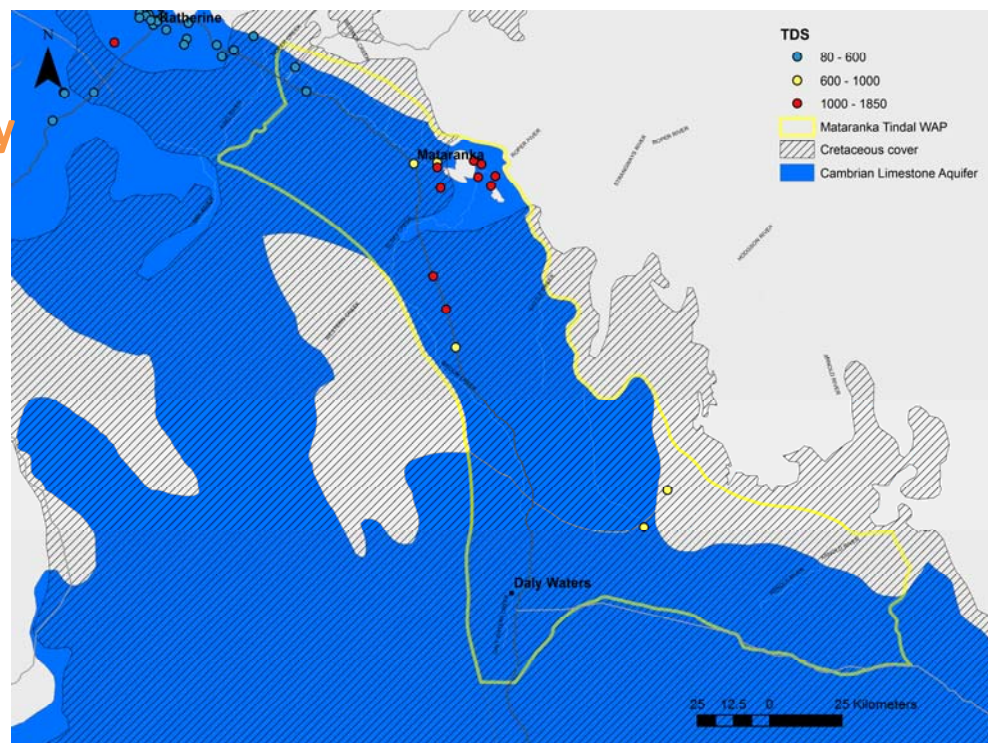
Groundwater Flow

- » Northerly flow in Georgina, Wiso and southern Daly
- » Wiso & SW. Daly discharge to Flora River
- » N. Georgina and SE. Daly discharge to Roper River
- » Recharge non-seasonal and lower south of Daly Waters
- » Basin edge recharge
- » Groundwater age ~10,000's years in deep formation and in arid zone



Water Quality

- Bore water samples for DENR monitoring and investigation bores
- TDS is typically >600mg/L
- High TDS Poor palatability for drinking
- High TDS needs to be considered when irrigating ie impacts to soil



Water balance

- Recharge:
 - Rainfall that infiltrates past the root zone into the saturated zone
- Discharge:
 - Groundwater exiting to rivers and springs
- Pumped use:
 - Groundwater pumped for consumptive use
- Storage:
Change in Storage = Recharge – (Pumped use + Discharge)

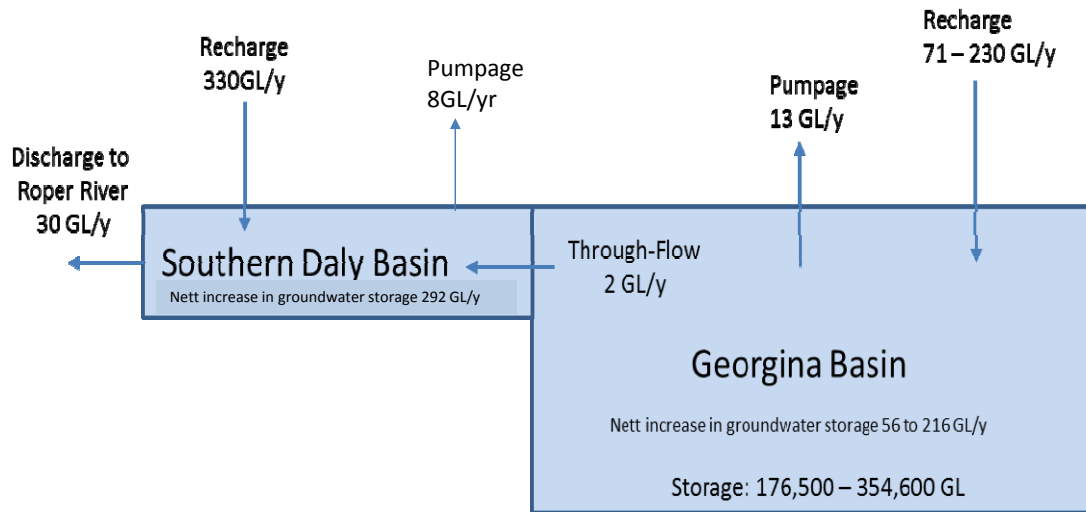
Water Balance

» Southern Daly Basin (*Tindall Limestone*)

- Annual Recharge Estimate 330 GL (Bruwer and Tickell 2015)
- Pumped usage (actuals) 8GL (Licensing)
- Discharge 30 GL (Numerical Model)
 - Includes 2GL/yr flow through from Georgina basin

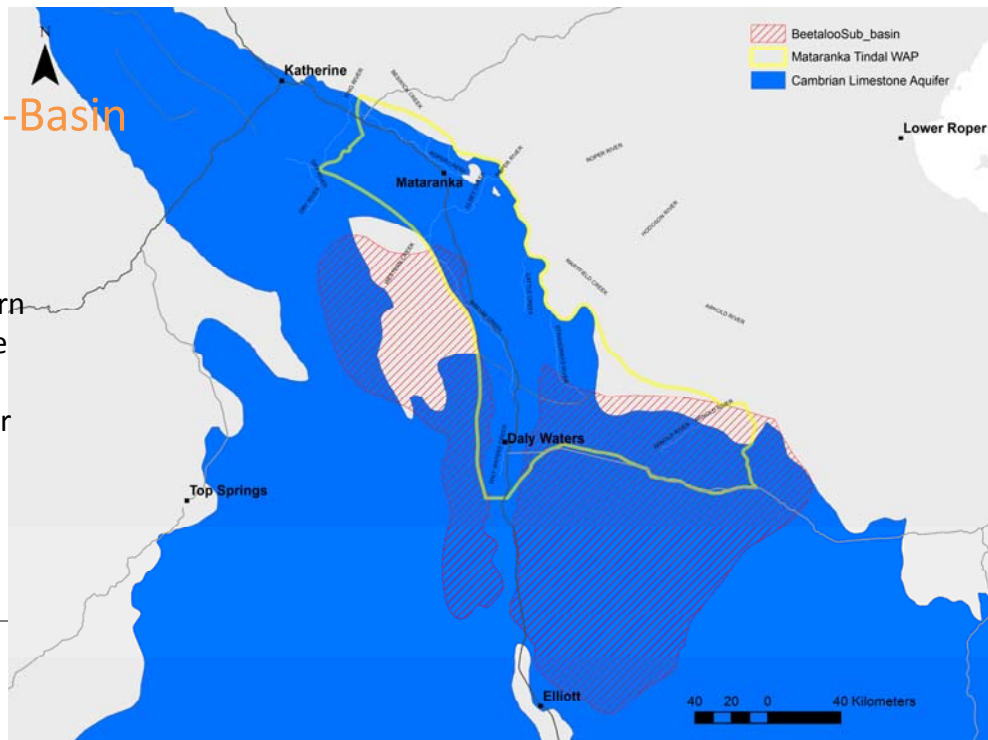
$$\text{Change in storage} = 330 - (8 + 30) = 292\text{GL}$$

Water Balance

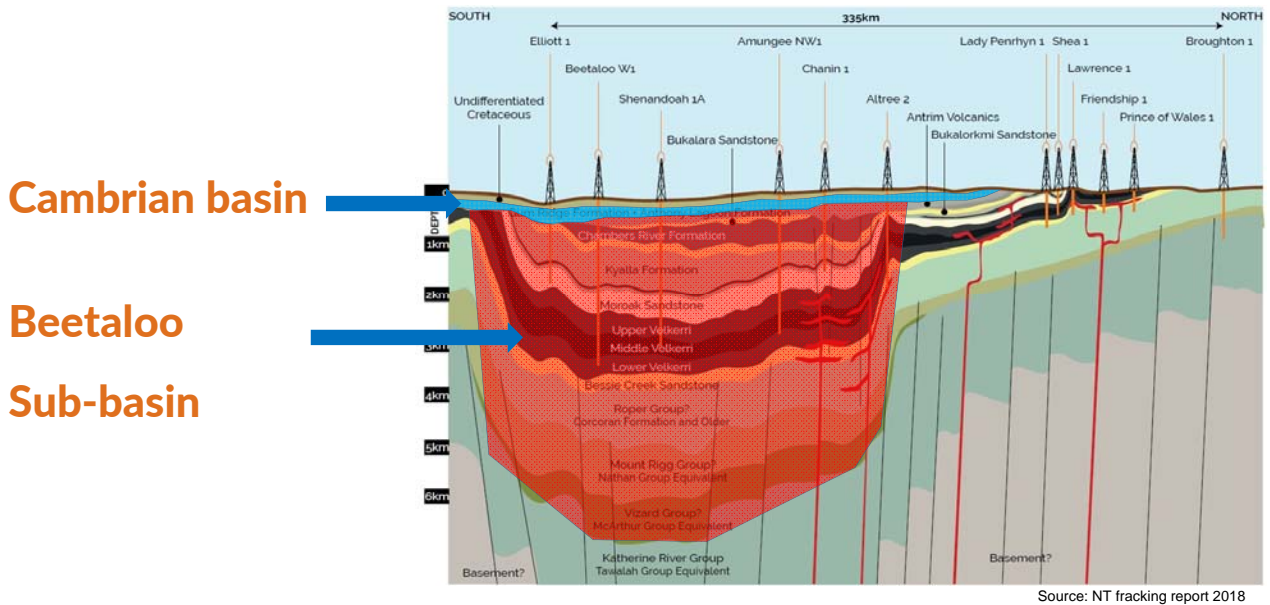


Beetaloo Sub-Basin

- Older basement
- Sub-basin of Macarthur Basin
- Underlies southern and western edge MTWAP area
- Focus example for fracking enquiry



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Water demand

- Example: Origin suggest total water requirement of 50-60ML per bore

Stage	Time frame	Min wells	Max wells	Min ML	Max ML
Exploration	3 years	4		200	
Appraisal	2-3 years	8	16	400	800
Delineation	2-4 years	2	4	100	200
Development - small scale	20 - 40 years	50	100	2500	5000
Development - large scale	20 - 40 years	400	500	20000	25000

Source: NT fracking report 2018