

**SENATE COMMITTEE: SENATE ENVIRONMENT AND COMMUNICATIONS
REFERENCES COMMITTEE**

INQUIRY: Inquiry into Oil and gas exploration and production in the Beetaloo Basin

QUESTION DATE: 2 AUGUST 2021

QUESTIONER: SENATOR MCMAHON

Senator McMAHON: There was evidence given by Mr Nicholas Fitzpatrick, who said in his written submission:

There are corrosive bacteria down in the Earth already that can eat through steel and concrete in a matter of years. This is a scientific fact. So it's just a matter of time before these well casings fail and seep gas oil and chemicals into our sacred water tables.

Is that a correct assertion?

Mr Trotman: I'm not aware of that, but I might hand over to Dr Andrew Heap from Geoscience Australia.

Dr Heap: Thanks for the question. That's not an area that we can provide an answer on today. It's an engineering question, rather than necessarily about the geology. However, we can take it on notice and provide advice back to you by 6 August.

ANSWER:

The report by Schlumberger Ltd published in 2003 and cited in submission 33 is an analysis of oil and gas well construction and does not make any reference to bacterial corrosion of wells. This report demonstrates how well design has improved over time to address and mitigate risks associated with well integrity.

A detailed assessment of well integrity has also been undertaken by the CSIRO and is summarised in a report prepared for the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (<https://publications.csiro.au/rpr/download?pid=csiro:EP179028&dsid=DS2>). The CSIRO report stipulates that the risks to well integrity can be appropriately managed.

QUESTIONER: SENATOR MCMAHON

Senator McMAHON: We heard evidence last week about the water tables and the basins of the Beetaloo area. It was an opinion of one of our witnesses that that water was connected to East Arnhem Land water tables.

Are you aware of any scientific evidence regarding that?

Dr Robinson: I think I'd probably need to take that question on notice.

Dr Heap: Maybe to assist today, there is some connection of the shallow aquifers beyond the Beetaloo itself, so it could be that that's what they're referring to but we'll take it on notice and provide the answer.

ANSWER:

A detailed examination of the groundwater systems above and around the Beetaloo Sub-basin was undertaken by Geoscience Australia as part of the Geological and Bioregional Assessments program run by the Department of Agriculture, Water and the Environment (<https://www.bioregionalassessments.gov.au/gba>). The available geological and hydrogeological data indicate that the groundwater system within the area of the Beetaloo Sub-basin is not connected to water tables of East Arnhem Land.

The geological and hydrogeological assessment also indicates that:

1. The water table in the Beetaloo region occurs in the Cambrian Limestone Aquifer (CLA), which is a known regional aquifer. The CLA is hosted within several geological basins (Georgina, Daly and Wiso basins) that overlie the Beetaloo Sub-basin. The deep geological units of the Beetaloo Sub-basin itself that are prospective for unconventional shale and tight gas are not sources of groundwater. The available geological and hydrogeological information also indicate that there is no connectivity between the deeper hydrocarbon bearing units and the shallower CLA.
2. The CLA extends beyond the boundaries of the Beetaloo Sub-basin, from north-western Queensland across the Barkly region and north-west beyond Katherine (Figure 1). The geological and hydrogeological evidence indicates that the regional groundwater system that occurs within the CLA does not extend into East Arnhem Land. The regional groundwater flow in the CLA is from the south towards the north-west (Figure 1).
3. There are other shallow aquifer systems overlying the Beetaloo Sub-basin that supply relatively small volumes of groundwater, mainly for pastoral use. These are localised aquifers that occur in geological units above or below the CLA, such as those comprising the Carpentaria Basin. The geological and hydrogeological information indicate that these groundwater sources do not extend into East Arnhem Land.

More detailed information on the regional groundwater systems in the Beetaloo region is provided in the report *Hydrogeology of the Beetaloo GBA region* (Evans et al., 2020), which was published in May 2020 (https://www.bioregionalassessments.gov.au/sites/default/files/gba-bee-stage2-appendix_hydrogeology_final.pdf).

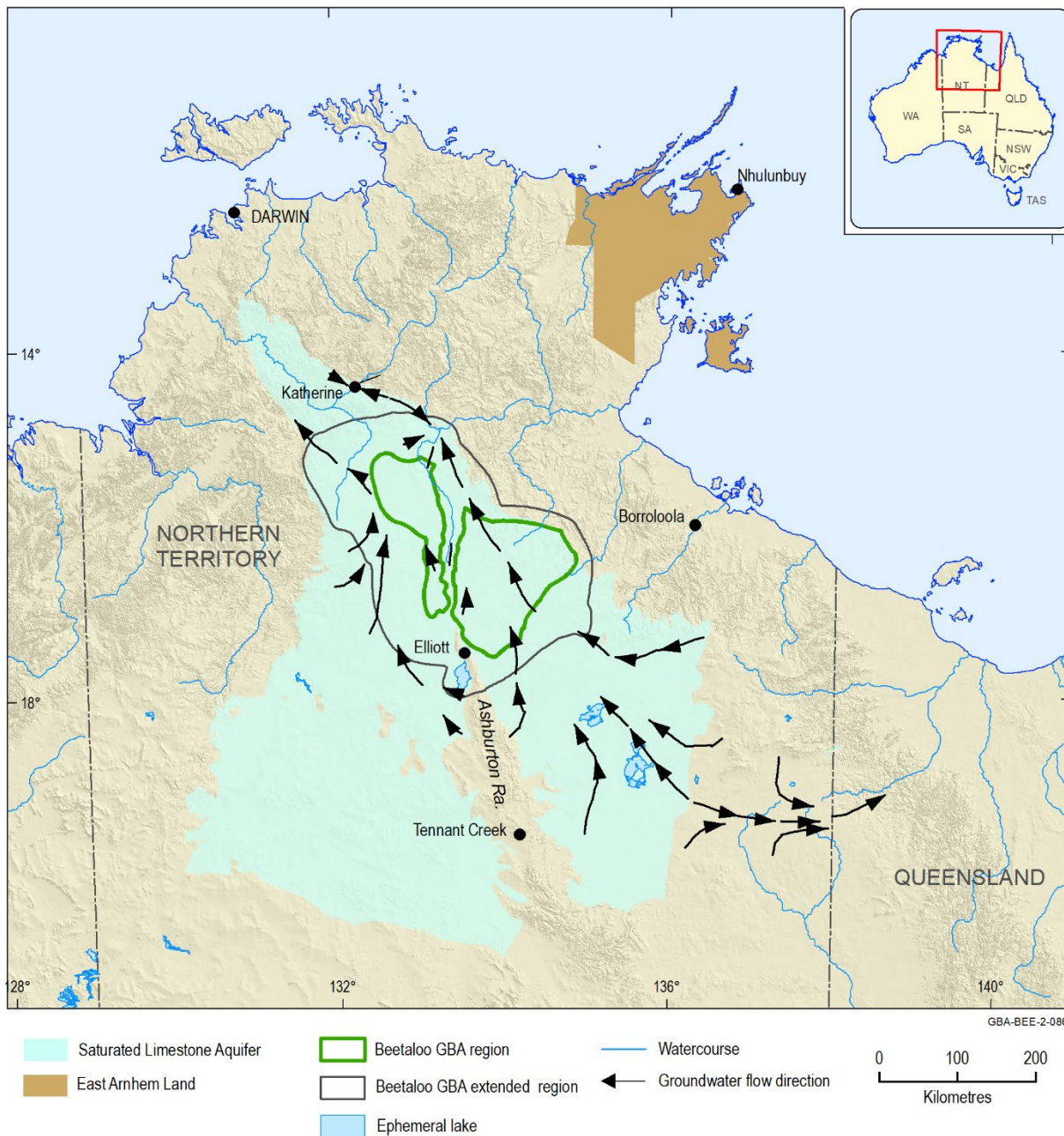


Figure 1 Distribution of the Cambrian Limestone Aquifer over the Beetaloo Sub-basin. The map highlights the major regional groundwater flow system patterns of the CLA.