

SCIENTIFIC INQUIRY INTO HYDRAULIC FRACTURING IN THE NORTHERN TERRITORY



CSIRO
Submission #451

Damien Barrett
Research Director - Energy
CSIRO

By email: [REDACTED]

Dear Mr Barrett

RE: HYDRAULIC FRACTURING INQUIRY – INFORMATION REQUEST

I refer to the *Scientific Inquiry into Hydraulic Fracturing of Unconventional Reservoirs in the Northern Territory (the Inquiry)*, which was established by the Northern Territory Government under the *Inquiries Act 1945 (NT)* in late 2016 to investigate the impacts and risks of hydraulic fracturing of onshore shale gas reservoirs and associated activities on the environmental, social, economic and cultural conditions in the Northern Territory. The Hydraulic Fracturing Taskforce (**the Taskforce**) has been established in the Department of the Chief Minister to support the Inquiry.

You provided the Inquiry with information regarding research being undertaken by the Gas Industry Social and Environmental Research Alliance (**GISERA**) on groundwater in the Hutton Sandstone aquifer in the Surat Basin.

I understand that the study used stable isotopes to determine the flow directions, transit times and age of water in the Hutton Sandstone aquifer. The Inquiry seeks further explanation about the last slide of your presentation (attached).

1. How was it determined that “<2% of sampled water is younger than 1960”?
2. The slide states that “Interpretation of age dating tracers requires detailed model of flow system”. Was this done for this study? If so, could details of the model be provided?
3. Please provide further information on the following statements:

“Double porosity assumption: Most groundwater flow occurs over ~5-10% thickness of the aquifer”.

“A derived value is 452 ML/y, or 2.7% of current estimated recharge rate estimated”.

4. Please comment on whether the above findings, as well as the comment that the recharge rate using stable isotopes was only 3% of the previously estimated recharge rate, are likely to be applicable to the Cambrian Limestone Aquifer in the Beetaloo Sub-basin.

In order to meet reporting deadlines, please provide your response by **25 August 2017**.

Yours sincerely



THE HON JUSTICE RACHEL PEPPER
Chair

14 August 2017

GW age dynamics: Hutton



- <2% of sampled water is younger than 1960
- ^{14}C (2ky-25ky): 1m/yr (h) 7 mm/yr (v)
- ^{36}Cl (100ky-1M): 7 cm/yr (h) 0.3 mm/yr (v)
- He: GW mixed and/or tracer signal is distorted by a diffusive process
- Interpretation of age dating tracers requires detailed model of flow system.
- Use a combination of age dating tracers to understand a flow system
- Double porosity assumption: Most GW flow occurs over ~5-10% thickness of the aquifer
- A derived value is 452 ML/y, or 2.7% of current estimated recharge rate estimated