

Hoffmann Drilling Pty Ltd Superannuation Fund v Gold Coast City Council & Ors

Planning and Environment Court Appeal No137 of 2020

Joint Expert Report on climate change in relation to the proposed commercial groundwater extraction between:

- Trevor Johnson (**TJ**) of SLR Consulting retained by Hoffmann Drilling on climate change issues (Dr Johnson is also acting for Hoffmann Drilling in relation to groundwater); and
- Professor Brendan Mackey (**BM**) retained by the Australian Rainforest Conservation Society in relation to ecology and climate change.

Dr Johnson and Professor Mackey’s Curricula Vitae are attached in Appendix A.

STATEMENT TO COURT

We, the undersigned, hereby acknowledge that we have been instructed on an expert’s duty to assist the Court and that, that duty overrides any obligation we may have to any party to the proceedings or to any person who is liable for our fees or expenses.

We furthermore state that no instructions were given or accepted to adopt or reject any particular opinion in preparing this report.

BACKGROUND

In April 2018, Hoffmann Drilling Pty Ltd Superannuation Fund [**Hoffmann Drilling**] made application to Gold Coast City Council [**Council**] for a Material Change of Use for extractive industry (commercial groundwater extraction) on land located at 263 Repeater Station Road, Springbrook. The land is described cadastrally as Lot 36 on RP 139816.

Council refused the development application by Decision Notice dated 12 December 2019. Council’s relevant reasons for refusal, inter alia, relate primarily to the development not having demonstrated that the proposed use will not impact on matters of environmental significance.

Thynne Macartney Solicitors acting on behalf of Hoffmann subsequently lodged a Notice of Appeal (No 137 of 2020) with the Planning & Environment Court on 17 January 2020.

The Australian Rainforest Conservation Society [**ARCS**] was a submitter to the application and has subsequently joined the appeal as a Co-Respondent by Election. ARCS has elected to call evidence in respect of climate change and its impacts, and has nominated BM to provide that evidence. Hoffmann Drilling has subsequently engaged TJ to contribute to the JER process.

The experts have been provided with the joint expert report on groundwater, dated 23 October 2020, prepared by TJ, Tony McAlister and Dr Matthew Currell, along with the background material contained therein.

[REDACTED]

[REDACTED]

[REDACTED]

POINTS OF AGREEMENT

1. It is relevant to consider climate change impacts on the area’s groundwater, [REDACTED]
[REDACTED]
3. Australia, south east Queensland and the Springbrook Plateau are characterized by seasonal rainfall and high variability in year-to-year rainfall, especially in winter (Figure 12) and severe droughts (Figure 13). Furthermore, a long-term drying trend is now evident based on the observed rainfall records (Figure 14).

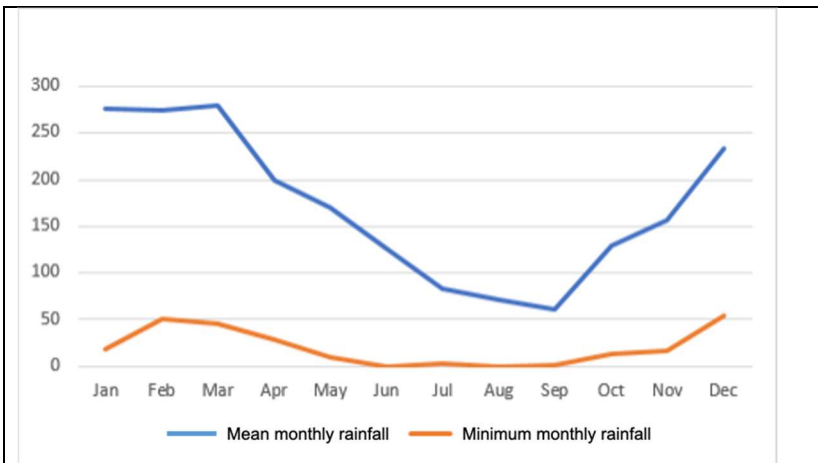


Figure 12 Mean and monthly rainfall for Springbrook Road, 1981-2020. Bureau of Meteorology. Climate Change Data Online. Note minimum recorded minimums in the winter months.

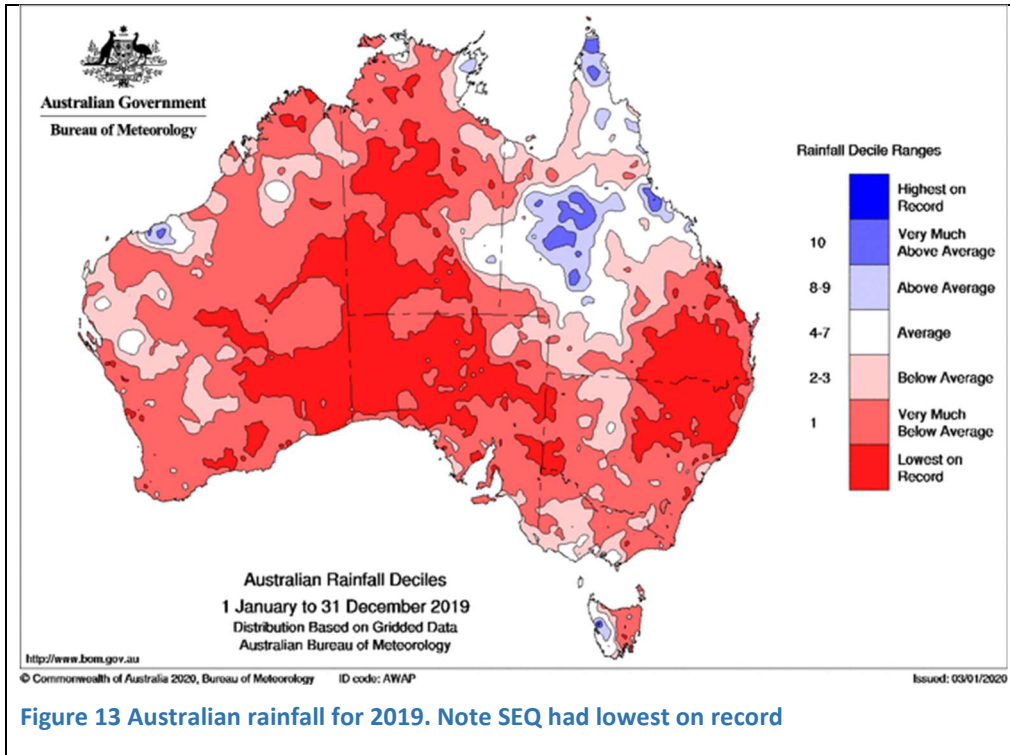


Figure 13 Australian rainfall for 2019. Note SEQ had lowest on record

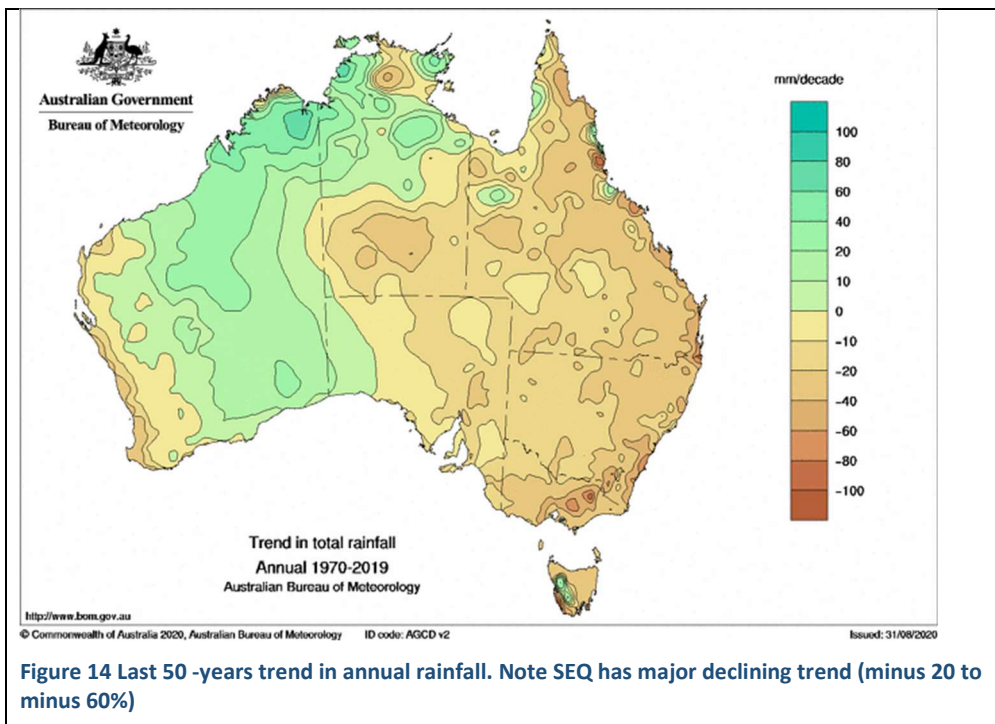
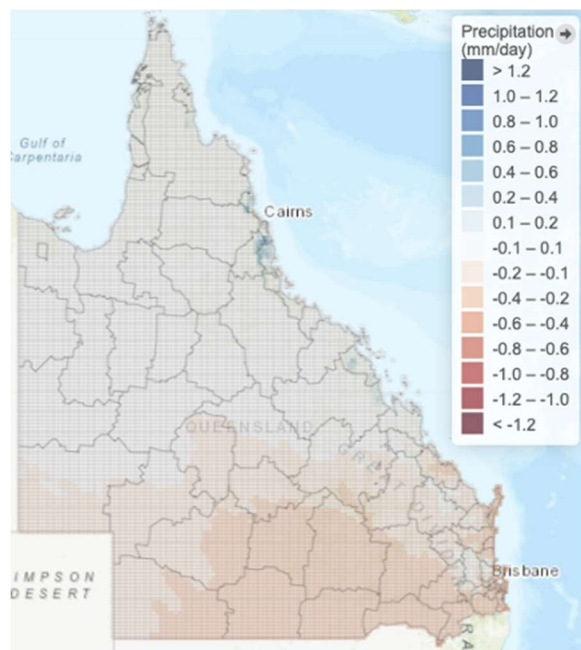
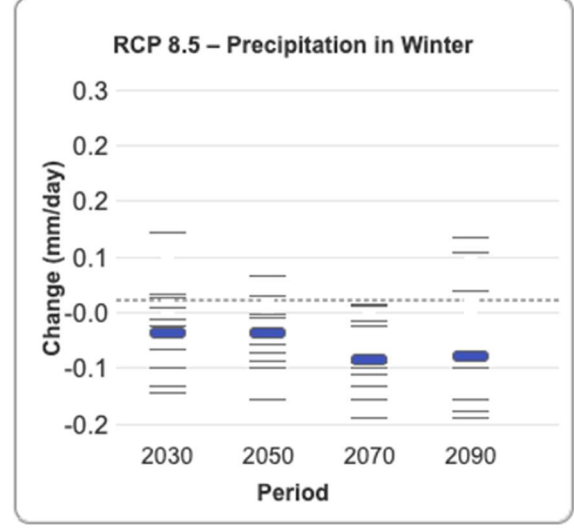


Figure 14 Last 50 -years trend in annual rainfall. Note SEQ has major declining trend (minus 20 to minus 60%)



Changes over time for Queensland
 Long-term changes relative to reference period (1986-2005)



Source: Queensland Future Climate Dashboard, Queensland Government
<https://www.longpaddock.qld.gov.au/qld-future-climate/dashboard/>

Figure 15. Projected decrease in winter rainfall from climate change, assuming global greenhouse gas emissions continue unabated.

[REDACTED]

[REDACTED]

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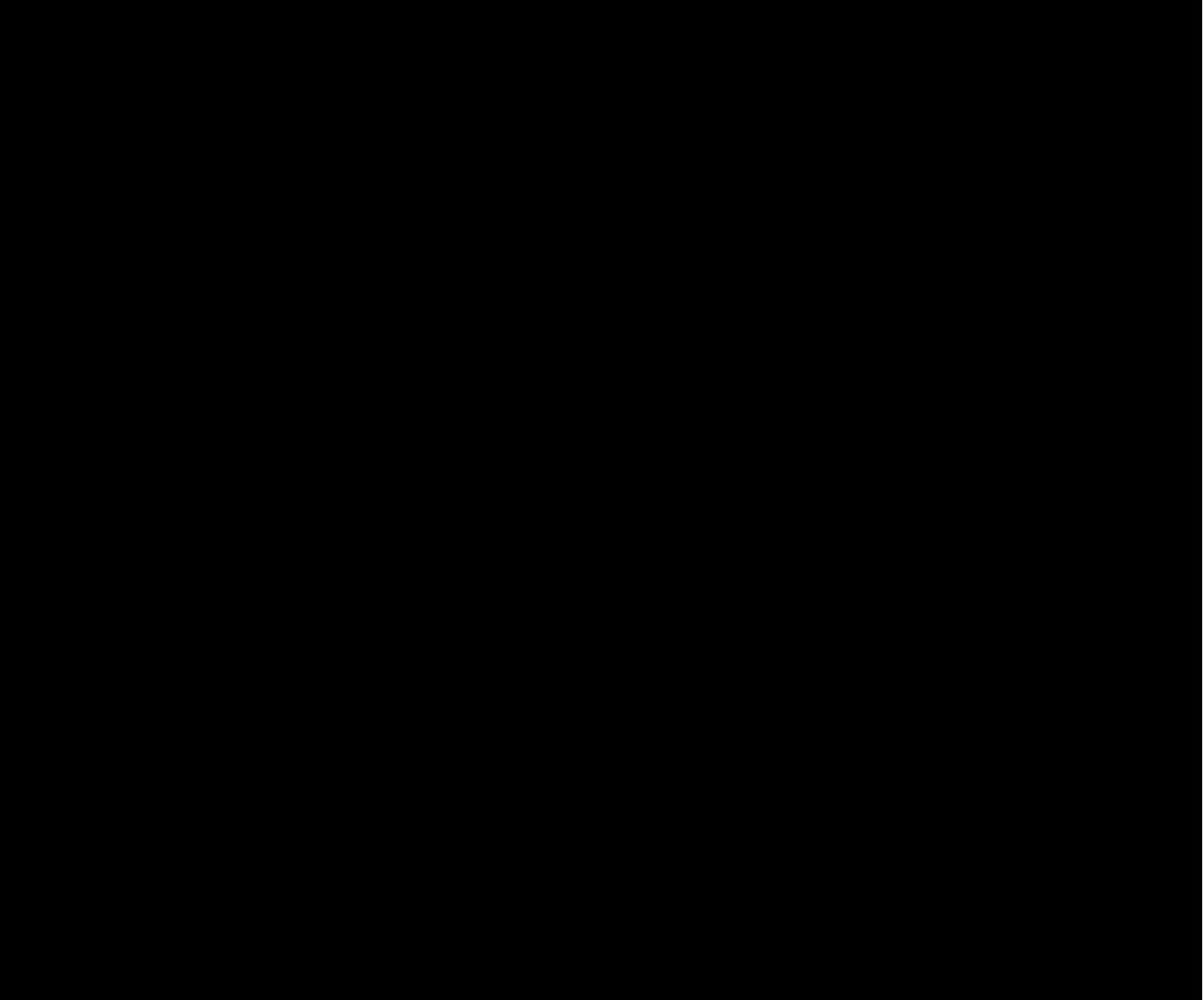
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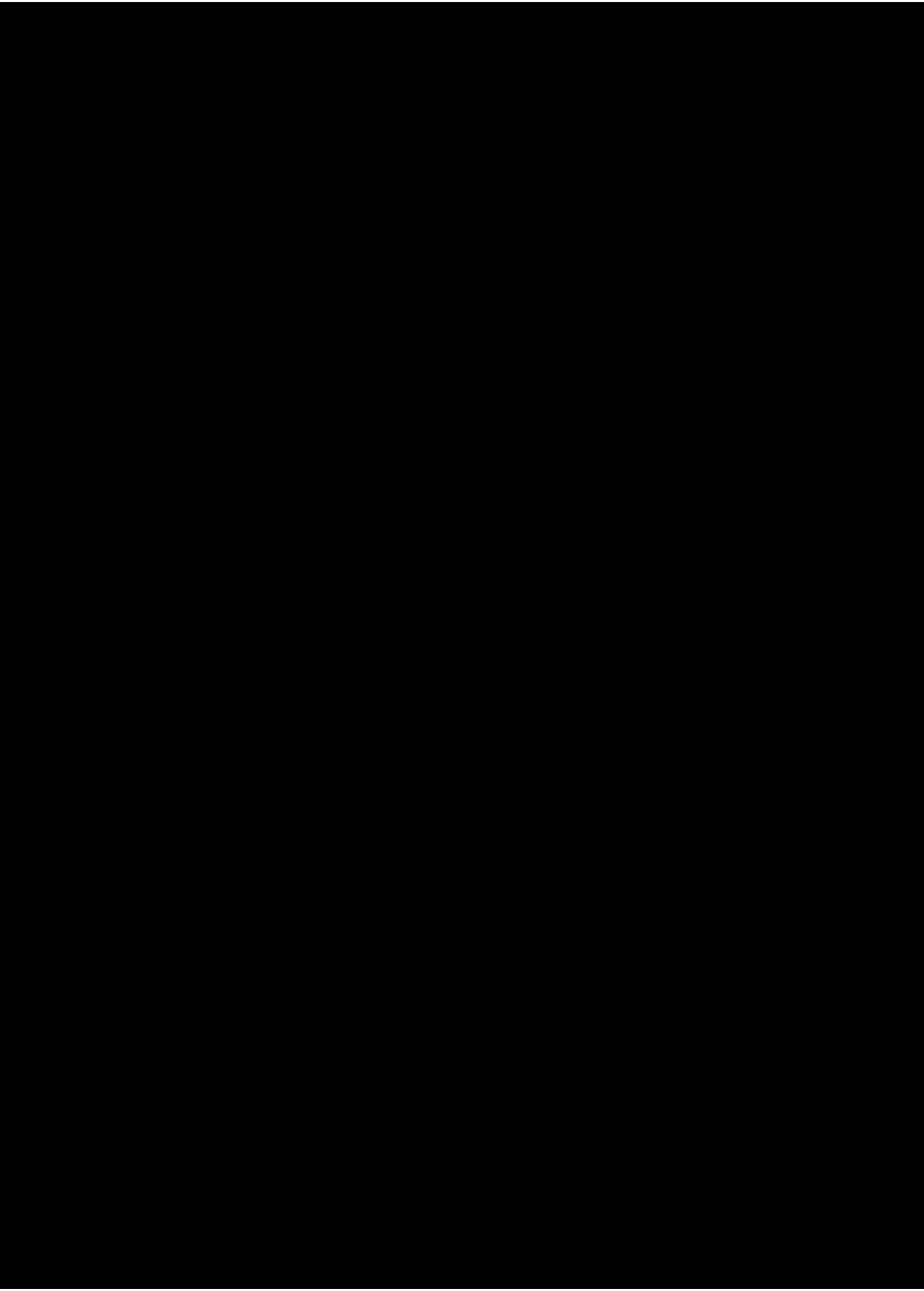
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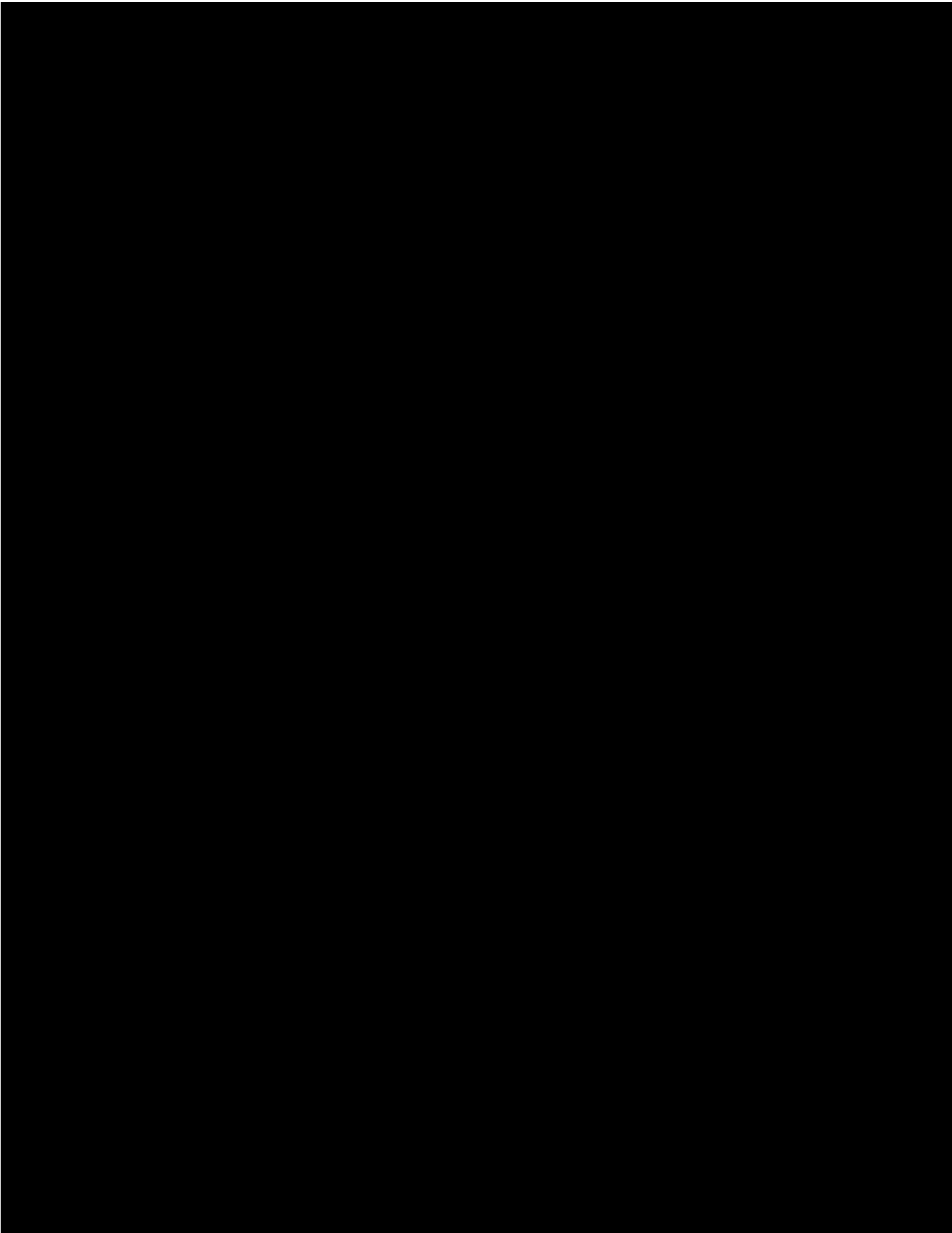
13. Furthermore, in reporting on **climate change** in relation to the proposed commercial groundwater extraction I have followed the impact assessment framework of the International Panel on Climate Change (IPCC) Working Group II – Impacts, Vulnerability and Adaptation. This is the world standard for climate change impact assessment endorsed by the Australian Government. The IPCC approach requires that climate-related impacts are assessed in terms of how they affect the values and objectives of all relevant systems and assets. Here, this requires assessing the impacts of current and projected climate change in relation to the above listed matters of environmental significance, including the impacts off site and in the surrounding World Heritage areas and national parks. Of particular interest therefore, is how climate change impacts the Springbrook landscape systems and associated natural assets. I have therefore focussed on the following critical components and their interactions:

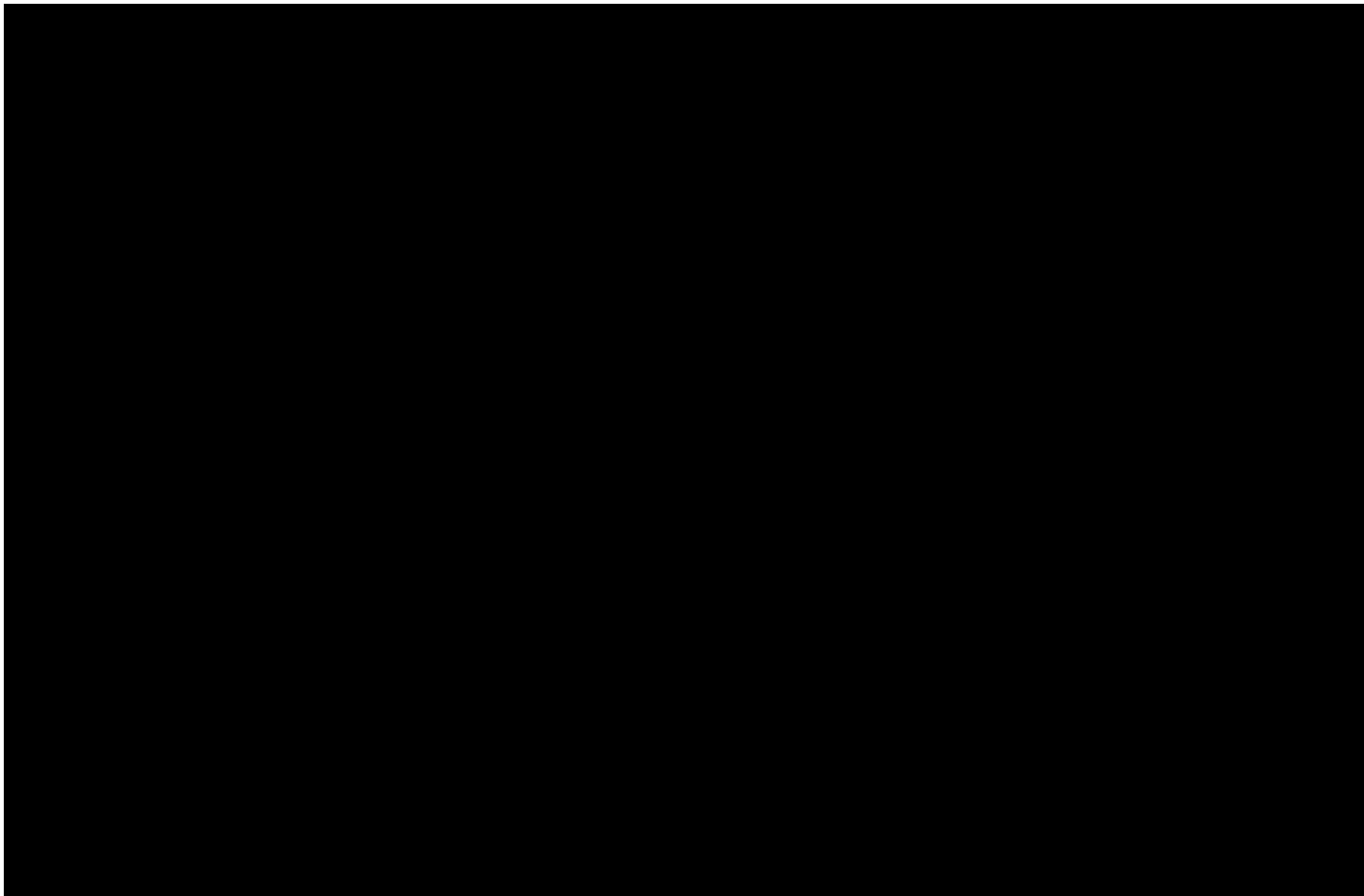
- I. ***Climate change and groundwater dependent ecosystems*** – [REDACTED]
[REDACTED]
- II. [REDACTED]
- III. ***Climate change and cascading risk to flora and fauna*** – [REDACTED]
[REDACTED]

[REDACTED]









14.

[Redacted]

15. TJ expects that any approval of this application will involve the imposition of suitable conditions on the extraction operation, which will include likely restrictions on the extent of water table level reduction which is permitted. If climate change results in a reduction in annual rainfall totals, then this will reflect in lower water table levels, which will limit the amount of extraction which is permitted. If the impacts of climate change predicted by BM occur by the year 2100, then I would expect the conditions of approval to prevent groundwater extraction for commercial purposes. However, this is a matter for future determination and monitoring.

16.

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

20. BM says that [Redacted]
[Redacted] . Climate change is driving further winter drought and
extreme heatwave conditions.
[Redacted]).

21. [Redacted]

22. [Redacted]

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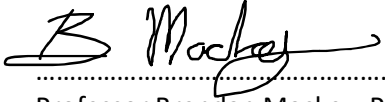
[REDACTED]

27. BM says that, given that the impacts of the development on groundwater are uncertain, and that the future extent of climate change regarding precipitation are currently limited, and the significant environmental values at stake, decisions should be guided by the precautionary principle whereby a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation or mitigating risks.
28. TJ says that the issue of any impact which may arise in the future as a consequence of climate change can be satisfactorily addressed by the imposition of suitable conditions to any approval which may be granted for the development. On the basis that changes in groundwater level or vegetation can be determined by regular monitoring, TJ does not consider that there is any significant risk associated with approval of the proposed development. The reality is that climate change is occurring, and humans will need to adapt to it since any remedial measures adopted by industry are certain to take decades to centuries to reflect in modified climatic conditions. Hence, it is neither reasonable nor possible to simply avoid making decisions on the basis of uncertainty.
29. BM says that the best available climate projections point to a continuation in south east Queensland of the current observed drying trend (Figure 15). It is critical to note that these projections are not derived from global scale climate model as stated in the Joint Expert Report on groundwater (TJ). Rather, they are the outputs of “dynamically downscaled” regional climate models which take into account finer resolution features of Queensland’s geography such as the topographic-related effects of coastal ranges. They are built upon the same physical process understanding that underpins current weather forecasts and they are able to replicate past and current climatic conditions in Australia and south east Queensland. The main factor influencing the accuracy concerns the course of greenhouse gas emissions and the international community’s success or failure to mitigate greenhouse gas emissions. The projections (climate science does not use the term “predictions”) shown in Figure 15 assume current levels of emissions continue unabated. However, even if

emissions reductions occur sufficient to limit warming the Paris Agreement temperate goal of well below 2° C above pre-industrial levels, all available evidence points to the current winter drying trend continuing with the main uncertainty being how severe it will become.

30. TJ says that the description of future estimates of effect and impact as “projections” is a matter of semantics. Nevertheless, these are predictions only, based firstly on estimates of future temperature increases which may or may not occur, and then further on estimates of how such temperature changes may affect weather patterns, rainfall intensities, rainfall totals and rainfall distribution. All models are wrong, some are useful, is an important aphorism which numeric modellers need to keep in mind. The computer simulations which have been used to produce the climate projections noted above are based on theoretical mathematical equations which represent the current state of knowledge in relation to complex global weather systems. There is no guarantee that the predictions of these models are accurate, or will actually occur. At best, there is a probability that a certain outcome may occur. The historical data which climate scientists have collected and analysed generally support the statistical proposition that anthropogenic climate change is occurring. The best use of climate models is to extrapolate these data sets to determine future scenarios each of which depends on a number of parametric assumptions which are required to be input to such models. The effect of these potential scenarios on the natural and man-made worlds can then be assessed.

SIGNATURES



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Professor Brendan Mackey, PhD



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Dr Trevor Johnson

BE, MEngSc, PhD, CPEng, NER, FIEAust, RPEQ

Date: 22 December 2020