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27th June, 2022

To whom it may concern,

**Independent, Impartial and Expert Opinion on Draft Reconsideration Request
in respect of decisions made by the Minister for the Environment under s 75(1) the
*Environment Protection and Biodiversity Conservation Act 1999 (Cth)***

1. In providing this expert opinion:
 - i. I have read and agree to be bound by the *Harmonized Expert Witness Code of Conduct*
 - ii. I state that my opinions are based wholly or substantially on specialised knowledge arising from my training and experience.

Statement of relevant qualifications and experience (see also attached CV)

2. My current position is Distinguished Professor of Biology and Interim Executive Dean, Faculty of Science and Engineering at Macquarie University. I am an ecologist by training and have spent the past 30+ years researching the impacts of climate change on species and ecosystems, with a focus on Australia. Relevant qualifications and appointments include the following (reverse chronological order):
 - i. Director, Climate Council of Australia (January 2022- present)
 - ii. Councillor, Climate Council of Australia (September 2013- present)
 - iii. Member, Science Advisory Group, Australian Wildlife Conservancy (2021-present)
 - iv. Chief Climate Change Advisor, Pollination Pty Ltd (2021-present)
 - v. Royal University of Bhutan, Consultant for PhD program in climate studies (2019-present)
 - vi. Climate Science advisor, NSW Bar Association (2020-present)
 - vii. Member, Steering Committee for The Earth Systems & Climate Change Hub, National Environmental Science Program (NESP) (2018-2021)
 - viii. Contact point, United Nations Framework Convention on Climate Change (UNFCCC) for Macquarie University (2014-present)

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- ix. Director, Governor, and member of Eminent Scientists Group, WWF Australia (2013-2021)
- x. Director, Biodiversity Node, NSW Office of Environment & Heritage Climate Adaptation Research Hub (2013-2019)
- xi. Chair, Tasmanian Climate Action Council (2012-2014)
- xii. Co-director, Climate Futures Research Centre, Macquarie University (2012-2014)
- xiii. Co-convenor, Terrestrial Biodiversity Adaptation Research Network for National Climate Change Adaptation Research Facility (NCCARF) (2009 – 2013)
- xiv. Chair, drafting team for the National Adaptation Research Plan for Terrestrial Biodiversity, NCCARF (2009-2010)
- xv. Commissioner, federal Climate Commission (2011-2013)
- xvi. Member, federal Land Sector Carbon & Biodiversity Board (2011-2013)
- xvii. Member, Wentworth Group of Concerned Scientists (2011- present)
- xviii. Reviewer, State of the Environment Report 2011 (2016)
- xix. Member, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Australian Representative Advisory Committee (2012)
- xx. Lead Author on the Intergovernmental Panel on Climate Change (IPCC) Fourth & Fifth Assessment Reports (AR4 & AR5), Working Group II.
- xxi. Member, Climate Scientists Australia (www.climatescientistsaustralia.org.au/) (2009-2011)
- xxii. Australian Representative on the United Nations Convention on Biological Diversity (CBD) *Ad Hoc* Technical Expert Group (AHTEG) on Biodiversity and Climate Change (2008)
- xxiii. Member, Botanic Gardens Trust (2008-2013) and Chair of the Scientific Committee of the Trust (2008-2013)
- xxiv. NSW Scientific Committee (2003-2008), Deputy Chair (2003-4), Chair (2005-2008). This committee is responsible for assessing and listing threatened species and communities in NSW. Unlike its counterparts in other states and territories, this committee has the power to list on scientific grounds, without Ministerial approval.
- xxv. Member Expert Advisory Group on Climate Change and Biodiversity, Australian Greenhouse Office (2007- 2009)
- xxvi. Member, NSW Dept of Environment, Climate Change and Water (DECCW), Climate Change Science Research Network (2008-2012)
- xxvii. Member, management committee, National Climate Change Adaptation Research Facility (NCCARF) (2007-2013)
- xxviii. Reviewer, Dept. of Environment and Conservation *Climate Change Adaptation Policy 2006*
- xxix. Member of the *IUCN World Commission on Protected Areas* (2005-present)

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- xxx. Co-convenor of workshop on Climate Change and Biodiversity, Canberra, October 2002, sponsored by the Biological Diversity Advisory Committee. Co-author and editor of workshop report (2003)
- xxxi. Scientific Editor 2004: *National Biodiversity and Climate Change Action Plan (2003-2007)*
- xxxii. Reviewer, Consultation Paper: “*Developing a National Biodiversity and Climate Change Action Plan*”, NRM Ministerial Councils’ Land, Water and Biodiversity Committee, Oct 2003
- xxxiii. Consultant: Community Biodiversity Network for Nomination of “*Anthropogenic Climate Change as a Key Threatening Process*” under the Threatened Species Conservation Act 1995. Expert Reviewer, Working Group II, Intergovernmental Panel on Climate Change (IPCC) (2004-2007)
- xxxiv. Australian representative, working party to draft guidelines on response of Red List species to climate change, IUCN (International Union for the Conservation of Nature) (2003)
- xxxv. Invited Reviewer, draft report on “*Interlinkages between Biological Diversity and Climate Change and Advice on the Integration of Biodiversity Considerations into the Implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol*”, Convention on Biological Diversity Secretariat (2003)

Publication summary (see attached CV for full list)

3. I have published 21 invited book chapters, a co-authored book, and >120 papers in peer-reviewed journals, including *Science* and *Nature*. My papers have been cited over 24,000 times, my h-index is 57, and i10 index is 126 (Google Scholar, 17 June 2022). One of my papers, Thomas *et al.* (2004) “Species extinction and climate change”, published in *Nature*, remains the most highly cited paper from Macquarie University (>8500 citations, Google Scholar 17 June, 2022).

Opinion

4. In deriving the opinion below I have made the following assumptions about the preparation and compilation of the material provided:
 - a. The steps summarised at [42]-[73] of Annexure 2 were followed as set out in those paragraphs, and the spreadsheets at Annexure 2.1 accurately reflect the product of those steps.

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- b. The list of materials at Annexure 2.2 and the accompanying source materials accurately reflect the categories of source material identified at [48] of Annexure 2.
- c. Where the analysis at Annexure 2 describes the operation and/or effect of the EPBC Act (see, for example, at [135]), those descriptions are accurate.
5. It is my opinion that the material referred to in Annexure 1 and the analysis in Annexure 2 (including the materials in Annexures 2.1 to 2.3) supports the following propositions:
6. There is a real (as opposed to a remote) chance that a consequence of continued emission of greenhouse gas emissions into the atmosphere — including through the combustion of coal and/or gas — will be an increase in the regularity, scope and intensity of climate hazards (such as fire, heat extremes, marine heatwaves and ocean acidification, heavy precipitation and flooding, and drought).
7. There is a real (as opposed to a remote) chance that those events (or one or more of them) will adversely affect the following MNES:
 - i. the world heritage values of declared World Heritage properties;
 - ii. the National Heritage values of National Heritage places;
 - iii. the ecological character of declared Ramsar wetlands;
 - iv. listed threatened species in the critically endangered category;
 - v. listed threatened species in the endangered category;
 - vi. listed threatened species in the vulnerable category;
 - vii. listed threatened ecological communities in the critically endangered category;
 - viii. listed threatened ecological communities in the endangered category;
 - ix. listed threatened species (other than a species included in the extinct category or a conservation dependent species) and listed threatened ecological communities (other than an ecological community in the vulnerable category);
 - x. listed migratory species;
 - xi. the environment in a Commonwealth marine area (containing listed marine species); and
 - xii. the environment in the Great Barrier Reef Marine Park.

This opinion is based on the following:

8. **My 30+ years of personal research experience addressing the impacts, both observed and projected, of climate change on species and**

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ecosystems in Australia and globally. I began this research in 1990 and was one of very few scientists in Australia focusing on the interactions of biodiversity and climate change for at least the next decade. With my colleague Prof. Mark Howden, I co-convened the first Australian research workshop on the topic, which led to an invitation to review the *National Biodiversity and Climate Change Action Plan (2003-2007)*, the first such planning document produced by any Australian government. As listed above, this early work led, over the following 30 + years to multiple invitations to lead climate change-associated advisory positions at state, national and international level, and numerous positions with environmental and climate-related NGOs. Most notably, these have included being a Lead Author on the 4th and 5th Assessment Reports of the IPCC, responsible for the biodiversity sections of the Australasian regional chapters for Working Group II; chairing the drafting team for the National Adaptation Research Plan for Terrestrial Biodiversity, NCCARF (2009 – 2010); and chairing the NSW Scientific Committee from 2005 to 2008, charged with listing threatened species and communities in NSW.

9. **My review of the methodology described in Annexure 2.** Given the explosion of research interest in the impacts of climate change on biodiversity over the past two decades, the quantity of potential material that could have been reviewed for this purpose is vast. Given this, I believe that the focus of the analysis on the most recent documents available (such as recent Conservation Advices for threatened species and ecological communities) is appropriate. I also believe that the specific focus on fire impacts for relevant biological entities is appropriate. Of all the extreme climate-related events that affect terrestrial (and to an extent, freshwater) species and ecological communities, severe fires generally have the most transformative impact, capable of causing extinctions of rare or geographically restricted species, and irreversible regime shifts between different types of ecological communities.
10. Over the last 30 years, the areas affected by fire in Australia have grown enormously. An analysis published in 2021 by CSIRO researchers found that over the past 30 years, the annual area burned in Australia has been increasing by about 48,000 ha p.a. The study also found that three out of four extreme fire years over the past 90 years have occurred since 2002. When satellite records from 1988–2001 are compared to the period from 2002–2018, the annual average fire area has increased 350%. If the fires that occurred in 2019-2020, the so-called “Black Summer” fires, are included, this figure

increases to 800%.¹ Amongst other ecological communities, the Black Summer bushfires burned extensive areas of Gondwanan rainforests on the east coast of Australia. This type of ecological community is not adapted to withstand or regenerate after fire and will likely not return to its former state unless protected from future fire for several hundred years.

11. **The consistency of the material presented in Annexure 2 with the wealth of peer-reviewed literature on the impacts of climate change, both observed and projected published over the past 2-3 decades.**² The material collated, such as from recent Conservation Advices for threatened species and ecological communities, consistently refer to published literature indicating that climate change is implicated either in their observed decline/degradation or is projected to do so in the future, increasing their risk of extinction (in the case of threatened species) or the degradation on ecological function, in the case of communities. In many instances, climate change is identified as the most serious threat.
12. The climate change impacts identified in the material include the direct effects of warming, changes in rainfall patterns or sea level rise, and/or the spatial extent, severity and/or frequency of extreme events such as bushfires, droughts, floods, cyclones and heatwaves. Indirect impacts of climate change on some species include changes in their interactions with other species, including the spatial extent, virulence and transmissibility of disease.
13. The identification of these impacts is closely aligned with conclusions, for example, from the joint report from the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) published in 2021³ including the following:
 - i. Increasing energy consumption, overexploitation of natural resources and unprecedented transformation of land-, freshwater- and seascapes¹ over the past 150 years have paralleled technological advances and supported better living

¹ <https://www.nature.com/articles/s41467-021-27225-4>

² Recent publications include: Climate Council of Australia (2019) This is what climate change looks like [https://onlinelibrary.wiley.com/doi/10.1111/gcb.15539](https://www.climatecouncil.org.au/resources/ecosystems-report/#::~:~:text=The%20Climate%20Council's%20new%20report,invasive%20feral%20animals%20and%20weeds; Bergstrom DM et al. (2021) Ecosystem collapse from the tropics to the poles. Global Change Biology <a href=); Australian Academy of Science (2021) The risks to Australia of a 3°C warmer world (www.science.org.au/warmerworld)

³ Pörtner, H.O et al. (2021) IPBES-IPCC co-sponsored workshop report on biodiversity and climate change; IPBES and IPCC. DOI:10.5281/zenodo.4782538.

standards for many but have also led to changes in climate and the accelerating decline of biological diversity worldwide, both negatively impacting many aspects of good quality of life.

- ii. Climate change and biodiversity loss are closely interconnected and share common drivers through human activities.
- iii. As climate change progresses, the distribution, functioning and interactions of organisms, and thus ecosystems, are increasingly altered.
- iv. The adaptive capacity of most ecosystems and social-ecological systems will be exceeded by unabated anthropogenic climate change, and significant adaptive capacity will be required to cope with residual climate change even under ambitious emissions reduction.

14. An earlier report from IPBES published in 2018,⁴ concluded that around a million species of plants and animals are at risk of extinction, some within decades, and identified climate change as one of five key drivers of this risk.

15. In Australia, the last State of the Environment Report (2016) concluded that the traditional stresses facing the Australian environment, including habitat loss and fragmentation, invasive species and overharvesting are now being exacerbated by the rapidly changing climate.⁵

16. A paper on which I was one of 38 national and international authors, published in 2021, documented 19 Australian ecosystems (including terrestrial, freshwater and marine) that were collapsing in some portion of their geographic range.⁶ Climate change impacts were implicated in the decline of virtually all these ecosystems.

17. In summary, in my opinion the material referred to in Annexure 1 and the analysis in Annexure 2 (including the materials in Annexures 2.1 to 2.3) provides detailed and convincing evidence that there is a real (as opposed to a remote) chance that a consequence of continued emission of greenhouse gas emissions into the atmosphere — including through the combustion of coal and/or gas — will be an

⁴ IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) (2018) Global Assessment Report on Biodiversity and Ecosystem Services (2018) (IPBES Secretariat, Bonn, Germany, 2018) <https://www.ipbes.net/>

⁵ SoE (2016) Australia State of the Environment Report. <https://soe.environment.gov.au/>. Note: the 2021 State of the Environment report has not yet been released by the government.

⁶ Bergstrom DM et al. (2021) Ecosystem collapse from the tropics to the poles. *Global Change Biology* <https://onlinelibrary.wiley.com/doi/10.1111/gcb.15539>;

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increase in the regularity, scope and intensity of climate hazards (such as fire, heat extremes, marine heatwaves and ocean acidification, heavy precipitation and flooding, and drought), and that there is a real (as opposed to a remote) chance that those events (or one or more of them) will adversely affect MNES as listed.

Sincerely,



Prof. Lesley Hughes

Distinguished Professor of Biology
Interim Executive Dean, Faculty of Science and Engineering
Macquarie University, NSW 2109, Australia
T: +61 2 9850 1023
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From: [Retta Berryman](#)
To: "Lesley Hughes"
Cc: [Hollie Kerwin](#); [Brittini Dienhoff](#); [Shannon McGrellis](#)
Subject: Confidential - Letter of Instruction - Your opinion on preparation of Reconsideration Requests (EPBC Act)
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[2022-06-07 Letter of instruction to Professor Hughes.pdf](#)

Dear Lesley,

Thank you again for being available to provide your opinion, including in such a busy period for you. We are grateful for you being able to provide your report by 20 June.

Further to our correspondence of 12 May 2022, **attached** here is your letter of instructions for the opinion, which includes the two questions on which your response is sought.

The letter also identifies material which is enclosed with your letter of instruction. This material is all available for you at [this link](#) . Please let us know if you have any difficulties accessing or navigating the material.

You will also see that the letter refers to providing your opinion in accordance with the Federal Court of Australia's Expert Evidence Practice Note and the Expert Witness Code of Conduct, both of which were provided with our letter sent by email on 12 May. Please do let us know though if it would be easier for us to send it to you again.

Please do not hesitate to contact us if you require any further information regarding the matter, or the scope of your engagement.

Kind regards

Retta

Retta Berryman (she/her)
Senior Lawyer

Work days: Monday-Thursday

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We acknowledge the Traditional Custodians of the lands on which we live and work. We pay respect to their elders past and present, and pay tribute to the vital role First Nations peoples play in caring for Country across Australia.

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7 June 2022

Professor Lesley Hughes
Interim Executive Dean
Faculty of Science and Engineering
Distinguished Professor of Biology
Macquarie University
Macquarie Park NSW 2109

By email: lesley.hughes@mq.edu.au

CONFIDENTIAL AND PRIVILEGED

Dear Professor Hughes

Preparation of reconsideration requests in respect of decisions made by the Minister for the Environment under s 75(1) the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) – Letter of Instructions

1. Our letter of 12 May 2022 engaged you to provide us with your independent, expert, opinion in relation to proposed requests by our client, the Environment Council of Central Queensland Inc (**ECCQ**), seeking that the Federal Minister for the Environment (**Minister**) reconsider a number of controlled action decisions made under s 75(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) (**Reconsideration Requests**).
2. We would be grateful to receive your report by **20 June 2022**.
3. This letter provides our detailed instructions. It sets out:
 - a. by way of background:
 - i. an overview of relevant provisions of the EPBC Act; and
 - ii. an overview of the draft Reconsideration Request to be made by our client, ECCQ;

- b. a list of the materials we have provided to you with this letter of instructions;
- c. the questions on which your opinion is sought; and
- d. the assumptions we ask you to make in providing your opinion.

Background

Relevant provisions of the EPBC Act

4. The objects of the EPBC Act include to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance (**MNES**) (s 3(1)(a)).
5. Part 3 protects MNES by imposing civil and/or criminal penalties on persons who take an action that has, will have or is likely to have a significant impact on a MNES, unless an approval of the action under Part 9 is in operation. The MNES protected under Part 3 are listed in the table in s 34 of the EPBC Act. In summary, they are:
 - a. the world heritage values of declared World Heritage properties (ss 12, 15A);
 - b. the National Heritage values of National Heritage places (ss 15B, 15C);
 - c. the ecological character of declared Ramsar wetlands (ss 16, 17B);
 - d. listed threatened species in the critically endangered category (s 18(2));
 - e. listed threatened species in the endangered category (s 18(3));
 - f. listed threatened species in the vulnerable category (s 18(4));
 - g. listed threatened ecological communities in the critically endangered category (s 18(5));
 - h. listed threatened ecological communities in the endangered category (s 18(6));
 - i. listed threatened species (other than a species included in the extinct category or a conservation dependent species) and listed threatened ecological communities (other than an ecological community in the vulnerable category) (s 18A);
 - j. listed migratory species (ss 20, 20A);
 - k. the environment in a Commonwealth marine area (ss 23(2), 24A(3), (4)) (containing listed marine species¹); and
 - l. the environment in the Great Barrier Reef Marine Park (ss 24B(2), 24C(5), (7)).

¹ As a constituent part of the Commonwealth marine area: EPBC Act, s 528 (definition of “environment”), Ch 5, Pt 13, Div 4.

6. An action that would be prohibited by a provision of Part 3 without relevant approval under Part 9 is known as a “controlled action”, and a provision of Part 3 that would prohibit the action is known as a “controlling provision” (s 67).
7. Proposals for actions that may be a controlled action must be referred to the Minister (s 68). The Minister is then required to decide under s 75(1) whether the action is a controlled action, and if so, which provisions of Part 3 are controlling provisions (i.e. whether the action will have or is likely to have a significant impact on a MNES). Section 78A(1) allows a person to request that the Minister reconsider a decision made under s 75(1). One basis upon which the Minister may revoke a decision made under s 75(1) and substitute a new decision is where the Minister is satisfied that the revocation and substitution of the decision is warranted by the availability of substantial new information about the impacts that the action has, will have, or is likely to have on a MNES.
8. As will be evident from the above summary, the legislative regime turns upon the “impacts” that an action has, will have or is likely to have on a MNES. The legislation defines “impact” in the following way (s 527E):
 - (1) For the purposes of this Act, an event or circumstance is an **impact** of an action taken by a person if:
 - (a) the event or circumstance is a direct consequence of the action; or
 - (b) for an event or circumstance that is an indirect consequence of the action — subject to subsection (2), the action is a substantial cause of that event or circumstance.
 - (2) For the purposes of paragraph 1(b), if
 - (a) a person (the **primary person**) takes an action (**the primary action**); and
 - (b) as a consequence of the primary action, another person (the **secondary person**) takes another action (the **secondary action**); and
 - (c) the secondary action is not taken at the direction or request of the primary person; and
 - (d) an event or circumstance is a consequence of the secondary action;
 then that event or circumstance is an **impact** of the primary action only if:
 - (e) the primary action facilitates, to a major extent, the secondary action; and
 - (f) the secondary action is:
 - (i) within the contemplation of the primary person; or
 - (ii) a reasonably foreseeable consequence of the primary action; and
 - (g) the event or circumstance is:
 - (i) within the contemplation of the primary person; or
 - (ii) a reasonably foreseeable consequence of the secondary action.

9. An impact is “significant” if it is important, notable or of consequence having regard to its context or intensity.² A significant impact is “likely” if it is a real or not remote chance or possibility.³

Proposed reconsideration requests

10. ECCQ proposes to make the Reconsideration Requests under s 78A(1) of the EPBC Act in respect of a number of proposed fossil fuel-related projects (**the Proposed Projects**) that have been the subject of “controlled action” decisions by the Minister under s 75(1), but have not yet received approval under Part 9.
11. The Proposed Projects vary in nature and scope. They include, for example, the extension or upgrade of existing coal mines, and the construction and operation of new coal mines. Each of the Proposed Projects is associated with a substantial volume of greenhouse gas and CO₂ emissions.
12. For each of the Proposed Projects, the Minister has decided that the action under the Proposed Project is a “controlled action” and has identified one or more controlling provisions for the action. However, it is ECCQ’s view that, in making those decisions, the Minister has not properly considered whether greenhouse gas emissions resulting from the action will have, or are likely to have, a significant impact on the MNES protected by Part 3. Consequently, the Minister’s decisions under s 75(1) in respect of the selected projects have not identified as controlling provisions various MNES which, in ECCQ’s view, will be or will likely be significantly impacted by the projects (within the meaning of those terms, as identified above).
13. ECCQ proposes to write to the Minister: (a) providing material not previously placed before the Minister about the link between greenhouse gas emissions and climate change, and the effect of climate change on a vast number of MNES protected by Part 3; and (b) asking the Minister to reconsider the previous s 75(1) decisions in light of that material. In particular, ECCQ will be submitting to the Minister that, in view of the material provided, the Minister should conclude that each of the Proposed Projects will have or are likely to have a significant impact on each and every one of the MNES identified at [5] above.

Materials provided

14. We enclose with this letter of instructions the following material:

² *VicForests v Friends of Leadbeater’s Possum Inc* [2021] FCAFC 66; 389 ALR 552, [62].

³ *Polaris Coomera Pty Ltd v Minister for the Environment* [2021] FCA 254, [212]-[226].

- a. Draft Annexure 1 – a draft of the list of materials relating to climate change and its physical effects that is proposed to be provided with the reconsideration requests, and copies of those materials.
- b. Draft Annexure 2 — a draft set of submissions that is proposed to be provided with the Reconsideration Requests, which contains analysis of research on climate change and its impacts on MNES under the EPBC Act.
- c. The documents underlying Draft Annexure 2, namely:
 - i. Annexure 2.1 – spreadsheets of data compiled from reviewing authoritative sources of information relevant to the protection of MNES;
 - ii. Annexure 2.2 – a full list of the authoritative sources of information relevant to the protection of MNES that were reviewed, and copies of those sources of information; and
 - iii. Annexure 2.3 – a spreadsheet and maps showing the impact of fire on species protected by Part 3 of the EPBC Act.

Assumptions

15. We ask you to make the following assumptions about the preparation and compilation of the material that we have provided to you with this letter of instructions:
 - a. The steps summarised at [42]-[73] of Annexure 2 were followed as set out in those paragraphs, and the spreadsheets at Annexure 2.1 accurately reflect the product of those steps.
 - b. The list of materials at Annexure 2.2 and the accompanying source materials accurately reflect the categories of source material identified at [48] of Annexure 2.
 - c. Where the analysis at Annexure 2 describes the operation and/or effect of the EPBC Act (see, for example, at [135]), those descriptions are accurate.
16. We appreciate that many (if not all) of the documents comprising the list of materials in Annexure 2.2 are not scientific literature of the kind that would ordinarily be required for you to express an opinion in a field of science. However, for the purpose of this opinion, you are instructed to assume that where any such document states that something (such as fire, climate change, etc) constitutes a threat or adverse effect on a MNES, you should assume it to be true that that thing does constitute such a threat or impact.
17. Please let us know if you require further information or material in order to complete your report, or if you have any questions about the assumptions we have asked you to make.

Questions

18. We request your independent expert opinion on the following questions:

1. Making the assumptions in paragraphs 15 to 16 above, does the material referred to in Annexure 1 and the analysis in Annexure 2 (including the materials in Annexures 2.1 to 2.3) support the following propositions? If not, why not?
 - a. There is a real (as opposed to a remote) chance that a consequence of continued emission of greenhouse gas emissions into the atmosphere — including through the combustion of coal and/or gas — will be an increase in the regularity, scope and intensity of climate hazards (such as fire, heat extremes, marine heatwaves and ocean acidification, heavy precipitation and flooding, and drought).
 - b. There is a real (as opposed to a remote) chance that those events (or one or more of them) will adversely affect the following MNES:
 - i. the world heritage values of declared World Heritage properties;
 - ii. the National Heritage values of National Heritage places;
 - iii. the ecological character of declared Ramsar wetlands;
 - iv. listed threatened species in the critically endangered category;
 - v. listed threatened species in the endangered category;
 - vi. listed threatened species in the vulnerable category;
 - vii. listed threatened ecological communities in the critically endangered category;
 - viii. listed threatened ecological communities in the endangered category;
 - ix. listed threatened species (other than a species included in the extinct category or a conservation dependent species) and listed threatened ecological communities (other than an ecological community in the vulnerable category);
 - x. listed migratory species;
 - xi. the environment in a Commonwealth marine area (containing listed marine species); and
 - xii. the environment in the Great Barrier Reef Marine Park.
2. To the extent you consider that any of the propositions set out in paragraphs (a)-(b) above is not supported by the material referred to in Annexure 1 and/or the analysis in

Annexure 2, please explain why it is not so supported, and advise whether you consider any further material is required in order to express an opinion in that regard.

Method of preparing your report

19. As set out in our letter of 12 May 2022, we ask that you prepare your report in accordance with the Federal Court of Australia's Expert Evidence Practice Note and the Expert Witness Code of Conduct, each of which we provided with our previous letter.
20. Your report should include:
 - a. a statement of your relevant qualifications, experience, appointments (and other roles) and any relevant publications (if you have research or publications that are in preparation but are not yet complete, you should list these separately). You may attach a current curriculum vitae to your report for the purpose of addressing these matters;
 - b. a brief explanation of how each opinion expressed in your report was arrived at, including identification of the facts, assumptions and specialised knowledge (based on your study, training or experience) relied upon, and the reasoning process involved; and
 - c. details of any sources of information used in preparing your report.
21. To the extent that any opinion is supported by the analysis in Annexure 2, it is sufficient to indicate your agreement with that reasoning, without needing to repeat it.
22. For practical reasons, we ask that you present your report as follows:
 - a. on numbered pages;
 - b. using unique, numbered paragraphs; and
 - c. using sub headings in appropriate places which indicate which of the questions you are answering.
23. Please attach to your report (in addition to other documents required to be attached), our letter of instructions dated 12 May 2022, this letter and any further letter of instructions we send you.

Other experts

24. We have also engaged Professor David Karoly to provide an expert opinion in relation to the ECCQ's draft Reconsideration Requests. You may discuss this matter with Professor Karoly, although the opinions given in your report must be your own and must be based substantially on your expertise (as derived from your own study, training or experience). To the extent you

discuss this matter with Professor Karoly (orally or in writing), please ensure that any such communications are conducted on a confidential basis. To the extent that you rely upon any fact, opinion or matter which originated from another expert, including Professor Karoly, you must disclose that reliance in your report (for example, by citing a publication authored by another expert).

Please contact me if you require any further information regarding the matter, or the scope of your engagement.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Retta Berryman', with a long horizontal flourish extending to the right.

Retta Berryman
Senior Lawyer - Environmental Justice Australia
03 8341 3118
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20 June 2022

Professor Lesley Hughes
Interim Executive Dean
Faculty of Science and Engineering
Distinguished Professor of Biology
Macquarie University
Macquarie Park NSW 2109

By email: lesley.hughes@mq.edu.au

CONFIDENTIAL AND PRIVILEGED

Dear Professor Hughes

Preparation of reconsideration requests in respect of decisions made by the Minister for the Environment under s 75(1) the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) – Updated Marine Species spreadsheets

1. I refer to our email to you on Thursday 16 June 2022 indicating that we would provide you with a small update to the package of material with which you have been briefed.

The updated material for Annexure 2.1 - Marine Species

2. Please now find enclosed three files, comprising five updated summary spreadsheets of data compiled, relating only to the Marine Species, specifically:
 - a. An updated version of the Impact Data Table for Marine Species originally provided to you titled 'Marine Species Irrelevant and Relevant results - Impact Data Table.pdf' that was attached at the link provided to you in Annexure 2.1.A.
 - b. An updated version of the Impact Data Table for Marine Species originally provided to you titled 'Marine Species - Impact Data Table - only relevant results.pdf' that was attached at the link provided to you in Annexure 2.1.B.

- c. A single PDF comprising an updated version of each of the direct, implied and fire spreadsheets relating to Marine Species, originally provided to you in a combined file titled 'Marine Species – only relevant results.pdf' that was attached at the link provided to you in Annexure 2.1.B.
3. For completeness, we confirm that the spreadsheets relating to Marine Species produced after the first three steps identified in Annexure 2 (up to and including the human review process)¹ that comprise the file 'Marine Species – Irrelevant and relevant results.pdf', provided with your original brief and attached at the link provided to you in Annexure 2.1.A, have not been updated.
4. We also confirm that none of the spreadsheets relating to the marine regions have been updated.
5. The updates to the spreadsheets at paragraph 2 remedy an issue that we noticed affecting only these spreadsheets. The issue is that, in these spreadsheets, a small amount of the data from the underlying spreadsheets identified at paragraph 3 was not transferred across to the related, derivative spreadsheets correctly.

Summary of the differences between the original and updated spreadsheets

6. The differences between the original versions of the spreadsheets, and the enclosed updates can be best pinpointed by referring to the further enclosed 'COMPARE updated Marine Species Irrelevant and Relevant results - Impact Data Table' (which combines the results from each of the other updated documents). The updates affect the following rows of that spreadsheet: 40, 49, 78, 86, 199, 201, 233, 253, 260, 268, 323, 354, 366, 367, 375, 394, 397, 398, 406, 407, 408, 409, 410.
7. In this 'compare' document the highlighted parts indicate the changes to each cell. Specifically, the entry in each highlighted cell has changed from either '0' to '1', or from '1' to '0', to be consistent with:
 - a. the correlating results in the underlying spreadsheets identified at paragraph 3 of this letter; and
 - b. the IUCN Red List data (version 2020-3).

¹ See Draft Annexure 2 – a draft set of submissions proposed to be provided with the Reconsideration Requests, which contains analysis of research on climate change and its impacts on MNES under the EPBC Act, especially at [61].

8. For transparency, I also note that the updated versions enclosed here are a product of Dr Peterson preparing the updated spreadsheets in accordance with the process set out in draft Annexure 2, and producing each from the unchanged spreadsheets comprising 'Marine Species – Irrelevant and relevant results' in Annexure 2.1.A.
9. We ask that you rely on updated versions of the documents listed at paragraph 2 and enclosed with this letter for your opinion, but your instructions remain the same.
10. I would be grateful if you could please attach this letter with your report.

Thank you again for your preparation of this opinion.

Kind regards,



Retta Berryman
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