Melissa Hornbein
Barbara Chillcott
Western Environmental Law Center
103 Reeder's Alley
Helena, MT 59601
(406) 708-3058
hornbein@westernlaw.org
chillcott@westernlaw.org

Roger Sullivan
Dustin Leftridge
McGarvey Law
345 1st Avenue East
Kalispell, MT 59901
(406) 752-5566
rsullivan@mcgarveylaw.com
dleftridge@mcgarveylaw.com

Nathan Bellinger (*pro hac vice*)
Andrea Rodgers (*pro hac vice*)
Julia Olson (*pro hac vice*)
Our Children's Trust
1216 Lincoln Street
Eugene, OR 97401
(413) 687-1668
nate@ourchildrenstrust.org
andrea@ourchildrenstrust.org
julia@ourchildrenstrust.org

Philip L. Gregory (*pro hac vice*)
Gregory Law Group
1250 Godetia Drive
Redwood City, CA 94062
(650) 278-2957
pgregory@gregorylawgroup.com

*Attorneys for Plaintiffs*

MONTANA FIRST JUDICIAL DISTRICT COURT
LEWIS AND CLARK COUNTY

| | |
|---|---|
| RIKKI HELD, et al.,<br><br>Plaintiffs,<br><br>v.<br><br>STATE OF MONTANA, et al.,<br><br>Defendants. | Cause No. CDV-2020-307<br><br>Hon. Kathy Seeley<br><br>**DECLARATION OF CATHY WHITLOCK IN SUPPORT OF PLAINTIFFS' RESPONSE BRIEF IN OPPOSITION TO DEFENDANTS' MOTION TO PARTIALLY DISMISS FOR MOOTNESS** |

36

Pursuant to MCA §1-6-105, Cathy Whitlock hereby declares as follows:

1. I am an expert and rebuttal witness in the above-entitled action. I am making this declaration in support of Plaintiffs' Response Brief in Opposition to Defendants' Motion to Partially Dismiss for Mootness. I have personal knowledge of the facts I state herein, except as to those stated on information and belief, and if called to testify, I would and could testify competently thereto.

**QUALIFICATIONS & SUMMARY OF EXPERT TESTIMONY**

2. I have jointly prepared an expert report in this case with Dr. Steven Running to explain Earth's Energy Imbalance; how greenhouse gas (GHG) emissions drive climate change globally and in Montana; Montana's long-standing knowledge of the dangers posed by climate change and fossil fuels; and how human-caused fossil fuel development and the resulting release of $CO_2$ into the atmosphere are harming Montana's ecosystems, water supplies, communities, and the Plaintiffs themselves. Doc. 222, Expert Report at 1. Dr. Running and I concluded that "Montana's ongoing actions to promote the utilization and development of fossil fuels are inconsistent with the need to reduce emissions to stabilize the climate system (Hansen et al. 2013) and will serve to penalize children and future generations, including these 16 youth Plaintiffs, for as far into the future as we can imagine." Expert Report at 39-40. In forming our opinions, Dr. Running and I reviewed a number of documents, listed in Attachment 5 of our expert report. Expert Report at 3.
3. In our joint rebuttal report, Dr. Running and I reviewed additional data and responded to several statements contained in the expert reports of Drs. Curry and Anderson. Among other things, we concluded that "Dr. Curry's effort to dispute these long-term trends by relying on individual years with extreme weather events is not how climate scientists evaluate long-term

climate trends and is inconsistent with the overwhelming science documenting numerous climate trends and related climate impacts in Montana, all of which are projected to get worse in the coming decades without steep reductions in greenhouse gas emissions." Doc. 240, Rebuttal Report at 10.

4. In both our expert and rebuttal reports, we reserved the right to supplement our discussion and findings should additional relevant or pertinent information become available. Expert Report at 3; Rebuttal Report at 1. One of the purposes of this declaration is to supplement my expert report based on a new Intergovernmental Panel on Climate Change (IPCC) report.

5. I am a Regents Professor Emerita of Earth Sciences and a Fellow of the Montana Institute on Ecosystems at Montana State University (MSU). In 2011, I was founding co-director of the Montana Institute on Ecosystems, which has hubs at Montana State University and the University of Montana and serves as the statewide center for interdisciplinary environmental science. I am the lead author of the *Montana Climate Assessment* (Whitlock et al. 2017), and recently co-authored a state-level *Montana Climate Solutions Plan* (2020) and a special report of the Montana Climate Assessment entitled *Climate Change and Human Health in Montana* (Adams et al. 2021). I was also co-lead author of the *Greater Yellowstone Climate Assessment* (Hostetler et al. 2021).

6. I received my Ph.D. in Earth Sciences at the University of Washington in 1983. I spent a year at Trinity College Dublin on a NATO Postdoctoral Fellow (1983-1984). Following that, I was on the staff of Carnegie Museum of Natural History (1984-1990) and a faculty member of the University of Pittsburgh's Department of Earth and Planetary Sciences (1988-1990). In 1990, I joined the Department of Geography at the University of Oregon and served as Department

Head there from 2000-2004. I accepted the position of Professor of Earth Sciences at Montana State University in 2004 and have remained there until retirement in 2021.

7. My research focuses on past environmental and climatic change, particularly on the long-term dynamics of vegetation, fire, and climate. I am nationally and internationally recognized for my scholarly contributions and leadership activities in this area of science. I have published over 225 peer-reviewed journal articles and book chapters on past climate and environmental change and my research studies extend from Montana and the western U.S. to New Zealand, Tasmania, Europe, and Patagonia. Since my arrival at MSU in 2004, I have built a successful research and teaching program, and founded the MSU Paleoecology Lab, which trains post-doctoral researchers, graduate students, undergraduates and visiting scientists from around the world. My research has been funded by national and international grant agencies, including the National Science Foundation, Joint Fire Sciences Program, National Park Service, Department of Energy, USDA Forest Service, and U.S. Geological Survey.

8. I am currently on the Advisory Board for the Geosciences (GEO) Directorate of the National Science Foundation, a member of the U.S. National Research Council Board on Environmental Change and Society, and serve on the editorial board of leading journals in my field. I am past President of the American Quaternary Association and have served on several national and international advisory committees concerned with climate change. I am a Fellow of the Geological Society of America and the American Association for the Advancement of Science. In 2018, I was elected to the National Academy of Sciences, the first person from the Montana University System to receive this honor. I have also received the AMQUA Distinguished Career Award (2017), the Association of Women Geoscientists Professional Excellence Award (2015), the Edmund O Wilson Biodiversity Technology Pioneer Award (2014), the

MSU Charles and Nora Wiley Faculty Award for Meritorious Research (2009), and the A. Starker Leopold Award from Yellowstone National Park (2022).

## THE REPEAL OF THE ENERGY POLICY ACT

9. I have been informed that the State of Montana repealed the Energy Policy Act, one of the statutes Plaintiffs identified in their Complaint as being illustrative of Montana's energy policies that promote fossil fuels.

10. The repeal of this statute does not change any of the scientific conclusions contained in either our expert or rebuttal reports because our opinions were based on policies that increase the use of fossil fuels and resulting GHG emissions, regardless of the specific law. *See, e.g.,* Expert Report at 4 ("Because of the dangers of increasing GHG emissions, it does not make scientific sense to continue to promote fossil fuels as an energy resource in Montana . . . ."); Expert Report at 39 ("any law that calls for increasing development and utilization of fossil fuels in Montana . . . can be expected to increase degradation of Montana's environment and cause further harm to Plaintiffs . . . .").

11. I have received no information that leads me to believe Montana has shifted its policies to stop promoting the utilization and development of fossil fuels, which we said is needed to reduce GHG emissions and stabilize the climate system.

## THE IPCC NEW SYNTHESIS REPORT

12. I have reviewed the IPCC *Summary for Policymakers* of the Synthesis Report of the IPCC Sixth Assessment Report.[1] This report confirms many of the opinions we expressed in our expert and rebuttal reports, including:

[1] Intergovernmental Panel on Climate Change, *Summary for Policymakers, in* Synthesis Report of the IPCC Sixth Assessment Report (AR6) (2023), available at https://www.ipcc.ch/report/ar6/syr/.

- "Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming .... (*high confidence*)." IPCC Summary for Policymakers at A.1.
- "Observed increases in well-mixed GHG concentrations since around 1750 are unequivocally caused by GHG emissions from human activities over this period. Historical cumulative net $CO_2$ emissions from 1850 to 2019 were 2400±240 $GtCO_2$ of which more than half (58%) occurred between 1850 and 1989, and about 42% occurred between 1990 and 2019 (*high confidence*). In 2019, atmospheric $CO_2$ concentrations (410 parts per million) were higher than at any time in at least 2 million years (*high confidence*), and concentrations of methane (1866 parts per billion) and nitrous oxide (332 parts per billion) were higher than at any time in at least 800,000 years (*very high confidence*)." IPCC Summary for Policymakers at A.1.3.
- "Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts and related losses and damages to nature and people (*high confidence*)." IPCC Summary for Policymakers at A.2.
- "Continued emissions will further affect all major climate system components. With every additional increment of global warming, changes in extremes continue to become larger. Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon

precipitation, and very wet and very dry weather and climate events and seasons (*high confidence*)." IPCC Summary for Policymakers at B.1.3.

- "Other projected changes include further reduced extents and/or volumes of almost all cryospheric [permafrost, seasonal snow cover, glaciers, the Greenland and Antarctic Ice Sheets, and Arctic Sea ice] elements (*high confidence*) . . . ." IPCC Summary for Policymakers at B.1.3.
- "With further warming, every region is projected to increasingly experience concurrent and multiple changes in climatic impact-drivers. Compound heatwaves and droughts are projected to become more frequent, including concurrent events across multiple locations (*high confidence*)." IPCC Summary for Policymakers at B.1.4.
- "In the near term, every region in the world is projected to face further increases in climate hazards (*medium to high confidence*, depending on region and hazard), increasing multiple risks to ecosystems and humans (*very high confidence*). Hazards and associated risks expected in the near-term include an increase in heat-related mortality and morbidity (*high confidence*), food-borne, water-borne, and vector-born diseases (*high confidence*), and mental health challenges (*very high confidence*), flooding in coastal and other low-lying cities and regions (*high confidence*), biodiversity loss in land, freshwater and ocean ecosystems (*medium to very high confidence*, depending on ecosystem), and a decrease in food production in some regions (*high confidence*)." IPCC Summary for Policymakers at B.2.1.

- "Cryosphere-related changes in floods, landslides, and water availability have the potential to lead to severe consequences for people, infrastructure and the economy in most mountain regions (*high confidence*). The projected increase in frequency and intensity of heavy precipitation (*high confidence*) will increase rain-generated local flooding (*medium confidence*)." IPCC Summary for Policymakers at B.2.1.
- "Risks and projected adverse impacts and related losses and damages from climate change will escalate with every increment of global warming (*very high confidence*)." IPCC Summary for Policymakers at B.2.2.
- "Climate change is a threat to human well-being and planetary health (*very high confidence*). There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all (*very high confidence*). . . . The choices and actions implemented in this decade will have impacts now and for thousands of years (*high confidence*)." IPCC Summary for Policymakers at C.1.
- "Evidence of observed adverse impacts and related losses and damages, projected risks, levels and trends in vulnerability and adaptation limits, demonstrate that worldwide climate resilient development action is more urgent than previously assessed in AR5." IPCC Summary for Policymakers at C.1.1.
- "Continued emissions will further affect all major climate system components, and many changes will be irreversible on centennial to millennial time scales and become larger with increasing global warming. Without urgent, effective, and equitable mitigation and adaptation actions, climate change increasingly threatens ecosystems, biodiversity, and the livelihoods, health and wellbeing of

current and future generations (*high confidence*)." IPCC Summary for Policymakers at C.1.3.

13. This new IPCC summary provides additional support for the statement in our expert report that "The impacts of climate change described in this report will worsen in the coming decades. While not all the consequences of climate change can be predicted with precision, the science is clear that there are enormous risks of truly catastrophic harm to the natural environment of Montana and the children and future generations of the state if fossil fuels continue to burn at any significant level." Expert Report at 39.

Pursuant to MCA §1-6-105, I declare under penalty of perjury that the foregoing is true and correct.

Executed this 7th day of April, 2023 in Bozeman, Montana.

Cathy Whitlock

Cathy Whitlock