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**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.**

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ENVIR. APPEALS BOARD

In re: Deseret Power Electric Cooperative)

) PSD Appeal 07-03

PSD Permit No. PSD-OU-0002-04.00)

**PHYSICIANS FOR SOCIAL RESPONSIBILITY'S AMICUS CURIAE BRIEF
IN SUPPORT OF PETITIONERS**

I. INTRODUCTION

This Amicus Curiae Brief is filed by and on behalf of Physicians for Social Responsibility ("PSR") and its members.¹ For the reasons outlined herein, we request that the Environmental Appeals Board ("EAB" or "Board") remand the Clean Air Act ("CAA") permit issued to Deseret Power Electric Cooperative with instructions to complete a full analysis of best available control technology ("BACT") for reducing emissions of CO₂ a potent greenhouse gas.²

¹ Physicians for Social Responsibility is a nonprofit organization, comprised of some 32,000 members. PSR submits this brief in its institutional capacity and on behalf of its membership.

² In the alternative, we request that the EAB remand the permit to EPA Region 8 to allow an opportunity for the appropriate policy decisionmaker to fully consider the *critical* health implications of this important policy decision (as outlined in this brief) *before* a final decision is made.

On October 1, 2007, the Sierra Club (the Petitioner in this case) filed a petition with the EAB for review of a final CAA prevention of significant deterioration (“PSD”) permit³ issued by EPA Region 8 on August 30, 2007, for Deseret Power Electric Cooperative’s proposed coal-fired electric utility generating unit at the existing Bonanza power plant near Bonanza, Utah (the “Bonanza Permit”).⁴ By Order dated November 21, 2007, the Board granted review of Region 8’s permit decision, and requested additional briefing on the issue of whether, in the wake of the Supreme Court’s decision in *Massachusetts v. EPA*,⁵ and other recent developments, CO₂ should be considered “subject to regulation” for purposes of the CAA’s preconstruction permitting program, therefore requiring establishment of a BACT emissions limitation for CO₂.⁶ In its Order granting review, in addition to providing an opportunity for additional briefing by the parties (Sierra Club and U.S. EPA), the Board invited “all other interested persons to file amicus briefs in this matter.” PSR files this brief in response to the EAB’s invitation.

³ PSD permits are preconstruction permits required under section 165 of the CAA for any new major source of pollutant emissions or major modification of an existing source.

⁴ The PSD permit was issued by EPA Region 8 because the proposed plant is located within the Uintah and Ourah Indian Reservation and these tribes do not have an EPA-approved tribal permitting program under the Clean Air Act.

⁵ 127 S.Ct. 1438 (2007).

⁶ Sierra Club’s Petition also raised the question of whether EPA should have exercised its discretion under CAA section 165(a)(2) to consider alternatives to the proposed plant, and whether EPA adequately explained why it did not exercise this authority. In the event that the Board does not remand the Bonanza Permit for reconsideration of the whether to establish a CO₂ BACT limit, the Board should, at minimum, require that EPA explain why it is appropriate for the agency, when faced with such compelling evidence of the adverse impacts of CO₂, to refuse to consider alternatives to the proposed project that might have lower CO₂ emissions.

II. DISCUSSION

1. Global Warming is a Serious Concern that Requires Immediate Action

A growing body of scientific evidence indicates that rising atmospheric concentrations of anthropogenic greenhouse gases are pushing the earth ever closer to dangerous climate tipping points, beyond which a number of severe ecological and societal impacts will become unavoidable.⁷ Considered in this context of climate tipping points, EPA's wholesale decision to ignore greenhouse gas emissions from new coal-fired power plants – the largest sources of CO₂ emissions – poses a clear danger to climate stability and correspondingly to public health.

As party to the United Nations Framework Convention on Climate Change, the U.S. is committed to the objective of “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”⁸ Though “dangerous anthropogenic interference” is not well defined in the UNFCCC, limiting global warming to 2°C is increasingly recognized as a target that would provide an acceptable likelihood of preventing runaway positive feedbacks to the climate system and avoiding the worst impacts of climate change.⁹ To achieve this target, global emissions must peak within ten years and be reduced to 50 percent below 2000

⁷ Testimony of James E. Hansen, Director, National Aeronautics and Space Administration Goddard Institute for Space Studies before the U.S. House of Representatives Select Committee on Energy Independence and Global Warming, April 26, 2007.

⁸ United Nations Framework Convention on Climate Change (UNFCCC). 1992. Online at: <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

⁹ International Climate Change Task Force (ICCT), *Meeting the climate challenge* (2005), available at: <http://www.ippr.org/publicationsandreports/publication.asp?id=246>.

levels by mid-century so that atmospheric greenhouse gas concentrations are ultimately stabilized at or below 450 parts per million (ppm).¹⁰ Recognizing the “common but differentiated responsibilities” embodied in the UNFCCC, the U.S., which has contributed *more than one quarter* of cumulative global greenhouse gas emissions,¹¹ must reduce its emissions at least 80 percent below 2000 levels by 2050. Permitting construction of new coal-fired power plants, without *any* consideration of their CO₂ emissions, is fundamentally at odds with this objective.

As scientists and physicians we rely on the evidence to identify solutions – treatments if you will. Medicine is based on notions of prevention. We devise treatment plans or solutions with an aim of curing the underlying problem. But those things that we cannot cure we must work to prevent – certainly that is the case with global warming. In order to reduce U.S. emissions to an acceptable level, we must take steps *now* to address greenhouse gases emissions, especially from the largest sources of emissions – coal-fired power plants

Given the narrow window of time in which we must slow, stop and reverse current emissions trends, the prospects for achieving both short and long-term emission reduction targets would be undermined substantially by construction and operation of even relatively few new coal plants. In addition to the Bonanza plant, federal PSD permits are currently under consideration or development for several other very large coal-fired

¹⁰ IPCC, *Contribution of Working Group III to the Fourth Assessment Report, Summary for Policymakers*, (2007).

¹¹ Baumert et. al., *Cumulative emissions, in Navigating the Numbers: Greenhouse Gas Data and International Climate Policy*, Chapter 6., World Resources Institute (2005). Available at: http://www.wri.org/climate/pubs_description.cfm?pid=4093.

power plants – the Desert Rock plant in New Mexico (1500 MW); and the White Pine (1590 MW), Ely (1500 MW), and Toquop (750 MW) facilities in Nevada, for example. The total lifetime emission from these plants alone would be more than **1.5 Billion tons** – a staggering figure by any measure. Lifetime CO₂ emissions from all currently identified coal plant projects in the U.S. would top **16 Billion tons**.¹²

To date there has been no significant federal action on global warming. As scientists and health professionals, we find this inaction unconscionable. We are, in effect, passing the responsibility for, and burden of, global warming to our children and grandchildren. EPA should be taking the lead in efforts to address greenhouse gas emissions from the largest emission sources. Recent litigation confirms the Agency's clear regulatory authority to do so (United States Supreme Court, *Massachusetts v. EPA*).

EPA's reliance on legal obfuscation (invoked only after the end of the notice and comment process) to avoid its responsibility to ensure that new sources of emissions are as clean as they can be is unbecoming an agency whose primary mission is to protect human health and the environment from the adverse impacts of industrial pollution. In particular, the Agency's stance (as articulated in connection with the final permit for the Bonanza facility) regarding its obligation to address greenhouse gas pollutants in the

¹² CO₂ emissions from already identified coal projects will be staggering if we do not begin to address the issue now. According to the Department of Energy there are 76 announced projects, totaling approximately 48,000MW. Using the generalized conversion of 3,500,000 tons of CO₂/year per 500MW, assuming a 50 lifetime, the CO₂ emissions from these plants will be about **16,800,000,000 tons** ((48,000/500) x 3,500 x 50). See National Energy Technology Laboratory, Tracking New Coal-Fired Power Plants (October 10, 2007).

context of the CAA's PSD permitting program reflects an abdication of its responsibility to confront one of the most serious public health issues of our day.

Because EPA issued the draft permit in this case without providing a clear articulation (let alone resolution) of the full range of *legal, factual and policy implications* of its position on the consideration of greenhouse gas emission under the PSD program in the wake of *Massachusetts v. EPA*, key stakeholders (including the medical/health community) were never put on notice that EPA planned to cement perhaps *the most significant precedent in the history of the PSD program* in the context of this decision. This failing alone compels a decision by the Board to remand the permit to EPA for full and open notice and comment not only on the legality of EPA's statutory interpretation but on the underlying technical, factual and policy justifications for EPA's exercise any discretion it may have.¹³

¹³ Even accepting *arguendo* EPA's view that it has discretion to decline to require consideration of CO₂ emissions in PSD permitting, in the wake of *Massachusetts v. EPA* (which makes clear that CO₂ may be regulated as a pollutant under the CAA), the most recent IPCC report (discussed below), EPA's announced commitment to address greenhouse gases from mobile sources, and other recent developments, at the *very least* EPA has an obligation to engage the public on the issue of the role of CO₂ in PSD permitting *before* writing in stone a policy that will foreclose any such consideration for the foreseeable future. Even if EPA had an existing and articulated policy addressing how it would treat CO₂ under the PSD program (which it does not appear to have had), the foundations of any such policy became structurally unstable in the wake of *Massachusetts v. EPA* and other recent events. The fact of the matter is, however, that *never in the history of the PSD program* (and certainly not in the wake of *Massachusetts v. EPA* and other recent events) has EPA clearly articulated any coherent "policy," or a meaningful underlying legal, technical, or policy rationale. EPA's failure to allow notice and comment on the legal, technical, and policy underpinnings of the Agency's implicit policy decisionmaking in the Bonanza case has deprived PSR (and countless other stakeholders) of its ability to raise *serious* concerns, and make EPA aware of *important* considerations, that Agency decisionmakers should hear and consider *before* making a final decision on a permit that will effectively *close the door* on a issue of such extraordinary importance. Nor can this EAB appeal substitute for a robust, *pre-decisional* notice and comment process on this issue, or remedy the absence of such a process. If EPA is going to make a decision of such magnitude in the context of this case, it should do so above board, not through administrative slight of hand that effectively deprives the process of meaningful public input.

2. There Have Been Major Developments in the Legal and Factual Landscape Regarding Global Warming

Our understanding of global warming, human contributions to this phenomenon, and the potentially devastating consequences of un-checked climate change has matured radically in recent years. Indeed, over just the past 12 months, it has become clear that concerns regarding global warming are both significant and immediate, and there is broad recognition of the need to take concrete and meaningful action right away.

In 2007, prior to EPA's issuance of the Bonanza Permit, the Intergovernmental Panel on Climate Change (the "IPCC")¹⁴ issued its Fourth Assessment Report, reflecting the latest and best scientific understanding of the phenomenon of climate change. Among other things, in connection with the IPCC's Fourth Assessment the IPCC's Working Group I (responsible for assessing the scientific aspects of the climate system and climate change) concluded:

- The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm to 379 ppm in 2005;

¹⁴ The IPCC was established by the World Meteorological Organization and the United Nations Environment Programme in 1988. The IPCC's mission is to comprehensively and objectively assess the scientific, technical and socio-economic information relevant to human-induced climate change, its potential impacts, and options for adaptation and mitigation. See <http://www.ipcc.ch/about/about.htm>. The IPCC completed its First Assessment Report in 1990, its Second Assessment Report in 1995, and its Third Assessment Report in 2001. *Id.* The full IPCC report is available at: <http://www.ipcc.ch/>. Additionally, the Supreme Court analysis in *Massachusetts v. EPA*, outlines numerous serious harms caused by global warming.

- The atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the last 650,000 years;
- The primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use;
- There is at least a 9 out of 10 chance that the global average net effect of human activities since 1750 has been one of warming;
- Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level;
- At continental, regional and ocean basin scales, numerous long term changes have been observed. These include changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones;
- There is greater than a 90% likelihood that most of the observed increases in global average temperatures since the mid-20th century are due to the observed increases in anthropogenic greenhouse gas emissions;

- For the next two decades, warming of about 0.2 Degrees Celsius per decade is projected for a range of emission scenarios;
- There is greater than a 90% likelihood that hot extremes, heat waves and heavy precipitation events will continue to become more frequent; and
- Anthropogenic warming and sea level rise would continue for centuries due to the time scales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized.¹⁵

Also in 2007, prior to issuance of the final Bonanza Permit, IPCC Working Group II¹⁶ released a summary of its finding, including, among other things:

- By mid-century, annual average river runoff and water availability are projected to decrease by 10-30% over some dry regions at mid-latitudes and in the dry tropics, some of which are presently water stressed areas;
- In the course of the century, water supplies stored in glaciers and snow cover are projected to decline, reducing water availability in regions supplied by meltwater from major mountain ranges, where more than one-sixth of the world population currently lives;

¹⁵ See the IPCC Working Group I Summary for Policymakers, available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>.

¹⁶ IPCC Working Group II is responsible for assessing the vulnerability of socio-economic and natural systems to climate change, the consequences of climate change, and the options for adapting to it. See <http://www.ipcc.ch/about/about.htm>

- Warming in the mountains of western North America is projected to cause decreased snowpack, more winter flooding, and reduced summer flows, exacerbating competition for over-allocated water resources;
- Drought-affected areas will likely increase in extent. Heavy precipitation events which are very likely to increase in frequency will augment flood risk;
- Increases in the frequency of droughts and floods are projected to affect local crop production, especially in subsistence sectors at low latitudes;
- Poor communities can be especially vulnerable, in particular those concentrated in high-risk areas. They tend to have more limited adaptive capacities, and are more dependent on climate-sensitive resources such as local food and water supply;
- Disturbances from pests, disease and fire are projected to have increasing impacts on North American forests, with an extended period of high fire risk and large increases in area burned;
- In North America, major challenges are projected for crops that are near the warm end of their suitable range or depend on highly utilized water resources;

- The resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g., flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land use change, pollution, over-exploitation of resources);
- For increases in global average temperature exceeding 1.5-2.5 Degrees Celsius and in concomitant atmospheric carbon dioxide concentrations, there are projected to be major changes in ecosystem structure and function, species' ecological interactions, and species' geographic ranges, with predominantly negative consequences for biodiversity, and ecosystem goods and service, e.g., water and food supply; and
- Projected climate change-related exposures are likely to affect the health status of *millions of people*, particularly those with low adaptive capacity.

In addition to this compelling new assessment of global warming, its causes, and its consequences, on April 2, 2007 (almost five months before EPA issued the final Bonanza Permit), the U.S. Supreme Court issued its watershed decision in *Massachusetts v. EPA*. The Court concluded, among other things, that EPA has authority to regulate greenhouse gas emissions (including CO₂) as pollutants under the CAA, and the Court found that EPA's decision not to regulate CO₂ based on policy judgments having nothing to do with

whether greenhouse gas emissions contribute to climate change did not amount to a “reasoned justification” satisfactory under the Act.¹⁷

In light of the IPCC’s Fourth Assessment Report, the *Massachusetts v. EPA* decision, numerous other sources of data (such as those referenced later in this brief), and other recent events, the legal, scientific, and policy landscape has so radically changed, and the concerns regarding global warming have become so urgent and compelling, that EPA simply cannot casually sweep aside suggestions that it should address CO₂ in the context of PSD permitting.¹⁸ Nonetheless, when it issued the final Bonanza Permit, that is exactly what EPA did.

¹⁷ The Supreme Court also acknowledged “the enormity of the potential consequences associated with man-made climate change” and the contribution of carbon dioxide emissions to global warming. 127 S. Ct. at 1457 - 58

¹⁸ Other events include EPA’s announcement that it will regulate greenhouse gases from motor vehicles, the President’s May 14, 2007 Executive Order (attached), and EPA statements in other proceedings. For example, EPA has specifically acknowledged that the impact of global warming pollutants is an important consideration for potential new sources. See Letter from EPA Region 8 to Charles Richmond, Forest Supervisor Gunnison National Forest (June 1, 2007) (attached). This letter relates to an Environmental Impact Statement regarding a proposal to drill 168 methane drainage wells at the West Elk Mine in Gunnison County, CO. In this letter, the Deputy Regional Administrator explains:

The draft EIS does not present information on the amount of methane that is expected to be released from the proposed action . . . As indicated on EPA’s website, methane is a greenhouse gas that remains in the atmosphere for approximately 9-15 years and is over 20 time more effective in trapping heat in the atmosphere than carbon dioxide (CO₂) over a 100-year period. Methane’s relatively short atmospheric lifetime, coupled with its potency as a greenhouse gas, makes it a candidate for mitigation global warming over the near-term (i.e., next 25 years or so). . . Given the project’s release of significant quantities of methane, there is an important economic and environmental opportunity here to capture and utilize the methane resource. . . [W]e recommend that the final EIS analyze measures for capturing all or part of the methane to be vented from the mine. . . Methane capture and reuse is a reasonable alternative to the proposal of venting the methane to the atmosphere, and thus, we recommend that it be analyzed. . . EPA believes that the information in the DEIS is insufficient and the missing information and analyses are substantial issues which must be resolved and disclosed in the Final Environmental Impact Statement.

Similarly, EPA has acknowledged that CO₂ emissions from power plants raise serious concerns. See Environmental Impact Statements and Regulations; Availability of EPA Comments, 73 Fed. Reg. 3463 (Jan 18, 2008) (describing EPA comments on the EIS for the proposed 750 MW Toquop coal plant in Nevada, EPA states “EPA expressed environmental concerns about potential adverse impacts to aquatic resources, uncertainty of groundwater availability, and carbon dioxide emissions. We recommend further discussion on renewable energy resources, groundwater protection, and issues associated with greenhouse

First, in light of the Supreme Court's determination that CO₂ is a pollutant under the Act and the existing regulation of CO₂ under section 821 of the Act, it appears clear that EPA has a legal obligation to establish BACT limits for CO₂ in PSD permits. However, even assuming *arguendo* that EPA had discretion to reach a different conclusion (which it very likely did not), the Agency has failed utterly to provide a robust explanation of its decision in light of the compelling scientific data and obvious policy reasons for acting as quickly as possible to limit CO₂ emission.¹⁹

That is, EPA failed to explain or solicit comment on key issues needed to make an informed policy decision about how to exercise its discretion here. It failed in the RTC to adequately explain the full range of underlying technical and policy factors that must necessarily inform its decision to resolve any statutory ambiguity as it has. Indeed, EPA

gas emissions and climate change"). Accordingly, EPA simply cannot pretend that these important considerations are not relevant to its decision not to require BACT analysis for CO₂ in the PSD program.¹⁹ Accepting for argument's sake that EPA's assertions regarding its "longstanding policy" were accurate (in fact, this assertion appears to be a post hoc justification for a uniquely *new* policy decision), EPA's own policy document acknowledges that the Agency has discretion to treat CO₂ as "subject to regulation" based on the existing section 821 provisions.

It should be noted that the 1990 Amendments to the Act did include provisions with respect to carbon dioxide (section 821) and methane (section 603), but these requirements involve actions such as reporting and study, not actual control of emissions. Therefore, these provisions do not preempt *EPA's discretion* to exclude these pollutants in determining whether a source is major. *If the results of the studies required by the 1990 Amendments to the Act suggest the need for regulation, these pollutants could be reconsidered at that time for classification as pollutants subject to regulation under the Act.*

Memorandum from Lydia N. Wegman, *Definition of Regulated Air Pollutant for Purposes of Title V* at 5. In light of the radically different technical, scientific, legal and policy landscape now, and the total absence of any past discussions of the technical, health, or environmental implications of this policy, it is grossly improper for EPA to refuse to take a *hard look* at the relevant issues (including considerations related to the potential human health consequences of its decision) in response to the comments filed in this case. Moreover, once it addresses these issues EPA must provide an opportunity for public comment on the Agency's analysis and conclusions.

failed to gather or reference *any* data regarding critical issues like potential adverse health implications.²⁰

If EPA did have any discretion in this instance, based on health issues *alone*, the Agency should have elected to treat CO₂ as “subject to regulation,” and begun taking immediate action to reduce greenhouse gas emissions on a plant by plant basis, when it is easiest to do so – at the planning stage *before* the plant is built. The alternative is to condemn the country and the global community to *hundreds of millions of tons* of additional global warming emissions without even acknowledging the sea of data that argues in favor of taking immediate and decisive action.

Below, we summarize the incredibly important health-related climate issues that are absolutely critical to any Agency determination regarding the appropriateness of requiring CO₂ BACT limits in PSD permits.²¹ In our view, concerns regarding the potentially severe human health implications of global warming, both in the U.S. and abroad, many of which are *already beginning to be felt* with painful and tragic results, justify taking every reasonably available action to immediately reduce greenhouse gas emissions. If EPA is not convinced of its legal *obligation* to address CO₂ under the Act,

²⁰ Significantly, EPA’s professed prior “interpretations” also never address these critical considerations. And certainly, the public has never been provided a meaningful opportunity to provide input with a full understanding of EPA’s interpretation, its implications, and the Agency’s underlying justification.

²¹ This data review is not comprehensive, but is representative of the health-related issues that must be taken into consideration when making any important decisions related to greenhouse gases. This should include the consideration of available, applicable, and economically feasible measures (as determined by robust BACT analysis) for reducing emissions of greenhouse gases from new coal-fired power plants. There is simply no valid justification (and certainly none that EPA has yet articulated) for declining to take this straightforward step toward ensuring that we allow no more emissions than are absolutely necessary from the largest new sources of greenhouse gases. It is striking that the record for permit decision in this case contains *none* of the information that EPA would need to make an informed policy decision on this matter – this fact alone compellingly demonstrates the arbitrariness of EPA’s action.

we believe that these considerations compel the Agency to conclude as a policy matter that CO₂ must be subject to regulation *now* and make clear that a conclusion to the contrary would be inherently arbitrary and unreasonable.

3. There is Widespread Concern Among Health Organizations About the Health Consequence of Global Warming

An increasing number of major medical associations and public health agencies have formally recognized the risks to human health posed by climate change, and are calling for swift and meaningful action:

- The Centers for Disease Control and Prevention (CDC), the nation's leading public health protection agency, has recognized climate change as a serious public health concern. In testimony before the Senate Committee on Environment and Public Works, CDC Director Dr. Julie Gerberding stated that "climate change is anticipated to have a broad range of impacts on the health of Americans and on the nation's public health infrastructure."²²
- In a letter addressed to Senator Barbara Boxer dated October 22, 2007, Dr. David Heymann, Assistant Director-General for Communicable Diseases at the World Health Organization (WHO) states that, "WHO has concluded that climate change

²² Testimony of Dr. Julie Gerberding, Director, Centers for Disease Control and Prevention before the U.S. Senate Committee on Environment and Public Works (October 23, 2007).

brings major new challenges to health security, and will increase the costs and difficulties of disease control.”²³

- During its 2007 annual meeting, the Association of State and Territorial Health Officials (ASTHO) unanimously adopted a position statement titled, “Climate Change and Public Health,” which “recognizes that climate change has serious far-reaching implications for the health of this and future generations.”²⁴
- The National Association of County and City Health Officials (NACCHO), in an official statement of policy very similar to that approved by ASTHO, acknowledged that “climate change has serious far-reaching health implications for this and future generations.”²⁵
- For more than 10 years the American Public Health Association (APHA) has recognized the potential human health consequences of climate change and has recommended “precautionary primary preventive measures to avert climate change, including reduction of greenhouse gas emissions...through appropriate energy and land use policies.”²⁶ In a recent letter sent to Senator Barbara Boxer, APHA Executive Director Dr. Georges Benjamin writes, “the public health community has a

²³ Letter from Dr. David Heymann, Assistant Director-General for Communicable Diseases, World Health Organization to Senator Barbara Boxer, Chair, U.S. Senate Committee on Environment and Public Works (October 22, 2007).

²⁴ Position Statement of the Association of State and Territorial Health Officials, Climate Change and Public Health (2007). Available at: <http://www.astho.org/>.

²⁵ National Association of County and City Health Officials (NACCHO), *Statement of Policy: Local Public Health Role in Addressing Climate Change* (Adopted July 11, 2007).

²⁶ American Public Health Association (APHA), *Global Climate Change*, Policy Number: 9510 (1995).

critical role to play in advocating for both mitigation of climate change and adaptation to the negative public health effects that will result.”²⁷

- Physicians for Social Responsibility has issued a “Call to Action”²⁸ urging members of Congress to acknowledge the growing health threats posed by global warming and to enact mandatory controls on greenhouse gas emissions. The “Call to Action” has been signed by 134 distinguished physicians, including professors from 15 medical schools, a former governor, two Nobel Laureates and former Surgeon General David Satcher. The “Call to Action” is also supported by the American Nurses Association, the American Public Health Association and the Association of Pediatric Nurse Practitioners. Together, these groups represent more than 200,000 physicians, nurses and public health professionals around the country.

In light of the well recognized threat that climate change poses to public health at home and abroad, it is disappointing that the U.S. Environmental Protection Agency would go to such lengths to *avoid* addressing global warming pollutants from the largest individual sources such emissions: coal fired power plants.

²⁷ Letter from Dr. Georges Benjamin, Executive Director, American Public Health Association to Senator Barbara Boxer, Chair, U.S. Senate Committee on Environment and Public Works (Oct. 22, 2007).

²⁸ Physicians for Social Responsibility, Medical Leadership on Global Warming: A Call to Action (2007). Included as Appendix A, also Online at: http://www.psr.org/site/DocServer/Call_to_Action.pdf?docID=2982.

4. Global Warming Poses a Serious Threat to Public Health

There is now scientific consensus, as expressed by the United Nations Intergovernmental Panel on Climate Change (IPCC),²⁹ that anthropogenic greenhouse gas emissions from the combustion of fossil fuels are warming the planet and that this human-induced climate change has grave implications for public health.³⁰

The health effects of global warming already are apparent around the world. In 2002, the World Health Organization estimated that climate change caused more than 150,000 deaths annually across the globe, with this mortality burden overwhelmingly concentrated on children in poorer countries.³¹ While developing nations will be disproportionately burdened by the adverse health effects of global warming, the American public will also face increasing health risks from more frequent and severe heat waves, increasingly intense floods, droughts and hurricanes, and rising incidences of pest and waterborne disease.³² As the inadequate response to Hurricane Katrina demonstrated,

²⁹ IPCC Summary for Policymakers, *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007).

³⁰ IPCC Summary for Policymakers, *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) (this is a tremendously instructive document that surveys the very significant human health implications of climate change).

³¹ World Health Organization, *World Health Report: Reducing Risks, Promoting Healthy Life* (2002). Online at: <http://www.who.int/whr/2002/en/>.

³² Field CB, et al, *Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007). Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, and Hanson CE, Eds., Cambridge University; Kristie L. Ebi, *Climate Change and Human Health Impacts in the United States: An Update on the Results of the U.S. National Assessment*, Review, 114 ENV'L HEALTH PERSPECTIVES 1318 (2006) ("Climate change is expected to increase morbidity and mortality risks from climate sensitive health determinants and outcomes such as extreme heat events and flooding. A larger and relatively older U.S. population in future years will increase overall vulnerability to health risks, depending on the effectiveness of identifying, implementing, and monitoring appropriate adaptation measures"). See also, Jonathan A. Patz, et. al, *Impact of regional climate change on human health*, Note, 438 NATURE 310 (2005); Paul R. Epstein, *Climate Change and Human Health*, THE NEW ENGLAND JOURNAL OF MEDICINE, 353 N.E. J. of Med. 1433 (2005); World Health Organization, *Climate Change and Human Health - Risks and Responses, Summary* (2003)

the U.S. medical and public health community is not prepared for multiple, large scale disasters that will manifest themselves as a result of climate change. Similar to the disparity in climate change health impacts observed at the global level, the effects here in the U.S. will likely be most severe among those who are poor, suffer from pre-existing disease and/or lack access to adequate health care and other support services.

Already we are seeing the symptoms of global warming in the form of heat waves, fires, flooding, hurricanes, drought and increases in pest and water borne diseases. As discussed in more detail below, there has been a significant increase in the frequency and duration of heat waves over the last several decades, with serious health consequences. There are already more than 100 million Americans living in areas where ozone levels exceed national standards, and progress to reduce these levels is being hampered by increasing temperatures.³³ Additionally, vector borne diseases like West Nile Virus have spread significantly, due in part to climate-related influences.

Below, we outline below in some detail the types of public health harms associated with global warming that will be exacerbated by the addition of large new sources of greenhouse gas emissions like coal-fired power plants.

³³ Bell M, Goldberg R, Hogrefe C, et al. *Climate change, ambient ozone, and health in 50 US cities*. 82 CLIMATIC CHANGE 61 (2007); see also Mark Z. Jacobson, *On the Causal Link Between Carbon Dioxide and Air Pollution Mortality*, GEOPHYSICAL RESEARCH LETTERS (Rev. Sept. 30, 2007) (concluding that CO₂ may significantly increase U.S air pollution deaths and cancers).

a. Extreme Weather Events

There is a general recognition that one of the most obvious and significant effects of global warming will be disruption of climate systems with an increase in extreme weather events.

Temperature Events

The most recent IPCC report confirms that the frequency and duration of heat waves across the U.S. has increased over the last 50 years as a result of climate change. In the summer of 2003, record breaking heat waves across Europe claimed an estimated 35,000 lives,³⁴ tragically demonstrating the potentially disastrous consequences of a continued trend of increasingly frequent extreme heat events. In cities around the country, increasing extreme heat events will be magnified by the urban heat island effect.

Researchers estimate that Chicago will experience 25 percent more frequent heat waves under a business-as-usual scenario, while the number of annual heat wave days in Los Angeles will rise from 12 to between 44 and 95 – the upper end of this range marking a 692 percent increase.³⁵ Extreme heat, already the number one cause of weather-related deaths in the U.S., will become an increasing public health burden if global warming is left unmitigated.

³⁴ Epstein PR and Mills E (eds.), *Climate Change Futures: Health, Ecological and Economic Dimensions*, The Center for Health and the Global Environment, Harvard Medical School (2005) (emphasis added).

³⁵ Bell M, Goldberg R, Hogrefe C, et al. *Climate change, ambient ozone, and health in 50 US cities*. 82 CLIMATIC CHANGE 61 (2007); see also Mark Z. Jacobson, *On the Causal Link Between Carbon Dioxide and Air Pollution Mortality*, GEOPHYSICAL RESEARCH LETTERS (Rev. Sept. 30, 2007) (concluding that CO₂ may significantly increase U.S air pollution deaths and cancers).

In an article published in the journal *Science* in 2004, researchers describe an analysis that modeled the potential impacts of global warming on extreme heat events and concluded that:

There is a distinct geographic pattern to future changes in heat waves. Model results for areas of Europe and North America, associated with the severe heat waves in Chicago in 1995 and Paris in 2003, show that future heat waves in these areas will become *more intense, more frequent, and longer lasting* in the second half of the 21st century. Observations and the model show that present-day heat waves over Europe and North America coincide with a specific atmospheric circulation pattern that is intensified by ongoing increases in greenhouse gases, indicating that it will produce more severe heat waves in those regions in the future.³⁶

Floods and Storms

In addition to temperature extremes, global warming is likely to result in more severe and perhaps more frequent storms, with associated impacts on human health and human activity as a result of flooding and other storm-related conditions.³⁷ These kinds of

³⁶ Gerald A. Meehl and Claudia Tebaldi, *More Intense, More Frequent, and Longer Lasting Heat Waves in the 21st Century*, 305 *SCIENCE* 994 (2004). A study in 2001 similarly found that:

Heat and heat waves are projected to increase in severity and frequency with increasing global mean temperatures. Studies in urban areas show an association between increases in mortality and increases in heat, measured by maximum or minimum temperature, heat index, and sometimes, other weather conditions. Health effects associated with exposure to extreme and prolonged heat appear to be related to environmental temperatures above those to which the population is accustomed. Models of weather–mortality relationships indicate that populations in northeastern and midwestern U.S. cities are likely to experience the greatest number of illnesses and deaths in response to changes in summer temperature. . . . Within heat-sensitive regions, urban populations are the most vulnerable to adverse heat-related health outcomes. The elderly, young children, the poor, and people who are bedridden or are on certain medications are at particular risk.

Michael A. McGeehin and Maria Mirabelli, *The Potential Impacts of Climate Variability and Change on Temperature-Related Morbidity and Mortality in the United States*, 109 *ENVIRONMENTAL HEALTH PERSPECTIVES* 185 (2001).

³⁷ See C. D. Hoyos, et. al, *Deconvolution of the Factors Contributing to the Increase in Global Hurricane Intensity*, 312 *SCIENCE* 94 (2006) (“The results show that the trend of increasing numbers of category 4 and 5 hurricanes for the period 1970–2004 is directly linked to the trend in sea-surface temperature; other aspects of the tropical environment, although they influence shorter-term variations in hurricane intensity,

impacts were illustrated in dramatic and tragic fashion in New Orleans and other Gulf Coast communities in the wake of hurricanes Katrina and Rita. Health impact from Katrina, for example, ran the spectrum from ... sewage ... chemical releases (eg. oil spills, commercial chemicals, household chemical releases), mold, asbestos from demolition, redistribution of existing contaminants (lead, pesticides). The public health infrastructure in New Orleans in the wake of Katrina was so crippled that it was nearly impossible for remaining residents to access even the most routine medical care (eg for minor injuries, broken bone, etc.). The fact that this tragedy occurred in a major U.S. city (in the richest nation in the world) suggest bleak prospects indeed for similar events affecting high population areas in the developing world.

In addition to the direct and indirect effects on human health illustrated by hurricane Katrina, increased intensity and frequency of storms and other extreme precipitation events – and subsequent flooding and other related impacts – may exacerbate health factors such as vector bourn disease, malnutrition, and access to potable water, as discussed later in this brief.

b. Exacerbate Air Pollution

Although ambient air pollutant concentrations have generally fallen since passage of the 1970 Clean Air Act, more than 100 million Americans live in areas where ozone levels

do not contribute substantially to the observed global trend.”); Kerry Emanuel, *Increasing destructiveness of tropical cyclones over the past 30 years*, 436 NATURE 686 (2005); David R. Easterling, *Climate Extremes: Observations, Modeling, and Impacts*, 289 SCIENCE 2068 (2000); P. J. Webster, *Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment*, 309 SCIENCE 1844 (2005)

exceed the U.S. Environmental Protection Agency's 8-hour air quality standard and rates of asthma and other respiratory diseases continue to rise. Global warming will undermine efforts to improve air quality as rising temperatures accelerate ozone formation during summer months. A recent study published in the journal *Climatic Change* projects that across 50 U.S. cities, the number of unsafe air days – days when ozone levels exceed the U.S. Environmental Protection Agency's 8-hour air quality standard – will increase by 68 percent.³⁸ The study also estimates that the number of unhealthy “red alert” days – days when everyone, young and old, healthy and infirm are advised to avoid prolonged outdoor exertion – is expected to more than double across these 50 cities. Left unaddressed, rising ozone concentrations will cause serious respiratory and cardiovascular health problems in America's cities.

Another study in the journal *Environmental Health Perspectives*, concluded that global warming would result in a dramatic increase in ozone-related mortality.³⁹ It explains:

Results of our analyses illustrate how integrated models can be used to assess potential impacts of climate change at regionally relevant spatial scales, suggesting that, under a variety of assumptions, climate change alone could increase regional summer [ozone]-related mortality by a median 4.5% in the 2050s compared with the 1990s. These assumptions do not include the effect of projected population growth. When a more fully elaborated picture of the likely regional future was evaluated—that is, including population growth and anthropogenic [ozone] precursor emissions increases—much greater changes in

³⁸ Bell M, Goldberg R, Hogrefe C, et al. *Climate change, ambient ozone, and health in 50 US cities*. 82 CLIMATIC CHANGE 61 (2007) (concluding among other things that “potential increases in tropospheric ozone due to climate change would be accompanied by rises in the health outcomes associated with ozone for [the] 50 cities [studied], including an increase in total, cardiovascular, and respiratory mortality; hospital admissions for asthma; and hospital admissions for COPD and respiratory causes for older populations”).

³⁹ Kim Knowlton, et. al, *Assessing Ozone-Related Health Impacts under a Changing Climate*, 112 ENVIRONMENTAL HEALTH PERSPECTIVES at 1557 (2004).

summer mortality are projected: Regional summer [ozone]-related mortality would increase by a median 59.9% in the 2050s compared with the 1990s.⁴⁰

Other studies have similarly examined the potential for climate change to worsen air quality with associated impacts on human health, including implications for various pollutants such as ozone, nitrogen oxides, sulfur dioxide, particulate matter, lead, carbon monoxide, and acidic aerosols. A study published in 2001 in the journal *Environmental Health Perspectives*, broadly explained the potential mechanisms of climate-related pollution impact this way:

The air is contaminated with pollutants that may adversely affect health. These pollutants have many sources: natural (e.g., volcanoes and decomposition of vegetation), agricultural (e.g., methane and pesticides), commercial (e.g., dry-cleaning operations and auto body shops), industrial (e.g., fossil fuel-fired electric power plants and manufacturing facilities), transportation (e.g., truck and automobile emissions), and residential (e.g., home gas and oil burners and wood stoves). People are constantly and ubiquitously exposed to air pollutants, whether indoors or outdoors.

Through the Clean Air Act, however, the concentrations of key pollutants are regulated to protect the public's health. In this article we explore the potential linkages among climate change, air pollution exposures, and human health. . . . Climate change may affect exposures to air pollutants by a) affecting weather and thereby local and regional pollution concentrations; b) affecting anthropogenic emissions, including adaptive responses involving increased fuel combustion for fossil fuel-fired power generation; c) affecting natural sources of air pollutant emissions; and d) changing the distribution and types of airborne allergens (6). Local weather patterns—including temperature, precipitation, clouds, atmospheric water vapor, wind speed, and wind direction—influence atmospheric chemical reactions; they can also affect atmospheric transport processes and the rate of pollutant export from urban and regional environments to the global-scale environments. The chemical composition of the atmosphere may in turn have a feedback effect on the local climate.⁴¹

⁴⁰ *Id.* at 1560.

⁴¹ Susan M. Bernard, et. al, *The Potential Impacts of Climate Variability and Change on Air Pollution-Related Health Effects in the United States*, 109 ENVIRONMENTAL HEALTH PERSPECTIVES 199 (2001) (the authors also noted the possibility of climate-related changes in fungal growth or other natural allergens and related health implications).

The possibility of exacerbating the adverse health effects of conventional air pollutants and potentially undermining current and future progress associated with conventional pollutant control programs clearly militates in favor of taking every available opportunity *now* to prevent increases greenhouse gas emissions.⁴² It is alarming, in the face of such important health-related implications, that EPA would decline to *even consider* the greenhouse gas related impacts of major new sources of emission. Based on available data regarding likely air pollution-related concerns alone, we would expect EPA to take the most aggressive action possible – both to protect the important air pollutant advances of the last three decades and to ensure a continuing positive public health trend in the future.

c. Disease Vectors

Global warming also will create conditions more favorable to certain insect and rodent populations that carry and spread disease. The geographic range of illnesses such as Lyme disease (spread by ticks), hantavirus (spread by rodents) and West Nile Virus (spread by mosquitoes) have already expanded as a result of rising temperatures and changing precipitation patterns. West Nile Virus, virtually unseen in the U.S. as recently

⁴² In addition to localized adverse air quality impacts, global warming has the potential to cause problems with trans-boundary air pollution that could have serious implications for National Ambient Air Quality Standard compliance. EPA also failed to consider these implications in its Bonanza decision.

as 1999, has spread to 47 states. To date, more than 25,000 cases of West Nile Virus have been reported across the country and more than 1,000 deaths have been recorded.⁴³

The serious concerns associated with the infectious disease implications of climate change were well encapsulated by Paul R. Epstein of Harvard Medical School's Center for Health and the Global Environment:

Climate restricts the range of infectious diseases, whereas weather affects the timing and intensity of outbreaks. Climate change scenarios project a change in the distribution of infectious diseases with warming and changes in outbreaks associated with weather extremes, such as flooding and droughts. The . . . ranges of several key diseases or their vectors are already changing in altitude due to warming, along with shifts in plant communities and the retreat of alpine glaciers. In addition, more intense and costly weather events create conditions conducive to outbreaks of infectious diseases, as heavy rains leave insect breeding sites, drive rodents from burrows, and contaminate clean water systems. Conversely, drought can spread fungal spores and spark fires (and associated respiratory disease). In addition, sequences of extremes can destabilize predator/prey interactions, leading to population explosions of opportunistic, disease-carrying organisms. . . . If climate change continues to be associated with more frequent and volatile and severe weather events, we have begun to see the profound consequences that climate change can have for public health and the international economy.⁴⁴

Studies suggest that climate impacts in certain regions of the world may increase the spread malaria. For example, one study concluded with regard to malaria that "[a]dditional population[s] at risk due to climate change are projected in East Africa, central Asia, China and areas around the southern limit of the distribution in South America."⁴⁵

⁴³ Centers for Disease Control and Prevention, Division of Vector-Borne Infectious Disease. *West Nile Virus: Statistics, Surveillance, and Control*. Online at: <http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm#surveillance>.

⁴⁴ Paul R. Epstein, *Climate Change and Public Health: Emerging Infectious Diseases*, 1 *Encyclopedia of Energy* 381 (2004).

⁴⁵ M. van Lieshout, et. al, *Climate Change and Malaria: analysis of the SRES climate and socio-economic scenarios*, 14 *GLOBAL ENVIRONMENTAL CHANGE* 87. Among other things, this study explained:

Studies have similarly suggested that climate change may fuel an increase in the prevalence of dengue fever. Dengue Fever is an acute viral disease characterized by sudden onset of fever for 3-5 days, with intense headache, joint and muscle pain, pain behind the eyes, nausea, gastrointestinal disturbances, rash and minor bleeding. Occasionally, the disease may progress to Dengue Hemorrhagic Fever (DHF) with bleeding and shock, leading to death. The disease affects hundreds of millions of people every year, and is transmitted predominantly by one species of mosquito. No effective vaccine or drug treatment for dengue fever is yet available, so management of the disease has relied entirely on vector control measures.

In particular, the authors of a study published in the journal *The Lancet* in 2002 explained:

Our findings confirm that the geographical limits of dengue fever transmission are strongly determined by climate. On the assumption that other factors affecting dengue fever transmission remain the same, we forecast that climate change will contribute to a substantial increase in the number of people and proportion of global population at risk of dengue fever. . . . This is vital information for policy makers who want to understand the potential effects of climate change, and to set priorities for mitigation and adaptation.⁴⁶

Malaria is one of the world's most serious and complex public health problems. Each year, the disease causes an estimated 400–500 million cases and more than one million deaths, mostly in children (WHO, 2001). Malaria is undergoing a global resurgence because of a variety of factors. These include the complacency and policy changes that led to reduced funding for malaria control programs in the 1970s and 1980s, the emergence of insecticide and drug resistance, human population growth and movement, land-use change and deteriorating public health infrastructure. . . . Malaria is currently confined to tropical areas and poorer countries. The burden of mortality is unevenly distributed, with approximately 85% of all deaths and disease occurring in Africa.

Id. at 89.

⁴⁶ Simon Hales, et. al, *Potential effect of population and climate changes on global distribution of dengue fever: an empirical model*, 360 *THE LANCET* 830, 833 (2002).

d. Malnutrition and Access to Water

More arid condition and more extreme drought conditions, extreme weather events (such as storms and floods), and rising sea levels threaten water supplies to people all around the world. Just this month, a report was issued regarding the impacts of rising sea level and drought on clean water supplies in China.⁴⁷

Recently, three United Nations agencies – the Food and Agriculture Organization, the World Food Programme and the International Fund for Agricultural Development – expressed their “deepest concern” that global warming will increase hunger and malnutrition around the world, threatening perhaps millions of lives. Already, the Food and Agriculture Organization estimates that some 854 million people worldwide suffer from hunger and malnutrition, including 820 million in developing countries. It is critical to remind ourselves, as we contemplate the number of 854 million lives affected, that this number reflects real people who are suffering, whose children go to bed at night crying with hunger pains; it reflects families that have lost parents, children, friends and loved ones taken too early due to complications of malnutrition, leaving behind shattered

⁴⁷ For example, a recent Associated Press article explains that:

Higher sea levels and sinking land caused by dropping water table levels complicate Shanghai's already difficult task of providing safe water supplies to its 20 million people due to salt water leaching into its aquifer, the administration said.

“Rising Sea Levels Threaten China Cities” available at <http://ap.google.com/article/ALeqM5hmOKbkqI7ICe03DC7hRIFdrIhCtwD8U7G22O3>.

Also, reports indicate that

The Yangtze River is suffering severe water shortages, with some parts reaching its lowest level in over 140 years. Stones are exposed, setting obstacles for water traffic. According to the Yangtze Waterway Bureau, over 40 vessels have been stranded since last October. The River has entered the second-class warning state. The severe drought is causing a shortage of drinking water for local residents. It's also exacerbating water pollution and having an impact on a number of endangered species, such as the Chinese sturgeon.

CCTV International, available at <http://www.cctv.com/english/20080117/101443.shtml>.

survivors, shattered communities, and shattered hopes. According to Jacques Diouf, director of the Food and Agriculture Organization, "If we do not act now, climate change will increase the number of hungry people in the world." Mr. Diouf specifically identified climate change as "a major challenge to world food security," explaining that "Vulnerable people and food systems will be particularly affected."⁴⁸

With arctic ice melting faster than anticipated even just a few years ago, global weather patterns shifting, and extreme weather events increasing, stresses on food supplies are going to worsen (especially for populations already burdened by malnutrition). Consider statements by Dr. Margaret Chan, the Director-General of the World Health Organization, made in December 2007.

The health sector must add its voice – loud and clear – to the growing concern. Just as we fought so long to secure a high profile for health on the development agenda, we must now fight to place health issues at the centre of the climate agenda. We have compelling reasons for doing so. Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of health: food, air, water.

This is the reality that concerns me the most. Developing countries will be the first and hardest hit. Subsistence agriculture will suffer the most. Areas with weak health infrastructures will be the least able to cope.

Imagine the impact on health in areas where the food supply is already precarious, rural areas are populated with subsistence farmers and the capacity to cope with any emergency is already fragile.

As the scientists tell us, the nature of climate change during this century is likely to go beyond human experience. But public health has abundant experience as a basis for interpreting the health consequences and understanding their impact. Public health has decades of experience in dealing with problems that will be made bigger and broader by climate change.

Ladies and gentlemen,

⁴⁸ See http://www.world-science.net/othernews/071212_warming.htm.

When I announced to my staff that I had selected climate change as the theme for next year's World Health Day, I described climate change as the defining issue for public health during this century.

Let me take this statement one step further today. I have given my impressions about the public health landscape of today, the difficult challenges we face, but also the many reasons for unprecedented optimism.

...

I believe that climate change will ride across this landscape as the fifth horseman. It will increase the power of the four horsemen that rule over war, famine, pestilence, and death – those ancient adversaries that have affected health and human progress since the beginning of recorded history. Research already has a great deal to say about the impact of climate change on famine and pestilence.

Let us consider famine, hunger, food security, and malnutrition. In many parts of the world, the severe adverse effects of climate change – one could say, the catastrophic effects – are not expected to be felt until around the middle of this century or even later.

Not so for Africa. According to the latest projections, Africa will be severely affected *as early as 2020*. This is just a dozen years away. By that date, increased water stress is expected to affect from 75 million to 250 million Africans. A dozen years from now, crop yields in some countries are expected to drop by 50%.

Imagine the impact on food security and malnutrition. In many African countries, agriculture remains the principal economic activity, and agricultural products are the principal source of export trade. Vast rural populations survive, hand-to-mouth, on subsistence farming. There is no surplus. There is no coping capacity. Yes, as I said, these are catastrophic effects.⁴⁹

e. Health Inequity

One dramatic near term effect of climate change will be the exacerbation of global health inequities. Global warming is already starting to have serious impacts on the world's poor populations, and as the effects of climate change worsen so too will the health

⁴⁹ Statements of Dr. Margaret Chan made at the David E. Barmes Global Health Lecture in Bethesda, Maryland on December 10, 2007 (emphasis added). Available at <http://www.dea.org.au/node/213>.

indicators for poor and developing nations – at a rate that is likely to be much faster than for richer, developed countries. As a result, the health gap between rich and poor is likely to expand significantly as a result of global warming.

The Director of the World Health Organization, Dr. Margaret Chan, has described the concerns this way:

Let us look at death, and let us do so from a public health perspective. Public health looks especially hard at preventable deaths. This is my greatest personal concern. Climate change could vastly increase the current huge imbalance in health outcomes. Climate change can worsen an already unacceptable situation that the Millennium Development Goals⁵⁰ were explicitly and intricately designed to address.

Let me remind you. The Millennium Declaration and its Goals are all about fairness. As stated: “Those who suffer or who benefit least deserve help from those who benefit most.” More specifically, the Declaration stresses fairness in a world that is being radically reshaped by the forces of globalization.

As stated: “The central challenge we face today is to ensure that globalization becomes a positive force for all the world’s people. For while globalization offers great opportunities, at present its benefits are very unevenly shared, while its costs are unevenly distributed.”

This is indeed the problem. Globalization creates wealth and this is good. But globalization has no rules that guarantee fair distribution of this wealth. Health and wealth are intricately linked. The consequences of inequity can be measured by the great and growing gaps in health outcomes. I believe that, in matters of health, our world is dangerously out of balance, possibly as never before. Fairness in access to health care really is a matter of life and death. The principle is easy to express. People should not be denied access to life-saving or health-promoting interventions for unfair reasons, including those with economic or social causes.

⁵⁰ According to the U.N. Millennium Development Goals website (<http://www.un.org/millenniumgoals/>) “The eight Millennium Development Goals– which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015 – form a blueprint agreed to by all the world’s countries and all the world’s leading development institutions. They have galvanized unprecedented efforts to meet the needs of the world’s poorest.”

Let me give some examples. The difference in life expectancy in poor and rich countries now varies by more than 40 years. Medicine has never before possessed such a sophisticated arsenal of tools and technologies for curing disease and prolonging life. Yet each year, more than 10 million young children and pregnant women have their lives cut short, largely from causes that could have been prevented by available, affordable, and effective interventions.

As I said, this is my greatest concern. With impoverished populations in the developing world *the first and hardest hit*, climate change is very likely to increase the number of preventable deaths. The gaps in health outcomes we are trying so hard to address right now may grow even greater.

This is unacceptable.⁵¹

5. The Nation is at a Critical Juncture

The US is the world's largest historical producer of greenhouse gases.⁵² With only 4 percent of the world's population, the US is responsible for 25 percent of global warming pollution, most of which comes from burning fossil fuels. Coal, in turn, is the most significant single contributor to global warming pollution. Specifically, electricity generation accounts for more than 40 percent of US fossil fuel-related carbon dioxide emissions; within that sector coal-fired electricity generation comprise nearly 80 percent

⁵¹ Statements of Dr. Margaret Chan made at the David E. Barnes Global Health Lecture in Bethesda, Maryland on December 10, 2007 (emphasis added), available at <http://www.dea.org.au/node/213>.

⁵² Energy Information Administration, Table H.1CO₂, World Carbon Dioxide Emissions from the Consumption and Flaring of Fossil Fuels (Million Metric Tons of Carbon Dioxide), 1980-2005 in: *International Energy Annual 2005*. EIA, 2007, available at: <http://www.eia.doe.gov/iea/carbon.html> (Note: a more recent study from the Netherlands Environmental Assessment Agency indicates that China surpassed the U.S. in CO₂ emissions in 2006: Netherlands Environmental Assessment Agency. *China now no. 1 in CO₂ emissions; USA now no. 2*. Available at: <http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html>); U.S. Environmental Protection Agency. *Inventory of Greenhouse Gas Emissions and Sinks 1990-2005*. U.S. EPA, 2007, available at: <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>; U.S. Department of Energy and US Environmental Protection Agency, *Carbon Dioxide Emissions from the Generation of Electric Power in the United States (2002)*, available at: http://www.eia.doe.gov/cneaf/electricity/page/co2_report/co2report.html.

of the total emissions (despite the fact that the share of electricity generation from coal is only about 50 percent).⁵³

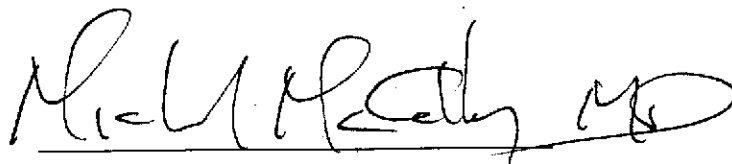
The problem has been ignored and denied for decades, while sources of emissions have increased. Now there is a firm consensus that climate change is real and that it poses a serious threat to human health, here in the U.S. and around the world. The time to act is now, especially when it comes to factoring in climate implications to decisions regarding the largest single contributors to global warming – coal-fired power plants. It is clear that the time for action is now.

III. CONCLUSION

We reject EPA's assertion that it lacks authority to address greenhouse gas emissions under the CAA's PSD program, especially for large new sources of CO₂ like coal-fired power plants. CO₂ is clearly regulated already under the CAA, and the Supreme Court's decision in *Massachusetts v. EPA* removed any doubt that such substances when released to the atmosphere are indeed "pollutants." Accordingly, the Board should direct EPA to

⁵³ In addition to massive CO₂ emissions, coal combustion is a major direct contributor to other air pollution, with severe health effects. Coal-fired power plants emit nitrogen oxide (NOx), sulfur dioxide (SO₂), and mercury. The health effects of NOx exposure range from eye, nose and throat irritation at low exposure levels to tissue damage of the upper respiratory tract, fluid build-up in the lungs and death at high exposure levels. NOx emissions from coal plants also pose a serious health risk as ozone precursors. Ozone pollution, also known as smog, is formed when NOx reacts with volatile organic compounds (VOCs) in the presence of sunlight. Smog is a powerful respiratory irritant. At low levels of exposure, it can cause coughing, wheezing, shortness of breath and chest pain. At higher concentrations, breathing ozone can lead to more serious effects, including lung tissue damage, reduced lung capacity, asthma exacerbation, as well as increased risk of hospitalization for asthma, bronchitis and other chronic respiratory diseases. Recent studies demonstrate that ozone exposure may lead to premature death. Particulate matter also harms health. Coal plants increase particle pollution concentrations both through direct particulate emissions and indirectly through the formation of particulate matter from atmospheric reactions of NOx and SO₂. Finally, Burning coal produces millions of pounds of toxic air emissions each year, making coal-fired power plants the largest source of air toxics in the U.S.

take immediate steps to ensure that every available measure (consistent with the BACT requirements of the CAA) is employed to reduce or eliminate emissions of CO₂ in connection with the approval of every new coal-fired power plant, including the Bonanza plant at issue in this case.⁵⁴



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⁵⁴ Moreover, contrary to EPA's assertions, we see no evidence that the Agency has ever attempted to form a coherent policy on the issues that are central to this permitting decision – specifically balancing, for example, the range of health-related concerns outlined in this brief and other relevant issues – prior to its final decision on Bonanza's PSD permit. Thus, the Agency is using this permit inappropriately to articulate a significant new legal and policy position, without announcing, explaining, justifying, or soliciting comment on that policy in connection with issuance of the draft permit. Accordingly, if the Board does not find that the CAA unambiguously requires consideration of CO₂ in the PSD permitting analysis, it should remand the permit decision to the Agency to allow for a full and robust public process, *prior* to the decisionmaker's final permit determination, regarding all relevant legal, technical, factual, and policy considerations implicit in the Agency's groundbreaking permit decision.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing document, **PYSICIANS FOR SOCIAL RESPONSIBILITY'S AMICUS CURIAE BRIEF IN SUPPORT OF PETITIONERS**, has been provided by U.S. Mail, this 31st Day of January, 2008, to the following:

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