Carbon Dioxide: Harmless, Ubiquitous, and Certainly Not a "Pollutant" Under a Liability Policy's Absolute Pollution Exclusion

J. Wylie Donald & Craig W. Davis[*]

I. INTRODUCTION

In February 2008, the Inupiat Eskimo community of Kivalina, Alaska, filed suit against ExxonMobil Corporation and various other energy-producing concerns for their purported contribution to global warming. The Inupiat allege that global warming is destroying their ancestral habitat on the northern Alaskan coast, seventy miles north of the Arctic Circle.[1] The *Kivalina* complaint characterizes the defendants as "many of the largest emitters of greenhouse gases in the United States"[2] and seeks damages under federal and state common law, largely under theories of public and private nuisance.[3] *Kivalina* represents the second wave of climate change litigation, the first wave having been stalled by federal court decisions dismissing those cases on justiciability grounds.[4] Notwithstanding those first wave decisions (all of which are on appeal), the *Kivalina* case makes it clear that climate change litigation, like climate change itself, is not going away, and that those businesses that might be targeted in such litigation should be aware of the possibilities of, and potential roadblocks to, insurance coverage for these suits. This Article addresses a specific aspect of that broader theme: whether carbon dioxide should be

[*] J. Wylie Donald is a Partner at McCarter & English, LLP in Wilmington, Delaware; he received his B.A. in mathematics. Craig W. Davis is an Associate at McCarter & English in Newark, New Jersey; he received his B.A. in geological sciences. The opinions contained in this Article are those of the authors and not necessarily of McCarter & English or its clients. The authors wish to thank Gregory Little for his research assistance and the staff of the Seton Hall Law Review for their fastidious editorial efforts and professional courtesy.

[1] *See* Complaint at 1, Village of Kivalina v. ExxonMobil Corp., No. CV-08-1138 (C.D. Cal. filed Feb. 26, 2008) [hereinafter *Complaint*].

[2] *Id.* at 1.

[3] *Id.*

[4] *See infra* note 47 and accompanying text.

considered a "pollutant" under a commercial general liability (CGL) policy for purposes of applying the policy's "absolute pollution exclusion."[5] A consideration of the science underlying climate change and, particularly, the dynamics of the terrestrial carbon cycle, side-by-side with an analysis of the typical absolute pollution exclusion, leads inexorably to the conclusion that carbon dioxide cannot reasonably be considered a "pollutant" as defined in a typical CGL policy. Therefore, the costs and liabilities associated with climate change litigation should not be barred by the exclusion.

The Supreme Court of the United States perhaps set the stage in *Massachusetts v. EPA*.[6] In that case, the Court ordered the United States Environmental Protection Agency (EPA) to reconsider its decision not to regulate anthropogenic carbon dioxide emissions, which many scientists agree are contributing to a global rise in temperature.[7] Also, as exemplified in the *Kivalina* case, global temperature increase is tied to a number of adverse environmental consequences, including a rise in sea level and resulting destruction of coastal property[8] and, according to some, an increase in storm activity and consequent coastal erosion.[9] By elbowing its way into the global warming debate, the Court raised many more questions than it answered. In addition to its broad reading of Article III standing jurisprudence and its potential impact on future environmental regulation and basic principles of administrative law, one of the myriad questions prompted by the Court's decision (and by cases such as *Kivalina*) is whether an absolute pollution exclusion in a liability insurance policy should act to exclude coverage for damages—such as submersion of property due to sea-level changes or property damage caused by coastal erosion from increased storm activity—claimed to result from a party's release of carbon dioxide into the atmosphere, or, in short, whether carbon dioxide qualifies as a "pollutant" under the exclusion. This issue has been brought specifically to bear in cases like *Kivalina*, in which plaintiffs seek damages from alleged producers of

[5] For another facet of the issue of insurance coverage for climate change-related litigation and liability, see J. Wylie Donald & Loly Garcia Tor, *Climate Change and the D&O Pollution Exclusion*, 41 TORT TRIAL & INS. PRAC. L.J. 1033 (2006).

[6] 127 S. Ct. 1438 (2007).

[7] *Id.* at 1446. The Court specifically addressed only the regulation of carbon dioxide emissions from motor vehicles. *See id. passim.* The decision nonetheless raised many questions about anthropogenic carbon dioxide emissions in general.

[8] *See id.* at 1452.

[9] *See Complaint*, *supra* note 1.

atmospheric carbon dioxide specifically for the kinds of injuries purported to result from climate change in the form of global warming.[10]

The typical absolute pollution exclusion requires that the damages for which a policyholder seeks coverage "arise out of" the release of a "pollutant," which is defined in relevant part as a "gaseous . . . irritant or contaminant."[11] Under a close reading of that language, atmospheric carbon dioxide comes up shy of qualifying as a "pollutant" so as to fall within the exclusion's bar to coverage. Carbon dioxide is ubiquitous, and it plays a varied and essential role in nature (and in technology). It is an essential element of both inorganic earth processes and of the organic cycles of the biosphere. Further, the sources of atmospheric carbon dioxide are vast and are part of an enormously complex chemical system with many unknown or poorly understood variables. Even in its present-day atmospheric concentrations, carbon dioxide can be considered neither an "irritant" nor a "contaminant," but is simply an integral part of the biogeochemical carbon cycle.

Part II of this Article addresses the science of carbon dioxide in the environment by examining its sources and the processes by which it is formed, transferred, transformed, and destroyed. Part III discusses carbon dioxide and its relationship to coverage under a liability insurance policy. Specifically, Part III addresses the applicability of absolute pollution exclusions to claims for damages based on the environmental effects of anthropogenic carbon dioxide emissions and, concomitantly, whether carbon dioxide is excluded by the operation of an absolute pollution exclusion. Part III focuses particularly on whether carbon dioxide can be considered an "irritant" or "contaminant" as those terms are used in the exclusion.

II. CARBON DIOXIDE AND THE CARBON CYCLE

Atmospheric carbon dioxide is essential to life on Earth.[12] Apart from water, one would be hard pressed to think of a more ubiquitous, benign, and useful substance than carbon dioxide. Carbon dioxide is a by-product of a wide variety of natural and human-induced processes, including fermentation, animal respiration, decomposition of organic matter, volcanism, plate tectonics, and the combustion of

[10] *Id.* at 45–46.

[11] *See* R. Stephen Burke, *Pollution Exclusion Clauses: The Agony, the Ecstasy, and the Irony for Insurance Companies*, 17 N. KY. L. REV. 443, 466 (1990).

[12] F. STUART CHAPIN III ET AL., PRINCIPLES OF TERRESTRIAL ECOSYSTEM ECOLOGY 21 (2002).

carbon-containing materials, such as fossil fuels.[13] In its natural state, carbon dioxide is a non-reactive, slightly water-soluble gas.[14] At atmospheric levels, it is non-toxic, though in high concentrations it can cause suffocation simply by displacing oxygen available for respiration.[15] If subjected to high pressure and then allowed to return to normal atmospheric pressure levels, carbon dioxide forms a sublimating solid that is familiar to concert and theatergoers as dry ice.[16] It is used in fire extinguishers, inflatable life rafts, and carbonated beverages.[17] It is also used as a fume suppressant in certain metallurgical processes, i.e., as an agent for reducing atmospheric pollutants.[18] Although comprising only about 0.037 percent of the earth's atmosphere,[19] that amount nonetheless constitutes an enormous global pool of carbon dioxide, accounting for more than 750 billion metric tons of atmospheric carbon.[20] By comparison, studies estimate that in 2004 human industrial activity contributed almost eight billion metric tons of carbon (as carbon dioxide) into the atmosphere through the burning of fossil fuels and, to a lesser extent, cement production.[21]

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[13] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CARBON DIOXIDE CAPTURE AND STORAGE 385 (Bert Metz et al. eds., 2005); *see generally* Kim Holmén, *The Global Carbon Cycle*, *in* GLOBAL BIOGEOCHEMICAL CYCLES 239 (Samuel S. Butcher et al. eds., 1992).

[14] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 13, at 385–90.

[15] *See id.* at 391. In 1986, 1746 people died from asphyxiation when a volcanic crater lake in Cameroon released a burst of carbon dioxide gas. Michael R. Rampino, *Volcanic Hazards*, *in* UNDERSTANDING THE EARTH 506, 513 (Geoff Brown et al. eds., 1992). It is interesting to contrast non-toxic carbon dioxide with oxygen, which is poisonous to some organisms and in great enough concentrations is toxic to humans. *See* A.F. HOLLEMAN & EGON WIBERG, INORGANIC CHEMISTRY 472 (Nils Wiberg ed., Mary Eagleson & William Brewer trans., 34th ed. 2001) (1900).

[16] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 13.

[17] *See id.* at 393.

[18] *Id.*

[19] *Id.* at 390; CHAPIN et al., *supra* note 12.

[20] *See* Kennth L. Denman et al., *Couplings Between Changes in the Climate System and Biogeochemistry*, *in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 499, 515 fig.7.3 (Susan Solomon et al. eds., 2007); D. Schimel et al., *Radiative Forcing of Climate Change*, *in* CLIMATE CHANGE 1995: THE SCIENCE OF CLIMATE CHANGE 65, 77 fig.2.1 (J.T. Houghton et al. eds., 1996). Climate scientists typically measure carbon dioxide amounts in terms of gigatons of carbon (in the form of carbon dioxide). *See, e.g.*, *id.* at 77–78 & fig.2.1. This is a meaningful measurement because other atmospheric carbon compounds, such as carbon monoxide (CO) and methane (CH_4), are quantitatively negligible in comparison with carbon dioxide. *Id.* at 78. *See also* ENCYCLOPEDIA OF ENVIRONMENTAL SCIENCE AND ENGINEERING 118 tbl.1 (James R. Pfafflin & Edward N. Ziegler eds., 5th ed. 2006) (listing relative quantities of chemical components of atmosphere in parts per million). A gigaton equals one billion metric tons. *See* Denman et al., *supra*, at 512.

[21] G. Marland et al., *Global, Regional, and National CO_2 Emissions*, *in* CARBON DIOXIDE INFORMATION ANALYSIS CENTER, U.S. DEP'T OF ENERGY, TRENDS: A

As suggested above, the sources of atmospheric carbon dioxide—anthropogenic and naturally occurring—are many. The primary sources of anthropogenic carbon dioxide in the atmosphere are the burning of fossil fuels and the destruction of forests.[22] The former is a direct source of atmospheric carbon dioxide, increasing from about 5.4 billion metric tons per year through the 1980s to 7.2 billion tons per year between 2000 and 2005.[23] It is estimated that between 1750 and 2005, human industrial activity released 315 billion tons of carbon dioxide into the atmosphere, with more than half of that amount accumulating since the mid-1970s.[24] The destruction of forests has also resulted in an increase of atmospheric carbon dioxide—estimates of the increase generally range between 1.6 and 2.2 billion tons per year during the 1980s and 1990s—not directly, but because of the diminution or partial elimination of a carbon dioxide "sink"; i.e., the plants destroyed in deforestation had functioned to remove carbon dioxide from the atmosphere.[25] This anthropogenic one-two punch is only one small part of a vast and complex chemical system known as the carbon cycle.[26]

The carbon cycle is a closed chemical system in which carbon circulates through nature largely, though not exclusively, in the form of carbon dioxide.[27] The primordial source of atmospheric carbon dioxide is related to the evolution of the primitive earth atmosphere

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COMPENDIUM OF DATA ON GLOBAL CLIMATE CHANGE (2008). By far, burning fossil fuels accounts for most of this amount (about ninety-five percent), with cement production contributing to a much lesser extent (about four percent). *Id.* These figures have increased in the last few decades. In 1990, the same human industrial activity contributed about six billion metric tons of carbon into the atmosphere. Schimel et al., *supra* note 20, at 78. These numbers do not represent the net increase of atmospheric carbon dioxide, which is a smaller amount (averaging about 4.1 billion tons of carbon dioxide per year between 2000 and 2005, up from about 3.3 billion tons in the 1980s and 1990s) due to uptake of carbon dioxide by other regions of the carbon cycle, such as the oceans. *See* Denman et al., *supra* note 20, at 501, 516 tbl.7.1; Schimel et al., *supra* note 20, at 78.

[22] Denman et al., *supra* note 20, at 511; Eric T. Sundquist, *The Global Carbon Dioxide Budget*, 259 SCI. 934, 934, 937–38 (1993).

[23] Denman et al., *supra* note 20, at 501, 516–17 & tbl.7.1; Schimel et al., *supra* note 20, at 78. As discussed *supra*, note 21, these figures include the relatively minor contribution of cement production.

[24] Marland et al., *supra* note 21.

[25] Sundquist, *supra* note 22, at 937–38; Denman et al., *supra* note 20, at 517–18 & tbl.2; Schimel et al., *supra* note 20, at 78.

[26] *See* Sundquist, *supra* note 22, at 934 ("Although we can quantify the earth's major [carbon] reservoirs and fluxes, balancing the anthropogenic [carbon dioxide] budget requires accounting for differences that are often small relative to the natural exchange and abundance of [carbon].").

[27] *See generally* OXFORD DICTIONARY OF BIOCHEMISTRY AND MOLECULAR BIOLOGY 98 (Richard Cammack et al. eds., 2d ed. 2006); Denman et al., *supra* note 20, at 511–39.

and the natural build-up of carbon dioxide, nitrogen, and oxygen at the expense of more volatile components, such as methane and ammonia.[28] The eventual appearance of organic compounds, and ultimately of life, is closely related to the creation of a chemical environment in which the carbon cycle is manifest.[29] That cycle consists of a dynamic equilibrium between carbon dioxide in the atmosphere, carbonate and bicarbonate ions dissolved in the world's oceans and other waters, and carbonate minerals in the earth's crust.[30] The best known aspect of the carbon cycle is perhaps the uptake of atmospheric carbon dioxide and water by plants and their conversion through the sunlight-induced chemical reaction known as photosynthesis into carbohydrates and oxygen, which is released into the atmosphere.[31] When the carbohydrates in plants are oxidized—either through consumption and digestion by herbivorous, respiring organisms, by death and decomposition, or by incineration as fuel—carbon dioxide is released back into the atmosphere and the cycle is (in simplified terms) complete.[32] As discussed above, human industrial activity has resulted in a net increase in atmospheric carbon dioxide, and human land-use patterns, particularly deforestation, have had a similar effect, although the effects of land-use changes are uncertain and complicated by the interplay of tropical deforestation (which causes a net gain of atmospheric carbon dioxide), reforestation in the northern hemisphere (which acts as a carbon dioxide sink), and the de-

[28] *See generally* Richard P. Wayne, *Chemical Evolution of the Atmosphere*, *in* HANDBOOK OF ATMOSPHERIC SCIENCE 3, 18–29 (C.N. Hewitt & Andrea Jackson eds., 2003).

[29] *See id.*

[30] JOHN M. WALLACE & PETER V. HOBBS, ATMOSPHERIC SCIENCE: AN INTRODUCTORY SURVEY 42–45 (2006). As noted above, there are about 750 billion metric tons of atmospheric carbon in the form of carbon dioxide. *See supra* note 20 and accompanying text. By contrast, oceanic carbon (as dissolved carbon dioxide in the form of carbonate and bicarbonate ions) is on the order of forty to fifty trillion tons. Denman et al., *supra* note 20, at 514–15 & fig.7.3. The carbon locked up in rocks and sediments (in the form of carbonate minerals) is on the order of sixty to seventy thousand trillion tons. *See* 14 ENCYCLOPAEDIA BRITANNICA 318 (15th ed. 1995).

[31] *See* I.S. Sheoran & Randhir Singh, *Carbon Dioxide Metabolism in Photosynthesis*, *in* CONCEPTS IN PHOTOBIOLOGY: PHOTOSYNTHESIS AND PHOTOMORPHOGENESIS 430, 430–31 (G.S. Singhal et al. eds., 1999).

[32] *See* Sundquist, *supra* note 22, at 937–38. Oxidation, and its complement, reduction, are chemical reactions whereby electrons—either directly or in the form of hydrogen or oxygen atoms—are transferred between compounds. J. STENESH, BIOCHEMISTRY 523 (1998). A simple oxidation reaction is the combustion of carbon to form carbon dioxide: $C + O_2 \rightarrow CO_2$. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 13, at 138, 335.

composition (oxidation) of organic debris and plant products (which releases carbon dioxide into the atmosphere).[33]

But oxidation reactions among organic compounds comprise only one source of the global carbon dioxide budget. The earth's oceans constitute a significant pool of carbon dioxide.[34] Carbon dioxide dissolved in the oceans' surface waters are on the order of approximately one trillion metric tons of carbon.[35] Whereas carbon dioxide dissolved in oceanic surface waters is thought in the long run to be in steady-state equilibrium with atmospheric carbon dioxide (i.e., there is exchange but no net transfer of carbon dioxide), variations in factors as diverse as vertical circulation of ocean water, changes in the production and dissolution of calcium carbonate (the mineral generally comprising coral reefs and the shells of marine organisms), and the rate of bicarbonate deposition into the oceans by terrestrial rivers can result in an imbalance and consequent "leaking" of carbon dioxide into the atmosphere.[36] The oceanic factors affecting the global carbon dioxide budget are not completely understood, and the system's complexity tends to "prevent easy discrimination of the anthropogenic [carbon dioxide] signal from natural trends."[37] However, there is little doubt the oceans comprise an important component of the global carbon cycle and consequently are a significant factor influencing the earth's carbon dioxide budget.[38]

In addition, geological processes provide a long-term backdrop to climate change and the carbon cycle. Rock metamorphism, volcanism, the chemical weathering of rock, and plate tectonics are all factors contributing to the earth's carbon dioxide budget; indeed, in terms of geological time scales, atmospheric carbon dioxide levels are closely related to plate-tectonic processes, which are themselves a "major control on the long-term climate evolution of the earth."[39] Rock metamorphism (transformation of rock composition and texture resulting from high pressures and/or temperatures) releases

[33] Sundquist, *supra* note 22, at 938.

[34] *See* COMM. ON THE SCI. OF CLIMATE CHANGE, NAT'L RESEARCH COUNCIL, CLIMATE CHANGE SCIENCE: AN ANALYSIS OF SOME KEY QUESTIONS 10 (2001) (discussing the atmospheric-terrestrial-oceanic interface of carbon dioxide cycle).

[35] *See* Denman et al., *supra* note 20; Schimel et al., *supra* note 20; Sundquist, *supra* note 22, at 935 fig.1.

[36] Sundquist, *supra* note 22, at 936–37.

[37] *Id.* at 938. *See* Schimel et al., *supra* note 20, at 79–80.

[38] *See* Sundquist, *supra* note 22, at 940.

[39] Eric J. Barron, *Palaeoclimatology*, *in* UNDERSTANDING THE EARTH, *supra* note 15, at 485, 497–98; *see also* TECTONIC UPLIFT & CLIMATE CHANGE 8–10 (William F. Ruddiman ed., 1997) (discussing the interplay between tectonic processes and the biogeochemical carbon cycle); WALLACE & HOBBS, *supra* note 30, at 44–45.

volatile compounds such as carbon dioxide and water into the environment.[40] Throughout the geologic past, volcanic activity, metamorphism, and diagenesis (formation of rock by burial and compression of sediments) at plate tectonic boundaries have resulted in the release of immeasurable quantities of carbon dioxide into the atmosphere.[41] On the other hand, under present global geological conditions, volcanoes, another important source of atmospheric carbon dioxide, discharge into the atmosphere about forty to fifty million tons of carbon (as carbon dioxide) per year.[42] The carbon dioxide added to the environment by geological activity is thought to be in long-term, steady-state equilibrium with the carbon dioxide that is removed from the environment through chemical weathering processes.[43] Nevertheless, perturbations in the global rate either of chemical weathering of rocks or of geotectonic carbon dioxide emissions could result in short-term net variations in atmospheric carbon dioxide levels.[44] For example, the weathering of rocks is linked to global mountain distribution and to the amount of unsubmerged land mass exposed to weathering (as well as precipitation amounts), and volcanism is a function of the rate of seafloor spreading at tectonic plate boundaries, all of which vary over geological time.[45] In any event, geological and geotectonic processes constitute a crucial, albeit long-term, complicating factor that underlies any discussion of climate change as it relates to atmospheric carbon dioxide levels.[46]

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[40] Alan B. Thompson, *Metamorphism and Fluids*, *in* UNDERSTANDING THE EARTH, *supra* note 15, at 222, 224; Peter J. Wyllie, *Experimental Petrology*, *in* UNDERSTANDING THE EARTH, *supra* note 15, at 67, 72.

[41] *See* Simon Conway Morris, *The Early Evolution of Life*, *in* UNDERSTANDING THE EARTH, *supra* note 15, at 436, 456; Maurice E. Tucker, *Limestones Through Time*, *in* UNDERSTANDING THE EARTH, *supra* note 15, at 347, 358.

[42] Sundquist, *supra* note 22, at 935.

[43] *Id.*; Barron, *supra* note 39, at 498; *see also* WALLACE & HOBBS, *supra* note 30 (discussing rock weathering and terrestrial carbon dioxide cycle). Chemical weathering and rock metamorphism comprise a chemical system in which minerals and carbon dioxide are exchanged with silica (the major component of the primary terrestrial minerals such as quartz) and calcium carbonate (the major component of deep-ocean sediments and sedimentary rocks such as limestone). *See* Barron, *supra* note 39, at 498.

[44] *See* Sundquist, *supra* note 22, at 935.

[45] Barron, *supra* note 39, at 498.

[46] No less significantly, carbon dioxide is not the sole contributor to global temperature change. Other factors include atmospheric water vapor, methane, chlorofluorocarbons, and nitrous oxide; fluctuations in solar luminosity; variations in topography; and long-term astronomical cycles associated with the earth's movement in space. Barron, *supra* note 39, at 486, 497. For example, methane, the main component of natural gas and a by-product of certain manufacturing processes, is also naturally produced as "swamp gas" (for example, in rice paddies) and flatulence

III. CARBON DIOXIDE AND THE ABSOLUTE POLLUTION EXCLUSION

A. The Regulation of Carbon Dioxide and Claims of Damages Based on the Environmental Effects of Anthropogenic Carbon Dioxide Emissions

Prior to the *Kivalina* action, litigation had commenced throughout the country alleging corporate liability for the adverse environmental and economic effects of climate change. Courts dismissed those cases on justiciability grounds, and all currently are on appeal.[47] Moreover, whereas several states have attempted to regulate automobile carbon dioxide emissions as they relate to adverse climatological

(particularly, bovine flatulence), and is a "greenhouse gas" that is about twenty-four times more effective at trapping heat in the atmosphere than carbon dioxide. *See* Donald J. Wuebbles & Katherine Hayhoe, *Atmospheric Methane: Trends and Impacts*, *in* NON-CO_2 GREENHOUSE GASES: SCIENTIFIC UNDERSTANDING, CONTROL AND IMPLEMENTATION 1, 30 (J. van Ham et al. eds., 2000); Donald Goldsmith, *Ice Cycles*, NAT. HIST., Mar. 2007, at 14, 18. As discussed earlier, atmospheric methane is a minor component of the atmosphere, comprising less than two parts per million by volume, as compared to between 300 and 400 parts per million by volume for carbon dioxide. *See* ENCYCLOPEDIA OF ENVIRONMENTAL SCIENCE AND ENGINEERING, *supra* note 20. Thus, even though methane is a much more effective greenhouse gas than carbon dioxide, carbon dioxide, because of its relative abundance, is thought to be the major contributor to the intensification of the greenhouse effect. *See* Sundquist, *supra* note 22, at 934.

These additional influences on global temperature change—many of which are not well quantified, further distend the causal chain between any individual carbon dioxide source, a rise in global temperature, and the end effect of a particular instance of resulting economic or environmental harm. *See generally* Goldsmith, *supra* (discussing difficulty of discerning precise cause-and-effect relationship between climate and earth's astronomical cycles known as "Milankovitch cycles"). Indeed, calculating the precise effect of a particular climatological "forcing factor" is an exceedingly difficult, if not impossible, task for scientists, let alone jurists. Barron, *supra* note 39, at 486 (describing the gaining of "an understanding of the climatic response to a specific forcing factor" as "a major challenge"); Goldsmith, *supra*, at 18 (averring that "climate experts still can't calculate the details of climatic 'output' from 'inputs' such as solar heating"); *see also* Barron, *supra* note 39, at 501 (speaking of "the difficulty [of] describing [such] a complex, non-linear system"). This complexity, and the causal uncertainty it engenders, should be kept in mind in any analysis of the purported effects of anthropogenically induced global temperature change. *See infra* note 105.

[47] *See* Comer v. Murphy Oil, USA, Inc., No. 1:05-cv-436 (S.D. Miss. Aug. 30, 2007) (dismissing on political question grounds and for lack of standing global warming nuisance lawsuit against petrochemical company defendants), *appeal docketed*, No. 07-60756 (5th Cir. Sept. 28, 2007); California *ex rel.* Lockyer v. General Motors Corp., No. C06-05755 MJJ, 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007) (dismissing global warming nuisance case against automobile companies based on political question doctrine), *appeal docketed*, No. 07-16908 (9th Cir. Oct. 24, 2007); Connecticut v. Am. Elec. Power, Inc., 406 F. Supp. 2d 265 (S.D.N.Y. 2005) (dismissing global warming nuisance case against power companies based on political question doctrine), *appeal docketed*, No. 05-5104 (2d Cir. Sept. 22, 2005).

effects, the EPA has recently declared that those states' proposed emissions regulations are preempted by federal authority to set unified standards for greenhouse gas emissions.[48] Several of those states have appealed the EPA's decision,[49] but in any event, as the Supreme Court's decision in *Massachusetts v. EPA* makes clear, it is possible that the federal government will regulate carbon dioxide.[50] Indeed, some states already have classified carbon dioxide as a "pollutant."[51]

As a preliminary matter, it is clear that a regulatory or legislative classification should have no bearing on the analysis under a liability insurance contract because a regulatory definition of "pollutant" and the definition of that term in an insurance policy will not necessarily be similar in their terms.[52] Additionally, and no less significantly, a regulatory or statutory definition of pollutant is parol evidence and would be admissible only where it might provide extrinsic evidence of the parties' intent in the case of ambiguity in the policy's own terms.[53] Since any future regulatory or statutory definitions of "pollutant" will inevitably post-date parties' execution of existing liability policies, even given an ambiguity, any such definitions could not possibly aid in determining the parties' intent in entering those contracts.

Moreover, the respective analyses involved in interpreting an insurance policy and construing a regulation differ in kind, context,

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[48] John M. Broder & Felicity Barringer, *E.P.A. Says 17 States Can't Set Emission Rules*, N.Y. TIMES, Dec. 20, 2007, at Al.

[49] *Id.*

[50] *See* Massachusetts v. EPA, 127 S. Ct. 1438, 1460 (2007) (disagreeing with the EPA's conclusion that it could not properly classify carbon dioxide as pollutant under Clean Air Act).

[51] *See, e.g.*, N.H. REV. STAT. ANN. § 125-O:1 (2002); N.J. STAT. ANN. § 48:3-87(a)(2) (West 2008).

[52] Compare the definition of "pollutant" as any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acid, alkalis, chemicals and waste. Waste includes materials to be recycled, reconditioned or reclaimed," see text accompanying note 59, *infra*, with the definition of "pollutant" in the Clean Air Act:

> any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used.

42 U.S.C. § 7602(g) (2000).

[53] *See, e.g.*, Greenfield v. Philles Records, Inc., 780 N.E.2d 166, 170 (N.Y. 2002); Fid. Nat'l Title Ins. Co. of N.Y. v. Westhaven Props. P'ship, No. 1-06-1895, 2007 WL 3145359, at *9 (Ill. App. Ct. Oct. 26, 2007) ("In the absence of an ambiguity, the parties' intent is ascertained solely from the words of the contract itself . . . .").

and motivation. In interpreting an insurance contract, a court conducts a "case-specific" analysis of "a contract between private parties" that "turns on such issues as the particular language of the policy, the insured's reasonable expectations of coverage, and the rule that insurance policy exclusions must be construed strictly against the insurer."[54] Therefore, a regulatory definition of "pollutant" that is motivated by concerns of economy and public health can have little, if any, bearing on the analysis of an insurance policy in which the primary motivation is gleaning the intent of the parties when they entered into a particular contract of insurance.

B. The Absolute Pollution Exclusion and Its Applicability to Anthropogenic Carbon Dioxide Emissions

Thus, the question remains whether carbon dioxide is a "pollutant" under a typical CGL policy. To answer that question, one must consider the development of pollution exclusions.

In the 1970s, insurance companies began to add provisions, initially by endorsement, and then as an exclusion in the policy form, to their CGL policies that excluded coverage for property damage and bodily injury resulting from the release or escape of pollutants.[55] The 1973 general liability form of the Insurance Services Office (ISO), commonly known as the "sudden and accidental" pollution exclusion, excluded coverage for the escape or release of pollutants, unless the escape or release was "sudden and accidental":

> This [insurance] does not apply . . . :
>
> . . . .
>
> (f) to bodily injury or property damage arising out of the discharge, dispersal, release or escape of smoke, vapor, soot, fumes, acids, alkalis, toxic chemicals, liquids, or gases, waste materials or other irritants, contaminants or pollutants into or upon the land, the atmosphere or any other water course or body of water, but

[54] Adam M. Cole et al., *PCLJ 37-1 Insurance Coverage for Global Warming Liability*, 42 TORT TRIAL & INS. PRAC. L.J. 969, 975 (2007) (citing Haynes v. Farmers Ins. Exch., 89 P.3d 381, 385 (Cal. 2004); Waller v. Truck Ins. Exch., Inc., 900 P.2d 619, 627 (Cal. 1995); Am. States Ins. Co. v. Koloms, 687 N.E.2d 72, 75 (Ill. 1997); Northville Indus. Corp. v. Nat'l Union Fire Ins. Co., 679 N.E.2d 1044, 1048 (N.Y. 1997); Langone v. Am. Family Mut. Ins. Co., 731 N.W.2d 334, 340 (Wis. Ct. App. 2007)) (footnotes omitted).

[55] Sharon M. Murphy, Note, *The "Sudden and Accidental" Exception to the Pollution Exclusion Clause in Comprehensive General Liability Insurance Policies: The Gordian Knot of Environmental Liability*, 45 VAND. L. REV. 161, 167 (1992).

> this exclusion does not apply if such discharge, dispersal, release or escape is sudden and accidental . . . .[56]

As the "sudden and accidental" pollution exclusion came under judicial scrutiny, many courts interpreted the exclusion to provide coverage for pollution liabilities unless the discharge or release of pollutants was intended or expected by the insured.[57] This was a broader interpretation of the exclusion than insurers would have liked; consequently, in the 1980s carriers began to issue what they hoped would be a more restrictive exclusion.[58] The resulting "absolute" pollution exclusion purported to eliminate coverage that had been allowed under the "sudden and accidental" exception to the ISO exclusion:

> This insurance does not apply to . . .
> (1) "Bodily injury" or "property damage" arising out of the actual, alleged, or threatened discharge, dispersal, release or escape of pollutants:
> (a) At or from premises you own, rent or occupy.

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[56] 21 ERIC MILLS HOLMES, HOLMES' APPLEMAN ON INSURANCE 2D § 132.11[C] (2d ed. 2002); Int'l Risk Mgmt. Inst., Inc., 2007 COM. LIABILITY INS., p. IV.T.19 (1973 Coverage Part Specimen). There were variants of the 1973 ISO exclusion adopted and issued by other insurers. Policies issued by Lloyd's of London, for example, excluded coverage for:

> Personal Injury or Bodily Injury or loss of, damage to, or loss of use of property directly or indirectly caused by seepage, pollution or contamination, provided always that this [clause] shall not apply to liability for Personal Injury or Bodily Injury or loss of or physical damage to or destruction of tangible property, or loss of use of such property damaged or destroyed, where such seepage, pollution or contamination is caused by a sudden, unintended and unexpected happening during the period of this Insurance.

Indep. Petrochemical Corp. v. Aetna Cas. & Sur. Co., No. 83-3347, 1988 WL 877629, at *81 (D.D.C. Sept. 7, 1988). The Travelers Insurance Companies also issued their own pollution exclusion, which precluded coverage in part for:

> bodily injury or property damage arising out of any emission, discharge, seepage, release or escape of any liquid, solid, gaseous or thermal waste or pollutant . . . if such emission, discharge, seepage, release or escape is either expected or intended from the standpoint of any insured or any person or organization for whose acts or omissions any insured is liable . . . .

Millipore Corp. v. Travelers Indem. Co., 115 F.3d 21, 27 n.9 (1st Cir. 1997); *see also* Providence Journal Co. v. Travelers Indem. Co., 938 F. Supp. 1066, 1074 (D.R.I. 1996).

[57] *See* Morton Int'l, Inc. v. Gen. Accident Ins. Co. of Am., 629 A.2d 831, 847–48 (N.J. 1993); Murphy, *supra* note 55, at 172, 178–91. *See generally* HOLMES, *supra* note 56, § 132.6[A][1], at 87–89 & n.239.

[58] *See* Burke, *supra note* 11, at 456–66; HOLMES, *supra* note 56, § 132.6[A][1], at 89.

> (b) At or from any site or location used by or for you or others for the handling, storage, disposal, processing or treatment of waste:
>
> (c) Which are at any time transported, handled, stored, treated, disposed of, or processed as waste by or for you or any person or organization for whom you may be legally responsible; or
>
> (d) At or from any site or location on which you or any contractors or subcontractors working directly or indirectly on your behalf are performing operations:
>
> (i) if the pollutants are brought on or to the site or location in connection with such operations; or
>
> (ii) if the operations are to test for, monitor, clean up, remove, contain, treat, detoxify or neutralize the pollutants.
>
> (2) Any loss, cost, or expense arising out of any governmental direction or request that you test for, monitor, clean up, remove, contain, treat, detoxify or neutralize pollutants.
>
> Pollutants means any solid, liquid, gaseous, or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acid, alkalis, chemicals and waste. Waste includes materials to be recycled, reconditioned or reclaimed.[59]

Under both pollution exclusions, coverage is excluded for property damage or bodily injury only if it arises out of the release of a pollutant, which the absolute pollution exclusion defines as an "irritant or contaminant." In contrast, the term "pollutant" is not defined in the 1973 ISO form, yet that provision excludes coverage for damages caused by the release of "irritants, contaminants or pollutants,"[60] which strongly suggests that the exclusion similarly applies to irritating or contaminating substances. As will be discussed below, the definition of "pollutant" as an "irritant or contaminant" is dispositive of the absolute pollution exclusion's inapplicability to anthropogenic carbon dioxide emissions.

The majority of courts that have addressed the scope of a pollution exclusion have limited its reach to "traditional environmental pollution" and have declined to extend its effect to any instance of negligence that merely involved a toxic or hazardous substance.[61] The reasoning behind these decisions is exemplified by that of the Supreme Court of California, which held it to be "far more reason-

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[59] Burke, *supra* note 11, at 466. It is interesting to note that carbon dioxide emissions from motor vehicles, which are at issue in *Massachusetts v. EPA*, do not fall within the parameters of this exclusionary language.

[60] *Id.*

[61] *See* MacKinnon v. Truck Ins. Exch., 73 P.3d 1205, 1208–11 & n.2 (Cal. 2003) (considering absolute pollution exclusion).

able that a policyholder would understand [the exclusion] as being limited to irritants and contaminants *commonly thought of as pollution* and not as applying to every possible irritant or contaminant imaginable."[62] By the majority of courts' logic, therefore, even substances that fall literally within the terms of a pollution exclusion's definition of "pollutant" are not always considered pollutants subject to the exclusion.[63] As will be seen, anthropogenic atmospheric carbon dioxide does not even fall within the literal terms of the definition of "pollutant" and is thus even further removed from the exclusion's reach.

One court has discussed in depth the applicability of a pollution exclusion to environmental carbon dioxide. In *Donaldson v. Urban Land Interests, Inc.*,[64] the Supreme Court of Wisconsin held that exhaled carbon dioxide was not a pollutant and thus was not excluded by a CGL policy's absolute pollution exclusion.[65] In *Donaldson*, inadequate building ventilation purportedly allowed the excessive accumulation of carbon dioxide exhaled by the occupants of the building, which allegedly caused certain adverse health effects—a phenomenon referred to as "sick building" syndrome.[66] The Wisconsin Supreme Court reversed the decision of the appellate court,

[62] *Id.* at 1216 (internal citations omitted).

[63] *See* Evanston Ins. Co. v. Atkins, No. 3:05-CV-2068-L, 2006 U.S. Dist. LEXIS 73746, at *21–23 (N.D. Tex. Oct. 4, 2006) (setting forth three-prong test to determine whether substance is to be excluded as "pollutant": (1) whether claimed damages are caused by a substance that (2) qualifies as an irritant or contaminant, and adding that (3) even substances that fall literally within definition of "pollutant" will not always be excluded, if to do so would defy reasonable, common-sense expectations of the insured); *see also* W. Alliance Ins. Co. v. Gill, 686 N.E.2d 997, 1000 (Mass. 1997) (holding that carbon monoxide given off by tandoori ovens in Indian restaurant was not "pollutant" under CGL policy's pollution exclusion); Andersen v. Highland House Co., 757 N.E.2d 329, 334 (Ohio 2001) (holding that carbon monoxide from residential space heater was not "pollution" so as to be excluded by pollution exclusion).

[64] Donaldson v. Urban Land Interests, Inc., 564 N.W.2d 728 (Wis. 1997).

[65] *Id.* at 732.

[66] *Id.* at 730. The adverse health effects are not so much caused directly by carbon dioxide, but rather result from a paucity of oxygen or "fresh air" in a building. *See* Donaldson v. Urban Land Interests, Inc., 556 N.W.2d 100, 105 (Wis. Ct. App. 1996) (Anderson, J., dissenting), *rev'd*, 564 N.W.2d 728 (Wis. 1997); *supra* note 15 and accompanying text (discussing the non-toxic nature of carbon dioxide and ill health effects resulting from displacement of oxygen by carbon dioxide). Interestingly, and a point that the *Donaldson* courts did not remark upon, carbon dioxide was not the culprit in that case. The injuries alleged to have resulted from the "sick" building at issue were caused by various undefined and unquantified contaminants that accumulated as a result of poor air circulation. *Donaldson*, 556 N.W.2d at 101. According to the plaintiffs' expert, increased concentrations of carbon dioxide merely acted as an indicator of poor ventilation, and the accumulation of other "excessive concentrations of air contaminants" was therefore likely. *Id.*

which had "concluded that the policy definition of 'pollutant' unambiguously includes exhaled carbon dioxide because carbon dioxide is a gaseous substance which, at higher concentrations, can become an irritant."[67] The *Donaldson* court, while noting that the absolute pollution exclusion at issue "was intended by [the insurers] to have broad application," nonetheless disagreed that it was meant to apply to "claims that have their genesis in activities as fundamental as human respiration."[68] The majority agreed with the dissenting judge below, that the terms "irritant" and "contaminant" must be bounded by common sense or else unintended and absurd consequences would ensue.[69]

Although *Donaldson* did not involve industrial atmospheric carbon dioxide, it raised some interesting and dispositive issues with respect to the application of the pollution exclusion to global anthropogenic carbon dioxide emissions. First, in *Donaldson*, the Wisconsin Supreme Court recognized the centrality of the definition of "pollutant" as an "irritant or contaminant." Although it did not rest its decision on whether carbon dioxide fell within that definition, the court did join the determinative issue: at what concentrations, if any, is carbon dioxide to be considered either an "irritant" or a "contaminant"? Second, the *Donaldson* court noted the natural ubiquity of carbon dioxide, particularly that resulting from respiration, noting that "exhaled carbon dioxide is universally present and generally harmless in all but the most unusual instances."[70]

With these ideas in mind, we now turn to the discussion of whether atmospheric, anthropogenic carbon dioxide can be considered an "irritant or contaminant" as defined in the absolute pollution exclusion, and thus, whether liability insurance coverage for a claim of damages alleged to result from an insured's carbon dioxide emissions is barred by the absolute pollution exclusion.

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[67] *Donaldson*, 564 N.W.2d at 732 (citing *Donaldson*, 556 N.W.2d at 103).

[68] *Id.*

[69] *Id.*; *see* Pipefitters Welfare Educ. Fund v. Westchester Fire Ins. Co., 976 F.2d 1037, 1043 (7th Cir. 1992). A Michigan appeals court reached an opposite conclusion in an unpublished opinion affirming a grant of summary judgment to an insurer based on a policy's pollution exclusion, which was held to preclude coverage for injuries resulting from the accumulation of sewer gas and carbon dioxide as a result of poor building ventilation. Bituminous Cas. Corp. v. R.J. Taylor Corp., No. 203334, 1998 WL 1992911 at *1 (Mich. Ct. App. May 8, 1998). The court in that case, however, did not analyze the pollution exclusion or articulate the basis for its holding, other than to reject the insured's arguments that the exclusion should not apply to completed operations or alternatively that it was rendered inapplicable by parol evidence. *Id.*

[70] *Donaldson*, 564 N.W.2d at 732.

Some courts have held that a substance must be toxic in order to qualify as an irritant, contaminant, or pollutant.[71] In a case involving insurance coverage for asbestos-related products liability claims, the Ohio Court of Common Pleas observed that "[p]lentiful authority exists in support of the proposition that the [pollution] exclusion is generally aimed at the release of toxic waste causing environmental damage."[72] In *Beahm v. Pautsch*,[73] the Court of Appeals of Wisconsin addressed a form of absolute pollution exclusion that excluded coverage for "the discharge, dispersal, release or escape of smoke . . . or other irritants, contaminants or pollutants into . . . the . . . atmosphere . . . ."[74] The insured, by "burning-off" winter grass on his farm, contributed to a multi-vehicle accident when excessive smoke from the burning blew across a state highway, obscuring the vision of motorists.[75] The court found the pollution exclusion to be ambiguous, and interpreted it to "exclude[] coverage only where the injury or damage is caused by the toxic nature of the irritant, contaminant or pollutant . . . ."[76] Because the properties of smoke for which the insured sought coverage—its semi-opacity and ability to obscure vision—were unrelated to any toxic properties the smoke might have possessed, the court held that the pollution exclusion did not bar coverage.[77]

According to the reasoning in these cases, anthropogenic, atmospheric carbon dioxide does not qualify as a pollutant because atmospheric carbon dioxide is non-toxic and it is only harmful as an asphyxiant at concentrations far in excess of any conceivable atmospheric concentrations.[78] Therefore, following decisional law constru-

[71] *E.g.*, Owens-Corning Fiberglas Corp. v. Allstate Ins. Co., 74 Ohio Misc. 2d 144, 152 (Ct. C.P. 1993); *see also* Haman, Inc. v. St. Paul Fire & Marine Ins. Co., 18 F. Supp. 2d 1306, 1308 (N.D. Ala. 1998) (holding that the pesticide methyl parathion was "so toxic" that there was "no question" that it qualified as a pollutant).

[72] *Owens-Corning*, 74 Ohio Misc. 2d at 151.

[73] 510 N.W. 2d 702 (Wis. Ct. App. 1993).

[74] *Id.* at 705. The pollution exclusion in *Beahm* was in many respects similar to the 1973 ISO form, except that the former did not include a "sudden and accidental" provision.

[75] *Id.* at 704.

[76] *Id.* at 705, 706.

[77] *Id.* at 706. See also Guenther v. City of Onalaska, 588 N.W.2d 375, 376–80 (Wis. Ct. App. 1998), where the court held that a pollution exclusion defining "contamination" to "include[] any unclean, unsafe, damaging, injurious or unhealthful condition . . . [that] arises out of any pollutant" was limited to toxic substances, and that sewer backup did not qualify as a pollutant unless damage resulted from the toxicity, rather than the sheer unpleasantness, of raw sewage.

[78] *See supra* note 15 and accompanying text. Exposure to carbon dioxide concentrations in excess of 1.5 percent, which is roughly forty times greater than present

ing "irritant, contaminant or pollutant" to mean "toxic," industrial anthropogenic carbon dioxide alleged to cause climate change does not qualify as a "pollutant" and damages purported to result from its emission would not be excluded from coverage.[79]

Courts that do not limit the absolute pollution exclusion to toxic substances per se nonetheless require that, to be excluded, the released substance qualify as an "irritant" or a "contaminant," terms that are generally not defined in the policy.[80] In common parlance, an "irritant" is something that causes a physiological or psychological response in an organism.[81] At first blush, therefore, the term "irritant" (like the word "toxic") would not appear to apply to claims of property damage alleged to result from the effects of carbon-dioxide-induced global warming. And courts addressing the definition of "irritant" generally adhere to the biological connotation of the term. For example, one court distinguished an "irritant," which causes "physical irritation, resulting in bodily injury," and a "contaminant," which "contaminate[s] the environment, causing property damage."[82] Another court suggested that an "irritant" was something that evoked a physiological or mental response when it indicated that excessive light and noise could be considered "irritants," but holding nonethe-

atmospheric concentrations, produces "no noticeable physical consequences" in healthy human adults. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 13, at 391. At concentrations above three percent, physical symptoms such as hearing loss, impaired vision, confusion and difficulty breathing may manifest. *Id.* At seven percent (one-hundred and ninety times atmospheric concentrations), carbon dioxide acts as an asphyxiant, and exposure to this concentration will cause unconsciousness and, if exposure is prolonged, death. *Id.* As discussed above, carbon dioxide comprises roughly 0.037 percent of the composition of the atmosphere. *See supra* note 19 and accompanying text. Thus, anthropogenic, industrial emissions of carbon dioxide into the atmosphere, even at recent peak rates, do not approach creating physiologically dangerous levels of carbon dioxide on a global scale. *See supra* notes 23–26 and accompanying text.

[79] *See* WEBSTER'S NEW WORLD COLLEGE DICTIONARY 1112, 1515 (4th ed. 2002) (defining "toxin" as "poison" and "poison" as a substance causing illness or death when ingested or absorbed).

[80] *But see Guenther*, 588 N.W.2d at 377 (interpreting policy containing definition of "contaminant").

[81] *See* I SHORTER OXFORD ENGLISH DICTIONARY 1428 (5th ed. 2002) (defining "irritant" and "irritation" in biological terms); WEBSTER'S NEW WORLD COLLEGE DICTIONARY, *supra* note 79, at 756 (defining "irritant" as something that causes "inflammation or irritation," and defining "irritation" in terms of physiological or psychological response to stimulation).

[82] Sargent Constr. Co. v. State Auto Ins. Co., 23 F.3d 1324, 1327 (8th Cir. 1994); *see also* Danbury Ins. Co. v. Novella, 727 A.2d 279, 281-83 (Conn. Super. Ct. 1998) (adopting dictionary definition of "irritant" and concluding that there was no indication "that lead [from lead paint] 'irritates'"); *accord* Ins. Co. of Ill. v. Stringfield, 685 N.E.2d 980, 982 (Ill. App. Ct. 1997).

less that they were not pollutants within the meaning of a pollution exclusion because light and noise were not "*solid, liquid, gaseous or thermal* irritants."[83] Because claims of environmental damage from global warming do not implicate the biological or psychological connotations of the word "irritant," both in its common usage and as interpreted by courts construing the pollution exclusion, whether carbon dioxide qualifies as a pollutant in these types of cases hinges on whether anthropogenic, atmospheric carbon dioxide is a "contaminant" as that term is used in CGL policies' pollution exclusions.

Turning again to common usage, "contaminant" is a significantly broader concept than "irritant," encompassing anything that, through contact with or addition to something else, makes it "impure."[84] That definition is too broad to be of any use at all.[85] However, the verb "contaminate" is also defined as rendering something else "unfit for use by the introduction of unwholesome or undesirable elements."[86] Courts that have interpreted the word "contaminant" in the context of pollution exclusions have aligned themselves with this latter, more precise sense of the word, which essentially defines a contaminant as a harmful substance that does not belong in the environment into which it is released, discharged, or emitted.[87]

Courts construing the word "contaminant" in pollution exclusions have held it to include the bacterium *Listeria monocytogenes* in food products,[88] oil and other petrochemicals in soil,[89] liquefied cow manure leached into drinking water,[90] and friable asbestos in a build-

[83] Titan Holdings Syndicate, Inc. v. City of Keene, 898 F.2d 265, 268–69 (1st Cir. 1990).

[84] WEBSTER'S NEW WORLD COLLEGE DICTIONARY, *supra* note 79, at 314; I SHORTER OXFORD ENGLISH DICTIONARY, supra note 81, at 498.

[85] *Cf.* Massachusetts v. EPA, 127 S. Ct. 1438, 1476 n.2 (2007) (Scalia, J., dissenting) (characterizing the majority's broad construction of "air pollutant" in the Clean Air Act as including Frisbees).

[86] WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 491 (1993).

[87] *See* Vance v. Sukup, 558 N.W.2d 683, 686 (Wis. Ct. App. 1996), *vacated by* 568 N.W.2d 297 (Wis. 1997) (table).

[88] Landshire Fast Foods, Inc. v. Employers Mut. Cas. Co., 676 N.W.2d 528, 532 (Wis. 2004). *But see* Keggi v. Northbrook Prop. & Cas. Ins. Co., 13 P.3d 785, 789 (Ariz. Ct. App. 2000) (holding that "living, organic irritants or contaminants," such as bacteria that contaminated drinking water, did not qualify as pollutants because bacteria "defy description under the policy as 'solid,' 'liquid,' 'gaseous,' or 'thermal' pollutants"). The *Landshire Fast Foods* court expressly rejected this view. *Landshire Fast Foods*, 676 N.W.2d at 532.

[89] Breese v. Hadson Petroleum, Inc., 955 F. Supp. 648, 651 (M.D. La. 1996) (discussing diesel fuel); Harrison v. R.R. Morrison & Son, Inc., 862 So. 2d 1065, 1072 (La. Ct. App. 2003) (discussing gasoline); Graham v. Harleysville Ins. Co., 632 A.2d 939, 942 (Pa. Super. Ct. 1993) (discussing residential heating oil).

[90] Space v. Farm Family Mut. Ins. Co., 652 N.Y.S.2d 357, 358 (App. Div. 1997).

ing.[91] In those cases, the infecting substance entered a medium in which it did not normally occur and thus rendered the medium into which it had been discharged or released "unfit" for use. For example, in the case of *Listeria* bacteria, its presence in food rendered the food "unfit for consumption."[92] Under dictionary and common understandings of "contamination," the term "connotes a condition of impurity resulting from mixture or contact with a *foreign substance*," thus rendering the infected material "impure."[93] In cases involving the seepage or discharge of petrochemicals into soil, the petroleum products render the affected soil impure and the property of which it is part "unfit for use by the introduction of an unwholesome or undesirable element."[94] This reasoning was extended to a building containing friable asbestos, where the court, considering a "contamination" exclusion, concluded that, as with infected soil, the affected building was made "unfit for use by the introduction of unwholesome or undesirable elements and/or [was made] physically impure or unclean."[95] With respect to natural fertilizer, such as liquefied cow manure, that substance might not qualify as a "'pollutant' or 'contaminant' when properly applied (and confined) to cropland."[96] However, when the cow manure leaches into groundwater, and from there infiltrates a well (where it does not belong), it qualifies as a contaminant.[97]

Unlike harmful bacteria in food, petrochemicals in soil, friable asbestos in a building, and liquefied cow manure in drinking water, carbon dioxide is not a foreign substance in the atmosphere, nor does it render the atmosphere "impure" or "unfit for use" (whatever

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[91] Yale Univ. v. Cigna Ins. Co., 224 F. Supp. 2d 402, 422 (D. Conn. 2002). The *Yale* case involved a contamination exclusion that precluded coverage for damage related to the discharge, release, and so forth of "contaminants or pollutants." *Id.* at 421.

[92] *Landshire Fast Foods*, 676 N.W.2d at 532.

[93] *Id.* (quoting Richland Valley Prods., Inc. v. St. Paul Fire & Cas. Co., 548 N.W.2d 127, 131 (Wis. Ct. App. 1996) (emphasis added) (internal quotation marks omitted)).

[94] *Graham*, 632 A.2d at 942 ("When oil escapes from a neighbor's tank and invades the property of another, it is a contaminant. It has rendered the other's property unfit for use by the introduction of an unwholesome or undesirable element."); *see also Breese*, 955 F. Supp. at 651 n.7 (adopting definition of "contaminate" as "to soil, stain, corrupt, or infect by contact . . . to render unfit for use by the introduction of unwholesome or undesirable elements") (internal quotation marks omitted); *Harrison*, 862 So. 2d at 1072 n.4 (adopting the same definitions of "contaminant" and "contaminate").

[95] *Yale Univ.*, 224 F. Supp. 2d at 421–22 (internal quotation marks omitted).

[96] *Space*, 652 N.Y.S.2d at 358.

[97] *See id.*

that might mean). Whereas anthropogenic carbon dioxide emissions appear in recent history to have caused a "geochemical perturbation" in the global carbon budget,[98] it cannot be said that anthropogenic carbon dioxide is an impurity in the atmosphere. In spite of recent, human-induced increases in atmospheric carbon dioxide, the recent perturbation is comparable in magnitude to past, non-anthropogenic variations in the global carbon dioxide budget.[99] Such perturbations and their climatic effects are geohistorical facts.[100] As discussed above, on geological time scales, global plate tectonics is the main driving force behind long-term climate change.[101] Indeed, the geological evidence indicates that during the mid-Cretaceous Period (about one hundred million years ago) carbon dioxide levels might have been four to ten times greater than those of today.[102]

Seen in context, the present-day composition of the atmosphere—consisting of between 0.03 and 0.04 percent carbon dioxide—falls within a relatively stable norm. It makes little sense, therefore, to describe atmospheric carbon dioxide from any source as an "impurity."[103] Carbon dioxide is an integral atmospheric component. Its concentration in the atmosphere has varied dramatically during Earth's history, completely independent of human activity. When correctly understood, anthropogenic atmospheric carbon dioxide is akin to generally innocuous substances such as sand and water, which courts have held do not constitute pollutants under CGL policies' pollution exclusions. For example, one court has held that the term "contaminant" did not encompass excess quantities of rainwater but instead described those substances that "defile the environment."[104]

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[98] *See* Sundquist, *supra* note 22, at 935.

[99] *See id.* at 939–40.

[100] *See id.* at 935 (discussing an imbalance in the carbon dioxide budget at the end of the last ice age, between 10,000 and 20,000 years ago); Barron, *supra* note 39, at 492–96 (discussing record of climate change over past 2.3 billion years).

[101] *See supra* note 39 and accompanying text.

[102] Barron, *supra* note 39, at 498.

[103] Consider also that the major source of anthropogenic carbon dioxide is the burning of fossil fuels, which is only an accelerated oxidation reaction. The only difference pertinent to this discussion between burning fossil fuels (and releasing carbon dioxide into the atmosphere) and allowing natural processes, such as decomposition of organic matter (and release of carbon dioxide into the atmosphere), is the speed at which the process operates. *See supra* notes 31–33 and accompanying text; *see also* Sundquist, *supra* note 22, at 939–40.

[104] State Auto Prop. & Cas. Ins. Co. v. Gorsuch, 323 F. Supp. 2d 746, 753 (W.D. Va. 2004). *See also* W. Bend Mut. Ins. Co. v. Iowa Iron Works, Inc., 503 N.W.2d 596, 600 (Iowa 1993) (holding that "innocuous rubbish," such as discarded sand, was not an "irritant" or "contaminant"); State Farm Fire & Cas. Co. v. M.L.T. Constr. Co., 849 So. 2d 762, 770 (La. Ct. App. 2003) (holding that absolute pollution exclusion did

Anthropogenic carbon dioxide, much like water, does not qualify as a contaminant under a CGL policy's absolute pollution exclusion.[105]

IV. CONCLUSION

Carbon dioxide emitted by an industrial producer alleged to cause property damage as a result of global temperature rise is not a "pollutant" as defined in the absolute pollution exclusions typically found in CGL policies. Carbon dioxide is both a naturally occurring component of the atmosphere and an integral, indeed the essential, component of the earth's carbon cycle. Carbon dioxide therefore does not constitute an "irritant or contaminant" as those terms are used in CGL absolute pollution exclusions. Moreover, carbon dioxide sources, both anthropogenic and natural, vary extensively in kind and in quantity, and anthropogenic sources account for a small fraction of the global carbon dioxide budget. In claims of property damage alleged to be caused by anthropogenic-carbon-dioxide-induced climate change, insurers should thus not be able to successfully invoke their policies' absolute pollution exclusions to bar coverage.

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not apply to rainwater, which "is not a substance that is usually viewed as a pollutant").

[105] It should not be overlooked that pollution exclusions generally contain a causation element, and problems of causation closely attend to carbon dioxide's role in global temperature change and its environmental and economic consequences. *See supra* note 46 and accompanying text. In an action in which an insured would claim coverage for damages allegedly caused by its carbon dioxide emissions, the plaintiff faces a daunting task, both as a practical matter and theoretically. As discussed above, there are about 750 billion metric tons of carbon (as carbon dioxide) in the atmosphere. *Supra* note 20 and accompanying text. Since the 1980s, a combination of deforestation and human industrial pursuits has been contributing somewhere between seven and ten billion metric tons of carbon dioxide per year into the atmosphere. *See supra* notes 21–25 and accompanying text. Those pursuits include a vast array of individual activities, from cement production to agriculture to automobile operation. The time element should also be considered. Human carbon dioxide emissions are traceable to about 1750, and about half of anthropogenic carbon dioxide is attributable to the period before 1970. *See supra* text accompanying note 24. Factoring in the effects of other anthropogenic greenhouse gases, non-greenhouse-gas-related causes of climate change and the immense non-human sources of atmospheric carbon dioxide compared to which anthropogenic carbon dioxide emissions constitute a paltry quantity, as well as the complexities of the carbon cycle and its natural cycling of carbon dioxide through air, water, and rocks, the virtual and practical impossibility of showing that a particular claimant's damages arise out of a particular defendant's carbon dioxide emissions becomes manifest. *See supra* note 46 (discussing non-greenhouse-gas-related causes of climate change); *supra* Part I (discussing the immense non-human sources of atmospheric carbon dioxide). Climate scientists themselves admit as much. *See supra* notes 26 and 46, and accompanying text. Jurists should be no less modest.