PETITION FOR RULEMAKING
SEEKING THE REGULATION OF GREENHOUSE GAS
EMISSIONS FROM NONROAD VEHICLES AND ENGINES

I. INTRODUCTION AND SUMMARY

The States of California, Connecticut, Massachusetts, New Jersey and Oregon acting through their respective Attorneys General, and the Commonwealth of Pennsylvania Department of Environmental Protection (collectively "Petitioners" or "State Petitioners") pursuant to the Administrative Procedure Act ("APA"), 5 U.S.C. § 551, *et seq*. and Clean Air Act ("CAA"), 42 U.S.C.§ 7400 *et seq*., hereby petition the Administrator of the Environmental Protection Agency ("EPA") to undertake a rulemaking procedure to adopt emissions standards to control and limit greenhouse gas emissions from new nonroad vehicles and engines, excluding aircraft, locomotives and vessels.[1] EPA defines nonroad vehicles and engines as including outdoor power equipment, recreational vehicles, farm and construction machinery, lawn and garden equipment, logging equipment, marine vessels, locomotives, and aircraft. (See, EPA Program Update: Reducing Air Pollution from Nonroad Engines, April 2003, EPA420-F-03-011.) Emissions from these types of vehicles and engines are substantial, over 220 million metric tons per year, and significantly contribute to rising atmospheric levels of greenhouse gases. There are currently no regulations in place limiting greenhouse gas emissions from nonroad vehicles and engines. EPA has authority to adopt such standards under CAA, § 202, 42 U.S.C. § 7521 and CAA § 213(a)(4), 42 U.S.C. § 7547(a)(4).

As set forth below, the Petitioners' environment and their residents are already suffering from the effects of global warming, and are projected to suffer much more acute effects as climate change becomes more severe. They bring this petition to protect their environment and natural resources.

II. THE EARTH'S CLIMATE IS CHANGING BECAUSE OF GREENHOUSE GAS EMISSIONS

A. Evidence that Climate Change is Taking Place

Climate change caused by global warming is the most important environmental issue facing our planet. Greenhouse gases (primarily carbon dioxide, methane and nitrous oxide) are accumulating in the atmosphere, decreasing the amount of solar radiation that is reflected back

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[1]This is the latest in a series of similar requests made by the State of California and others. The State of California, with other States and environmental groups, recently petitioned the EPA requesting adoption of regulations for greenhouse gas emissions from aircraft and ocean going vessels. For this reason, aircraft and ocean going vessels are not included in this petition. Locomotives are also not included in this petition.

into space and warming the Earth's climate much like a greenhouse. The impacts of climate change from greenhouse gas emissions have been extensively studied and documented.[2] All climate models predict significant warming in this century, varying only as to the rate and magnitude of the projected temperature increases.

The National Academy of Sciences ("NAS") has expressed its expert opinion that concentrations of carbon dioxide in the atmosphere have increased and continue to increase due to human activity. (NAS, Climate Change Science (2001), Executive Summary at 2.) The NAS cites the burning of fossil fuels as the "primary source" of anthropogenic carbon dioxide emissions. (Id.) The Nobel-Prize-winning International Panel on Climate Change ("IPCC") has also expressed its expert opinion that the observed increase in global average temperatures since the mid-20th century "is very likely due to the observed increase in anthropogenic greenhouse gas concentrations." (IPCC Working Group II Fourth Assessment Report, Summary for Policymakers (November 16, 2007) ("IPCC 2007 II"), at 2-3.) The latest report shows that atmospheric concentrations of carbon dioxide grew 80% between 1970 and 2004 and presently exceed "by far the natural range over the last 650,000 years." (IPCC, Synthesis Report of the IPCC Fourth Assessment Summary for policymakers, 1 & 4 (November 16, 2007), www.ipcc/ch, last visited December 28, 2007.) It is the opinion of both the NAS and the IPCC that humans, largely through the ever-increasing burning of fossil fuels, are changing the Earth's climate.

B. The Environmental Effects of Climate Change Will Be Severe

Impacts from global warming that have occurred, are occurring, and will occur, include: temperature increases, heat waves, loss of Arctic ice and habitat, loss of Antarctic ice, melting of glaciers and related glacial lake outburst flows, loss of snowpack in California and elsewhere, changes in precipitation patterns, increased hurricane intensity, sea level rise and coastal flooding, public health harms such as increased heat-related illness and smog, harm to habitats, widespread species extinction, and the potential for substantial social upheaval resulting from significant environmental changes. Further, due to the thermal inertia of the oceans and ice sheets, new research demonstrates that the climate will continue to warm for several decades,

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[2]See Oreskes, Naomi, *The Scientific consensus on Climate Change*, 306 Science 1686 (Dec. 3, 2004) [review of 928 peer-reviewed scientific papers concerning climate change published between 1993 and 2003, noting the scientific consensus on the reality of anthropogenic climate change]; J. Hansen, *et al.*, *Earth's Energy Imbalance: Confirmation and Implications*, Sciencexpress (April 28, 2004) (available at http://pubs.giss.nasa.gov/abstracts/2005/hansenNazarenkoR.html) [NASA and Department of Energy scientists state that emission of CO_2 and other heat-trapping gases have warmed the oceans and are leading to energy imbalance that is causing, and will continue to cause, significant warming, increasing the urgency of reducing CO_2 emissions].)

even if greenhouse gas emissions are held constant.[3]

In the last year IPCC reports have confirmed the impacts of global warming, predicting with high or very high confidence that ice and frozen ground, lakes and rivers, the oceans, and the biological systems both in the Earth's waters and on its land are already being affected. (IPCC 2007 II at 2-4.) Eleven of the last 12 years have been among the warmest since temperatures have been recorded. (IPCC 2007 I at 5.) Glaciers are melting at accelerated rates,

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[3](See, e.g., Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Technical Summary (2007) ("IPCC 2007 I") at 35-58, 68, 82-85, 89; World Meteorological Organization (WMO) Statement on the Status of the Global Climate in 2004. WMO-No. 983 (2005 Geneva) at 12; Climate Change 2001: Synthesis Report ("IPCC 2001") at 12-13; ACIA, Impacts of a Warming Arctic: Arctic Climate Impacts assessment. Cambridge University Press (2004) at 22; Recent Warming of Arctic May Affect Worldwide Climate, Goddard Institute for Space Studies (Oct. 23, 2003) (connecting global warming with melting arctic ice cap); http://www.gsfc.nasa.gov/topstory/2003/1023esuice.html#addlinf; Arctic Ice Cap Will Melt Completely in 100 Years, http://www.greenhousenet.org/news/AUG-03/arctic-ice.html (Norwegian expert links melting of arctic ice cap to carbon dioxide emissions that cause global warming); A. J. Cook, A. J. Fox, D. G. Vaughan, J. G. Ferrigno, Retreating Glacier Fronts on the Antarctic Peninsula over the Past Half Century, Science, Vol 308, Issue 5721, 541 544 , 22 April 2005; http://www.nrmsc.usgs.gov/research/glaciers.htm; K. Hayhoe, et al., Emissions Pathways, Climate Change, and Impacts on California, Proceedings of the National Academy of Sciences, vol. 101, no. 34 (August 24, 2004), at 12426; United States Global Climate Research Program (USGCRP), Preparing for a Changing Climate: California (2002) at 4-1-34 and 4-1-35; Paul R. Epstein, Is Global Warming Harmful to Health?, Scientific American (Aug. 2000) at 50-51. http://www.med.harvard.edu/chge/sciam.pdf; Thomas R. Karl & Kevin E. Trenberth, Modern Global Climate Change, 302 Science 1719, 1720-21 (Dec. 5 2003) ("Basic theory, climate model simulations and empirical evidence all confirm that warmer climates, owing to increased water vapor, lead to more intense precipitation events, even when total precipitation remains constant, and with prospects for even stronger events when precipitation amounts increase"); http://yosemite.epa.gov/oar/globalwarming; See Peter H. Gleick and Edwin P. Maurer, Assessing the Costs of Adapting to Sea Level Rise (Pacific Institute, 1990) at 5 (a one meter sea level rise threatens $48 billion of commercial, industrial and residential structures in the San Francisco Bay). http://www.pacinst.org/reports/sea_level_rise/sea_level_rise_report.pdf; C. Rosenzweig and W. Solecki, eds., Climate Change and a Global City (2001) at 33; C.D. Thomas et al., Extinction Risk from Climate Change: the Potential Consequences of Climate Variability and Change (Metro East Coast Contribution to the National Assessment of the Potential Consequences of Climate Variability and Change for the United States) (July 2001) at ix-xiv, available at http://metroeast_climate.ciesincolumbia.edu; K. Emmanuel, 436 Nature 686-688 (Aug. 2005) (increase in hurricane intensity related to climate change); P.J. Webster, et al., Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment, 309 Science, 5742, 1844-1846 (Sept. 16, 2005).)

sea-levels are rising, plants are flowering earlier, the oceans are becoming more acidic, and animals are shifting their ranges, all in response to worldwide changes in the climate. As anthropogenic gases force greater climate change, drought-affected areas will likely increase in their extent, ice-bound water supplies will decrease or run off early, flooding will increase, the oceans will continue to acidify (harming coral-forming organisms), and an increasing number of plant and animal species will be at risk of extinction. (IPCC 2007 II at 7-8; IPCC 2007 I at 7-8, 16-17, Frequently Asked Questions Nos. 3.1, 3.2, 3.3, 4.1, 5.1, 10.1.) The greatest burdens of climate change and the floods, heat waves, droughts, shortages in food and water, and increased ranges for disease vectors that it will cause, will likely fall on those nations and populations least able to adapt or cope.

Even more alarming, we are quickly approaching what some scientists have termed a "tipping-point," a situation where feedback mechanisms in the climate system accelerate the rate of change to the point that the Earth can no longer accommodate, and irreversible environmental change results. (See, e.g., Center for Health and the Global Environment, Harvard Medical School, Climate Change Futures: Health, Ecological and Economic Dimensions (November 2005) at 26-27; IPCC (2001) at 14-16; IPCC 2007 I, Frequently Asked Question No. 10.2.) Recent data indicate that greenhouse gas emissions place the Earth perilously close to such disasterous changes due to possible large-scale disintegration of the West Antarctic and Greenland ice sheets. (See, Hansen et al., Climate change and trace gases, Phil. Trans. R. Soc. A (2007) at 1925.) If we continue our business-as-usual emissions trajectory, dangerous climate change will become unavoidable. According to NASA's James Hansen, proceeding at the emissions rate of the past decade will result in "disastrous effects, including increasingly rapid sea level rise, increased frequency of droughts and floods, and increased stress on wildlife and plants due to rapidly shifting climate zones." (Id.) The Bali Action Plan adopted at the December, 2007 United Nations climate conference recognizes that "deep cuts in global emissions" will be required to avoid dangerous climate change. Specifically, it acknowledges the need for industrialized nations to cut greenhouse gas emissions by 25 to 40% below 1990 levels by 2020. And, the experts tell us, we have very little time to take decisive action. As Rajendra Pachauri, Chairman of the IPCC recently declared: "If there's no action before 2012, that's too late. What we do in the next two to three years will determine our future." (Elisabeth Rosenthal, U.N. Chief Seeks More Leadership on Climate Change, N.Y. Times, (November 18, 2007).)

C. Effects of Climate Change on State Petitioners

In California, the State government has acknowledged the unique environmental impacts of greenhouse gas emissions on climate change in the State. Governor Schwarzenegger, in his Executive Order S-3-05 issued on June 1, 2005, recognized the significance of the impacts of climate change on the State of California, noting that "California is particularly vulnerable to the impacts of climate change." The Executive Order goes on to list a number of direct impacts that climate change will have on the State:

•"[I]ncreased temperatures threaten to greatly reduce the Sierra snowpack, one of the State's primary sources of water;"

•"[I]ncreased temperatures also threaten to further exacerbate California's air quality problems and adversely impact human health by increasing heat stress and related deaths;"

•"[R]ising sea levels threaten California's 1,100 miles of valuable coastal real estate and natural habitats;" and

•"[T]he combined effects of an increase in temperatures and diminished water supply and quality threaten to alter micro-climates within the state, affect the abundance and distribution of pests and pathogens, and result in variations in crop quality and yield."

(Executive Order S-3-05, June 1, 2005.)

The California legislature also recognized all of these severe impacts resulting from climate change, as well as a "projected doubling of catastrophic wildfires due to faster and more intense burning associated with drying vegetation." (Stats. 2002, ch. 200, Section 1, subd. (c)(4), enacting Health & Saf. Code § 43018.5.) The State is already suffering from increasing rates of wildfires and indications of drought. Further, we experience trends toward warmer winter and spring temperatures, less snow because warmer temperatures cause more precipitation to fall as rain instead, earlier spring snowmelt, and earlier spring flower blooms. (CalEPA, Climate Action Team Report to Governor Schwarzenegger and the Legislature (2006), 19-20.) A decrease in vital water supplies, an increase in wildfires, threats to agricultural output in a state that leads the nation in production of fresh vegetables and specialty crops, a decrease in the tourism that depends on snowpack and healthy forests, more frequent and more intense heat waves and the ozone whose amount and effects they exacerbate - all these are serious threats to public health and welfare that have already begun to be felt in California and are expected to grow more and more serious throughout this century.

In addition to California, the other State Petitioners are feeling the impacts of climate change. Massachusetts has roughly 1,500 miles of coastline and Connecticut has over 618 miles of coastline, most of which is densely populated. Therefore, these states are particularly vulnerable to problems resulting from climate change, such as loss of coastal wetlands, erosion of beaches, saltwater intrusion of drinking water, and decreased longevity of low-lying infrastructure, because this part of the East Coast is low and sandy. (“Climate Change Massachusetts” (September 1997) EPA 230-F-97-008u, available at http://www.epa.gov last visited January 28, 2008); (“Climate Change Connecticut" (Sept. 1997) EPA 230-F-97-008g, available at http://www.epa.gov last visited January 25, 2008.)

Additionally, heat waves have become more prolonged and intense with global warming. (Center for Health and the Global Environment, Harvard Medical School, "Climate Change Futures: Health, Ecological and Economic Dimensions" (Nov. 2005) at 53.) In the United States, heat waves are the most prominent cause of weather-related mortality, exceeding the mortality rates for all other weather events combined. (S. A. Changnon, et al., "Impacts and Responses to the 1995 Heat Wave: A Call to Action," Bull. Am. Meteorol. Soc. 77: 1497-1506 (1996).) Reports indicate that the Mid-Atlantic Region, of which Pennsylvania is a large part, is

likely to experience hotter summer days and increased precipitation as a result of global warming, which could increase heat related mortality, ground-level ozone concentrations, storm water runoff, and negative impacts from erosion and invasive species. In addition, water quality, water quantity, cold water fisheries, and valuable hardwood trees could suffer. ("How Will Climate Change Affect the Mid-Atlantic Region?," EPA/903/F-00/002 (June 2001), http://nepis.epa.gov/EPA/html/Pubs/pubtitleOther.htm, last visited Jan. 25, 2008; and "Climate Change Impact on the United States: the Potential Consequences of Climate Variability and Change," Report to the US Global Change Research Program (2001), available at www.usgcrp.gov, last visited Jan. 25, 2008).

Rising temperatures also lead to increased air pollution levels, with their attendant increases in respiratory illness and death. (http://yosemite.epa.gov/OAR/globalwarming.nsf/contentlhealth.html.) The presence of groundlevel ozone in concentrations above the national ambient air quality standards has significant adverse health affects in nonattainment areas, including increased hospitalizations and mortality risk for people with asthma and other respiratory diseases. (EPA Climate Change Health Effects website, available at http://www.epa.gov/climatechange/effects/health.html, last visited January 10, 2008.) The two largest metropolitan areas in Pennsylvania are in nonattainment for the 8-hour national ambient air quality standard for ozone. (http://www.epa.gov/ozonedesignations/regions/region3desig.htm, last visited January 25, 2008.)

The Oregon legislature enacted a recent law (Oregon Laws 2007, Chapter 907) that recognizes that greenhouse gas emissions and climate change pose a serious threat to the economic well-being, public health, natural resources and environment of Oregon. For example, the legislature acknowledged that Oregon relies on snowpack for summer stream flows to provide energy, municipal water, watershed health and irrigation and that a potential rise in sea levels threatens Oregon's coastal communities. Reduced snowpack, changes in the timing of stream flows, extreme or unusual weather events, rising sea levels, increased occurrences of vector-borne diseases and impacts on forest health could significantly impact the economy, environment and quality of life in Oregon.

In New Jersey, the State government has also recognized the particular environmental impacts of greenhouse gas emissions on climate change in the State. On February 13, 2007, Governor Jon Corzine signed Executive Order No. 54, stating that "New Jersey is particularly vulnerable to the economic and environmental effects of climate change as a result of our coastal topography, coastline subsidence, and the high density of our coastal development." New Jersey has 130 miles of highly populated coastline as well as thousands of acres of coastal salt marshes and tidal flats, coastal wetlands, and tidal freshwater wetlands. Rising seas would inundate many acres of New Jersey's remaining coastal salt marshes and tidal flats that provide flood protection, water quality benefits, and habitat for native species; alter flooding and salinity of the State's coastal wetlands, with substantial adverse impacts on wildlife and fisheries; and risk inundation or chronic flooding within this century. (See Richard G. Lathrop Jr. and Aaron Love, "Vulnerability of New Jersey's Coastal Habitats to Sea Level Rise" (Jan. 2007), available at http://deathstar.rutgers.edu/projects/coastal/sealevel/report/Vulnerability%20of%20New%20Jers

ey%20coastal%20habitats.pdf; Matthew J.P. Cooper et al., “Future Sea Level Rise and the New Jersey Coast” (Nov. 2005), available at http://www.princeton.edu/~step/people/Oppenheimer%20Future%20of%20Sea%20Level%20Rise.pdf.) Climate-related habitat loss could lead to loss of plant and animal species, and eliminate at least 37 species of birds from New Jersey. (Suzanne Leta Lious et al., Environment New Jersey Research & Policy Center, “An Unfamiliar State, Local Impacts of Global Warming in Jew Jersey” (May 2007), available at http://www.environmentnewjersey.org/uploads/tv/pj/tvpju7CoS7Y50GLiuuxAlg/An-Unfamiliar-State---Local-Impacts-of-Global-Warming-in-New-Jersey.pdf). Natural ecosystems, water supply and agriculture are also likely to be affected by climate change. (http://www.nj.gov/dep/dsr/trends2005/pdfs/climate-change.pdf.).

California, Connecticut, Massachusetts, New Jersey, Oregon, and Pennsylvania face an immediate and growing threat from global warming, and have an immediate and vital interest in the expeditious and effective control of all sources of greenhouse gases.

D. Actions by California to Reduce Greenhouse Gas Emissions

In response to the threat of climate change, California is taking innovative steps to reduce its own contribution to global warming through very aggressive regulations to reduce greenhouse gas emissions. Most important, California has adopted a ground-breaking statute, the California Global Warming Solutions Act of 2006, commonly known as AB 32. Carrying out AB 32 will reduce California's greenhouse gas emissions to 1990 levels by 2020. This emissions cap translates into a reduction of approximately 29% from what emissions would be in California under a “business as usual” scenario. The bill directs the California Air Resources Board ("CARB") to publish a list of discrete early action greenhouse gas emission reduction measures that will be implemented by 2010. CARB must then adopt comprehensive regulations that will go into effect in 2012 to require the actions necessary to achieve the greenhouse gas emissions cap by 2020. The legislation also encourages entities to voluntarily reduce greenhouse gas emissions prior to 2012 by offering credits for early voluntary reductions.

Additionally, in January 2007, the Governor issued Executive Order S-01-07, establishing a Low Carbon Fuel Standard (LCFS) for transportation fuels sold in California. By 2020 the standard will reduce the carbon intensity of California's passenger vehicle fuels by at least 10 percent. CARB recently adopted additional "early action" greenhouse gas reduction measures, such as reduction of refrigerant losses from motor vehicle air conditioning systems, increased methane capture from landfills, cooler auto paints, and tire inflation requirements for motorists. (CARB, Proposed Early Actions to Mitigate Climate Change in California (Dec. 2007).)

California has the authority to regulate emissions from certain categories of nonroad engines. Section 209(e) of the CAA allows the State to seek to obtain a waiver from EPA to regulate emissions from nonroad engines and vehicles. However, a waiver cannot be sought for farm and construction equipment under 175 horsepower, which constitutes a sizeable portion of

all engines in this category. For this category of engine, only EPA has authority to regulate emissions. Moreover, a national standard is necessary for states that do not adopt any regulations promulgated by California.

California is continuing its historic role as a leader in air pollution control in the U.S. and is taking action to reduce emissions of greenhouse gas emissions from sources for which it is responsible. It now petitions the Administrator to take action nationally to regulate greenhouse gas emissions from nonroad vehicles and engines.

II. GREENHOUSE GAS EMISSIONS FROM NONROAD VEHICLES AND ENGINES

A. Nonroad Vehicles and Engines Covered by This Petition

Nonroad engines are widely used in a variety of equipment ranging from lawnmowers to all terrain vehicles. There are different ways to categorize and define nonroad vehicles and engines. According to the CAA, a nonroad engine is "an internal combustion engine (including the fuel system) that is not used in a motor vehicle or a vehicle used solely for competition..." (42 U.S.C. § 7550(10).) EPA's definition of nonroad vehicles and engines includes outdoor power equipment, recreational vehicles, farm and construction machinery, lawn and garden equipment, logging equipment, marine vessels, locomotives, and aircraft. (See, EPA Program Update: Reducing Air Pollution from Nonroad Engines, April 2003, EPA420-F-03-011.) EPA also employs the term "non-transportation mobile sources" to refer to a subset of nonroad vehicles and engines that are mobile but not used on a traditional road system. This category includes snowmobiles, golf carts, riding lawn movers, agricultural equipment and offroad trucks and vehicles, and excludes aircraft, rail and watercraft. The term "non-transportation mobile sources" does not capture the entire universe of nonroad vehicles and engines which are subject to this petition because it excludes non-mobile nonroad engines, such as outdoor lawn mowers, as well as garden, farm and construction equipment. This petition targets greenhouse gas emissions from the broadest definition of new nonroad vehicles and engines, but excludes aircraft, locomotives and vessels.

B. Greenhouse Gas Emissions from Nonroad Sources are Significant and Require Regulation

EPA has computed greenhouse gas emissions from nonroad sources nationally and found them to be substantial. According to EPA, in 2007, CO_2 emissions from the nonroad sector totaled 220,145,231 tons/year. (See Figure 1.) Construction and mining equipment accounted for the largest share (32%) of the total CO_2 emissions from nonroad sources, followed by agricultural equipment, industrial equipment and lawn and garden equipment. (Id.) Because EPA does not currently regulate greenhouse gas emissions from any nonroad engines, growth in the use of these engines will result in increased emissions. EPA estimates that nonroad engine use will increase across the board by 2010. (See Nonroad Engine Growth Estimates, EPA 420-P-04-008, April 2004 at 5, Table 1.)

2007 U.S. Emissions: Non-road Sector	CO_2 tons/year	Percent Total
Agricultural Equipment	43,627,556	19.8%
Airport Equipment	1,068,325	0.5%
Commercial Equipment	18,046,747	8.2%
Construction and Mining Equipment	70,413,126	32.0%
Industrial Equipment	30,645,516	13.9%
Lawn and Garden Equipment	26,212,514	11.9%
Logging Equipment	2,117,651	1.0%
Pleasure Craft	17,399,940	7.9%
Railroad Equipment	266,237	0.1%
Recreational Equipment	10,347,620	4.7%
Total: All Categories	220,145,231	100%

Figure 1: Nationwide Nonroad CO_2 Emissions in 2007. Calculations by Western Environmental Law Center using EPA's NONROAD emissions model.

A recent EPA Report focusing on the segment of the nonroad engine population called "non-transportation mobile sources" shows that emissions from non-transportation mobile sources constitute the majority of nonroad emissions-- approximately 191.8 Tg[4] Carbon Dioxide Equivalent in 2005. (See, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, Annex 3, at A-125.) As discussed above, non-transportation mobile sources include vehicles that are used outside of traditional road systems, and have utility associated with their movement but do not have a primary purpose of transporting people, such as snowmobiles, riding lawn mowers, agricultural equipment and trucks used for off-road purposes. (See, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, Annex 3, A-104, fn 30 & A-124.) To put this number in perspective, this amount alone exceeds total U.S. greenhouse gas emissions from aircraft.[5] As the EPA itself noted, "[T]ogether, these sources emitted more greenhouse gases than boats and ships (domestic travel in the United States), rail, and pipelines combined." (Id.) EPA data show that emissions from non-transportation mobile sources are rising, increasing

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[4]Tg stands for a teragram, which is a value of 10^{12} g.

[5]U.S. greenhouse gas emissions from aircraft did not increase as much as other categories of transportation because of a sharp decrease in emissions from military aircraft (50%) coupled with a modest increase in commercial aircraft (16%). (See, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, Annex 3, A-125.)

approximately 49% between 1990 and 2005. (Id.) This is a more significant increase than emissions for both on-road vehicles and aircraft which grew by 32% and 4% respectively between 1990 and 2005. (Id., at Table A-108: Total U.S. Greenhouse Gas Emissions from Transportation and Mobile Sources, at A-126.)

C. Consistent with the National Data, Data from California Show Greenhouse Gas Emissions from Nonroad Sources are Significant and Increasing

Similarly, CARB calculated the California statewide annual average for CO_2 emissions from nonroad sources in California in 2007 to total approximately 20,887,052 tons/year. (See Figure 2.) Consistent with the trend seen in the national EPA data, CARB found that construction and mining equipment contributed the largest portion of nonroad CO_2 emissions, with 9,165,627 tons/year. (Id.) CARB further found that agricultural equipment accounted for 3,291,317 tons/year and industrial equipment contributed 2,311,948 tons/year of CO_2 statewide in 2007. (Id.)

Class	CO_2 tons per year
Agricultural Equipment	3,291,317
Airport Ground Support Equipment	317,222
Construction and Mining Equipment	9,165,627
Dredging	4,8243
Entertainment Equipment	2,0702
Industrial Equipment	2,311,948
Lawn and Garden Equipment	613,299
Light Commercial Equipment	1,094,498
Logging Equipment	278,506
Military Tactical Support Equipment	3,2867
Oil Drilling	96,0921
Other Portable Equipment	2,950
Pleasure Craft	1,666,101
Railyard Operations	279
Recreational Equipment	161,357
Transport Refrigeration Units	921,280
Total	**20,887,116**

Figure 2: Statewide Annual Average Emissions for California based on CARB's OFFROAD2007 Model,

[6] **Calculations by David Chou, Manager of the Off-Road Inventory and Assessments Section at CARB.**[7]

Emissions from nonroad vehicles are also increasing in California. CARB data show that between 1990 and 2007, the largest increases in greenhouse gas emissions from nonroad vehicles came from construction and mining equipment, followed by industrial equipment, pleasure craft and recreational equipment. (See Figure 3.)

CLASS	1990 Statewide Annual Average Emission for California (CO_2 tons per year) Based on OFFROAD2007	2007 Statewide Annual Average Emission for California (CO_2 tons per year) Based on OFFROAD2007	Percentage Increase
Construction and Mining	5,942,353	9,165,627	35%
Industrial equipment	2,098,363	2,311,948	9%
Pleasure craft	1,111,757	1,666,101	33%
Recreational Equipment	108,467	161,357	33%

Figure 3: Comparison of 1990 and 2007 Statewide Annual Average Emission for California (tons per day) based on CARB's OFFROAD2007 Model, Calculations by David Chou, Manager of the Off-Road Inventory and Assessments Section at CARB

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[6] CARB's OFFROAD2007 Model is available at http://www.arb.ca.gov/msei/offroad/offroad.htm, last visited January 3, 2008.

[7] EPA's NONROAD model does not exactly track all categories in CARB's OFFROAD2007 model, though some categories are similar. EPA's NONROAD model is a generic model that applies to all 50 States. CARB's OFFROAD model was designed to be specific to California (e.g., population of equipment, activity, emission factors).

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III. LEGAL BASIS FOR ACTION BY EPA

A. Regulatory Authority

1. EPA Has the Authority to Regulate Nonroad Greenhouse Gas Emissions

EPA has the authority to regulate emissions from nonroad vehicles and engines. If EPA determines that pollutants from these sources may endanger public health or welfare, EPA is authorized to regulate these emissions. (CAA § 213(a)(4).) Section 213 of the CAA, 42 U.S.C.§ 7547, subdivision (a)(1), directs EPA "to determine if [] emissions [from nonroad vehicles] cause, or significantly contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." Subsection (a)(2) specifically requires EPA to study and if appropriate, regulate the impacts of nitrous oxide, carbon monoxide or volatile organic compounds ("criteria pollutants"). (42 U.S.C. § 7547(a)(2), (3).) However, under subdivision (a)(4), if EPA determines that nonroad vehicle and engine emissions not referred to in subsection 2 "significantly contribute to air pollution[,]" the Administrator may adopt standards to reduce such emissions. (42 U.S.C. § 7547(a)(4).) Accordingly, Congress has clearly authorized EPA to both study and regulate other emissions, such as greenhouse gas emissions, from nonroad vehicles and engines.

EPA completed its CAA § 213 Report for nonroad engines in 1991.[8] The 1991 EPA Report examined a variety of air pollutants emitted from nonroad vehicles and engines, including nitrogen oxide, hydrocarbons, carbon monoxide and particulate matter, but did not measure greenhouse gas emissions. (Nonroad Engine and Vehicle Emission Study Report, EPA-21A-2001or EPA460/3-91-02, November 1991, available at http://www.epa.gov/nonroad/, last visited December 17, 2007.) In the study, EPA determined that nonroad vehicle and engine emissions significantly contributed to excessive levels of ozone and carbon monoxide in more than one non-attainment area. (59 Fed Reg. 31306, 31307 (June 17, 1994).) Following the study, EPA imposed regulations to limit emissions of criteria pollutants from nonroad sources. (Reducing Air Pollution from Nonroad Engines, EPA 420-F-03-011, April 2003, available at http://www.epa.gov/nonroad/, last visited December 18, 2007.) At present, EPA has not conducted a comprehensive study of greenhouse gas emissions from nonroad vehicles and engines and has not promulgated any regulations to curb greenhouse gas emissions from these sources. Only recently, to comply with Mass v. EPA, EPA initiated the process of making an endangerment determination for greenhouse gas emissions from motor vehicles.

2. Greenhouse Gas Emissions from Nonroad Vehicles and Engines Endanger Health and Welfare

CAA, §213(a)(4), authorizes EPA to regulate nonroad sources of pollutants other than criteria pollutants that endanger public health and welfare. (CAA, §213(a)(4).) The Supreme

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[8]EPA, "Nonroad Engine and Vehicle Emission Study," No. 460/3-91-02 (Nov. 1991).

Court recently ruled in Mass v. EPA, supra, that greenhouse gas emissions from vehicles are pollutants under the CAA and may be regulated by EPA. In the time that has elapsed since that landmark ruling, it has become even more clear that greenhouse gas emissions endanger every aspect of public health and threaten human "welfare" as Congress defined the term in the statute, including "effects on soils, water, crops vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being, whether caused by transformation, conversion or combination with other air pollutants." CAA §302(h), 42 U.S.C. §7602(h), Mass v. EPA at 1447. Given the range and severity of the possible impacts to public health and welfare from rising greenhouse gas levels generally and emissions from nonroad vehicles and engines specifically, regulatory control of greenhouse gas emissions from this equipment is within EPA's authority.

B. EPA Should Regulate Greenhouse Gas Emissions from Nonroad Sources to Protect Public Health and Welfare

In Mass v. EPA, the Supreme Court determined that greenhouse gases are "pollutant[s]" under the CAA. The Supreme Court read the term "pollutant" in section 202 as "sweeping" in its definition and fully broad enough to encompass not only the traditional criteria pollutants, such as ozone and particulate matter, but "all airborne compounds of whatever stripe," and broad enough to cover greenhouse gases. (127 S.Ct. at 1460.) The argument that greenhouse gases are not "pollutants" under the CAA has been soundly rejected.

Section 213 provides that EPA "may" promulgate standards applicable to emissions from nonroad vehicles and engines. Finally, EPA's discretion whether to limit greenhouse gas emissions from nonroad vehicles is not unlimited. See Mass v. EPA at 1462 (EPA's reasons for inaction must conform to the authorizing statute). EPA's discretion is also defined by the structure of the CAA itself. The CAA gives States the primary responsibility for pollution prevention. Yet States' ability to regulate emissions from vehicles, including nonroad vehicles, has been limited by Congress in favor of federal regulation which currently prohibits California and other States from directly regulating new construction or agricultural emissions from nonroad engines under 175 horsepower, and constrains their ability to regulate emissions above 175 horsepower. (CAA § 209(e).) By preventing States from undertaking their traditional police power role in regulating pollution, Congress has implicitly invested EPA with the responsibility to act to prevent harmful emissions.

To comply with Mass v. EPA, EPA is conducting an endangerment determination and proceeding with its rulemaking to regulate greenhouse gas emissions from motor vehicles. (72 Fed.Reg. 69934 (December 10, 2007)). The endangerment determination will conclude that these emissions endanger public health and welfare. EPA should also promulgate regulations to reduce greenhouse gas emissions from nonroad vehicles and engines.

IV. TECHNOLOGY IS AVAILABLE TO REDUCE GREENHOUSE GAS EMISSIONS FROM NONROAD VEHICLES AND ENGINES

Technology is available to reduce greenhouse gas emissions from nonroad vehicles and engines.[9] The available technology includes both physical and operational controls that are directed towards fuel savings and/or aim to limit pollutants. The following are possible measures:

•Measures to reduce idling, such as adopting anti-idling standards, including automatic engine shutdown systems;

•Measures that increase electrification in vehicles, such as diesel to electric conversion or replacement, including for port support, hauling, goods movement and ground service vehicles and equipment; truck refrigeration; forklifts; tow tractors/industrial tugs; carts and lawn and garden equipment; agricultural pump stations; sweepers/scrubbers; burnishers; or as auto-therm engine recovery systems for heating a cab, relying on an electric pump instead of the engines' water pump;

• Measures to increase fuel economy, such as use of low-carbon fuels, taking account of whole life-cycle greenhouse gas emissions;

• Use of standard hybrid or hydraulic-hybrid technology for large nonroad vehicles;

• Repowering to increase engine efficiency (outright replacement) of older engines;

• Use of low viscosity lubricants;

• Use of low greenhouse gas refrigerants in air conditioning equipment;

• Evaporative emissions controls in off-highway recreation vehicles, reducing ozone precursor emissions;

• Use of so called "cool paint" - a reflective coating on trucks and truck cabs which keeps

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[9] Available technology is discussed in California Air Resource Board, Proposed Early Actions to Mitigate Climate Change in California (April 20, 2007) and Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration (September 2007, both available at http://www.arb.ca.gov/cc/ccea/ccea.htm (last visited Dec. 20, 2007); U.C. Berkeley Transportation Sustainability Research Center, A Low-Carbon Fuel Standard for California: Part 1:Technical Analysis, 174-78 (May 29, 2007); conversation with AG's Office and Scott Rowland, Manager Off-Road Controls Section Mobile Source Control Division, California Air Resources Board (January 3, 2008).

the inside cooler and reduces the use of air conditioning;

• Use of lighter materials for ATVs and boats;

• Voluntary measures, such as encouraging more consumer outreach programs/incentives, such as, lawnmower trade-in programs designed to replace an outdated fleet more rapidly.

In addition to these measures, other greenhouse gas emissions reduction techniques are available. Moreover, Congress intended the CAA to be a technology-forcing statute - as held in Train v. Natural Resources Defense Council, 421 U.S. 60 (1975) - and EPA can and should consider control measures that force the development of new technology. EPA acknowledges that it has authority to adopt technology-forcing standards under §213 ("the Agency is not limited to in identifying what is 'technologically feasible' as what is already technologically achieved." (70 Fed. Reg. at 69677.) Given the diversity of nonroad vehicles and engines, EPA's regulations can promote a wide variety of technological improvements in these sources.

RELIEF REQUESTED

Petitioners respectfully request that the Administrator:

(1) Make a determination that greenhouse gas emissions from nonroad vehicles and engines significantly contribute to air pollution that may reasonably be anticipated to endanger public health and welfare;

(2) Propose and adopt regulations setting standards for greenhouse gas emissions from nonroad vehicles and engines under Section 213 of the Clean Air Act, 42 U.S.C. § 7547, such standards to take the form of emissions limitations, of work or operational practices;

(3) Propose and adopt such regulations, e.g., regulations specifying fuel type, as are necessary to carry out the emissions limitations adopted pursuant to the requests above.

We request that the Administrator take initial action within six months of receipt of this petition.

Dated: January 29, 2008

Respectfully submitted,

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