# BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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November 12, 2003

Dr. Phillip K. Hopke, Chair
Clean Air Science Advisory Committee
EPA Science Advisory Board

**Re: Review of the Air Quality Criteria Document for Particulate Matter: Fourth External Review Draft and Draft PM Staff Paper and Risk Assessment**

I appreciate the opportunity to address this distinguished committee today. I am Louis A. Zeller, director of the Clean Air Campaign of the Blue Ridge Environmental Defense League (BREDL). I have been on the staff of BREDL since 1986. I have worked on air pollution issues during most of that time. My work for BREDL includes extensive investigation of permitting for a wide range of emission sources including coal-fired power plants, incinerators, and many other industrial sources of criteria and hazardous air pollutants. Our work on asphalt plant air pollution has earned us national and international attention. We have done air pollution policy advocacy and public education and have participated in rulemaking processes in several states and at the federal level. Before coming to BREDL I worked as a physician assistant at a rural primary care clinic in western North Carolina. Blue Ridge Environmental Defense League is a non-profit, grassroots organization founded nearly 20 years ago by people of the Blue Ridge. Since then, we have expanded to serve communities all over Virginia, North Carolina, Tennessee, and South Carolina.

BREDL submitted comments during the EPA's 1997 rulemaking on ozone and particulate matter standards. We called for the strictest standards for the protection of human health and welfare. Subsequently, the EPA adopted a new National Ambient Air Quality Standards for PM-2.5: an annual standard of 15 micrograms per cubic meter ($g/m^3$) and a 24-hour standard of 65 $g/m^3$. However, these standards are inadequate. Under the rule adopted by EPA, violation of the annual standard is based on three years of data and spatial averaging; the 24-hour standard is violated only when recorded PM-2.5 data over a three year period exceed the average of the $98^{th}$ percentile. Although EPA estimates that 15,000 lives could be saved annually, these standards have not been implemented. I am here today to ask: Why not?

The Health Effects Institute reassessed the studies which resulted in the 1997 PM-2.5 standard and verified that tens of thousands of people die annually from the pollutants that cause haze. Haze is caused by fine particles in the atmosphere and obscures mountain vistas. Sulfur dioxide (SO2) and nitrogen oxides (NOx) emissions create droplets of acidic sulfates and nitrates which result in this deadly haze.

New research shows that air pollution can be linked to birth defects, asthma attacks, heart disease, and lung cancer. According to the EPA, asthma among children increased from 5.8% in 1990 to 7.5% in 1995. Pittsylvania County, Virginia and Caswell County, North Carolina are ranked number 1 in the nation for asthma mortality rates.

The EPA has indicated that 395 counties will not meet the new PM-2.5 standard. This figure is based on counties with monitors. More counties are probably not meeting the standards. As yet we do not have enough monitors to confirm it.

New evidence on the dangers o0f fine particle pollution continues to mount. On March 6, 2002 the *Washington Post* reported:

> A study published in today's issue of the Journal of the American Medical Association concludes that people living in the most heavily polluted metropolitan areas have a 12 percent increased risk of dying of lung cancer than people in the least polluted areas. The study's authors said that exposure to the tiny particles of industrial emissions and sulfate pollutants is comparable to inhaling second-hand smoke from a cigarette. (1)

I have attached to these remarks a copy of a report published by the American Heart Association in 2001 detailing the clinical investigation by the Harvard School of Public Health. They found short duration, transient increases in concentrations of PM-2.5 increase the risk of myocardial infarction and conclude that, "As a consequence, 24-hour averages might underestimate the association between air pollution and acute cardiovascular events." (2)

Dr. Ravindra Nadkarni submitted comments on the EPA's particulate matter and ozone rulemaking in 1997. I have excerpted below the segment of his written statement relevant to PM-2.5 standards under discussion today:

> Fine particulates in the micron or sub-micron range can be inhaled deep into the lungs all the way into the walls of the alveoli, the grape-like clusters at the end of the air passages in the lungs. The absorption of oxygen and the rejection of carbon dioxide takes place on the walls of the alveoli, which have to be wet at all times for this exchange to take place. This wet film contains strong emulsifiers such as lecithin that will dissolve most particulates. The chemicals released through this dissolution rapidly enter the blood stream. This fact is well known to medical science and has been used to rapidly deliver all types of drugs to the blood stream. For example, the inhaler used to counter an attack of asthma relies on this.
>
> My point here is that the body considers each inhaled particle a separate source of irritation, therefore the regulatory standards should also follow this approach and **consider regulating PM-2.5 not by weight but by the number of particles captured in that size range**. The following example will illustrate my point.
>
> Consider a single particle just under 10 microns in diameter, therefore meeting the PM-10 criterion. A thousand particles of size 1 micron would weigh as much as this particle or a 1,000,000 particles of 0.1 micron size will weigh the same. However, their physiological effects are quite different. The 10 micron particle will not penetrate deep into the lungs and will be expelled through coughing or by blowing the nose. The finer particles will penetrate deeply and result in a 1,000 to 1,000,000 sources of irritation.

> There is automated instrumentation available that can measure particle sizes and plot particle size distributions by weight or number and so on. This instrumentation is used in the industry to characterize powders and pigments and also used to control grinding and fine milling circuits through a feedback control loop. Thus, it will be easy to characterize the PM-2.5 sample collected by particle size, number count, etc. I strongly urge the EPA to incorporate this measurement technique into the PM-2.5 standard. (3)

We agree with Dr. Nadkarni's recommendation that the EPA should adopt a protocol for chemical characterization of the fine particles. Speciation would allow research linking health effects to specific chemicals in the fine particles and consequently to the source of the pollutant.

The CACAC should recommend to the EPA the most protective standards to protect sensitive individuals including children, the elderly and individuals with heart and lung disease. Attached to these remarks is a list of principles which we have adopted and which we encourage this committee to consider. The BE SAFE campaign is a national effort to bring about a new paradigm for protecting our citizens and the natural world. BE SAFE stands for Blueprint Ensuring Our Safety And Future Economy. The BE SAFE platform states:

> In the 21st century, we envision a world in which our food, water and air are clean, and our children grow up healthy and thrive. Everyone needs a protected, safe community and workplace, and natural environment to enjoy. We can make this world vision a reality. The tools we bring to this work are prevention, safety, responsibility and democracy.

Our goal is to prevent pollution and environmental destruction before it happens. The first principle is to heed early warnings: Government and industry have a duty to prevent harm, when there is credible evidence that harm is occurring or is likely to occur -- even when the exact nature and full magnitude of harm is not yet proven.

On behalf of the Blue Ridge Environmental Defense League, I ask the committee to heed the voices of our most vulnerable citizens, the elderly and the young, and to ignore the siren song of the electric utilities, the fossil fuel industry, and other industry groups who's counsel is always delay. More study without action will yield more sickness and more death. We call for a strengthening of the existing PM-2.5 standard. We ask the CASAC to recommend a 12 $g/m^3$ annual standard based on its latest review, to lower the 24-hour limit and to set a new one-hour standard; further, we ask that the EPA move ahead with designation of non-attainment areas for this dangerous pollutant as soon as possible.

Thank you.

## Footnotes

1. Study Ties Pollution, Cancer Risk, Eric Pianin, *Washington Post*, Wednesday, March 6, 2002; Page A1

2. Increased Particulate Air Pollution and the Triggering of Myocardial Infarction; Peters, Dockery, et al; *Circulation*, 2001;103:2810

3. Letter to Carol Browner, EPA Administrator; Re: EPA Dockets A-95-54, A-95-58, A-96-61, A-95-38; R. Nadkarni; January 21, 1997

## Attachments

Increased Particulate Air Pollution and the Triggering of Myocardial Infarction; Peters, Dockery, et al; *Circulation*, 2001;103:2810

Letter to Carol Browner, EPA Administrator; Re: EPA Dockets A-95-54, A-95-58, A-96-61, A-95-38; R. Nadkarni; January 21, 1997

BE SAFE Platform and Principles

*Circulation*. (2001;103:2810.)


*Clinical Investigation and Reports*

*http://circ.ahajournals.org/cgi/content/abstract/103/23/2810*

# *Increased Particulate Air Pollution and the Triggering of Myocardial Infarction*

***Annette Peters, PhD; Douglas W. Dockery, ScD; James E. Muller, MD; Murray A. Mittleman, MD, DrPH***

*From the Department of Environmental Health (A.P., D.W.D.) and Department of Epidemiology (M.A.M.), Harvard School of Public Health; the Division of Cardiology, Massachusetts General Hospital, Harvard Medical School (J.E.M.); and the Institute for Prevention of Cardiovascular Disease, Cardiovascular Division, Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School (M.A.M.), Boston, Mass; and the Institute of Epidemiology, GSF-National Research Center for Environment and Health, Neuherberg, Germany (A.P.).*

*Correspondence to Annette Peters, PhD, GSF-National Research Center for Environment and Health, PO Box 1129, 85758 Neuherberg, Germany.*

***Background*—Elevated concentrations of ambient particulate air pollution have been associated with increased hospital admissions for cardiovascular disease. Whether high concentrations of ambient particles can trigger the onset of acute myocardial infarction (MI), however, remains unknown.**

***Methods and Results*—We interviewed 772 patients with MI in the greater Boston area between January 1995 and May 1996 as part of the Determinants of Myocardial Infarction Onset Study. Hourly concentrations of particle mass <2.5 μm ($PM_{2.5}$), carbon black, and gaseous air pollutants were measured. A case-crossover approach was used to analyze the data for evidence of triggering. The risk of MI onset increased in association with elevated concentrations of fine particles in the previous 2-hour period. In addition, a delayed response associated with 24-hour average exposure 1 day before the onset of symptoms was observed. Multivariate analyses considering both time windows jointly revealed an estimated odds ratio of 1.48 associated with an increase of 25 $\mu g/m^3$ $PM_{2.5}$ during a 2-hour period before the onset and an odds ratio of 1.69 for an increase of 20 $\mu g/m^3$ $PM_{2.5}$ in the 24-hour period 1 day before the onset (95% CIs 1.09, 2.02 and 1.13, 2.34, respectively).**

***Conclusions*—The present study suggests that elevated concentrations of fine particles in the air may transiently elevate the risk of MIs within a few hours and 1 day after exposure. Further studies in other locations are needed to clarify the importance of this potentially preventable trigger of MI.**

***Key Words: myocardial infarction • air pollution • heart disease • epidemiology***

***January 21, 1997***

***To**: Carol Browner*
***Administrator, U.S. EPA***
***401 M Street SW***
***Washington DC 20460***

***Attention**: EPA Dockets A-95-54, A-95-58, A-96-61, A-95-38*

***Subject:** Expanded Comments of Dr. Ravindra M. Nadkarni at the Boston Public Hearing of January 14, 1997*

***Qualifications***

***My name is Ravindra M. Nadkarni. I received a Ph.D. in Metallurgy & Ceramic Engineering from the University of Utah. I have about 35 years of broad industrial experience. The first part was with the international research and consulting firm of Arthur D. Little, Inc. Starting as a member of the Professional Staff, I became Vice President, Energy Technology and then Vice President, Chemical & Metallurgical Engineering. In the latter role, I was in charge of the company's technical activities in the process industries, supervising a group of about 45 professionals. My consulting work involved numerous projects for the metals, chemical, biotechnology and energy industries, for private clients and for government agencies such as the EPA. These projects ranged from development or evaluation of new technology, project economics and feasibility analysis, market studies, evaluation of alternative energy sources, the evaluation of economic impact of pollution control regulations through econometric modeling, air and water pollution control technology, environmental policy, conversion of coal and biomass to alternate fuel forms and resource recovery from solid wastes. From 1983 until retirement, I was associated with the precious metal industry as a V.P.,General Manager of a research company and a General Manager of a major precious metal refinery.***

***Over the years, I have authored/coauthored over 70 professional papers or presentations. These have included subjects such as precious metals processing, strategic materials, recycling, resource recovery from wastes, economic impact of pollution control regulations (work which directly resulted in Section 119 of the Clean Air Act), several reports for the EPA on New Source Performance Standards and economic impact of effluent limitation guidelines for controlling pollution from the non-ferrous industry, production of conventional and non-conventional fuels (such as coal gasification and liquefaction), slurry transportation and so on. I have edited two books. I hold many patents in the chemical processing and pollution control fields.***

***I am currently the Chairman of the Board of Health in the town of Wrentham, MA.***

***My comments will cover various topics where I believe my background knowledge and understanding will be helpful to the EPA in promulgating the final regulations.***

***The relevance of statistical association:***

***Many individuals from affected industries have argued recently that statistical association between the health effects of air pollution and the presence of pollutants such as fine particles and ozone is not medical proof of cause and effect. Unfortunately, the same argument has been used in the past to discredit the association between smoking and lung cancer (starting around the time that the Surgeon General required labeling - around 1964) and with asbestos. The final proof was discovered later after many years of research but, in the area of public health, a statistical association is sufficient to act to prevent unnecessary deaths.***

***Do the current standards protect public health?***

***Many in the industry have also argued that current standards are sufficient to protect public health. There is much evidence that this is not so. Reported incidents of asthma and other forms of respiratory distress jump up rapidly on days when ozone concentrations are high but still below the short term standards. If these standards were sufficient, this association between the frequency of such distress and the higher levels of ozone would not exist.***

***It is important that the EPA make its standard strong enough so that it protects not only the healthiest parts of the population but also its weakest and most vulnerable. The most vulnerable groups are the elderly, the children, particularly those with asthma, people with heart and lung disease and even healthy people that exercise outdoors.***

***Asthma***

***An article in the AAAS Journal Science published earlier this month notes that the incidence of asthma has doubled in the last 20 years. The article proposes a hypothesis that this increase in severity and prevalence of asthma can be explained by a decline in childhood infections of diseases such as TB or whooping cough. They hypothesize that without such infections, the immune system is not trained and not as robust. The implications of this study are that inner cities, with their poorer populations and higher rates of infectious diseases, would have a much lower incidence of asthma and other respiratory distress and that the more affluent suburbs, with their lower incidence of childhood diseases, would have a higher incidence of asthma. Unfortunately, data collected by the Boston Board of Health and Hospitals (and I am sure data collected around any urban center) contradicts this hypothesis. The Boston data shows that the rate of such respiratory distress is about 3.5 times higher in the inner city than in the suburbs.***

***The importance of controlling fine particulates***

***Fine particulates in the micron or sub-micron range can be inhaled deep into the lungs all the way into the walls of the alveoli, the grape-like clusters at the end of the air passages in the lungs. The absorption of oxygen and the rejection of carbon dioxide takes place on the walls of the alveoli, which have to be wet at all times for this exchange to take place. This wet film contains strong emulsifiers such as lecithin that will dissolve most particulates. The chemicals released through this dissolution rapidly enter the blood stream. This fact is well known to medical science and has been used to rapidly deliver all types of drugs to the blood stream. For example, the inhaler used to counter an attack of asthma relies on this. Recreational drugs such as tobacco/nicotine, cocaine, etc. are smoked so that the active alkaloids enter the blood stream through the lungs. This delivery system has even been used in chemical warfare. Because nerve agents are gases at ambient temperatures, they can be effectively absorbed on activated charcoal and an activated charcoal mask would prevent a soldier from inhaling this nerve gas. In order to break through this barrier, these gases have been mixed with a sub-micron particulate emetic. These emetic particles are not adsorbed on the charcoal and break through the filter to be inhaled deep into the lungs. The emetic cause the person to throw up and remove the mask when it fills up. This then allows the nerve gas to do its "job". I am using this example to illustrate that masks with activated carbon canisters or with particulate filters do not capture sub-micron particles and that these particles are best controlled at the source.***

***The effects of sub-micron particles*** ***(Docket A-96-51 and A-95-54)***

***In the previous paragraph, I mentioned that sub-micron particles are dangerous because a) they penetrate deep in the lungs, and b) because they are readily dissolved by body fluids. In many cases, the particles are insoluble in bodily fluids. They stay embedded and cause irritation at the site where they are lodged. If this irritation persists and the particles are not dislodged over time, scar tissue develops which impairs the lung function and capacity. Many occupational diseases are a result of this type of reaction. Examples are black lung in coal miners, asbestosis in workers handling asbestos, etc. It should be noted that while hard rock miners have always inhaled more than their share of silica, the incidence of silicosis increased dramatically with the introduction of the pneumatic drill because this drill produced many sub-micron particles of rock. The incidence of silicosis decreased only after the widespread use of water for dust control during drilling.***

***My point here is that the body considers each inhaled particle a separate source of irritation, therefore the regulatory standards should also follow this approach and consider regulating PM-2.5 not by weight but by the number of particles captured in that size range. The following example will illustrate my point.***

> ***Consider a single particle just under 10 microns in diameter, therefore meeting the PM-10 criterion. A thousand particles of size 1 micron would weigh as much as this particle or a 1,000,000 particles of 0.1 micron size will weigh the same. However, their physiological effects are quite different. The 10 micron particle will not***

*penetrate deep into the lungs and will be expelled through coughing or by blowing the nose. The finer particles will penetrate deeply and result in a 1,000 to 1,000,000 sources of irritation.*

*There is automated instrumentation available that can measure particle sizes and plot particle size distributions by weight or number and so on. This instrumentation is used in the industry to characterize powders and pigments and also used to control grinding and fine milling circuits through a feedback control loop. Thus, it will be easy to characterize the PM-2.5 sample collected by particle size, number count, etc. I strongly urge the EPA to incorporate this measurement technique into the PM-2.5 standard.*

*In addition, EPA should consider a protocol for chemical characterization of the fine particles. Such characterization (speciation) will enable further research in linking health effects to specific chemicals in the fine particles and the source of this pollution.*

*<u>Other comments on the proposed particulate health standard</u> (Docket A-95-54)*

*I strongly believe that EPA should adopt the most protective standards to protect sensitive individuals such as children and the elderly and individuals with heart and lung disease. It is important that the standards include a margin of safety. I have the following specific suggestions in addition that those in the previous paragraph.*

*<u>24-hour PM-10 standard:</u> This standard should not be weakened by allowing 98 percentile compliance averaged over three years. This will allow more exceedances than is allowed under the present standard and may result in several Western cities achieving an "attainment" status. It would be preferable if EPA adopted the California standard or, at the very least, maintain the current standard.*

*<u>24-hour PM-2.5 standard:</u> I consider the 50 ug/m3 standard to be extremely weak, both in terms of the permissible level as well as the form of the measurement. I suggest the following changes.*

1. *Set the standard at 25 ug/m3.*
2. *Drop the 98-percentile compliance method and allow instead one exceedance per year.*
3. *Consider a standard based on the permissible number of PM-2.5 particles rather than the weight of such particles, for reasons discussed in the previous section.*
4. *Do not use spatial averaging for the annual PM-2.5 standard. There are three problems with spatial averaging. First, it creates a low bias in the recorded results. For example, if a point source is surrounded by instruments, the instrument downwind of the source will show a higher pollutant level than the instrument upwind. Averaging these readings is meaningless since it reveals more information about wind direction than about actual emissions. Second, a single high reading would reveal a hot spot requiring more investigation. Spatial averaging will not yield this information. Third, if a second exceedance triggers a non-attainment status,*

*it provides an incentive for controlling emissions at the source. Spatial averaging, with its built in low bias, does nothing to create this incentive to control emissions.*

5. *Measure compliance with the PM-2.5 standard based on 1 year's worth of data.*

*<u>Ozone Health Standard</u> (Docket A-95-58)*

1. *Retain the current 1-hour standard of 124 ppb.*
2. *Tighten the 8-hour standard to 65 ppb based on a single exceedance per year.*
3. *Don't allow rounding up of the standard to 85 ppb before a violation is registered.*

*<u>Monitoring Methods and Strategies for PM-2.5</u> (Docket A-96-51)*

1. *Characterize PM-2.5 by a number count, which is the correct way to understand its physiological effects, rather than by weight, as discussed in an earlier section.*
2. *Characterize PM-2.5 in terms of the chemical composition of the collected particles, as discussed earlier.*
3. *Every day monitoring should be required.*
4. *More monitors must be used, at least twice or three times the current level, and they must be sited in the most polluted areas.*

*Overall, I strongly applaud EPA for its attempts at tightening the Clean Air Act requirements in this area and my major complaint is that EPA is not going far enough.*

*While EPA deserves "bouquets" for its efforts in this area, I am afraid that I also have to hurl a "brick bat" at the EPA for allowing the emissions of fine particulates, rich in carcinogenic polycyclic aromatic hydrocarbons from hot-mix asphalt plants.*

*According to EPA-published data in AP-42, "Compilation of Air Pollutant Emission Factors", there are about 3600 asphalt plants in the U.S. At an asphalt plant, sand and crushed stone are dried in a rotary dryer and then the hot liquid asphalt is mixed with the hot rock. This mixture, called hot mix or hot mix asphalt (HMA), is then loaded onto trucks for transport to wherever it is needed in road surfacing. All asphalt plants are in the open and the truck loading area is also in the open ,or, in very few instances, inside a shed with side walls and a roof, but open in the front and the back. During truck loading, the hot mix drops from the mixer or from a storage silo on to the truck bed, falling through a distance of 10 to 20 feet. During this free fall, there is intimate contact between the loose hot mix and the surrounding air. Volatile components of asphalt evaporate and create large clouds of hydrocarbons. A part of the volatilized hydrocarbons are light hydrocarbons (VOCs) which will not condense. The major portion, about 70%, are heavier hydrocarbons which evaporate around the operating temperature of 300 - 350 degrees F and condense in the ambient air as sub-micron particles. These condensed*

*particles form a stable aerosol, known in the trade as "blue smoke". Since the blueness of the smoke is a result of Raleigh scattering, I expect the particle size to be between 0.1 to 0.5 microns, although I have not seen any data on actual measurements. I have submitted calculations to the EPA Office of Air Quality Planning and Standards (OAQPS) in RTP, based on data collected in EPA's own labs. EPA felt that they preferred that anything published in AP-42 should be based on a measurement in the field and not be based on any calculation, even if it relied on data measured in their own labs. I and my colleagues, a citizen group called Coalition Against Asphalt Plant (CAAP), agreed that a measurement was preferable to calculations but that the field measurements should be planned with input from outside citizen groups to ensure that the measurements were correctly done and that erroneous measurements were not used to define policy in an area with important health consequences. EPA agreed to such involvement in planning the test.*

*Three months ago, while we were waiting for a preliminary test plan to review, the industry lobby group, National Asphalt Pavement Association (NAPA) had already conducted a test at an undisclosed California facility. They presented the results of this test to EPA and EPA has already decided to incorporate these results in the forthcoming edition of AP-42. Many people outside of EPA-OAQPS have reviewed the NAPA report and have concluded that the test was poorly conducted, and the measurements were imprecise and unsupervised. In one case, pollutant concentration was higher downstream of a pollution control device than the upstream measurements. Another objection was that the fan which should have collected all of the fugitive emissions at truck loadout could not possibly have collected all the fugitive emissions. Several Boston area engineers/scientists and interested citizens have observed an almost identical facility with the same sized fan in Rochester MA which at best collected 20% of the fugitive emissions at truck loadout. Finally, the first sampling point was over 60 feet from the fugitives collection point. This means that all readings had a low bias because of condensation of heavier hydrocarbons in the duct. A scientist at EPA Region I's Office of Environmental Measurement and Evaluation stated in his report that "The test was apparently intended to demonstrate the control efficiency of a "Smog Hog" electrostatic precipitator system for total particulate matter and total hydrocarbons (light hydrocarbons). The test results presented were not intended for and are not suitable for the development of asphalt load-out emission factors." Yet, EPA-OAQPS appears to be ready to publish these questionable results in the form of emission factors.*

*We find it incredible that EPA would accept such suspect data from a lobby group, go back on its promise to involve citizen groups who brought this issue to EPA's attention in the first place, and then rush to publish these results in AP-42 in an attempt to "nip in the bud" the external review process. We already know of one case, in Vermont, where EPA-OAQPS has already leaked the results of the California "stealth" test, improperly hastening the issuance of the air permit by the State Air Pollution Agency.*

*There is considerable data in the literature on the carcinogenic constituents of asphalt fume as well as the higher incidences of various types of cancer in asphalt workers. I hope that EPA's efforts at controlling fine particulates are not restricted to a few industries such*

***as electric power plants, but are across the spectrum of all industries that generate fine particulates and ozone precursors***

# *Environmental Health Alliance*

## *Blueprint Ensuring Our Safety And Future Economy*

## *BE SAFE Platform*

***In the 21st century, we envision a world in which our food, water and air are clean, and our children grow up healthy and thrive. Everyone needs a protected, safe community and workplace, and natural environment to enjoy. We can make this world vision a reality. The tools we bring to this work are prevention, safety, responsibility and democracy.***

***Our goal is to prevent pollution and environmental destruction before it happens. We support this precautionary approach because it is preventive medicine for our environment and health. It makes sense to:***

***_ Prevent pollution and make polluters, not taxpayers, pay and assume responsibility for the damage they cause;***

***_ Protect our children from chemical and radioactive exposures to avoid illness and suffering;***

***_ Promote use of safe, renewable, non-toxic technologies; and***

***_ Provide a natural environment we can all enjoy with clean air, swimmable, fishable waters, and stewardship for our national forests.***

***We choose a "better safe than sorry" approach motivated by caution and prevention.***
***We endorse the common-sense approach outlined in the Blueprint's four principles listed below.***

## *BE SAFE Platform Principles*

### *HEED EARLY WARNINGS*

***Government and industry have a duty to prevent harm, when there is credible evidence that harm is occurring or is likely to occur -- even when the exact nature and full magnitude of harm is not yet proven.***

### *PUT SAFETY FIRST*

***Industry and government have a responsibility to thoroughly study the potential for harm from a new chemical or technology before it is used -- rather than assume it is harmless until proven otherwise. We need to ensure it is safe now, or we will be sorry later. Research on impacts to workers and the public needs to be confirmed by independent third parties.***

### *EXERCISE DEMOCRACY*

***Precautionary decisions place the highest priority on protecting health and the environment, and help develop cleaner technologies and industries with effective safeguards and enforcement. Government and industry decisions should be based on meaningful citizen input and mutual respect (the golden rule), with the highest regard for those whose health may be affected and for***

***our irreplaceable natural resources - not for those with financial interests. Uncompromised science should inform public policy.***

## *CHOOSE THE SAFEST SOLUTION*

***Decision-making by government, industry and individuals must include an evaluation of alternatives, and the choice of the safest, technically feasible solutions. We support innovation and promotion of technologies and solutions that create a healthy environment and economy, and protect our natural resources.***

***http://www.washingtonpost.com/wp-dyn/articles/A44143-2002Mar5.html***

# *Study Ties Pollution, Cancer Risk*

***By Eric Pianin***
***Washington Post Staff Writer***
***Wednesday, March 6, 2002; Page A1***