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February 10, 2006

Docket ID No. EPA-HQ-OAR-2001-0017

Mr. Stephen L. Johnson, EPA Administrator
Environmental Protection Agency
Mailcode: 6102T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

SUBJECT: COMMENTS ON U.S. EPA PROPOSED RULE: NATIONAL AMBIENT AIR QUALITY STANDARDS FOR PARTICULATE MATTER – *FEDERAL REGISTER*, JANUARY 17, 2006

Dear Administrator Johnson,

Thank you for providing the nation with an opportunity to submit comments and additional information prior to your final decision on the rule for a particulate matter (PM) National Ambient Air Quality Standard (NAAQS). The Great Basin Unified Air Pollution Control District is a local air district in eastern California that enforces air regulations in Alpine, Inyo and Mono Counties. **Great Basin has the dubious distinction of being home to two of the largest single sources of particulate matter air pollution in the country: Owens and Mono Lakes**. We hope that because of this you will give our comments more than due consideration. Our comments and data relate primarily to thoracic coarse particles. We provide general comments on the proposed rule, we answer your solicitation for comments on specific aspects of the rule and we provide detailed comments on portions of the draft proposal.

SUMMARY OF COMMENTS AND REQUESTS OF THE ADMINISTRATOR

1. Air pollution from windblown dust at Owens and Mono Lakes make these lake beds the largest sources of particulate matter air pollution in the United States. The proposed NAAQS PM rule must include protection from windblown dust at Owens and Mono Lakes.

2. During development of the 1990 Clean Air Act amendments, the U.S. Congress specifically required control of the air pollution from Owens and Mono Lakes. The proposed NAAQS PM rule must be amended to carry out Congress' directives.

3. At some extreme level, even "rural" dust must be harmful. The extreme dust levels in the Great Basin Unified Air Pollution Control District require an amendment to the proposed NAAQS PM rule to include protection from the windblown dust at Owens and Mono Lake and any other areas of the country that experience elevated dust levels.

4. It is possible for "rural" dust to contain naturally occurring toxic materials. The windblown dust from Owens and Mono Lake contains elevated levels of arsenic, cadmium, nickel and sulfate salts. Because of these toxic materials, the proposed NAAQS PM rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas, as well as anywhere people are exposed to toxic dust, regardless of the population count.

5. The proposed NAAQS PM rule is not a "National" standard if air pollution is excluded from regulation based on population and not health or toxic threat. The proposed PM rule discriminates against areas of the country that have harmful dust but not large populations—this is a 14th Amendment "equal protection" and an environmental justice issue. The proposed NAAQS PM rule must be amended to protect rural populations from toxic air pollution.

6. The proposed NAAQS PM rule would protect only about two percent of the country's land mass and only 63 percent of the population. 103 million people and over 3.5 million square miles would not be protected from elevated levels of harmful coarse PM.

7. EPA approved the 1998 SIP for the Owens Valley Non-Attainment Area. The proposed NAAQS PM rule must make provisions for preserving the progress that has been made at Owens Lake.

8. Section 172(e) of the Clean Air Act requires "no backsliding." The EPA Administrator must provide for equivalent controls for non-attainment areas (like Owens and Mono Lakes) which are not less stringent than controls applicable to areas designated non-attainment prior to any modification of the NAAQS. The proposed NAAQS PM rule must be amended to require coarse PM controls in all existing PM_{10} non-attainment areas.

9. Dust storms from Owens Lake are a threat to operations at the U.S. Navy's China Lake Naval Air Weapons Station and are therefore a threat to national security. The proposed NAAQS PM rule must be amended to require coarse PM controls in the Owens Valley non-attainment area.

10. Three Class I national parks and four Class I wilderness areas, which are granted special air quality protections in the federal Clean Air Act, are adjacent to the Owens and Mono Lakes non-attainment areas. Windblown dust from Owens and Mono Lakes can impact the air quality in these national parks and wilderness areas. The proposed PM NAAQS

rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas in order to protect these natural resources.

11. We support retaining the PM_{10} standard and subtracting $PM_{2.5}$ values greater than 35 $\mu g/m^3$. This standard should apply everywhere this number is greater than 70 $\mu g/m^3$, or some other number equivalent to the protection that the PM_{10} standard currently gives. Otherwise, there will be the possibility of backsliding in much of the country.

12. The use of the 98th percentile form of both the $PM_{2.5}$ and $PM_{10-2.5}$ standards is not appropriate, because it allows 21 days of harmful high values every three years. This may bring protection to regions where levels are nearly the same every day, but it denies protection in areas that have episodic, but health-threatening air pollution events.

GENERAL COMMENTS

The air pollution levels at Owens and Mono Lakes are the Highest in the U.S.

One hundred years ago Owens and Mono Lakes were two of the largest natural lakes in California. They are both saltwater terminal lakes—freshwater flows into them but only leaves through evaporation. The small amounts of chemicals contained in the fresh inflow waters are left behind as water evaporates and over thousands of years these chemicals have concentrated and made the lakes very salty—more than twice as salty as seawater. During the first part of the 20th century the City of Los Angeles obtained the rights to much of the freshwater supplies in eastern California and diverted waters destined for Owens and Mono Lakes into the Los Angeles Aqueduct and south to their growing city. The water diversions cut off inflows to the lakes and by the mid-1920s Owens Lake was essentially dry and by 1980 Mono Lake was over 50 feet lower than it had been in 1920.

The City of Los Angeles' water diversions caused the lake levels to drop and the sediments on the beds of Owens and Mono Lakes became exposed and subject to wind erosion. The resulting dust storms are the worst source of PM_{10} in the United States, both in terms of maximum levels of 24-hour PM_{10} values and in terms of total tons emitted per year. Since 2000 the highest annual 24-hour PM_{10} values have ranged from 5,500 to 21,000 $\mu g/m^3$ at Owens Lake and from 987 to 10,500 $\mu g/m^3$ at Mono Lake. Owens Valley is currently classified as a "Serious" PM_{10} nonattainment area and Mono Basin is classified as "Moderate." The State Implementation Plans (SIPs) for these two sources estimate that prior to placement of dust controls, Owens Lake emitted over 80,000 tons of PM_{10} per year and Mono Lake emitted 5,700 tons annually (Great Basin, 2003 and Great Basin, 1995).

The attached tables summarize the highest levels of PM_{10} measured in the U.S. for each year between 2000 and 2004. It can be seen that **of the 100 highest "dusty days" that occurred in the entire U.S. during that 5-year period, 99 of the days occurred at Owens and Mono Lakes**.

In addition to extreme PM_{10} levels, the standard is exceeded on a frequent basis in the eastern Sierra. **During the 5-year period from 2000 through 2004, the federal 24-hour PM_{10} standard of 150 $\mu g/m^3$ was violated on 247 days in the Owens Valley and Mono Basin non-attainment areas**. That is 14 percent of the time or an average of **seven weeks per year**.

During large dust storms, the air pollution at Owens and Mono Lakes is dominated by coarse ($PM_{10-2.5}$) material. Often, more than 90 percent of the total PM_{10} is composed of $PM_{10-2.5}$ and less than ten percent of the total is composed of $PM_{2.5}$. Monitoring at Owens Lake shows that the area would be in attainment for the proposed $PM_{2.5}$ standard. In addition, Owens and Mono Lakes are located in eastern California, which is sparsely populated—an estimated 40,000 people are affected by the PM_{10} emissions, including the residents of five federally-recognized Indian tribes. Therefore, because the dust is coarse and the exposed population is less than 100,000, the proposed PM NAAQS would simply redefine the extreme dust emissions from Owens and Mono Lakes as "not air pollution" and the federal PM standards would not provide the protection intended by Congress (as well as the protection that 40,000 people deserve). The proposed rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas.

Congress has specifically required control of the air pollution from Owens and Mono Lakes

In their Committee Reports for the 1990 Clean Air Act Amendments both the U.S. Senate and U.S. House of Representatives agreed that the dust from the exposed beds of Owens and Mono Lake is anthropogenic (human-caused) and these air pollution sources required controls. The Committee Reports (excerpts attached) stated:

> The term "anthropogenic source" includes sources that are indirectly created by human activity as well as those that are the direct result of such activity. An example of a source indirectly created by human activity are the dust storms that are generated from the dry lake beds at Owens and Mono Lakes in California. These dust storms, which have resulted in the highest PM-10 levels in the country, are a result of the diversion of water that would normally flow into the lakes. The diversion has exposed alkali lake beds which have been the source of severe dust storms that have created PM-10 concentrations that exceeded levels measured in forest fires. **Measures to control PM-10 from sources such as these must be developed and implemented**, and waivers of the requirements in subpart 4 of the Act, applicable to PM-10 nonattainment areas, are not available in these cases. (U.S. Senate, 1989) [emphasis added]

and

> The term "anthropogenic sources" is intended to include activities that are anthropogenic in origin. An example of such sources is the dry lake beds at Owens and Mono Lakes in California, which give rise to dust storms that are a result of the diversion of water that would otherwise flow to such lakes and should be considered anthropogenic sources. (U.S. House of Representatives, 1990)

The proposed rule must be amended to carry out a specific directive from the U.S. Congress. The proposed rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas.

At some level, even "rural dust" must be harmful

Although the EPA contends that windblown, agricultural and mining dusts are not harmful, there can be no argument that at some high concentration, even these dusts will cause adverse health effects. The few health studies that have been conducted where wind-blown dust was at least

some part of the total dust component looked at 24-hour concentrations of at most only a few hundred micrograms per cubic meter (Schwartz, et al., 1999 and Ostro et al., 2003). Twenty-four-hour PM_{10} concentrations at Owens and Mono Lakes can be 10 to more than 100 times the standard (24-hour values have been greater than 20,000 $\mu g/m^3$). These levels of PM_{10} are surely harmful, even on an episodic basis. A local health survey of people exposed to the Owens Lake dust storms found that a large number of people reported significant respiratory-related symptoms during and after the dust storms. This survey did not seek out cases where exposure may have resulted in death, so mortality statistics are not available. (Kittle, 2000; see attached) The extreme levels experienced by residents in the Great Basin Air Pollution Control District require an amendment to the proposed rule to include these extreme sources in order to protect our health.

<u>All dust, including "rural" dust, is NOT created equal</u>

The EPA argues in the proposed rule that there is an intrinsic difference between the coarse dust created in cities with more than 100,000 people (urban dust) and the dust generated in areas with less than 100,000 people (rural dust). That may very well be true, even if the EPA's distinction between urban and rural (100,000 people) is completely disconnected from the mechanisms that cause dust. However, it is certainly true that there are differences in the chemical compositions of coarse dusts generated in different rural areas. Because Owens and Mono Lakes are both saltwater terminal lake basins (water flows in, but only leaves through evaporation), the chemicals naturally found in their sediments are concentrated many times above the natural levels found in upland areas. For example, the PM_{10} generated at Owens Lake contains naturally-elevated levels of the metals arsenic (greater than 250 ppm), cadmium (greater than 50 ppm) and nickel ($\approx$ 40 ppm) and it contains extremely high levels of sulfate salts (greater than 17%). Sulfate concentrations over 100 $\mu g/m^3$ have been measured at Owens Lake. (Chester LabNet, 1996, Great Basin, 2003). These are precisely the type of particles that the EPA contends can "influence health responses" (proposed rule, *Federal Register*, page 2627). They are also the type of particles that the proposed rule will protect urban residents from.

The 14th Amendment to the U.S. Constitution guarantees "equal protection of the laws" to all citizens. Thus, air pollution that would be considered hazardous, and therefore regulated, in a populous city (like Los Angeles) should be equally regulated in a rural community (like the Owens Valley). We argue that our "rural dust" is every bit as toxic, and possibly even more toxic, than most "urban dusts." Yet, because the dust does not directly affect more than 100,000 people and is not caused by urban processes, we are denied the protection provided by the Clean Air Act (and the Constitution) to more populated areas. If Owens or Mono Lakes were located in Los Angeles, the extreme PM_{10} levels and toxics would require these problems to be controlled. It is only because we do not have a large population that the proposed standard would deny our protection. The coarse dust from our dried lake beds is extreme and toxic; it must be controlled—why should it matter that less than 100,000 people are affected? The proposed rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas, as well as in all rural communities threatened by toxic dust, regardless of the source.

The National Ambient Air Quality Standards are "National" standards that should protect ALL Americans—the proposed rule is illegal in that it does not provide equal protection

On page 2665 of the proposed rule it states: "the Administrator provisionally concludes that the current suite of PM_{10} standards should be revised, and that the revised standard(s) should provide more targeted protection from short-term exposure to those thoracic **coarse particles that are of concern to public health**." [emphasis added] We argue that the coarse particles emitted from the dried beds of Owens and Mono Lakes are a serious public health threat and that, even though only about 40,000 people live in the area most affected by the dust, the new standards must provide us with protection from these epic sources of particulate matter air pollution. This is an environmental justice issue—by defining air pollution on the basis of population and not on the severity or toxicity of the air pollution, the proposed standards discriminate against areas of the country that have health-harming dust, but not large populations.

If the coarse PM standard is applied, as proposed, only to urbanized areas with greater than 100,000 people, **the new coarse standard would protect about two percent of the country's land mass and 63 percent of the population** (2000 U.S. Census data calculation, attached). This means that over 98 percent of the U.S. (3.5 million square miles) and more than 103 million people would not be protected from elevated levels of potentially harmful coarse PM. Again, this would seem to be a violation of the 14th Amendment which guarantees equal protection to all. Every American has a right to breathe clean air. The proposed rule must be amended to include coarse PM protection for all Americans, not just those living in large cities.

Progress has been made and must continue

In 1998 the EPA approved a PM_{10} State Implementation Plan for the air pollution from Owens Lake—the largest single source of particulate matter air pollution in the country. In 2000 the City of Los Angeles began solving the problem by constructing Best Available Controls Measures on the lake bed. By the end of 2006 the City of Los Angeles will have spent about $415 million to control annual PM_{10} emissions of over 80,000 tons and they will have constructed control measures on 30 square miles (19,000 acres) of emissive lake bed. This is an area almost half the size of Washington, D.C. In addition, the controls have been cost-effective. We estimate that final controls will cost on the order of $1,000 per ton—reasonable PM_{10} controls adopted by the South Coast AQMD (Los Angeles) range as high as $13,400 per ton (South Coast, 2003). The cost per ton for control of windblown dust in the San Joaquin Valley Unified APCD ranges from $7,700 to $65,000 per ton (San Joaquin, 2003).

Our current dust control efforts at Owens Lake are well on the way toward eliminating this enormous source of air pollution. But, it is an enormous problem and it will take time for us to be successful. However, now in 2006 the EPA is proposing to revise the coarse PM standard to redefine the toxic dust emissions from Owens Lake as "not air pollution." The proposed standard must make provisions for preserving the progress that has been made to date. It must also provide a means to finally solve the PM problems at Owens and Mono Lakes.

The federal Clean Air Act requires that there be no backsliding

Section 172(e) of the Clean Air Act (42 USC 7502) is known as the "no backsliding" provision of the Act. It reads as follows:

> 172(e) Future modification of standard
> If the Administrator relaxes a national primary ambient air quality standard after November 15, 1990, the Administrator shall, within 12 months after the relaxation, promulgate requirements applicable to all areas which have not attained that standard as of the date of such relaxation. Such requirements shall provide for controls which are not less stringent than the controls applicable to areas designated nonattainment before such relaxation.

Completely eliminating PM_{10} requirements in non-attainment areas and areas with approved PM_{10} SIPs is certainly "relaxing" the PM_{10} standards in those areas. Applying the new coarse $PM_{10-2.5}$ indicator to only communities greater than 100,000 people is relaxing protections for those that live in communities of less than 100,000. Unilaterally eliminating windblown, agricultural and mining dusts from the PM standards, without specifically studying the impacts of such an action, is also a relaxation on the previous PM protections which included those types of dust. Therefore, according to Section 172(e) the Administrator must provide for equivalent controls for those nonattainment areas (like Owens and Mono Lakes) that will be affected by the new standard. The proposed rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas, as well as in all other currently designated PM_{10} non-attainment areas in the nation.

The PM_{10} from Owens Lake is a national security concern

The U.S. Navy's China Lake Naval Air Weapons Station lies immediately adjacent to Owens Lake. A portion of the base even lies within the Owens Valley serious non-attainment area. According to the attached letter from the base commander, "China Lake is the Navy's largest land holding, and its premier land range for the test and evaluation of weapons systems, training, Navy research and development, and modeling and simulation applications." (U.S. Navy, 1996, attached) The commander goes on to say that "good visibility is a resource which we at China Lake consider to be 'critical' to our ability to perform these test and evaluation activities on our ranges." In short, the China Lake NAWS is an important national defense facility and it is an important element of the United States national security infrastructure.

On occasion, tests at the base must be cancelled due to dust storms from Owens Lake. This costs the Navy and/or its customers direct losses of approximately $10,000 to $50,000 per day per test. According to the Navy, the dust storms "can lead to the cancellation of several tests per day and can last for one to two days, or occasionally longer." Therefore, in addition to the potential health impacts to Navy personnel, their families and their community, we argue that the dust storms from Owens Lake are a threat to national security. This type of impact was not even considered by the EPA during the development of the proposed particulate matter rules. The proposed rule must be amended to require coarse PM controls in the Owens Valley non-attainment area.

PM_{10} from Owens and Mono Lakes impacts Class I wilderness areas

Class I federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protections in the federal Clean Air Act. Section 169A(a)(1) of the Act states:

> Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.

Three Class I national parks (Yosemite, Sequoia and Kings Canyon) and four Class I wilderness areas (Hoover, John Muir, Ansel Adams (formerly Minaret) and Dome Land) are within or immediately adjacent to the Owens and Mono Lake non-attainment areas. In addition to the designated Class I areas, Death Valley National Park and two more recent wilderness areas (Golden Trout and South Sierra) are adjacent to the Owens Lake non-attainment area. These natural areas are unique national resources that deserve protection from man-made sources of air pollution, yet the proposed rule eliminates protections because less than 100,000 people live in the non-attainment areas. This is surely not what Congress intended when the Clean Air Act was enacted. The proposed rule must be amended to require coarse PM controls in the Owens Valley and Mono Basin non-attainment areas and in all other rural areas where Class I areas may be threatened.

Great Basin supports an unqualified $PM_{10-2.5}$ indicator (page 2674)

The $PM_{10-2.5}$ discussion states "The limited available information is not sufficient to define an indicator for thoracic coarse particle solely in terms of metrics other than size-differentiated mass, such as specific chemical components." (page 2665, point 4). The present attempt to define a PM standard by composition, as well as size, when the data are not there to determine precisely what composition causes the health effects will certainly lead to a situation of reduced health protection for most of the United States, and should be abandoned. We support retaining the PM_{10} standard and subtracting $PM_{2.5}$ values greater than 35 $\mu g/m^3$. This standard would apply everywhere this number is greater than 70 $\mu g/m^3$, or some other number equivalent to the protection that the PM_{10} standard currently gives. Otherwise, there will be the possibility of backsliding in much of the country.

The 98^{th} percentile form does not protect areas subject to episodic elevated PM levels

The Great Basin Air Pollution Control District opposes the use of the 98^{th} percentile form of both the $PM_{2.5}$ and $PM_{10-2.5}$ standards because it allows 21 days of harmful high values every three years. This may bring protection to regions where PM levels are nearly the same every day, but it denies protection in areas that have episodic, but health-threatening air pollution events (e.g. Donora, Pennsylvania in 1948 and the London "fog" in 1952). In the Great Basin District, we have ski areas with wood smoke problems that are aggravated by inversion weather conditions and influxes of skiers on winter weekends. Elevated PM levels can occur on holiday weekends when the resorts are full of skiers, yet protections would no longer be required since the three-year average of the eighth-high day may meet the standard.

CONCLUSION

The proposed PM rule must be amended to include clean air protections for the millions of Americans that live in rural areas who are potentially exposed to health-threatening levels of coarse particulate matter air pollution. In particular, the proposed rule must be amended to provide for the Congressionally-mandated control of PM from the dried beds of Owens and Mono Lakes—the largest single sources of PM air pollution in the country.

Thank you for the opportunity to comment on this important issue.

Sincerely,

Theodore D. Schade
Air Pollution Control Officer

Enclosures:

- Detailed comments
- References
- Highest 24-hour PM_{10} values in the U.S. – 2000 through 2004
- Congressional committee reports excerpts
- U.S. Navy, 1996
- Kittle, 2000
- 2000 U.S. Census data calculation

cc: Wayne Nastri, EPA Region 9 Administrator
Catherine Witherspoon, California Air Resources Board
U.S. Senator Barbara Boxer
U.S. Senator Dianne Feinstein
U.S. Congressman Howard "Buck" MeKeon
Calif. Senator Dean Florez
Barbara Lee, California Air Pollution Control Officer's Association

DETAILED COMMENTS

Notes:
1. Page numbers refer to the *Federal Register*, Volume 71, Number 10, January 17, 2006.
2. Quotes from the proposal with bold and/or underlined text have been added for emphasis.

Page 2655 – The proposed rule states, "…coarse particulate metals appeared to have a role in cytotoxicity effects (Monn and Becker, 1999)." Owens and Mono Lakes dust contains naturally elevated levels of the metals arsenic (greater than 250 ppm), cadmium (greater than 50 ppm) and nickel (≈ 40 ppm), which can be expected to cause the referenced "cytotoxicity effects," yet the rural exemption for $PM_{10-2.5}$ would not provide protection to residents living in these areas. (Chester LabNet, 1996).

Pages 2657, 2660 and 2664 – The discussion of results from studies in California's Coachella Valley, Phoenix, Reno, Anchorage and Tucson concludes that coarse particles in these western cities either caused or contributed to the observed PM_{10} respiratory and cardiovascular associations (Ostro et al., 2003, Mar et al., 2003, Chen et al., 2000, Choudhury et al., 1997 and Schwartz, 1997). It is likely that significant portions of the coarse particles in these cities were generated by dust from "crustal materials." This is especially true in the Coachella Valley and Phoenix, which exceed the current PM_{10} standards and are desert areas subject to high winds and high levels of wind-blown dust—just like the Owens Valley and Mono Basin. The proposed rule states on page 2664: "This group of studies provides additional supportive evidence for associations between short-term exposure to thoracic coarse particles and health effects, particularly morbidity effects, generally in areas not meeting the PM_{10} standards." **This argues for including the Owens Valley and Mono Basin in the list of those areas that will need to meet the new $PM_{10-2.5}$ standard**.

Page 2658 – the results from only one study of the impact of storm events and health effects in Spokane (Schwartz, et al., 1999) were used to conclude that $PM_{10-2.5}$ is "not likely associated with mortality." It's wrong to focus on the mortality statistics in the case of the Spokane study, since most people who may be sensitive to dust (and especially those who might die) seek shelter and protection during dust storms. Experience has shown that dust storms are generally not invisible events. Unlike ozone, CO and fine particle episodes, people are usually well aware of their exposure to elevated PM_{10} levels during dust storms. This "run and hide" effect during dust storms biases the statistics. As shown by our Owens Lake health effects study, high levels of PM from dust storms is associated with adverse respiratory health effects. (Kittle, 2000) Another point about the Spokane study is that the average PM level was only 221 $\mu g/m^3$ higher on dust storm days than on other study days. It is not appropriate for EPA to extend health effects conclusions from this low concentration study to areas with much higher concentrations, such as the Owens Valley and Mono Basin where PM_{10} concentrations were measured as high as 5,000 to 20,000 $\mu g/m^3$ between 2000 and 2004.

Page 2658 – The proposal states:

> Coarse particles are generally not distributed over broad areas, but rather reflect contributions from more localized sources, **thus it is more difficult than for fine particles to generalize the results of these studies to areas with other types of sources**.

The District would agree with this statement. We argue that our extremely high 24-hour PM_{10} values (as high as 5,500 to 21,000 $\mu g/m^3$ between 2000 and 2004), our relatively frequent number of exceedances (a total of 247 days exceeding the 24-hour standard between 2000 and 2004 at Owens and Mono Lakes), and the dangerous toxics (arsenic, cadmium, nickel and sulfates) naturally contained in our wind-blown rural dust argue for providing protection for our residents, even though the number of people effected is less than 100,000.

Page 2663 – The proposal states:

> …coarse particles in urban areas can contain all of the components found in more rural areas, but be contaminated by a number of additional materials, from motor vehicle-related emissions to metals…

Dusts containing toxic metals are not exclusive to urban areas. Rural-sourced dust can certainly contain elevated levels of metals, as evidenced by the naturally occurring toxic metals found in Owens Lake PM emissions (see our comment above). Rural dust by its nature is not necessarily non-toxic.

Pages 2665 through 2668 – Partial quotes from these pages read:

> "…the Staff Paper notes that there appears to be clear distinctions between (1) the character of the ambient mix of particles **generally found in urban areas** as compared to that found in nonurban and, more specifically, rural areas, and (2) the nature of the evidence concerning health effects associated with thoracic coarse particles **generally found in urban versus rural areas**." (page 2665)
>
> "…monitoring information indicates that exposures to thoracic coarse particles **tend to be higher in urban areas** than in nearby rural locations." (page 2665)
>
> "…the mix of thoracic coarse particles **typically found in urban areas** contains a number of contaminants that are **not commonly present** to the same degree in the mix of natural crustal particles that is **typical of rural areas**." (page 2665)
>
> "Epidemiologic studies that have examined exposures to thoracic coarse particles **generally found in urban environments**, together with studies that have taken into account exposures to natural crustal materials **typical of rural areas**, **generally support** the view that the mix of thoracic coarse particles **generally found** in urban areas is of concern to public health, in contrast to natural crustal dusts of geologic origin." (page 2666)

The poet William Blake (1757-1827) said, "To generalize is to be an idiot. To particularize is the alone distinction of merit." The words "generally," "tend," "commonly" and "typical" are used over and over (more than 35 times) in this section of the proposal. The EPA is using "general" conclusions to justify dropping protections for rural areas from coarse PM air pollution. Residents in some rural areas have "particular" problems with toxic crustal dust and we expect the PM NAAQS to protect us from this type of air pollution. Particularly, the coarse PM emitted from the dried beds of Owens and Mono Lakes contains high levels of toxic materials, exceedances of the 24-hour standard are frequent, and the PM_{10} levels are extreme. The proposed rule needs to be amended to protect all Americans from these particular types of air pollution.

Page 2666 – Three studies (Schwartz et al., 1999, Gordian et al., 1996; and Ostro et al., 2000) are cited to conclude that "these studies provide no suggestion of significant health effects from uncontaminated natural crustal materials that would typically form a major fraction of coarse particles in non-urban or rural areas." The Ostro study does conclude that crustal dust caused health impacts in California's Coachella Valley. However, these three studies are not evidence that all rural dust is not harmful to health. Much more research needs to be conducted before protections for rural areas are abandoned. The proposed rule needs to acknowledge and provide protections for rural areas with known toxic dusts, like Owens and Mono Lakes.

Page 2666 – The proposal quotes from the Criteria Document:

> Certain classes of ambient particles appear to be distinctly less toxic than others and are **unlikely** to exert human health effects **at typical ambient exposure concentrations** (or perhaps only under special circumstances). For example, particles of crustal origin, which are predominately in the coarse fraction, are **relatively non-toxic under most circumstances**, compared to combustion-related particles (such as from coal and oil combustion, wood burning, etc.) However, **under some conditions, crustal particles may become sufficiently toxic to cause human health effects**. (EPA, 2004, p. 8-344)

PM_{10} emissions from the dried bed of Owens and Mono Lakes are not "typical" or "non-toxic" and the extreme concentrations measured at these sources would certainly qualify as "some conditions" under which crustal particles are "sufficiently toxic to cause human health effects." Yet the proposed rule would define the emissions from these lake beds as "not air pollution" and would provide no protection for humans, animals or plants in the area.

Page 2667 – The proposal states:

> Given the apparent differences in composition and in the epidemiologic evidence, the Staff Paper concludes that **it is not appropriate to generalize** the available evidence of associations with health effects that have been related to thoracic coarse particles generally found in urban areas and apply it to the mix of particles typically found in nonurban or rural areas (EPA, 2005a, p. 5-57).

The EPA feels that it is not appropriate to generalize health effect associations between urban and rural areas, but that it is appropriate to generalize all rural dust as being the same. The absurdity of this logic needs no further comment.

Pages 2667 – The proposal states that:

> [The $PM_{10-2.5}$] indicator would also be consistent with an appropriately cautious interpretation of the epidemiologic evidence that does not potentially over-generalize the results of the **limited available studies**.

In a written statement to the *Los Angeles Times* published on January 18, 2006, EPA spokesman John Millett said the new rule was based on "thorough consideration of **thousands of studies** of the health effects of particulate matter."

Are there "limited" studies or are there "thousands"?

Page 2667 – The proposal states:

> Further, most CASAC Panel members concurred that "the **current scarcity of information on the toxicity of rural dusts** makes it necessary" for EPA to base its standard for thoracic coarse particles "on the known toxicity of urban-derived coarse particles."

The "known toxicity" of urban dusts and the "scarcity of information on the toxicity of rural dusts" lead the EPA to simply abandon protections for rural dust. Apparently the EPA believes that lack of proof of health impacts is the same as proof of lack of health impacts. Again, this logic needs no additional comment.

Page 2667 – The proposal states that:

> the Administrator notes that identifying it as an "urban" thoracic coarse particle indicator could be misconstrued as meaning that the standard is limited to certain geographic locations and, thus, not a national standard.

Developing a $PM_{10-2.5}$ standard and then applying it only to communities with populations of 100,000 or more is not a national standard. Applying it on the basis of population alone ignores those rural dust sources that contain toxics every bit as dangerous as those found in "urban dust." The proposed coarse standard applies to about two percent of the country's land mass and abandons protections for 100 million Americans. This can hardly be called a "National" Ambient Air Quality Standard.

Page 2668 – The proposal states:

> The regulation for the proposed thoracic coarse particle indicator states that "[a]gricultural sources, mining sources, and other similar sources of crustal material shall not be subject to control in meeting this standard." This proposed language reflects that the information supporting the proposed standard for thoracic coarse particles does not support extending controls to thoracic coarse particles from agricultural, mining sources, and other similar sources of crustal material. This statement in the regulations therefore is designed to make clear that **there is no need nor basis to control these sources to obtain the public health benefits intended by the proposed indicator**.

So, the proposed indicator is only intended to provide public health benefits from coarse PM sources that are not agricultural- or mining-derived. The proposed $PM_{10-2.5}$ standard will indeed then provide these "public health benefits" to urban areas. What the rule does not say is that the proposed standard does not provide any protection for rural areas from public health threats due to toxic pesticides, herbicides, metals and natural toxic materials contained in rural dust. There simply has not been enough research to conclude that all windblown, agricultural and mining dusts are not health threatening (nor would common sense indicate that this is the case).

Page 2668 – The Administrator solicits comment in reference to the inclusion of urban-derived dusts and the exclusion of windblown, agricultural and mining dusts:

> Although the Administrator believes that an indicator qualified through reference to these categories and named sources appropriately identifies the ambient mixes that the epidemiologic studies indicate are of concern to public health, **he solicits comment as to whether there may be other classes of sources which should also be included or excluded from the indicator**. More generally, comment is also solicited on the approach of defining the indicator in terms of both particle size and categories of named sources.

The Great Basin Unified Air Pollution Control District requests that the Administrator include all types of dust in the coarse standard, but especially dusts with known toxics such as those found at Owens and Mono Lakes.

Page 2669 – The proposal states:

> In making this recommendation, CASAC notes that the use of [the 98th percentile form] will tend to minimize "measurement error and spatial variability, which are larger for coarse-mode particles than for fine PM" as well as "the influence in arid areas of **occasional but extreme excursion contributions from rural, coarse-mode dust sources that <u>are thought to be inherently less toxic</u>** than coarse-mode particles heavily enriched with urban source contaminants" (Henderson, 2005b).

The CASAC admits that arid areas have "occasional but extreme" dust levels, but that these should be ignored because they "are thought to be inherently less toxic" than dust in urban areas. At Owens and Mono lakes we present examples of dusts that are possibly even more toxic than most urban dusts, yet the proposed standard would not provide any protection from these sources. On page 2622 of the proposal it states,

> The requirement that primary standards include an <u>adequate margin of safety</u> was intended to address uncertainties associated with inconclusive scientific and technical information available at the time of standard setting. It was also intended to provide a <u>reasonable degree of protection against hazards</u> that research has not yet identified.

Standards that are required to include an "adequate margin of safety" and a "reasonable degree of protection" against unknown hazards cannot be set based on the general assumption of no adverse impact to rural areas.

Page 2674 – The proposal states:

> …another view that the Administrator takes note of would place greater weight on the available epidemiologic evidence as a basis for selecting a level down to 50 $\mu g/m^3$ or below and/or for selecting **an unqualified $PM_{10-2.5}$ indicator**. While recognizing that important uncertainties are present in the available evidence, this view **would support incorporating a larger margin of safety consistent with a more highly precautionary policy response**. In soliciting comments on a wide array of views, the Administrator solicits comment on this view and on standard levels that are consistent with this view.

The Great Basin Air Pollution Control District requests that because of uncertainties, as well as actual evidence such as that presented in this letter, the Administrator should select an unqualified $PM_{10-2.5}$ indicator. The unqualified indicator is necessary in order to provide an adequate margin of safety for rural areas where there has not been sufficient research (or where there is evidence to the contrary) to conclude that all rural coarse PM is non-toxic.

Page 2674 – The proposal states that:

> …the Administrator is proposing to revoke the current 24-hour PM_{10} standard everywhere except in areas where there is at least one monitor that is located in an urbanized area with a minimum population of 100,000 people and that violates the 24-hour PM_{10} standard based on the most recent three years of data.

The Great Basin Air Pollution Control District requests that the Administrator maintain the existing 24-hour PM_{10} standard in <u>all</u> current PM_{10} non-attainment areas, but especially in the Owens Valley and Mono Basin non-attainment areas due to extreme PM_{10} levels and known toxics in the dust from these sources.

Page 2675 – The proposal states that:

> [The EPA] also request[s] comment on whether the 24-hour PM_{10} standard should be retained in areas that are either urbanized areas with population less than 100,000 people or non-urbanized areas (i.e. population less than 50,000) but where the majority of the ambient mix of $PM_{10-2.5}$ is generated by high density traffic on paved roads, industrial sources, and construction activities, and which have at least one monitor that violates the 24-hour PM_{10} standard.

What about areas of the country that have less than 50,000 people, but where coarse PM contains known toxics or where the coarse PM levels are so high as to be a health threat regardless of the dust's origins or contents? Once again, the proposed rule must be revised to include protection from these types of dust sources.

Page 2675 – The proposal states that:

> The EPA requests comments on how … information on the location of sources relative to the violating PM_{10} monitor, could be used to identify additional areas to which the 24-hour PM_{10} standard should continue to apply due to the presence of industrial sources. The EPA also requests comments on which areas would meet these criteria or other criteria that may be appropriate to determine in which, if any, areas the 24-hour PM_{10} standard should be retained, and the appropriate boundaries within which the standard should continue to apply for these areas.

The indicator for toxics should not simply be "industrial sources," but rather actual known toxics. Once again, the existing 24-hour PM_{10} standard should be retained in <u>all</u> current non-attainment areas, but especially in the Owens Valley and Mono Basin and any other areas with known toxic PM or where elevated PM levels are threat regardless of PM content.

Page 2693 – The proposal states:

> [The EPA] believe[s] that the environmental health risk addressed by this action may have a disproportionate effect on children. The proposed NAAQS will establish uniform, national standards for PM pollution; these standards are designed to protect public health with an adequate margin of safety, as required by CAA section 109. However, the protection offered by these standards may be especially important for children because children, along with other sensitive population subgroups such as the elderly and people with existing heart or lung disease, are potentially susceptible to health effects resulting from PM exposure. Because children are considered a potentially susceptible population, we have carefully evaluated the environmental health effects of exposure to PM pollution among children.

What about the potential impact on children, elderly and diseased residents in rural areas of the country? We contend that the EPA has proposed a PM standard that is not uniform or national and that it has ignored the potential environmental health effects of exposure to PM pollution among sensitive rural residents. The proposed NAAQS must be amended to protect all Americans.

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Highest 24-Hour PM-10 Values in the U.S. - 2000 thru 2004

Note: All PM-10 values are in units of micrograms per cubic meter (μg/m^3)

Owens Lake and Mono Lake are located in the Great Basin Air Pollution Control District

SUMMARY

Year	# of Great Basin in Top 20	Great Basin Highest in USA?	non-Great Basin Highest Rank	Highest Great Basin Value	Highest non-Great Basin Value
2000	20	Yes	24	10,842	508
2001	20	Yes	27	20,754	610
2002	20	Yes	28	7,915	590
2003	19	Yes	20	16,619	590
2004	20	Yes	22	5,225	625

2004

RANK	PM-10	Date	Location
1	5,225	4/2/2004	Owens Lake - Dirty Socks Hot Spring
2	4,472	3/10/2004	Owens Lake - Dirty Socks Hot Spring
3	4,125	11/21/2004	Owens Lake - Dirty Socks Hot Spring
4	3,322	3/25/2004	Owens Lake - Keeler
5	3,295	4/22/2004	Owens Lake - Dirty Socks Hot Spring
6	2,214	5/10/2004	Owens Lake - Dirty Socks Hot Spring
7	2,116	11/27/2004	Owens Lake - Dirty Socks Hot Spring
8	1,901	4/1/2004	Owens Lake - Shell Cut Monitor
9	1,374	12/21/2004	Owens Lake - Shell Cut Monitor
10	1,268	5/11/2004	Owens Lake - Dirty Socks Hot Spring
11	1,241	4/28/2004	Owens Lake - Dirty Socks Hot Spring
12	987	9/18/2004	Mono Lake North Shore
13	913	5/17/2004	Mono Lake North Shore
14	898	10/18/2004	Mono Lake North Shore
15	871	10/19/2004	Mono Lake North Shore
16	843	5/12/2004	Mono Lake North Shore
17	813	2/18/2004	Owens Lake - Keeler
18	781	12/23/2004	Owens Lake - Shell Cut Monitor
19	741	1/31/2004	Owens Lake - Shell Cut Monitor
20	686	2/9/2004	Owens Lake - Shell Cut Monitor
21	669	11/22/2004	Owens Lake - Dirty Socks Hot Spring
22	625		Black Thunder Mine, WY (Highest non-Great Basin APCD value in U.S.A.)

Highest 24-Hour PM-10 Values in the U.S. - 2000 thru 2004 (Continued)

2003

RANK	PM-10	Date	Location
1	16,619	2/2/2003	Owens Lake - Dirty Socks Hot Spring
2	6,592	3/18/2003	Owens Lake - Dirty Socks Hot Spring
3	5,745	4/25/2003	Mono Lake North Shore
4	5,283	4/24/2003	Mono Lake North Shore
5	3,586	2/4/2003	Owens Lake - Dirty Socks Hot Spring
6	2,521	5/14/2003	Owens Lake - Dirty Socks Hot Spring
7	2,400	2/5/2003	Owens Lake - Shell Cut Monitor
8	2,327	3/27/2003	Owens Lake - Dirty Socks Hot Spring
9	2,265	2/20/2003	Owens Lake - Dirty Socks Hot Spring
10	2,195	3/13/2003	Owens Lake - Dirty Socks Hot Spring
11	2,030	3/28/2003	Owens Lake - Dirty Socks Hot Spring
12	1,658	3/14/2003	Mono Lake North Shore
13	1,637	3/17/2003	Owens Lake - Dirty Socks Hot Spring
14	1,218	1/5/2003	Owens Lake - Dirty Socks Hot Spring
15	1,209	3/14/2003	Owens Lake - Keeler
16	1,170	4/13/2003	Mono Lake North Shore
17	1,169	2/1/2003	Owens Lake - Dirty Socks Hot Spring
18	979	7/22/2003	Owens Lake - Dirty Socks Hot Spring
19	672	4/18/2003	Owens Lake - Dirty Socks Hot Spring
20	590		El Paso, TX (Highest non-Great Basin APCD value in U.S.A.)

2002

RANK	PM-10	Date	
1	7,915	3/1/2002	Owens Lake - Dirty Socks Hot Spring
2	7,071	4/17/2002	Owens Lake - Dirty Socks Hot Spring
3	6,505	5/19/2002	Mono Lake North Shore
4	3,089	4/14/2002	Mono Lake North Shore
5	2,962	6/9/2002	Owens Lake - Shell Cut Monitor
6	2,638	11/25/2002	Owens Lake - Shell Cut Monitor
7	2,525	2/28/2002	Owens Lake - Dirty Socks Hot Spring
8	2,295	4/15/2002	Owens Lake - Dirty Socks Hot Spring
9	1,785	11/26/2002	Owens Lake - Shell Cut Monitor
10	1,745	11/7/2002	Mono Lake North Shore
11	1,671	5/10/2002	Owens Lake - Dirty Socks Hot Spring
12	1,654	6/8/2002	Owens Lake - Dirty Socks Hot Spring
13	1,504	3/10/2002	Owens Lake - Dirty Socks Hot Spring
14	1,481	5/20/2002	Mono Lake North Shore
15	1,172	1/9/2002	Owens Lake - Dirty Socks Hot Spring
16	1,157	4/15/2002	Mono Lake North Shore
17	1,109	1/19/2002	Owens Lake - Dirty Socks Hot Spring
18	1,099	3/18/2002	Owens Lake - Dirty Socks Hot Spring
19	972	3/13/2002	Owens Lake - Dirty Socks Hot Spring
20	967	3/6/2002	Owens Lake - Dirty Socks Hot Spring
21	871	1/22/2002	Owens Lake - Dirty Socks Hot Spring
22	857	5/7/2002	Owens Lake - Dirty Socks Hot Spring
23	809	12/31/2002	Owens Lake - Dirty Socks Hot Spring
24	790	10/2/2002	Owens Lake - Shell Cut Monitor
25	784	4/26/2002	Owens Lake - Dirty Socks Hot Spring
26	611	1/29/2002	Owens Lake - Dirty Socks Hot Spring
27	611	4/18/2002	Owens Lake - Dirty Socks Hot Spring
28	590		El Paso, TX (Highest non-Great Basin APCD value in U.S.A.)

Highest 24-Hour PM-10 Values in the U.S. - 2000 thru 2004 (Continued)

2001

RANK	PM-10	Date	
1	20,754	5/2/2001	Owens Lake - Dirty Socks Hot Spring
2	12,153	2/8/2001	Owens Lake - Dirty Socks Hot Spring
3	10,963	2/7/2001	Owens Lake - Dirty Socks Hot Spring
4	5,124	2/6/2001	Owens Lake - Dirty Socks Hot Spring
5	4,482	9/25/2001	Mono Lake North Shore
6	4,130	5/3/2001	Owens Lake - Dirty Socks Hot Spring
7	3,912	6/13/2001	Owens Lake - Dirty Socks Hot Spring
8	3,541	12/14/2001	Owens Lake - Dirty Socks Hot Spring
9	3,519	4/10/2001	Owens Lake - Dirty Socks Hot Spring
10	3,302	12/10/2001	Owens Lake - Dirty Socks Hot Spring
11	2,730	4/1/2001	Owens Lake - Dirty Socks Hot Spring
12	2,646	6/4/2001	Owens Lake - Dirty Socks Hot Spring
13	2,044	1/16/2001	Owens Lake - Dirty Socks Hot Spring
14	1,923	4/11/2001	Owens Lake - Dirty Socks Hot Spring
15	1,517	6/1/2001	Owens Lake - Dirty Socks Hot Spring
16	1,469	4/19/2001	Owens Lake - Keeler
17	1,195	11/22/2001	Owens Lake - Dirty Socks Hot Spring
18	1,143	10/12/2001	Owens Lake - Dirty Socks Hot Spring
19	1,082	6/3/2001	Owens Lake - Dirty Socks Hot Spring
20	993	4/12/2001	Owens Lake - Dirty Socks Hot Spring
21	945	12/15/2001	Owens Lake - Dirty Socks Hot Spring
22	872	2/28/2001	Owens Lake - Dirty Socks Hot Spring
23	822	3/29/2001	Owens Lake - Dirty Socks Hot Spring
24	789	4/20/2001	Owens Lake - Keeler
25	750	3/10/2001	Owens Lake - Dirty Socks Hot Spring
26	665	1/27/2001	Owens Lake - Dirty Socks Hot Spring
27	610		Jasper County, MO (Highest non-Great Basin APCD value in U.S.A.)

2000

RANK	PM-10	Date	
1	10,842	10/22/2000	Owens Lake - Dirty Socks Hot Spring
2	10,549	3/20/2000	Owens Lake - Dirty Socks Hot Spring
3	10,466	11/29/2000	Mono Lake North Shore
4	3,454	10/21/2000	Owens Lake - Dirty Socks Hot Spring
5	3,169	3/21/2000	Owens Lake - Dirty Socks Hot Spring
6	3,078	5/11/2000	Owens Lake - Dirty Socks Hot Spring
7	3,059	5/9/2000	Mono Lake North Shore
8	2,524	4/29/2000	Owens Lake - Dirty Socks Hot Spring
9	1,923	3/30/2000	Owens Lake - Dirty Socks Hot Spring
10	1,642	6/7/2000	Mono Lake North Shore
11	1,607	3/31/2000	Owens Lake - Dirty Socks Hot Spring
12	1,513	5/10/2000	Mono Lake North Shore
13	1,350	4/28/2000	Owens Lake - Dirty Socks Hot Spring
14	1,266	11/7/2000	Owens Lake - Dirty Socks Hot Spring
15	1,063	5/4/2000	Mono Lake North Shore
16	977	6/8/2000	Owens Lake - Dirty Socks Hot Spring
17	843	11/6/2000	Owens Lake - Dirty Socks Hot Spring
18	798	12/24/2000	Owens Lake - Dirty Socks Hot Spring
19	690	4/8/2000	Mono Lake North Shore
20	627	11/29/2000	Owens Lake - Dirty Socks Hot Spring
21	548	12/25/2000	Owens Lake - Dirty Socks Hot Spring
22	528	2/14/2000	Owens Lake - Keeler
23	514	4/8/2000	Owens Lake - Keeler
24	508		Las Vegas, NV (Highest non-Great Basin APCD value in U.S.A.)

Calendar No. 427

101ST CONGRESS *1st Session*	SENATE	REPORT 101-228

CLEAN AIR ACT AMENDMENTS OF 1989

REPORT

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

together with

ADDITIONAL AND MINORITY VIEWS

TO ACCOMPANY

S. 1630

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form in the atmosphere from gases that were emitted directly, usually by point sources, and which are less susceptible to direct control. The area must commit to implementing all reasonably available control measures, including, but not limited to, technology and measures issued by the Administrator in guidelines as required by new section 195 of the Act.

An attainment date may be waived by the Administrator for an area that, because of nonanthropogenic sources and extraordinary meterological conditions, is unable to meet the attainment deadline. Such an area must have implemented every available control technology and measure for stationary and area sources that are anthropogenic to be eligible for consideration for such a waiver. The Administrator must then find that violations of the standard are not caused by human activity that can be modified or ameliorated, but rather by natural forces.

The term "anthropogenic source" includes sources that are indirectly created by human activity as well as those that are the direct result of such activity. An example of a source indirectly created by human activity are the dust storms that are generated from the dry lake beds at Owens and Mono Lakes in California. These dust storms, which have resulted in the highest PM-10 levels in the country, are a result of the diversion of water that would normally flow into the lakes. The diversion has exposed alkali lake beds which have been the source of severe dust storms that have created PM-10 concentrations that exceeded levels measured in forest fires. Measures to control PM-10 from sources such as these must be developed and implemented, and waivers of the requirements in subpart 4 of the Act, applicable to PM-10 nonattainment areas, are not available in these cases.

The Administrator may grant two one-year extensions of an attainment deadline if (1) the State has fully implemented all of the provisions in its SIP for an area, (2) the area does not exceed the PM-10 standard averaged over one year, and (3) the area has not exceeded the PM-10 standard averaged over a 24-hour period by more than 10 percent at any time in the two years preceding the attainment deadline. Extensions in these cases are justified because not only has the area made all possible efforts to meet the standard, but it is also very close to attainment and therefore not subjecting residents to extreme health risks.

Inventories.—The need for improved inventories for PM-10 is described above in the discussion of section 102 of the bill. The requirement that inventories must be updated every three years is important, not only inventories are designed to assess the ongoing effectiveness of new and existing control requirements, but also because the techniques for gathering data and preparing inventories for PM-10 will continue to improve over time, as will the quality of the inventories and their value in developing control strategies.

Implementation plan provisions.—Within 18 months of enactment States are to submit SIP revisions requiring major stationary sources to pay a fee, beginning not later than six months after the revision is submitted, of not less than $75 for each ton of PM-10 or PM-10 precursor emitted. Liability for the fee is in addition to any fee for hydrocarbons, oxides of nitrogen or carbon monoxide. A major stationary source is any stationary source that emits or has

101ST CONGRESS
2d Session

HOUSE OF REPRESENTATIVES

REPT. 101-490
Part 1

CLEAN AIR ACT AMENDMENTS OF 1990

REPORT

OF THE

COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

ON

H.R. 3030

together with

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29-694 WASHINGTON : 1990

caused by sources on the United States side can be effectively addressed through a SIP for achievement of the desired goal; however, the following efforts on the Mexican side are essential for the success of air pollution control in El Paso:

Acquisition of an accurate emissions inventory for all Juarez major sources and accurate estimates for area and mobile sources.

Ambient monitoring/sampling of the pollutants and crucial meteorological parameters at selected Juarez sites.

Using the two statements above and corresponding data from El Paso County, performance of air dispersion modeling analyses and/or receptor modeling analyses in order to determine the degree of control necessary for sources, given several different scenarios, for attaintment of all NAAQS in El Paso County.

Assessing the extent and cost of necessary industrial controls in Juarez by means of a survey of sources in Juarez for the applicability of new source performance standards.

Devising and implementing a plan for relatively short-term changes in management practices and simple and quickly initiated controls for selected Juarez industrial/commercial enterprises.

Devising and implementing a long-term plan for control of major stationary, area, and mobile sources in Juarez sufficient to attain all NAAQS in El Paso County.

The proposed Annex V to the 1983 U.S.-Mexico Environmental Agreement, if approved, will enable both countries to initiate the first comprehensive emissions inventory in Juarez.

Waivers for certain areas.—Section 188(f) provides that the Administrator may waive any requirement applicable to a serious area, if he determines that anthropogenic sources of PM–10 do not contribute significantly to the PM–10 problem in that area. Similarly, EPA may waive the requirement of a specific attainment date where the Administrator determines that nonanthropogenic sources of PM–10 contribute significantly to the problem. The attainment date may only be waived for areas that have fully implemented their plan requirements under this section.

The term "anthropogenic sources" is intended to include activities that are anthropogenic in origin. An example of such sources is the dry lake beds at Owens and Mono Lakes in California, which give rise to dust storms that are a result of the diversion of water that would otherwise flow to such lakes and should be considered anthropogenic sources. The Committee notes that in an August 2, 1989 letter to a California official, EPA commented about Mono Lake as follows:

The Environmental Protection Agency (EPA) is concerned about the extremely high concentrations of PM–10 occurring within the Great Basin Unified Air Pollution

Control District. EPA agrees that the cause of this severe nonattainment problem in dust blowing from the Owen's Dry Lake Bed and from the exposed portions of the Mono Lake shoreline. Furthermore, EPA is aware of the well-developed body of evidence supporting the conclusion that such high concentrations of this extremely fine dust have been generated by the continued diversion of water that would normally have flowed into the Mono and Owens Lakes. At this time, EPA is not aware of any credible argument or evidence that refutes your conclusion that this particular PM-10 problem is anthropogenic in origin and thus is subject to control. We therefore support your efforts to develop innovative emission control programs for both lakes.

Also, in a September 12, 1989 letter to the Committee, EPA reiterated this view and added:

> Furthermore, on August 9, 1989, representatives from the Los Angeles Department of Water and Power met with my staff. During that meeting, the representatives agreed that the PM-10 problems in the subject areas would not occur, or at least would not be as severe, if the city did not divert the water which would normally flow into the lakes. They reaffirmed their Department's commitment to work with the Greak Basin Unified Air Pollution Control District to mitigate the PM-10 air quality problem.

Requirements for moderate areas.—Section 189(a) provides that moderate areas are to submit revisions to their SIPs that require a new source review permit program meeting the requirements of section 172 and section 173, and submit either a demonstration that the plan will provide for attainment by the attainment date, or a demonstration that attainment by that date is impracticable. In addition, moderate areas must include in their submission provisions to require that reasonably available control measures for the control of PM-10 emissions be implemented no later than December 10, 1993, or four years after designation in the case of a areas classified as moderate after enactment of this subpart. Such provisions must include the application of reasonably available control technology to existing stationary sources. The plan submissions required in this subsection are to be submitted not later than one year after enactment for areas designated nonattainment under section 107(d)(4), except that provisions for the new source review program required under section 189(a)(1)(A) are to be submitted no later than June 30, 1992.

Serious areas.—Section 189(b) provides that serious areas must meet the requirements applicable to moderate areas, and provide either a demonstration that the plan will provide for attainment by the attainment date, or (for those areas for which the State is seeking an extension) a demonstration of attainment by the most expeditious alternative date practicable. In addition, serious areas must include in their submission provisions to require that the best available control measures for the control of PM-10 emissions are implemented no later than four years after the area is classified or

R.09

DEPARTMENT OF THE NAVY
NAVAL AIR WEAPONS STATION
1 ADMINISTRATION CIRCLE
CHINA LAKE, CALIFORNIA 93555-6001

IN REPLY REFER TO:

5090
Ser 823E00D/618
9 May 96

Dr. Ellen Hardebeck
Great Basin Unified Air Pollution Control District
157 Short Street, Suite 6
Bishop, CA 93514

Dear Dr. Hardebeck:

I am writing in reply to your letter of February 22, requesting information about the impacts of Owens Lake dust events on testing operations at China Lake.

In contrast to the position of the Los Angeles Department of Water and Power, there is ample evidence showing that these dust storms significantly impact the Indian Wells Valley (in which our test ranges are located). The enclosed photograph documents one Owens Lake dust storm "rolling into" the City of Ridgecrest a number of years ago. A dust storm of similar scope (i.e., "valley-wide") but of unknown magnitude impacted the Ridgecrest area as recently as March of this year. Although the "average" Owens Lake dust storm does not impact our valley with such severity, these events are quite noticeable and, in some years, frequent.

China Lake is the Navy's largest land holding, and is its premier land range for the test and evaluation of weapon systems, training, Navy research and development, and modeling and simulation applications. As you are aware, good visibility is a resource which we at China Lake consider to be "critical" to our ability to perform these test and evaluation activities on our ranges. This is because some of the most important data normally collected during tests are optically acquired. In other words, not only is visual information obtained from high-speed video taken during a test, very precise "Time, Space, Position" information is also obtained through the use of optical instrumentation.

Impacts to testing operations at China Lake due to Owens Lake dust storms have not been tracked over the years, however, they are referenced in documents going back at least a decade. The China Lake Test Management Office does track cancellations due to weather (which includes Owens events), however, test managers interviewed recall cancellations which were due to Owens Lake dust storms. These events are easily discerned by the large dust cloud appearing from the north to northwest, at times obscuring views of buildings located only a mile or two away.

The ranges at China Lake are used for a wide variety of tests. The type of testing which is most sensitive to Owens Lake events is an "air-to-air" test (an air-launched weapon whose target is also in the air). This is because the distance from camera to test item is much greater, the test item and target are moving at high speeds, and because these tests are usually conducted in the western portion of the Valley (which is more frequently and more severely impacted by Owens Lake dust storms) Once a test is scheduled, cancellation of the test costs the Range and/or its customer approximately $10,000 to $50,000. My experience has been that an Owens event can lead to the cancellation of several tests per day and can last for one to two days, or occasionally longer.

In addition to the direct costs noted above, cancellation of tests can result in costly schedule delays for customers. Cancellations can also lead to permanent loss of a customer for China Lake, when that customer chooses to test on ranges at other locations. Just as importantly, some feel that these Owens events negatively impact the health of local residents including our employees. This

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opinion has been voiced on occasion by various members of the local medical community, who should be contacted directly for further information in this area.

I hope this information adequately answers your question. If you need any additional information or clarification, please do not hesitate to ask.

Sincerely,

C. A. STEVENSON
Captain, U. S. Navy
Commanding Officer

Encl (1):
Photograph of Owens Lake Dust Storm entering the City of Ridgecrest (date unknown)

Ellen Hardebeck
Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street - Bishop, CA 93514
(760) 872-8211 * Fax (760) 872-6109

Survey of Reported Health Effects of Owens Lake Particulate Matter

By
Sarah Kittle

January 14, 2000

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Introduction

Owens Dry Lake is the largest single source of particulate (PM_{10}) pollution in the United States. Numerous scientific studies have been published documenting the multiple adverse health effects caused by particulate air pollution. Upper respiratory problems include runny/stuffy nose, sinusitis, sore throat, wet cough, head cold, hay fever and burning/red eyes. Lower respiratory problems include wheezing, dry cough, phlegm, shortness of breath and chest discomfort or pain. A link between increased particulate matter concentrations and a decrease in lung function has been established. Associations between particulate matter and asthma cases in children as well as aggravation of the disease in adults and children have been documented.

This report attempts to summarize conclusions from major health studies related to particulate matter and health effects, as well as health problems caused by metals found in the lake dust. For years, Owens Valley and Indian Wells Valley residents have complained about adverse health effects suffered because of the lake dust. This report documents the evidence that was collected anecdotally from residents of the Owens and Indian Wells Valleys who believe their health has been compromised from breathing the dust coming off the lakebed. Their reported symptoms are consistent with health effects observed by epidemiologists in studies done in large population areas. This information was collected from residents through phone calls, e-mails, personal interviews and written surveys. Over 100 people responded to requests asking how the dust has affected their health. Doctors and nurses in the area have commented on what they observe in patients shortly after a dust storm has occurred.

Method

Requests for information regarding the health effects people feel they have suffered because of the dust coming off Owens Lake were published in three local newspapers and local newsletters including the bi-weekly newsletter at the China Lake Naval Air Weapons Station. Requests also appeared on the local television and radio stations. Written surveys were left in health clinics and given to faculty and students at Lone Pine High School. People responding to the requests were asked several questions about what health effects they have suffered that they attribute to air pollution from Owens Lake, why they attribute the effects to the lake dust and how that affected their daily activity. The survey asked how long residents have lived in the area and how long he/she had been suffering from the reported health effects. Information was collected beginning in September 1999 and ending in early December 1999. In 1997, an e-mail was sent out to all hands at China Lake Naval Air Weapons Station asking them what health effects they or family members have suffered that they would attribute to the lake dust.

Survey Results

The attached charts show the occurrence of each symptom reported that residents say are caused by the lake dust. Percentages are calculated from the 114 anecdotal reports received since

September 1999. The most common symptoms reported were increased allergies (54%), breathing problems (27%), asthma (26%) and aggravated sinus problems (25%). People reported suffering from headaches (13%), stuffy/runny noses/nasal drip (11%) and congestion (11%) that they say was brought on by the blowing dust. Often times, these allergy and sinus symptoms would develop into sinus infections, which required antibiotics. There were also reports of ear infections (3 reports), which also required antibiotics to treat. Other health problems reported were bronchitis (1 report) and bronchial infections (1 report), eye irritation (20%), sore throats (10 cases), coughing and wheezing (27%) and a general feeling of tiredness (2 reports). Many reported never having any symptoms until moving to this area. There have been several reports stating that when they leave the valley, their symptoms go away. Figure 1 summarizes the health effects reported by respondents in this study. Figure 2 summarizes previous responses on Owens Lake health effects reported through email messages from the Navy.

A common comment was that when the dust blows, people just know to stay indoors to avoid adverse health effects as much as possible. However, most people do not like the fact that their everyday activities must be curtailed when the dust is blowing. Sometimes, just being indoors is not enough. People, especially in the Ridgecrest and Keeler area, have reported that the dust gets in the house even if all windows and doors are shut. It can be seen as a fine film on furniture in the house. Many people have installed HEPA filters in their homes so they won't be breathing as much of the dust. One woman reported spending $8,000 to install double-paned windows throughout the whole house. Before doing this, the dust would aggravate her asthma so bad she would have to be hospitalized.

Asthma attacks were another prevalent health problem reported for adults and for children. Parents reported keeping their children indoors during dust storms to prevent an asthma attack. There were reports that the dust triggers asthma attacks and increased usage of asthma inhalers and medication. Several students from Lone Pine High School, who responded to a written survey, reported their asthma acting up when the dust blows. A few parents have reported that after a dust storm, their children had to be hospitalized with lung and breathing problems. One 10-year-old boy, never before diagnosed with asthma, had to be hospitalized twice (once for three days and once for two days) in March 1999 after dust storms when he experienced serious lung and breathing problems. Another parent reported her daughter had to be hospitalized for five days following an asthma attack she suffered after a big dust storm.

In the absence of scientific studies conducted on health effects caused by Owens Lake dust, doctors in this area are reluctant to say that the lake dust is the cause of many health problems people in the Owens Valley and Indian Wells Valley suffer. A doctor from Ridgecrest said that when the wind blows the dust so bad that the Sierras cannot be seen, he knows it will be a busy day for him. He will see people with bad sinus headaches and chronic sinus infections. He doesn't know if the dust causes asthma, but in his asthmatic patients he does notice more aggravation. Many patients tell him that when they leave the valley they get better, but their problems resume as soon as they return. A doctor who has practiced in the area for 36 years said he noticed an increase of patients with cold, sinus and allergy problems when the dust would blow. He also said that people with pre-existing conditions such as asthma and other respiratory problems, would experience aggravation of these diseases.

A former nurse in southern Inyo noticed that when the dust would blow, clinic visits would increase. Many of these visits would be from patients with pre-existing conditions such as emphysema, chronic obstructive pulmonary disease (COPD) or asthma that would have aggravated symptoms. Sometimes, their regular medications would not be strong enough and they would have to either increase their dosage and/or get stronger medication temporarily. Some patients experienced bad air exchange and had to increase their oxygen supply. Symptoms she observed in patients coming in during dust storms were wheezing, difficulty breathing, difficulty in catching breath and bad air exchange. When the dust storms stopped, she said there were far fewer clinic visits for respiratory symptoms.

A nurse currently working in southern Inyo states that asthmatics do get worse when they are exposed to the dust. She gets complaints of skin burning when the dust is really bad. Spring seems to be the worst. Another nurse at Southern Inyo Hospital said that when the dust storms kick up, the hospital usually expects to see about 1-2 people in the emergency room. She also stated that since the hospital only has four beds, it is hard to correlate hospital admissions rates with the dust storms. This was supported by another medical staff person who said that it is a fact that more patients come in when the dust blows. She has seen patients with existing respiratory problems come in when the dust blows with exacerbated symptoms such as difficulty breathing and shortness of breath. People with allergies have increased symptoms such as itchy runny eyes and noses along with post-nasal drip. In asthma patients, she has seen exacerbated attacks.

A former staff member at Lo-Inyo Elementary noticed that every time there was a dust storm, the asthmatic students had difficulty breathing and came into the office for their doctor-prescribed asthma medications. This was documented at the time. Records of past years documenting each time a student came in for asthma medication were not available.

Known Health Effects of Particulates

Many scientific studies have been published documenting health effects from particulate air pollution. The Harvard Six City Study (Dockery, et. al. 1993) followed the health of over 8,000 adults and children in six cities for 14-16 years to study the effects of air pollution on human health. The six cities chosen ranged from relatively clean to very polluted. The study looked at various sources of particle pollution. The samples of each city were representative of age, sex and occupational distribution of the population of each city. The study found that even after eliminating factors such as cigarette smoking, occupational exposure, obesity and socio-economic status, a direct relationship between particle concentrations in the air and increased mortality rates was found. It also shows lung cancer and cardiopulmonary disease to be associated with air pollution.

The American Lung Association (ALA 1994) found that there is an association between particulate matter air pollution and chronic cough, respiratory illness, asthma attacks and death. They also found that illness, morbidity and mortality all increase even at particulate matter levels below federal standards.

The booklet, Breath Taking: Premature Mortality due to Particulate Air Pollution in 239 American Cities, published by the Natural Resources Defense Council (NRDC, 1996),

summarizes studies conducted on different cities regarding the health effects of particulate pollution. The Utah Valley Studies were conducted in Utah County where the percentage of smokers is the lowest in the nation. A local steel mill (the largest source of air pollution in the valley) was shut down for 13 months (1986-87) due to a strike. PM levels during this period were half the rate compared to when the mill was open. Hospital admissions for children were 2-3 times higher during winters when the mill was open. Hospital admissions for pre-school aged children with bronchitis and asthma were twice as high. It was found that higher PM_{10} concentrations were associated with a decline in lung function. There were increased reports of respiratory disease and asthma medication usage. These results were reported at air quality levels below the national standard.

In St. Louis, Missouri and Kingston/Harriman, Tennessee (NRDC, 1996), total mortality was strongly associated with PM_{10} concentrations. In Detroit, Michigan (NRDC, 1996), PM_{10} was associated with daily admissions for ischemic heart disease and heart failure. Daily monitoring data is available for PM_{10} in Birmingham, Alabama (NRDC, 1996). PM_{10} levels were associated with hospital admissions for pneumonia and chronic obstructive pulmonary disease (COPD). In Seattle, Washington (NRDC, 1996), it has been observed and studied that emergency room visits were highly associated with PM_{10} exposure from the previous day. 12% of emergency room visits for asthma were associated with average PM_{10} concentrations in the Seattle area, where these concentrations never exceeded 70% of the current National Ambient Air Quality Standards. PM_{10} was strongly associated with increased hospital admissions for the elderly in New Haven, Connecticut, and Tacoma, Washington. In March 1995, the American Cancer Society Cohort Study was published (NRDC, 1996). The ACS followed the health of 552,138 people between 1982 and 1989, in an attempt to determine the number of people who had died. The large number of people used gave it significant statistical power. This study was not representative of the general population because participants were recruited for the study. They found that exposure to air pollution is shortening lives by several years.

A study published in the May/June 1999 issue of Archives of Environmental Health (Goren et. al. 1999) looked at 638 children living in an area near an industrial zone and 338 children in an area not exposed to the industrial source. The children living near the industrial zone had a higher instance of physician diagnosed asthma, cough without cold, sputum without cold and cough with sputum. Expiratory flow was measured and it was found that the peak expiratory flow was significantly lower for children near the industrial zone.

Concentrations of particulate matter have been found to be inversely related to lung function (Jedrychowski, et. al. 1999). Also, positive associations between lung cancer and particulate matter exist. A study done by the School of Public Health at Loma Linda University has found excess lung cancer risk at levels below the federal standard for PM_{10} (Abbey, et. al. 1995).

A study by the Department of Public Health and Epidemiology at the University of Birmingham Medical School (Wordley, et. al. 1996) observed variations in hospital admissions and mortality with variations in particulate matter air pollution. This was found for respiratory and bronchial admissions for same day PM_{10} concentrations. Pneumonia and asthma admissions increased for PM_{10} concentrations over three days. Mortality rates from COPD, circulatory deaths were

associated with 24-hour PM_{10} concentrations. These associations have all been seen at levels below the federal standards.

Asthma and Particulate Matter

There have been many recent studies documenting the association of asthma and particulate air pollution. Asthma is the most common chronic disease in children. Particulate matter has been shown to exacerbate asthma and asthma conditions. Asthma symptoms include wheezing, shortness of breath, tightness in chest and coughing. Allergic asthma is characterized by an immediate reaction (within an hour, often minutes) of exposure. Particulate matter has been associated with increased asthma symptoms, increased emergency room visits, increased asthma medication usage and increased hospital admissions for asthma. Increases in morbidity and mortality after air pollution episodes have been observed. Several studies (Lipsett, et. al. 1997; Norris, et. al. 1999; Schwartz, et. al. 1993) have documented particulate air pollution associations with emergency room visits for asthma. Three separate studies (Norris, et. al. 1999) have been done in Seattle that shows a significant association between aggravated asthma and PM_{10}.

Metals and Adverse Health Effects

Owens Lake dust contains elements such as arsenic, cadmium and nickel. All three of these elements have adverse health effects associated with them. Studies published in International Archives of Occupational and Environmental Health (Byrd, et. al. 1996), Epidemiological Reviews (Engel, et. al. 1994) and in Regulatory Toxicology and Pharmacology (Hughes, et. al. 1994) have all reported an association between inhaled inorganic arsenic and lung and respiratory cancers. Cadmium (Kahan, et. al. 1992) can be very toxic in high doses. Reduced sense of smell, ulceration of the nose, emphysema, renal tubular syndrome and anemia can all occur from prolonged exposure to cadmium dust. There may also be an association between inhaled cadmium compounds and incidences of lung cancer. Nickel (Barceloux 1999) is an irritant of the respiratory tract. It is recognized as having carcinogenic potential. The inhalation of nickel can cause asthma (in rare instances), sinusitis and nasal polyposis.

Conclusions

Particulate matter has been shown in several recent scientific studies to cause various adverse health effects such as wheezing, coughing, sore throat, sinus problems and asthma. These studies show symptoms occur even when PM_{10} levels are within federal standards. PM_{10} has been found to increase both mortality and morbidity rates. The anecdotal claims collected from residents of the Owens Valley and Indian Wells Valley are consistent with evidence found in the studies. The most common symptoms reported by people affected by Owens Lake dust storms are aggravated sinus problems, increased allergies, headaches, and ear infections. These allergies and sinus problems often developed into infections requiring antibiotics. Owens Lake dust was also implicated in aggravating existing health problems related to lung disease such as bronchitis and asthma, with reports of increased medical treatments and asthma attacks.

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Figure 1. Health Effects Reported By Survey Respondents

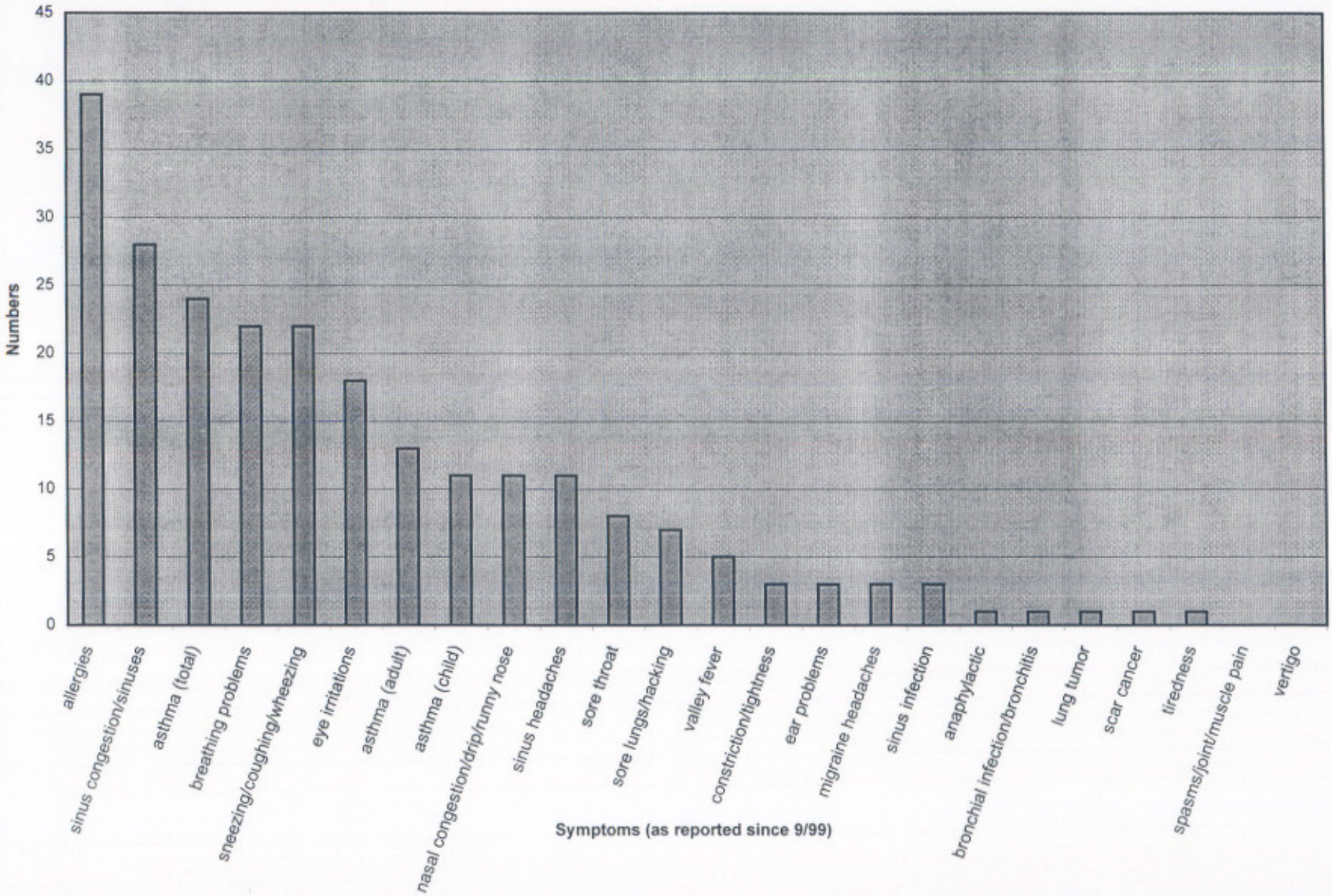
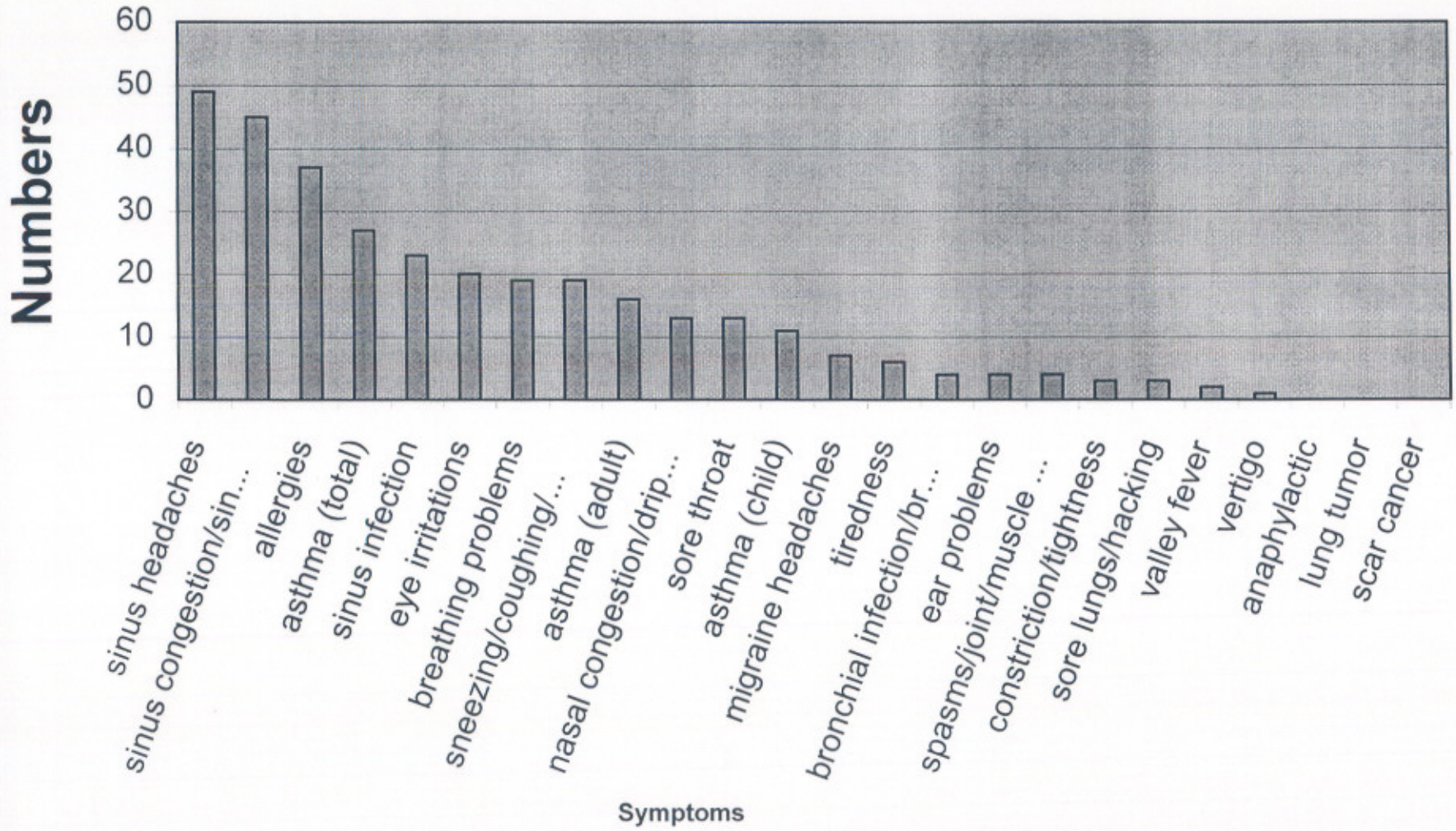


Figure 2. Previously Reported Health Effects from Navy Emails



Determination of U.S. Area and Population Inside and Outside of Urbanized Areas

U.S. Census Bureau defined Urbanized Areas, from the 2000 census, of at least 100,000 persons were selected. The total population and aerial extent of the selected areas were then compared to the 2000 census totals for the U.S. population and the aerial extent of the U.S.

	Total Population		Aerial Extent (sqm)	
U.S. States (Generalized)	100%	281,421,906	100%	3,586,497
U.S. Census Urbanized Areas (UA) >= 100,000 persons	63%	177,912,367	2%	64,889
Non-Urbanized Areas	37%	103,509,539	98%	3,521,608

Based on U.S. Census 2000 data as compiled by ESRI; "ESRI® Data & Maps 2004"
50 States & District of Columbia only

63% of the U.S. population is within the Urbanized Areas of at least 100,000 persons.
2% of the U.S. aerial extent is within the Urbanized Areas of at least 100,000 persons.

37% of the U.S. population is outside of the Urbanized Areas of at least 100,000 persons.
98% of the U.S. aerial extent is outside of the Urbanized Areas of at least 100,000 persons.

"ESRI® Data & Maps 2004"

U.S. States (Generalized) represents the 50 states and the District of Columbia of the United States.

U.S. Census Urbanized Areas represents the Census 2000 Urbanized Areas (UA) and Urban Clusters (UC). A UA consists of contiguous, densely settled census block groups (BGs) and census blocks that meet minimum population density requirements (1000ppsm /500ppsm), along with adjacent densely settled census blocks that together encompass a population of at least 50,000 people. A UC consists of contiguous, densely settled census BGs and census blocks that meet minimum population density requirements, along with adjacent densely settled census blocks that together encompass a population of at least 2,500 people, but fewer than 50,000 people. The dataset covers the 50 States plus the District of Columbia within United States.