MINUTES OF MEETING
SENATE NATURAL RESOURCES
January 30, 1981

The fifth meeting of the Natural Resources Committee was called to order by Senator Harold Dover, Chairman, at 1:00 P.M., on the above date in Room 405 of the State Capitol Building.

ROLL CALL: Upon roll call, all members were present with the exception of Senators Etchart, Ryan and Van Valkenburg.

CONSIDERATION OF SB 65:

AN ACT TO REQUIRE LEGISLATIVE APPROVAL OF CERTAIN AMBIENT AIR QUALITY STANDARDS

Senator Johnson, District #49, presented this bill and distributed copies of her testimony and amendments proposed to this bill. (copies attached)

James D. Mockler, Montana Coal Council, supports this bill. The federal standards were adopted after long and careful consideration. They also are charged with protecting the health and welfare of people in the United States.

J. P. Sieverson, ASARCO East Helena Smelter, spoke in favor of this bill. He feels if Montanans desire ambient air standards more stringent than federal requirements, the legislature is better positioned to represent the people of Montana. The United States has six primary lead smelters and all but Montana's require compliance with federal standards.

Dave Duel, United Steel Workers of America, is afraid that unless we go back to the federal standards, what happened in Anaconda could happen throughout the state. The federal standards should be acceptable for the people of Montana.

Dr. Carlton Grimm, representing Montana Power, feels that the federal standards were set at levels that have adequate standards of safety. He does not feel that Montana needs to have different standards.

Janelle Fallan, Montana Chamber of Commerce, supports this bill.

Keith Anderson, Montana Taxpayers Association, gave a brief testimony endorsing this bill.

Bill Sternhagen, Northwest Mining Association, stated that Montana's air standards should not be more stringent than the federal standards.

Bill Hand, Montana Mining Association, feels the mining industry has been a victim of unrealistic air standards and that legislative approval would reflect the will of the people.

George Johnston, representing ASARCO, supports this bill. He feels that the jobs of 375 people at the smelter are in jeopardy because of the high Montana air standards.

Don Peoples, Chief Executive of Butte Silver Bow Government, supports the adoption of air quality conditions that are consistent with federal standards.

Darryl A. Lee, Butte Local Development Corporation and Butte Chamber of Commerce, presented written testimony in support of this bill. (copies attached)

Bernie A. Swift, Hamilton, believes there must be provisions for the legislature to control boards and committees, which this bill is designed to accomplish. This bill also will prevent undue penalties and pressures being put upon business and industry within the state of Montana.

Dan Worsdell, City-County Manager, Anaconda-Deer Lodge Counties, furnished a written statement (copy attached) in support of this bill.

Ray Tilman, Stauffer Chemical Company, also submitted a written statement supporting this bill. (copy attached)

Don Allen, Montana Petroleum Association, gave a brief statement in support of this bill.

R. L. Hollingsworth, Teamsters Union, said the 8,000 members of this union in the state of Montana support this bill.

Chairman Dover asked for opponents to this bill.

Oral testimony was given by the following in opposition to this bill (written statements are attached): C. P. Loehnen, M. D., Western Montana Clinic, Missoula; Peter M. Rice, Missoula; Ellen Knight, Missoula League of Women Voters; Marty Onishuk, League of Women Voters of Montana; Janet McMillan submitted petition; Jerry J. Bromenshenk, Missoula; Gail Peterson, Deer Lodge; Jessie Mola, LISCA, Helena; Janice Hand, Missoula County Health Department; and Suzanna E. Raker, Forester, Butte.

Virginia Grady, Alberton, opposes this bill. Alberton suffers with bad air when Missoula has air pollution and she would hate to see it if the standards were lowered.

Rita Sheehy, former member of the Board of Health,feels that the Board of Health, who is set up specifically to review information received and compiled relative to the air quality standards, is best qualified to determine the air standards. She was surprised to hear the companies testify to the committee that they might have to close - that jobs were at stake. She has worked closely with representatives from these companies and never got the

impression that the companies could not solve the air problems without closing down.

Susan Taylor, Missoula, has an asthma problem and when the air is badly polluted in Missoula, cannot leave her apartment.

Ron Erickson, teacher at University of Montana, feels that the health and welfare of Montanans is not protected by federal standards.

As there was not enough time to hear all opposition to this bill, attached are copies of written statements from the following: Jan Flaharty, Missoula; Dave Gorton, County Commissioner, Yellowstone County; Hal Robbins, Chief, Air Quality Bureau; Michael Dahlem, University of Montana; Mike Halligan, Senate District #48; Noel Rosetta, Montana Audubon Council; Ellen Sallee, Missoula; Don Snow, Staff Coordinator, Montana Environmental Information Center; and Richard Steffel, Missoula.

Chairman Dover asked for questions from the committee.

Senator Hafferman asked Ellen Knight, if we kill SB 65 and the industry has to shut down, how will we fund Missoula?

Ellen Knight said that she didn't think the industry would shut down.

Senator Brown asked Senator Johnson, that since the Board of Health's decision is based on scientific and technical information reviewed by board members who do this job on a full time basis, isn't this enough. Does the legislature have to duplicate this procedure?

Senator Johnson does not believe that the process has to be duplicated, but that the Board of Health would conduct the same kind of hearing and then have the EPA put out a summary. This is what the legislature would look at.

Senator Tveit asked the opponents to this bill, if the Board of Health were to place a restriction on the use of fireplaces in Missoula, would the citizens be willing to shutdown their fireplaces?

Senator Van Valkenburg protested this question, stating that this did not deal with the bill at hand.

Senator Keating said that the Board of Health has established standards for Montana that are higher than the federal standards. He asked if this bill, when enacted, would actually reduce Montana's standards to the federal standards.

There was much discussion from the committee on this and it was decided that the standards would have to be changed by the legislature, not by this bill.

Senator Van Valkenburg stated that the legislature, by Joint Resolution, can overrule any rule that the Board adopts. Why is this not enough to deal with the problem.

Senator Johnson believes that the power to make laws should rest in the hands of the legislature.

Senator Manley said that Missoula seems quite concerned about lowering the standards, but if even the federal standards were being enforced, would they have to shut down the town of Missoula. Until we enforce the standards, whether federal or state, what difference does it make?

Senator Van Valkenburg said that by lowering the standards the problem can only get worse.

Senator Keating asked what a federal non-compliance area was?

Senator Brown said that if the standards are exceeded, then the state is required to identify the problem and develop a plan that would lower the air pollution to the point where they could be in compliance. They are given a certain amount of time for this.

ADJOURNMENT: There being no further business, the meeting adjourned at 3:00 P.M.

Harold L. Dover

HAROLD L. DOVER, Chairman

ROLL CALL

NATURAL RESOURCES COMMITTEE

47th LEGISLATIVE SESSION - - 1981 Date 1/30/81

NAME	PRESENT	ABSENT	EXCUSED
Harold Dover, Chairman	✓		
Mark Etchart, Vice Chairman		✓	
Thomas Keating	✓		
Roger Elliott	✓		
Larry Tveit	✓		
Jesse O'Hara	✓		
John Manley	✓		
William Hafferman	✓		
Steve Brown	✓		
Dave Manning	✓		
Patrick Ryan		✓	
Fred Van Valkenburg	arrived late ✓		

Each day attach to minutes.

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE, I AM JAN JOHNSON, SENATOR FROM DISTRICT 49, MISSOULA, AND SPONSOR OF SENATE BILL 65.

THE EFFECT OF SB 65 IS OBVIOUS AND STRAIGHTFORWARD, THAT BEING TO LIMIT THE BOARD OF HEALTH AND ENVIRONMENTAL SCIENCES TO THE AIR STANDARDS ESTABLISHED BY THE EPA.

THE EPA IS CHARGED WITH ESTABLISHING AIR QUALITY STANDARDS THAT WILL PROTECT THE HEALTH AND WELFARE OF THE PUBLIC.

THE STATE OF MONTANA IS ALLOWED TO ADOPT ITS OWN STANDARDS ONLY INSOFAR AS THEY ARE AS STRINGENT AS THOSE ADOPTED BY EPA. THIS WAS DONE AFTER A LONG HEARING PROCESS LAST YEAR. AS A RESULT, STANDARDS WERE ADOPTED THAT IN SOME INSTANCES WERE MUCH MORE SEVERE THAN THOSE OF EPA.

IT IS MY CONTENTION THAT THESE STRICT STANDARDS ARE NOT NECESSARY TO PROTECT THE HEALTH AND WELFARE OF OUR PEOPLE AND HAVE HAD THE NET EFFECT OF TELLING INDUSTRY THAT PRESENTLY OPERATES HERE, AS WELL AS THOSE WHO MAY WANT TO OPERATE HERE, THAT THEY ARE NOT WELCOME IN MONTANA.

I AM ACUTELY AWARE THAT THE NEW AIR QUALITY RULES HAVE NOT YET FORCED ANYONE OUT OF BUSINESS. I AM ALSO ACUTELY AWARE THAT IT IS AN ADDITIONAL STRAW FOR THAT POOR OLD CAMEL TO BEAR; AND AS WE HAVE SO SADLY LEARNED OF RECENT, THERE IS A LIMIT AS TO WHAT THE CAMEL CAN BEAR.

THE ENTIRE INTENT OF MY BILL IS, THEREFORE, MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE, A SIMPLE STEP TOWARD ESTABLISHING A CLIMATE THAT WILL HOPEFULLY ENCOURAGE THE CREATION OF PRODUCTIVE JOBS SO THAT OUR OWN PEOPLE WILL BE ABLE TO STAY HERE AND ENJOY A SOUND ECONOMY.

AT THIS TIME, MR. CHAIRMAN, I OFFER THE COMMITTEE AMENDMENTS TO SIMPLIFY THE PROCESS FOR ADOPTING STANDARDS THAT ARE NOT ESTABLISHED BY THE FEDERAL GOVERNMENT.

I RESERVE THE RIGHT TO CLOSE AND WOULD NOW LIKE TO CALL ON PROPONENTS OF SB 65.

Proposed Amendments to

SB 65

Page 1, line 14: Following "standards" delete balance of line

Page 1, line 15: Delete

Page 1, line 16: Delete line through "established"

Page 1, following line 18 insert:

"(3) If a substance does not have an ambient air standard promulgated by the environmental protection agency (EPA) and a standard is necessary to protect human health and welfare, the board shall recommend adoption of such a standard for the state after conducting an assessment according to subsection (4).

(4) For purposes of this section, "assessment" means:

(a) reviewing existing research on the substances;

(b) taking ambient air measurements from appropriate sites within the state;

(c) evaluating the types and cost of controls needed by the affected industries;

(d) evaluating the effect of the proposed standard on energy resources and employment; and

(e) analyzing the environmental, economic, health and social impact of the proposed standard."

TO: NATURAL RESOURCES COMMITTEE (Senate)

FROM: BUTTE LOCAL DEVELOPMENT CORPORATION

SUBJECT: Senate Bill 65

DATE: FRIDAY january 30, 1981

The Executive Committee of the Butte Local Development Corporation met Wednesday 28th of January, 1981 and discussed the merits of S.B. 65. Following considerable discussion it was unanimously agreed that we support this legislation.

It was the attitude of the committee that such legislation as provided in S.B. 65 would give the needed protection to industry and the economy of the state from arbitrary rulings of government agencies.

We feel that Federal Ambiant Air Quality Standards adquately protect the health and welfare of our citizens, and that any deviation from those standards should be brought back to the State Legislative body for changes.....or if the legislature is not in session, that such changes should be proposed to the Legislative Code Committee.

Victor Burt - President

Joe Roberts - Secretary

Joe McCarthy - Vice President

Floyd Brinton - Treasurer

CF Industries, Inc.

SALEM LAKE DRIVE
LONG GROVE, ILLINOIS 60047
312/438-9500

May 15, 1980

Mr. Darryl A. Lee
Economic Development Representative
Butte Local Development Corporation
P.O. Box 507
Butte, Montana 59701

Dear Mr. Lee:

Mr. Baxter has forwarded your letter of May 9th to me, and I read with interest your description of the consideration being given to developing phosphate fertilizer production in the Butte-Anaconda area.

As the largest inter-regional farm supply cooperative in the U.S., CF Industries is most interested in phosphate supply development. CF markets fertilizer in the Pacific Northwest through two of its eighteen member cooperatives, Cenex and Western Farmers. Therefore, we already have a considerable market presence in your area.

I would be most interested in visiting with parties interested in the development of phosphate production in Montana, but, I must admit to a certain amount of apprehension because of Montana's stringent environmental and industrial development regulations.

Please keep me advised of developments on this project.

Yours truly,

Donald V. Borst
Senior Vice President

DVB/lkz

2950 HARRISON AVENUE • PHONE 494-5595 (AREA CODE 406) • BUTTE, MONTANA 59701

January 30, 1981

Senator Harold Dover
Chairman
Senate Natural Resources Committee
Montana State Capitol
Helena, Montana 59601

Dear Chairman Dover and Members of the Committee:

The Butte-Silver Bow Chamber of Commerce with almost 300 business members, representing 70% of the Butte work force, strongly endorses S. B. 65, "An Act to Require Legislative Approval of Certain Ambient Air Quality Standards."

As you might expect the Butte Chamber supports economic growth, high employment and a strong business community. Of course, we also support a healthy and safe environment. In so doing, we have carefully followed the administrative process setting the State Ambient Air Standards. Frankly, we are disturbed and upset by the Montana Board of Health actions.

The executive branch must generally be responsible for promulgation of regulations. However, when those regulations are passed without adequate evidence or consideration of economic impacts, in our opinion, it becomes the responsibility of the Legislature to take action.

Senate Bill 65 is not an intrusion into the prerogatives of the executive branch. It is a definition of the limits and authority of the Board and provides the needed "checks and balances" to ensure that the legislative intent is not usurped.

The Legislature would, by this act, recognize that there may be instances where the Federal Standards are not appropriate for Montana. However, if such is the case, the people, through their representatives, would be approving that decision rather than a bureaucratic administrative agency.

We hear state-wide cries that the Ambient Air Standards adopted last year are far more stringent than are required or which are achievable. In fact three of Butte's largest employers, Stauffer Chemical Company, Montana Power Company

and Anaconda Copper Company, have been forced to challenge the Standards in the state courts. Obviously, such drastic action is not conducive to a strong business community.

Recently newspaper articles reported Department of Health officials have made statements that the Department has not closed any businesses and have implied that none will be closed. These vague and unenforceable promises are not persuasive or comforting to existing or prospective businesses.

It is clear that legislative action is required. We sincerely hope you support S. B. 65.

Yours very truly,

C. DAN REGAN
President

CDR/je

Anaconda - Deer Lodge County
Courthouse
Anaconda, Montana 59711

Phone No. 563-8421
Ext. 201

January 30, 1981

To: Natural Resources Committee

From: Daniel J. Worsdell, City-County Manager
Anaconda-Deer Lodge County

Re: Senate Bill No. 65

Anaconda-Deer Lodge County would like to testify in favor of Senate Bill No. 65. Ambient air quality standards more stringent than federal ambient air quality standards or ambient air quality standards applicable to pollutants for which no federal standard has been established should be approved by action of the legislature before such standards can be effective.

The Department of Health and Environmental Sciences has taken action to implement air quality standards in excess of the federal standards without consideration to the economic impact to areas such as Anaconda. As a result, Anaconda and the surrounding area has been devastated economically. The Department of Health and Environmental Sciences obviously disregarded economic impacts. They required a full environmental impact statement but made its decision based on no full economic impact statement. There was a small section in the environment impact statement that was addressed to the economics of the higher ambient air standards. In discussing this problem with Mr. Barrett prior to the closure on September 29, 1980 by the Anaconda Company, and making him aware that there was a possibility and probability these air standards might cause the Anaconda Company to decide to close down the plant, as they had announced they would make a decision by October 1, 1980. Mr. Barrett's only reply was we are not sure what will happen but we will keep our fingers crossed.

Certainly a major economical impact statement would have been able to more clearly decipher the probability of the Anaconda Company closing down the smelter operation in Montana. It is unfortunate that a small group of people was able to make such a tremendous impact on the economy of the State of Montana without consciousness to the feelings and wishes of the people that met with the catastrophe.

With proper legislative review which entails hearings and public participation, the people will be able to make known the problems and wishes and their concerns so that a reasonable decision can be made. Again, it is obvious that the decision made by the Department of Health and Environmental Sciences was grossly in error and if you have any questions on that, please come to Anaconda and look at 12,500 people that have been directly affected by loss of jobs, property devaluation, and social problems. There is not a person in the area that has not been affected.

DJW:cg

INDUSTRIAL
CHEMICAL DIVISION

Stauffer Chemical Company
P. O. Box 3146 / Butte, Montana 59701 / Phone (406) 792-1215

January 29, 1981

SENATE NATURAL RESOURCE COMMITTEE:

TOPIC: SENATE BILL 65
Proposed by Senator Jan Johnson - Republican Missoula

My name is Ray Tilman, I am the Plant Manager for Stauffer Chemical Company's Plant at Silver Bow, Montana. I come here as a proponent of Senator Johnson's Bill, Senate Bill 65. I think there are several points that should be made concerning the adoption of such a bill.

I personally feel that Federal Ambient Standards are very protective of the health of all citizens including those citizens in the State of Montana. Therefore, any more stringent regulations must be weighed very carefully especially as it pertains to economics and technology.

I also think that when you consider this Bill you should not be excited by the fact that all of the Montana Ambient Air Standards would have to be overturned by the Legislature. This Bill specifically states that only those standards passed by the Board of Health that are more stringent than the Federal Standards would the Legislators and the Legislative Code Committee have to act. When that condition exists, I feel that it is very important that a check and balance type of system be employed where those persons making the final decision, such as the Legislators or the Legislative Code Committee, are those people closest to the voters and not a Board, such as the Board of Health who has been appointed.

I personally want to See Montana continue as a good recreational outdoor State with sufficient protection for all citizens and the children of our citizens, but I strongly feel that the passage of Senate Bill 65 is in the best interest of all present and future citizens of the State of Montana.

Ray

R.V. Tilman

THE WESTERN MONTANA CLINIC

501 WEST BROADWAY
MISSOULA, MONTANA
59801

TELEPHONE 721-5600

January 27, 1981

Mr. Harold Dover, Chairman
& Members of The Committee
On Natural Resources

Dear Sir:

I am a lung specialist living in Missoula and at present am serving on a health advisory committee on air pollution to the County Board of Health. As you no doubt know, lung disease is becoming a major killer and one of the most important causes for social security benefits. The misery related to lung disease is attaining massive proportions, and thus any factor which can increase this problem is to be very carefully evaluated. The health impact of air pollution is very complex. Universal standards are not appropriate when one considers the interaction and potentiation of various pollutants. Thus, in an area where various polluting gases are present in combination with respirable particles the situation may change considerably. Therefore, analyzing the entire situation prevailing in the area under question will lead to the adoption of more rational standards. The federal standards are guidelines but not necessarily appropriate when there are multiple factors present.

It is also becoming increasingly apparent that health impact may be much more serious than heretofore expected. In this area where there are still many unknowns, Montana is one of the scientific leaders in this field. The Montana Air Pollution Study (MAPS) has found in fact that pulmonary function in children from a clean environment (Great Falls) is better than that from a polluted area (Missoula). The long-term effects are still not clear, but by no means insignificant. Potential problems varying from lung cancer to chronic bronchitis and emphysema are theoretically possible with prolonged excessive exposure to air pollution.

The decisions are certainly difficult and many factors need to be considered, including economic impact. However, if we are risking

our children's long-term health, I believe the decision is not a difficult one. Much scientific data with many subtle variables needs to be considered in order to arrive at appropriate air standards.

With the limited time available I believe the very tedious task requiring much testimony, should be left to the State Board of Health. It took two years of work and analysis of a large amount of data to arrive at appropriate air quality standards. This board, by nature of its present composition would appear to be best qualified to expend the time and efforts to insure the future health of all Montanans. Without the latter, economic prosperity will be meaningless.

Sincerely,

C.P. Loehnen, M.D.

CPL:bn

January 30, 1981

TESTIMONY TO SENATE NATURAL RESOURCES COMMITTEE
CONCERNING SENATE BILL 65 (JOHNSON) WHICH WOULD REQUIRE
LEGISLATIVE REVIEW OF STATE AMBIENT AIR QUALITY STANDARDS

Peter M. Rice

My name is Peter Rice. I reside at 340 South Second West in Missoula. I am employed as a Research Associate in the Botany Department at the University of Montana. My field of expertise is the impact of air pollutants on plant life and ecosystems. I have appended a copy of my vitae to this testimony. I am not representing the University of Montana today, but I am here as a Montana citizen.

I participated as a volunteer expert witness in the 2½-year review of Montana's ambient air quality standards. My work on this issue began in the summer of 1977 when Senator Steve Brown brought the question of "the legal enforceability of the states' ambient air standards" to the attention of the Board of Health and the Air Quality Bureau. The question of the adequacy of the standards was to be reviewed in conjunction with that of enforceability. Thus, a review of the criteria underlying the standard was required. I limited my contribution to the review process primarily to the effects of sulfur dioxide on vegetation and will only address that specific area today.

Montana's original short-term standard for sulfur dioxide was 0.25 ppm for one hour not to be exceeded more than once in any four consecutive days. The draft EIS proposed that the allowable short-term concentration be raised to 0.4 ppm for one hour and allowed for one exceedance per year. The Final EIS raised the standard even further to 0.5 ppm for one hour (with one exceedance per year). The Board of Health finally adopted an even more lenient standard of 0.5 ppm for one hour which allows 18 exceedances per year. What the Board of Health (and the Air Quality Bureau) did via the lengthy and

involved review process was create a less stringent standard and bring it into closer agreement with the federal standard.

The extensive factual details of the scientific and economic considerations underlying these negotiations would require a very time consuming effort to recreate. This example of the short-term sulfur dioxide standard illustrates: (1) the complexity of options to be considered in setting standards, and (2) the demonstrated willingness of the Health Board to consider the finanancial interest of industrial pollutors.

The federal sulfur dioxide standards are not adequate to protect vegetation resources from injury and economic damage. The federal standards were based on a criteria document for welfare effects which only considered scientific work published no later than 1971.

There have been many important changes in air pollution science since 1971. These have led to recognition of injury at much lower sulfur dioxide levels than is reflected in the old federal standards. I will briefly summarize several of these points.

1. Prior to government regulation of air pollution, ambient concentrations were much higher in the United States than they are now. Chicago's annual average for sulfur dioxide in 1969 was .068 ppm, over two times the current federal standard (.03 ppm). This led researchers to concentrate their work on acute effects causing visible injury to vegetation. Chronic and invisible injury was largely ignored as a matter of priorities.

2. Prior to federal legislation on clean air (Clean Air Act of 1967), little money was available for independent research work. Most research was funded by industrial pollutors who were involved in court litigation with agricultural concerns or timber owners who were claiming damages. The industrial pollutors exercised proprietory rights over this research.

Research work and publications were restricted to protect the legal position of the industries involved in litigation. This also influenced the educational process and training of scientists. Subsequent federal funding has allowed more independent research in universities and various government agencies.

3. With the expansion of air pollution research, the sensitivity of measurements and experimental sophistication have increased.

4. Important conceptual changes have come to play an increasing role in air pollution research in the last decade. These include the predomination of the invisible injury theory, the scientific proof of synergisms resultant from the interaction of multiple pollutants, the experimental demonstration of no apparent threshold for sulfur dioxide injury to stomatal control, and statistical verification of declines in root biomass without visible foliar injury.

I have appended a table of 28 scientific publications of the last decade which illustrate these scientific advances and demonstrate the need for ambient standards well below the current federal levels.

The lack of a current research base to justify the National Ambient Air Quality Standard is recognized by the federal government. They are now involved in a lengthy and extensive review of scientific publications concerning sulfur dioxide and vegetation. I had the priviledge of reviewing the first external draft which was circulated this summer. Chapter 7, "Effects on Vegetation," contained 498 citations of scientific literature almost entirely published after the literature (1971 and earlier) used in the earlier federal criteria document.

The draft of the new federal criteria document also incorporates portions of the Montana State EIS or criteria document which was used to establish Montana's new standards. A lengthy table of synergistic effects on vegetation

[illegible] by the [illegible] scientific [illegible] This [illegible] to the accuracy and scientific integrity of the review process conducted by the Montana Department of Health.

In its deliberations concerning the state ambient standards, the Board of Health read and heard a massive amount of testimony, including that of [illegible] nationally-recognized experts. Section 75-2-411 of the Montana Clean Air Act provides for appeals by persons who may be aggrieved by the board's standards. In an appeal under this code, the district court is to hear and decide on the record of the board. The court must determine if the board regularly pursued its authority, if its findings were supported by substantial competent evidence, and if the Board made erroneous interpretations of the law to the appellant. If the Board has made such obvious errors should legislation such as this proposed amendment before you be [illegible] or should a court [illegible] such errors.

On the other hand, what if the Board has not made such errors, and the standards are justifiable and necessary to protect human health, safety, and welfare? If such standards were not affirmed by the legislature, there would be people, vegetation, and especially agriculture at risk from [illegible] legislative action.

A Table of Some Research of The Last Decade Which Demonstrates Injury and/or Damage To Plants At Levels of Sulfur Dioxide Well Below The Federal Ambient Air Quality Standards

Source	Shortest Duration*	Lowest Concentration ($\mu g/m^3$ SO_2)**	Response and Comments
Karnosky, 1980	1-hour max.	315	Increased mortality to sensitive P. strobus.
Solar, 1980	0.5 hours	150	Recommended standards based on Yugoslavian forestry research.
	24 hours	100	
Linzon, 1971	annual	23	Visible injury to P. strobus over seven years.
Black and Unsworth, 1979a	2 hours	50	Net photosynthesis depressed stomatal resistance altered.
Black and Unsworth, 1979b	0.5 hours	35	Net photosynthesis depressed; dark respiration increased; response independent of concentration.
	growing season	35	Crop model suggests yield loss for Vicia faba.
Black and Black, 1979	2 hours	50	Death of epidermal cells.
	2 hours	500	Death or structural disorganization of guard cells.
Houston, 1974	6 hours	72	Necrosis in elongating P. strobus needles; O_3 synergism.
Vins and Mrkva, 1973	annual	43	No short-term peak data; 30% growth loss in pine stands.
Bell, Rutter, and Relton, 1979	173 days	43	68% yield reduction in grass Lolium perenne.
Crittenden and Read, 1979	first 23 days	62	Dactylis glomerata yield depressed 22%.
	23-72 days	37	
	72 days	45	Dactylis glomerata yield depressed 42%.

*Apparent shortest time period at which injury was observed.

**Lowest concentration at which injury was observed; not necessarily a threshold concentration.

Source	Shortest Duration	Lowest Concentration ($\mu g/m^3$ SO_2)	Response and Comments
Costonis, 1972	4 hours	172	Field injury to P. strobus; possible O_3 synergism.
Suwannapinunt and Kozlowski, 1980	0.5 hours	1300	Root growth of Ulmus americana inhibited without visible foliar injury.
Karnosky and Stairs, 1974	4 hours	858	Populus deltoides pollen tube growth depressed.
Constantinidou, Kozlowski, and Jensen, 1976	0.25-2 hours	1300	Responses by conifer seedlings; see Appendix C of this report.
Keller, 1980	2-10 weeks	143	Reduced relative CO_2 uptake and wood increment; see Keller's Figures 2 and 5.
Tingey, Heck, and Reinert, 1973	8 hours/day 5 days/week 5 weeks	143	SO_2 + .05 ppm O_3; radish yields depressed.
Colrufo and Berry, 1970	2 hours	715	Foliar injury to P. strobus
Costonis, 1970	1 hour	143	Acute foliar injury to P. strobus
Reinert et al., 1970	2-hour max.	418	Foliar injury to many species; O_3 and NO_x present
Navara, Horvath, and Kaleta, 1978	annual	10	Chronic damage when other pollutants present; 5 $\mu g/m^3$ suggested as protective.
Cowling and Lockyer, 1978	85 days	55	Increase in proportion of necrotic leaves at second harvest; N added with S deficient soils.
Walsh and Carlsen, 1978	3 hours 24 hours annual	25 5 2	Review document; recommends those Class I PSD standards for U.S. Forest Service primitive and wilderness areas.

Source	Shortest Duration	Lowest Concentration ($\mu g/m^3$ SO_2)	Response and Comments
Schwartz et al., 1978	5-6 months	57	Decreased protein content and dry matter digestibility after two seasons of SO_2.
Malhorta, 1977	18 hours	74	Carbon fixation reduced in P. contorta; concentrations are from aqueous SO_2 equivalents.
	22 hours	143	Chlorophyllide b increases, then declines; chlorophyllase activity increases then declines.
Ma, 1973	0.5-hour max.	143-286	The fumigation enhanced chromatid aberration in Tradescentia pollen tubes; 18-20 hours incubation.
Ma, 1976	0.5-hour max	214	Lowest concentration tested reduced mitotic index from 38.7 to 24.3%; chromosome damage; 19-hour incubation.
Houston and Dochinger, 1977	annual	15	Sulfation rate equivalents, cone, seed, and pollen responses reduced in two Pinus spp. proximal to coal-fired power plant.
Biscoe, Unsworth, and Pinckney, 1973	.33 hour	72	Decreased stomatal resistance in V. faba.
	.17 hour	140	

PETER MARVIN RICE
340 South Second West
Missoula, MT 59801
(406) 243-5648 (work); 549-9998 (home)

January 1981

BORN: September 23, 1946
Tamaqua, Pennsylvania

EDUCATION: B.A., 1973, University of Montana, Environmental Biology

RESEARCH INTERESTS: Experimental Design and Statistical Analysis
Biological Impact of Air Pollutants

ASSOCIATION MEMBERSHIPS: American Association for the Advancement of Science
Air Pollution Control Association

EMPLOYMENT: Research Associate, Environmental Studies Laboratory, Botany Department, University of Montana, Missoula, Montana 59801
Full time: July, 1975, to present
Part time: June, 1971, to July, 1975

DIRECT EXPERIENCE:

Field Work and Analysis
Anaconda Aluminum, Columbia Falls
Reynolds Aluminum, Massena, New York
Alcoa Aluminum, Massena, New York
Stauffer Chemical, Ramsay, Montana
Rocky Mountain Phosphates, Garrison, Montana
Cominco American, Hall, Montana
Anaconda Copper, Anaconda, Montana
Cenex Refinery, Laurel, Montana
Exxon, Conoco, Corette Power Plant Complex, Billings, Montana
Montana Power Units (2100 MW), Colstrip, Montana
Zonal Air Pollution System (ZAPS), EPA, Ashland, Montana

Analysis, Critique, and Testimony
TVA Shawnee Power Plant, Puducah, Kentucky
Indiana Dunes Lakeshore Industrial Complex, Gary, Indiana
Missoula Air Pollution Control, Missoula, Montana
Tri-State Generation's proposed Hemingford, Nebraska, coal-fired power plant (1500 MW)
Revision of Montana State Air Quality Standards (1977-80)
Flathead Reservation Class I Air Quality Redesignation
Graduate student consultant, numerous projects

Current (1981) Active Research Areas
Fluoride content and bone structure alterations in small mammals
Residual sulfur contamination of grassland ecosystems
Sulfur dioxide alterations of pollination systems
Sulfur dioxide effects on seed responses of native grasses
Deposition and accumulation rates of air pollutants to vegetation canopies
Vertical stratification of ambient pollutants as determined by passive monitoring techniques

PETER M. RICE

PUBLICATIONS AND MAJOR REPORTS:

Gordon, C.C., P.C. Tourangeau, J.J. Bromenshenk, C.E. Carlson, and P.M. Rice. 1977. Pre- and Post-Operational Investigations into the Impacts of Coal-Fired Power Plant Emissions in the Northern Great Plains. National Academy of Sciences/National Research Council Meeting, Washington, D.C. March.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1977. Atmospheric Sciences: Potential of Energy Extraction Processes in the Northern Great Plains for Heavy Metal Contamination and Consequent Uptake and Turnover in a Range Ecosystem Model. ERDA Quarterly Report. U.S. Energy Research and Development Administration, Iowa State University, Ames, Iowa. February.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1977. Atmospheric Sciences: Potential of Energy Extraction Processes in the Northern Great Plains for Heavy Metal Contamination and Consequent Uptake and Turnover in a Range Ecosystem Model. ERDA Quarterly Report. U.S. Energy Research and Development Administration, Iowa State University, Ames, Iowa. July.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1977. Atmospheric Sciences: Potential of Energy Extraction Processes in the Northern Great Plains for Heavy Metal Contamination and Consequent Uptake and Turnover in a Range Ecosystem Model. ERDA Quarterly Report. U.S. Energy Research and Development Administration, Iowa State University, Ames, Iowa. November.

Gordon, C.C., J.J. O'Toole, L.A. Rancitelli, E.A. Crecelius, F.F. Munshower, P.C. Tourangeau, P.M. Rice, S. Garcia, and E.J. Depuit. 1978. Atmospheric Sciences: Potential of Energy Extraction Processes in the Northern Great Plains for Heavy Metal Contamination and Consequent Uptake and Turnover in a Range Ecosystem Model. ERDA Annual Report. U.S. Energy Research and Development Administration, Iowa State University, Ames, Iowa. February.

Gordon, C.C., P.C. Tourangeau, P.M. Rice, and K.J. Zackheim. 1978. A Report on Fluoride Levels in the Bone Tissues of Indigenous Animals Collected from the Fort Union Basin of Southeastern Montana from 1973-1977. Montana Department of Fish and Game, Helena, and Bureau of Land Management, Billings, Montana. May.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1978. Atmospheric Sciences: Potential of Energy Extraction Processes in the Northern Great Plains for Heavy Metal Contamination and Consequent Uptake and Turnover in a Range Ecosystem Model. ERDA Quarterly Report. U.S. Energy Research and Development Administration, Iowa State University, Ames, Iowa. July.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1978. Investigation of the Impact of Coal-Fired Power Plant Emissions Upon the Disease/Health/Growth Characteristics of Ponderosa Pine-Skunkbush Ecosystems and Grassland Ecosystems in Southeastern Montana (Section 4, pp. 65-139). Effects of Low-Level SO_2 Exposure on Sulfur Accumulation and Various Plant Life Responses of Some Major Grassland Species Under Various Conditions (Section 13, pp. 399-472). In: The Bioenvironmental Impact of a Coal-Fired Power Plant, Third Interim Report, Colstrip, Montana, December, 1977. EPA-600/3-78-021. U.S. Environmental

PETER M. RICE

PUBLICATIONS AND MAJOR REPORTS: (continued)

Protection Agency, Environmental Research Laboratory, Office of Research and Development, Corvallis, Oregon. February.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1979. Foliar Pathologies of Ponderosa Pine Near Colstrip (Section 5, pp. 141-214). In: The Bioenvironmental Impact of a Coal-Fired Power Plant, Fourth Interim Report, Colstrip, Montana, December, 1978. EPA-600/3-79-044. U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory, Corvallis, Oregon. April.

Rice, P.M., L.H. Pye, R. Boldi, J. O'Loughlin, P.C. Tourangeau, and C.C. Gordon. 1979. The Effects of "Low Level SO_2" Exposure on Sulfur Accumulation and Various Plant Life Responses of Some Major Grassland Species on the ZAPS Sites (Section 14, pp. 494-591). An Evaluation of the Nature of SO_2 Fumigations on the ZAPS Sites and Two Different Methods of SO_2 Monitoring (Addendum). In: The Bioenvironmental Impact of a Coal-Fired Power Plant, Fourth Interim Report, Colstrip, Montana, December, 1978. EPA-600/3-79-044. U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory, Corvallis, Oregon. April.

Tourangeau, P.C., P.M. Rice, and C.C. Gordon. 1979. Comments on Final Draft City-County Attainment Plan. County Commissioners, Missoula, Montana. January.

Gordon, C.C. and Environmental Studies Laboratory Personnel. 1979. Outline of Air Pollution Monitoring and Impact Evaluation Studies in Southeastern Montana (Colstrip). U.S. Department of Agriculture, Forest Service, Region I, Missoula, Montana. March.

Gordon, C.C., P.C. Tourangeau, and P.M. Rice. 1979. Progress Report for the Department of Energy (ERDA). U.S. Department of Energy, Iowa State University, Ames, Iowa. March.

Gordon, C.C., J.J. Bromenshenk, P.C. Tourangeau, and P.M. Rice. 1979. Comments on EPA Protocol Outline. U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory, Corvallis, Oregon. August.

Gordon, C.C., P.C. Tourangeau, P.M. Rice, and J.J. Bromenshenk. 1979. University of Montana Comments on "Draft Outline for Integrated Report on ZAPS Experiments." U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory, Corvallis, Oregon. August.

Rice, P.M., C.C. Gordon, P.C. Tourangeau, and L. Pye. 1980. Mycorrhizal Association and Root Characteristics in Western Wheatgrass Fumigation with Sulfur Dioxide (Section 8, pp. 120-135). In: The Bioenvironmental Impact of a Coal-Fired Power Plant, Fifth Interim Report, Colstrip, Montana, April, 1980. EPA-600/3-80-052. U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory, Corvallis, Oregon. June.

Rice, P.M., C.C. Gordon, and P.C. Tourangeau. 1980. Weight and Germination Responses of Grass Seeds from Parental Stock Subjected to Sulfur Dioxide Fumigation (Section 11, pp. 153-171). In: The Bioenvironmental Impact of a Coal-Fired Power Plant, Fifth Interim Report, Colstrip, Montana, April, 1980. EPA-600/3-80-052. U.S. Environmental Protection Agency, Corvallis Environmental Research Laboratory, Corvallis, Oregon. June.

PETER M. RICE

PUBLICATIONS AND MAJOR REPORTS:

Rice, P.M. and P.C. Tourangeau. 1980. Proposed Air Pollution Biomonitoring Study for the Colville Reservation. Colville Confederated Tribes, Nespelem, Washington. December.

League of Women Voters

Missoula, Montana
January 29, 1981

To: Senate Natural Resources Committee
Senator Harold Dover, Chair
Re: SB 65, Air Quality Legislation

Mr. Chairman and members of the committee, my name is Ellen Knight and I am president of the Missoula League of Women Voters. The Missoula League is strongly opposed to Senate Bill 65. As everyone in the state is quite aware, Missoula has serious air pollution problems and we do not want them increased. We need every available tool to help us solve our problems.

We are certainly aware that Missoula's ambient air quality problems stem in large degree from the individual emissions from more and more wood stoves. We also recognize that Montana's current air quality standards would have little effect on this pollution source because the standards can presently deal most effectively with industrial sources of pollution. While this might appear to be putting a greater than deserved proportion of the burden on industry, new devices for controlling wood stove emissions are being developed. We are hopeful that these will be perfected and become available at reasonable cost in the not too distant future. At that time state ambient and emission air quality standards could and should begin to deal with these sources as well as industrial ones and the burden for controlling pollution could then be shifted more equitably.

But, in the meantime, are we to give up the progress we've made so far? In Missoula the answer has to be NO! If we throw out our Montana standards and adopt instead the federal minimum air quality standards can we be assured that the legislature will take special efforts to inact the specific stricter standards that will adequately cover health-affecting sulfer dioxide and particulates? The rotten egg smell of hydrogen sulfide, also of special concern to Missoulians, is not even covered by the federal minimum standards. These pollutants present significant problems in both emissions and for ambient air quality in Missoula.

Missoulians (including the League) are working hard to help control our local air quality problems. We cannot do it alone, however. We need stricter-than-federal state standards to have the most effective control over air pollution. Local government ordinances and local efforts on their own cannot deal effectively to control air pollution.

Further, we believe that the State Board of Health should have the authority to enact the standards. The Board has demonstrated that it, together with the Department of Health, can take the time and diligent care needed to conduct thorough hearings and study specific and detailed evidence relating to all air quality issues. The legislature, on the other hand, cannot possibly take the time to consider this kind of specific decision-making during the legislative process. This committee,

(over, please)

for instance, has time to hold one brief hearing. The House committee will have time for one brief hearing. The legislature does, however, already have watch-dog authority over the Board through use of provisions in the law relating to the Administrative Code Committee and to legislative review of administrative rules. These laws provide for legislative supervision both between and during legislative sessions and they are entirely adequate. Additionally, existing laws spell out the economic costs the Health Board must consider in its decision-making process. These include economic impacts to the State and to citizens as well as to industry. Again, the law is adequate.

In summary, the Missoula League of Women Voters supports the current stricter-than-federal air quality standards. We also support the principle that boards, such as the Board of Health, should be the vehicles to establish specific standards and rules, and that the role of the legislature should be that of policy-maker and watch-dog. This is the way the current laws are set up. We believe they are appropriate and should remain unchanged.

We thank you for this opportunity to comment and urge that you recommend a "do not pass" on this legislation.

Ellen D. Knight

Ellen Knight, President
Missoula League of Women Voters
5800 Rattlesnake
Missoula, Mt. 59801

16 Hidden Valley Road
Havre, Mt. 59501
25 January 1981

To: Senate Natural Resources Committee

From: The League of Women Voters of Montana MLO
Marty Onishuk, State Air Quality Chairman

Suoject: Opposition to SB 65

The Montana League of Women Voters comprises 550 citizens interested in governmental issues. We support the present emission and ambient air quality standards and the procedure by which the state Board of Health established them.

The Montana Constitution Declaration of Rights guarantees citizens "the right to a clean and healthful environment" and states that it is the responsibility "of the state and each person to maintain and improve a clean and healthful environment." In addition, the 1967 Montana Clean Air Act, passed three years before any federal air pollution legislation, declares it is the"public policy of this state to achieve and maintain such levels of air quality as will protect human health and safety and, to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote economic and social development of this state, and facilitate the enjoyment of natural attractions of this state."

State emission standards and, more recently, ambient standards were set after extensive hearings considering the best scientific, technical, economic, environmental and social data available. Participants included industry, labor, environmental and other groups.

Emission standards were set in 1972 with updates as tech - nology and information changed. The ambient standards have not been significantly changed since they were found to be "goals and guidelines" and not legally enforceable in 1977. The newly-adopted standards, the result of a two-year study, are practically identical to the old ones except for one fluoride standard.

A study by Data Resources, Inc. for the Environmental Protection Agency and the Presidential Council on Environmental Quality states pollution control spending will create jobs in the manufacture and operation of pollution control equipment, reducing the unemployment rate by 0.2 percent per year between 1982 and 1986. Most jobs lost by plant closings have occurred at old,

economically marginal facilities, such as the Anaconda smelter. President Cox of the Anaconda Company has indicated pollution control costs were only one of many considerations for closing the older smelter at Anaconda. Just how important those other considerations were became evident in December, when EPA expressed its willingness to extend compliance deadlines for seven years. The company had never met federal sulfur dioxide standards, let alone state standards. Since Anaconda had already proceeded with its plans to have its ore smelted in Japan, the company naturally turned down EPA's offer. (In view of the frequent criticism that stringent environmental standards repel industry, Anaconda's move to Japan is particularly interesting since Japan's sulfur dioxide standards are considerably more strict than Montana's as are those of twenty other states. We would also like to point out that Anaconda's and ARCO's decision to close the smelter is inconsistent with the statement ARCO made before purchasing Anaconda that it was willing and able to implement the retrofitting required by federal air quality standards. The inconsistency has never been explained, but we believe it raises the strong possibility that the decision to move was based on economic factors unrelated to pollution control.

According to Michael Baram, Director of the Program on Governmental Regulations at the Franklin Pierce Law Center, "Solutions to societal problems such as nuclear reactor safety and human exposure to chemical carcinogens require consideration of humanistic and environmental principles. Consideration of these principles is imcompatible with a regulatory decision-making process in which economic factors play a dominant role."

The cost-benefit approach to decisions on environmental matters harbors a basic flaw. The risks are borne by members of the population and sometimes even by generations that do not enjoy the benefits; for example, many children in Missoula have decreased lung function because of the pollution in the valley and 5-8% of the children in East Helena have blood levels of lead known to cause anemia or mental damage. A congressional report suggests that risk-benefit analysis may institutionalize a bias <u>against</u> public interest. Why? Because benefits are easier to measure than risks which may not occur for years.

Environmental standards must be set with the health and welfare of Montanans receiving first priority. Because of the complex, technical nature of the data, we feel that setting emission and ambient air quality standards belongs to the state Board of Health working with the Department of Health and Environmental Sciences. The Legislature does not have the time to properly review the Board's action in the 90- day biennial session. A bad precedent would be set if the Legislature must approve the rules of any duly appointed state boards. Where would review stop?

The time required for a decision on standards would be extended by an additional review by the biennial Legislature. Industry has repeatedly testified here against additional governmental regulation. Ironically, the legislature review industry has demanded would only increase governmental red tape.

The League of Women Voters of Montana supports the present procedure of the State Board of Health as final authority in setting air quality standards. Weakening Montana's standards to federal levels will not protect Montanans from continued damage caused by fluoride and hydrogen sulfides, pollutants not even listed in federal standards. Further, human health, especially of the very young and the elderly, will not be adequately protected. Higher allowable level of sulfur dioxide and particulates will adversely affect human health.

Montanans were pioneers in establishing air quality standards. Our Board of Health and Environmental Sciences has now established reasonable and effective standards to protect the health and welfare of the citizens of Montana. Let us not sacrifice air quality on the pretext of economic hardship.

NAME: Janet McMillan DATE: January 30, 1980

ADDRESS: 2817 Juneau Drive

PHONE: 721-2805

REPRESENTING WHOM? myself

APPEARING ON WHICH PROPOSAL: S.B. 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: attached letter petition

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

To: The Honorable Jan Johnson
Senate of the State of Montana

Dear Senator Johnson:

We believe that good air quality is important to the State of Montana and to Missoula in particular. We want to see air quality standards established which are stronger than the minimum Federal Standards. Therefore we oppose SB 65.

N Hoff	Box 51	Arlee, MT 59821
L. Busch	1325½ S. 3rd W.	Msla, 59801
Kathy Daugherty	2830 Juneau	Msla, 59801
Kimberly K Lemm	2836 Juneau	Msla, 59801
Bonnie McDonald	44 N. Travis	Msla, 59801
Donna Mendenhall	825 Hazel	Msla 59801
James T. Olsgaete	121 Short	Msla, 59801
Ramon Fuego	2157 S. 13th W	MSLA 59801
Regina M. Erickson	3250 Patteegan Rd.	Missoula 59801
[illegible]	117 W Broadway	Msla
Ronald E Erickson	3250 Patteegan	Missoula
[illegible]	[illegible]	[illegible]
T. Gail Stecker	252 Elk [illegible]	[illegible]
Marsha Michaels	5853 Pinewood	59801
Donna Skinner	6975 Rosemarie Ln	59801
Sara Hoon	416 Westview Dr.	59801
Ellen Knight	5800 Rattlesnake	Msla. 59801
Peter Price	240 S 2nd W	Missoula
Bill Cochran	12400 Bench Road	Missoula, Mt 59801
Vickie Rea	Box 1532	Bozeman, MT. 59715
[illegible]	[illegible]	[illegible]
H. Howard III	306 S. 7th Ave.	Bozeman, MT. 59715

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Sara Hunter	Box 7581 Miss	59807
Janet McMillan	2817 Juneau	59801
Mr. Jack A. Smith	2941 Juneau Dr.	59801
[illegible]	[illegible]	[illegible]
Marilyn A. Jobin	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Audrey L. Sheridan	9126 Huckleberry Lane	Missoula
David S. Johnson	605 Phillips St	Missoula 59801
Joanne Wilson	332 S. 6th East	Missoula
Connie Hubbard	208 W Spruce	Missoula 59807
[illegible]	521 Redwood	Msla
[illegible]	[illegible]	[illegible]
[illegible]	607 E. Central	Missoula, MT 59801
[illegible]	1242 [illegible]	Missoula 59801
Lynn Chiodo	1325 Catlin	Missoula, MT 59801
Sue Irion	200 Woodford Apt 4	Missoula, Mt.
Kristen J. Nelson	208 S 5th West	Missoula MT 59801
Susan Wilander	P.O. Box 2562	Missoula 59806
Jerry Walker	340 Mcleod	Msla 59801
[illegible]	340 McLEOD	MISSOULA 59801
Ronnie VanDamme	Box 164 Star Rt	Bonner MT 59823
Jill Abbott	Star Route Box 172	Bonner, MT. 59823
Doug Batt	Box 26	Dixon, MT. 59831
Margo Field	Box 83	Dixon, Mt. 59831
Jim Morgaard	Box 83	Dixon MT. 59831
Stanley [illegible]	333 DALY AVE	MSLA MT 59801
Thomas Doyle	1715 Hollins St.	Msla MT. 59801
[illegible]	213 W Beckwith	Msla, MT 59801
[illegible]	845 Edith	Missoula, MT 59801
[illegible]	950 [illegible]	[illegible] 59801
Jeffrey L. McClain	220½ S 5th W	Missoula MT 59801
Dean Christopherson	5412 Mannrew	Msla MT. 59801
Laura Wyman	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Donna Taylor	543 So 2nd W 1023 Elm St	Msla MT 5980 " " "
Thomas L. Black	323 E. Central	Msla 598
Daniel McMeyer	#5 Virginia Dr.	Msla 5980
Carole Evans	714 Coreen Cr.	Missoula
Carlen Harvey	9 Mile	Huson 5984
Marilyn Vickers	2807 Highland Dr	5435
Michael S Crater	402 E. Front	Missoula 5
Judy. Mpls	Rt 3	Stevensville MT 5987
Gordon H. Hays	Rt. 3	Stevensville Mt 5987
Gary Ray Orsum	519 East Main	Msla MT 59801
Kathleen O'Connell	2411 Valley Dr.	Missoula MT 5980
Ellen Sallee	714 City Dr	Msla
Sarah Daughtridge	618½ Rollins St.	Msla, MT 59801
Patricia Tucker	237½ E Front	Msla MT 5980
Lynn Heldt MA	1523 S. 10th West	Missoula, MT 598
Shelley Nixon	2006 Kensington	Msla 5980
Bob Page	"	"
David Claman	323 Eddy	Msla 59801
Virginia Grady	Stark, Box 12	Alberton, MT 5982
Margaret Jacobson	119 Daly	Msla Mt 59801
Neil Miller	2819 S Rose	Missoula
L. A. Crane	Rt #5 Miller Cr Rd	Missoula
Betty M. Crane	Rt. 5 Miller Cr. Rd.	Missoula
[illegible]	604 Toole Msla	
George M. Oblowski	Southern Cross	Anaconda, MT.
Regina Squilicick	402 S Third W.	MT 59801
Stanton Hall	618 So 5th W.	Msla Mont 5980
Sharon Milyko	115 E. Cutler	

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Mike Clabunde	613 S. Ave W.	Msla
Patricia Roesch	633 Stoddard	Missoula
Eddie Hackenberg	631½ W Alder	Missoula
Debby Soules	1049 S. 1st W.	Missoula
Jerry Privits	2532 Spurgin Rd	Msla
June S. Michel	408 North Ave E	Missoula
William H Brunner	504 Lolo St.	Missoula
L. Widdicombe	2610 Arcadia	Missoula
Pamela Stone	615 E. Kent	Msla
Michele Neal	1941 Strand	Miss
Marian Thurgold	340½ So 2nd West	Miss
Carolyn Johnson	307 So 4th West	Missoula
Rick Northcross	St Ignatius	Mt.
Noelle Naiden	5030 Elk Ridge Rd	Missoula Mt.
Patty Blonds	516 W. Alder	" "
Bruce Lee	633 Stoddard	Missoula
Lloyd Hassenstein	922 Taylor	Msla
Lynne Wolfe	511 River St	Msla
Pamela Scott	1229 Ronald Ave	Msla
Miriam Morgan	205 EAST KENT	MSLA
HARRY EZELL	430 HARTMAN	MSLA
Alan T Hoyt	131 So. 5th E.	Missoula
Coco Chipoke	717 Cherry	Missoula
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Helena S. Maclay	POBOX8957 Missoula, MT 59807	
Joseph Evarts	Box 8803 Missoula, MT. 59807	
Frank Matuk	328 E. Central	Msla 59801
Richard Fiorito	319 S 3 W	Msla 59801
Paul Anderson	418 Hazel	Msla. 59801
Jess LaBuff	336 So. 5th E. #2	Msla. 59801
Marcia Edell	137 Locust	Msla 59801
Sylvia Hefty	622 Dearborn	Msla 59801
Jeanne Ellinger	931 Wolf	Msla 59801
[illegible] Schenk	928 Elm	Msla. 59801

THOMAS CRAWFORD

1229 JACKSON

For Janet McMillan

January 29, 1981

Mr. Harold Dover, Chairman
Members of the Committee
Senate Natural Resources Committee
Montana State Legislature
Helena, Montana

Dear Sirs:

I regret that a recent injury prevented my appearing before you to testify against Senate Bill 65. Therefore, I have requested that this statement be read on my behalf.

My name is Jerry Bromenshenk. I am a native Montanan, grew up on a farm near Billings, am currently employed as a research entomologist, and have spent the last six years studying the effects of air pollution on pest and beneficial insects which are economically important to Montana agricultural and forest industries. For example, excessive levels of toxic pollutants in the ambient air accumulate in honey bees affecting honey and wax production and pollination service. Pest insect populations in timber stands may reach epidemic proportions as a result of pollution induced changes such as weakening trees or reducing the numbers of predatory and parasitic insects that normally keep pest populations in check.

I oppose Senate Bill 65 because:

- It is based on the premise that the federal government is better qualified to set ambient air quality standards than Montanans.
- It negates the purpose and authority of the Montana Board of Health.
- It saddles the Legislature with the difficult task of reviewing established and proposed ambient air quality standards and of setting standards for pollutants that the federal government has failed to regulate. To properly accomplish these tasks, the Legislature would have to examine the reams of evidence relating to air quality and the protection of the environment and human health, analyze factors such as economics, industrial growth, and jobs; conduct hearings, and disseminate information for public review and comment. It took the Board of Health 2½ years to accomplish these tasks before they made their decisions.

The concept that Montana should have only minimum air quality standards displays a total disregard for our health and the protection of our agricultural, timber, and recreational industries. Whereas there is no evidence that the new Montana standards have caused or will cause shutdowns of industries and loss of jobs or that the federal government is better qualified to set ambient air standards, there is evidence that air pollution harms Montana's unique resources, public welfare, and human health.

As a biologist, I am concerned about the potential for air pollutant induced harm to Montana's farmers, ranchers, and beekeepers, to the timber industry, and to the plant and animal life which are so much a part of our state and so vital to our tourist industry.

As a Montanan, I object to waiving our rights to develop our own ambient air quality standards in a careful, sound, and reasonable manner.

As a Missoulian, I am upset that an elected Senator from our city should demonstrate such indifference to the serious problems posed by air pollution -- problems which are self-evident in the Missoula valley.

Finally, as a victim of chronic allergies and asthma, I am concerned about the health of Montanans, especially children and sufferers of respiratory ailments.

Last spring, during a prolonged and intense pollution episode, I experienced acute laryngeal spasms brought on by the irritants in the air. On several occasions, I awoke in the middle of the night unable to breathe or swallow. Fortunately the attacks were of short duration and responded to medical treatment.

I wish that Ms. Johnson and any other individual attempting to overthrow or to weaken Montana's air quality standards could just once experience the very real and very frightening sensation of not being able to breathe.

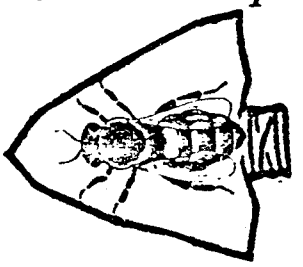
Sincerely,

Jerry J. Bromenshenk

Jerry J. Bromenshenk
733 W. Sussex, No. 3
Missoula, Montana

Arrowhead Apiaries

Route 1 Box 57
Deer Lodge, Montana 59722
Telephone (406) 846-1481



Owners:
Paul and Bette Peterson

Testimony of Arrowhead Apiaries on SB 65
Senate Natural Resources Committee January 30, 1981

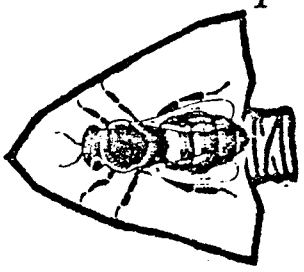
Mr. Chairman, members of the committee. My name is Gail Peterson and I am representing the family business of Arrowhead Apiaries in Deer Lodge where my father has been a commercial beekeeper for 20 years.

From USDA figures, the influence of the honey bee on American agriculture is almost 8 billion dollars per year. Almost one third of the total American diet is derived directly or indirectly from the honey bee.

On the state level, there are a few facts about the average general beekeeper in Montana which I would like to share with you. He produces an average of 150,000 pounds of honey and 2,500 pounds of beeswax per year with a combined total value of about $85,000.00. He has 1,500 colonies of bees on 50 different registered apiaries. In addition to himself, he employs one full-time and one part-time employee for an average payroll of $25,000 to $35,000. (Keep in mind we are talking about an "average" general beekeeper. Overall, the general beekeepers as a group in Montana employ 250 to 300 people per year on a full-time basis and another 250 to 300 on a seasonal part-time basis.) He pays about $3,500 per year in property taxes and fees. This does not include his federal and state income taxes. It is a family business in that in many cases the business has been handed down from one generation to another. Out of the 59 full-time general beekeepers in Montana, 27 of them are a family business that has been passed down from father to son and the grandchildren are now involved in the business.

Arrowhead Apiaries

Route 1 Box 57
Deer Lodge, Montana 59722
Telephone (406) 846-1481



Owners:
Paul and Bette Peterson

We talk a great deal in Montana about protecting our local businesses and preserving the family farm.

According to the Montana Standard dated January 29, 1981, Jan Johnson "has said the new air standards are an impediment to recruiting new industry to the state and could present problems for industry already here".

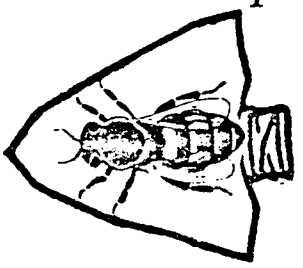
I say, from beef to bees, agriculture is still the largest industry in the state and must be protected by Montana's own state standards. These standards must be made workable under the operation of the State Health Board, for how is it possible for the Legislature to spend the equivalent amount of time to form impartial rules and to set up a workable system of standards.

Adjustments in these standards should be through court procedures or Health Board review.

Action by the Legislature to control these standards brings back memories of when the Copper Kings controlled the Montana Legislature.

Arrowhead Apiaries

Route 1 Box 57
Deer Lodge, Montana 59722
Telephone (406) 846-1481



Owners:
Paul and Bette Peterson

Testimony for the Select Committee on Economic Problems, January 6, 1981

Genclemen:

I am a native of the Deer Lodge Valley, and minister, having pastored two congregations in the area for 20 years in Deer Lodge and Anaconda. I am self-supporting, having been involved in farming and ranching and for the past 20 years as a commercial beekeeper, maintaining a honey production area in the 4 counties of Powell, Deer Lodge, Silver Bow and Beaverhead.

The honey bee is responsible for a vast part of agriculture production in the United States. Without their services, our standard of living would not be what it is today. See attachment from the Wall Street Journal.

The State Board of Health has been and is being accused of improper action. However, I would like to review some of my own experiences on Air Pollution over the 4 county area of Powell, Deer Lodge, Silver Bow and Beaverhead.

In the process of obtaining livelihood, I have suffered a honey crop loss of approximately 2.5 million pounds of honey, due to bee kill by arsenic and flourides from industry in the area. According to the wind pattern and time of year, the kill area by industrial pollutants was the following:

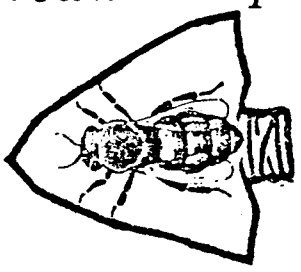
Deer Lodge Valley - All
Garrison to Avon - All
Anaconda to Wise River and Divide
Silver Bow County - All

In fact a neighboring beekeeper in Whitehall area (Cloverdale Apiaries) had wipeouts in his bee yards.

See attached results of tests taken by Will Kissinger, State Apiarist.

Arrowhead Apiaries

Route 1 Box 57
Deer Lodge, Montana 59722
Telephone (406) 846-1481



Owners:
Paul and Bette Peterson

As to whether industry can clean up is proved by our last 3 years of operation:

Arsenic damage by A.C.M. - None that could be seen.
Flouride damage by Stauffer - None that could be seen.
Garrison Rocky Mountain Phosphate - Shut down. Their operation was a crime as their conduct showed. Out of business by misconduct.

Besides a 2.5 million pound decrease in honey crop, we will be paying off debts for many years because of cash losses along the way. Our production capacity today is where it should have been 15 years ago. Nobody held our hand along the way.

My lawyer told me that on a local level we could win a suit, but that on the appeal level, the big companies would break us.

In our operation we have been involved in many air quality hearings and have counted on the State Health Board as there was no true recourse for a just procedure of law as our attorney told us.

We are only one honey business of several in a many county area who have been affected by poor air quality conditions. Yet we are as vital as any type of business in existence.

It would appear that there are hidden motives in that which is taking place, and that is to break the unions and bring the working man back into line. But it is also time for the workers of this nation to realize we are on a World Market System.

We need wise use of our natural resources and moral use of power.

Arrowhead Apiaries

Route 1 Box 57
Deer Lodge, Montana 59722
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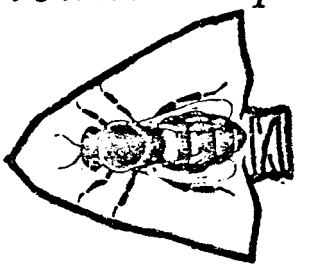


Owners:
Paul and Bette Peterson

Federal Air Standards are not fitted for Montana. Some industry would not be covered by them. The Butte Berkeley Pit, Stauffer, Anaconda Smelter, and Eastern Montana coal fields all are problem areas which do not relate well to Federal Standards. We recognize that Stauffer needs an operating standard at a higher level. Twenty parts per million of flouride is too low. It is hoped that when the Pit switches from trucks to a conveyer belt system that they will not blame it on air standards when it is actually an economic problem.

Montana should be governed by fair Montana standards.

Politics can in no way be allowed to enter into the process of establishing state standards.

Respectfully Submitted,

Paul Peterson

Enclosed:
Letter dated 8-16-73 - W. Kissinger
" " 8-13-73 - D. Maughan, Health Dept.
" " 7-25-73 - K. [illegible], [illegible]
" " 4-11-74 - J. Picardi, A.C.M.
p 1 - report with chart Jan. 11-7-74
[illegible] dated 5-1-71, A.C.M. [illegible]

LISCA
Low Income Senior Citizens Advocates
P.O. Box 897 — Power Block Bldg., Suite 612
Helena, MT 59601
(406) 443-1630

TESTIMONY OF JESSIE MOLA
ON
SENATE BILL 65

LISCA (THE LOW INCOME SENIOR CITIZENS ADVOCATE), IS A STATE-WIDE ORGANIZATION CHARGED WITH ADVOCATING FOR THE NEEDS OF LOW-INCOME ELDERLY BEFORE PUBLIC AND PRIVATE DECISION-MAKING ENTITIES. AND SO, IT IS WITH THIS CHARGE THAT I AM HERE TODAY TO TALK TO YOU ABOUT AIR QUALITY AND IT'S IMPACT ON SENIOR CITIZENS.

IN THE STATE OF MONTANA'S FINAL ENVIRONMENTAL IMPACT STATEMENT ON AIR QUALITY, SEVERAL STATEMENTS ARE MADE RELATIVE TO SENIOR CITIZENS. ONE OF THE FINDINGS IS THAT "PERSONS WITH CHRONIC BRONCHITIS WHO ARE OVER 55 YEARS HAVE BEEN FOUND TO BE MORE VULNERABLE TO SULFUR OXIDES POLLUTION THAN YOUNGER CHRONIC BRONCHITIS PATIENTS." ALSO, THE NATIONAL CENTER FOR HEALTH STATISTICS, IN A 1973 REPORT, STATES THAT 11 PERCENT OF THE POPULATION OVER THE AGE OF 65 EXPERIENCES CHRONIC LUNG IMPAIRMENTS. COMPARE THIS TO THE 7 PERCENT OF THE GENERAL POPULATION WHO SUFFER CHRONIC LUNG IMPAIRMENTS AND THE CONCLUSION IS OBVIOUS: AIR POLLUTION AFFECTS THE LEDERLY MORE THAN IT AFFECTS THE GENERAL POPULATION.

INDUSTRY ALSO HAS STATEMENTS TO MAKE IN THE FINAL EIS ABOUT THE ELDERLY AND UNEMPLOYED. ON PAGE 43, IN A COMMENT WHERE THE VALUE OF ONE'S LIFE IS BEING ASSESSED, INDUSTRY STATES THAT OLDER WORKERS ARE NOT ECONOMICALLY PRODUCTIVE. ON THE SAME PAGE, THEY STATE "SOME OF THE PEOPLE WHO WILL DIE FROM AIR POLLUTION ARE UNEMPLOYED AND THEREFORE HAVE NO ECONOMIC VALUE."

IN SUMMARY, SENATE BILL 65 WILL GIVE THE LEGISLATURE AN IMPOSSIBLE TASK. THE BOARD OF HEALTH SHOULD REMAIN THE RULE MAKING AUTHORITY FOR AIR QUALITY STANDARDS. I THINK THIS BILL IS A BAD IDEA AND YOU SHOULD VOTE AGAINST IT. THANK YOU VERY MUCH FOR GIVING ME THIS TIME..

NAME: Janice Hand DATE: 1/30

ADDRESS: 301 W. Alder St Missoula MT 59801

PHONE: 721-5700 ex 379

REPRESENTING WHOM? Mslla Co. Health Dept. / Co. Commissioners

APPEARING ON WHICH PROPOSAL: SB-65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS: Please see attachments:

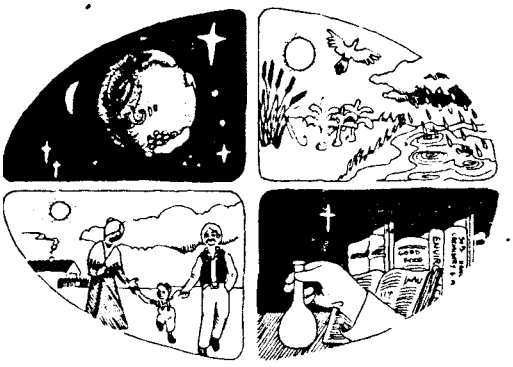
1) Janice Carlson, Missoula C-C Health Dept, Dir. Air Quality Unit

2) Janice Hand, Missoula C-C Health Dept; Research Specialist (results of public opinion survey)

[3) Co. Commissioners' letter to follow via mail]

JH

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY



...MAKING A DIFFERENCE...

Testimony - S.B. 65
Natural Resources Committee

Committee Members and Citizens:

Missoula, Montana is currently in violation of all State and Federal Standards for total suspended particulate.

In addition, we experience frequent exposure to hydrogen sulfide which has a distinctive aroma that has achieved statewide recognition.

The hydrogen sulfide odor is and has been a consistent problem in Missoula. The ambient standard for hydrogen sulfide was recently weakened by the State Board of Health from 30 ppb to 50 ppb. The human nose can detect the odor at 4 ppb.

We recognize that the Board weakened the standard for hydrogen sulfide because adverse health effects cannot be shown at the 30 ppb level. However, the presence of this odor does continue to be an insult to the noses of our citizens and we ask that the standard not be lowered further.

The Montana Air Pollution Study, funded by the two previous legislatures, has shown that normal Missoula children and adults with pulmonary problems are adversely affected by suspended particulate. Thus, it is important to recognize that the effects of air pollution are not evenly distributed in our population. It effects the elderly and people with asthma and other lung diseases and it affects our young children.

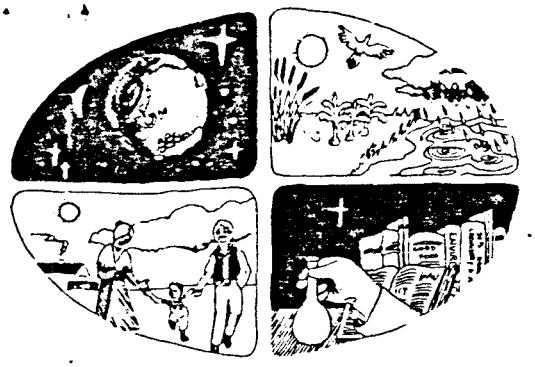
MISSOULA CITY-COUNTY HEALTH DEPARTMENT
301 WEST ALDER STREET MISSOULA, MT 59801
TELEPHONE 721-5700

Missoula's wintertime air quality has been shown to contain a large percentage of respirable particulate. This particulate is of small size and is able to penetrate the lungs where it can do damage. As a result, it is important to realize that this material is much more hazardous than the material present in many other portions of the state where the particulate contains larger percentages of relatively large particles such as wind blown dust.

Because we are very concerned about the health of our citizens, we ask that the State Legislature recognize our pollution as a threat to our greatest resource--the Citizens of Montana. We ask that you do not take any action which would weaken our present air pollution standards.

Scott Church
Air Pollution Control Board
for James H. Carlson

James H. Carlson
Director, Air Quality Unit
Missoula City-County Health Department



...MAKING A DIFFERENCE...

January 28, 1981

STATEMENT

Senate Natural Resources Committee Hearing on SB-65

January 30, 1981

My name is Janice Hand, Research Specialist II with the Missoula City-County Health Department. I have been asked to present some information pertinent to SB-65, in the form of a brief summary of results of a December, 1980 public opinion survey about Missoula's urban air quality.

The survey was designed to find out (1) if Missoulians think there is an air pollution problem in the city, (2) if they believe there are adverse health effects from Missoula's air quality and (3) their support or opposition for limited regulations against source pollution. We surveyed 401 urban residents by telephone in early December.

Very briefly, the most relevant results for you are:

- When asked if they believed air pollution was a major problem with living in Missoula, 83% of the respondents said yes.
- Wood burning and industry are seen as having the greatest effect on Missoula's air quality.
- Respondents strongly felt that breathing Missoula's air pollution is harmful to their health.
- Respondents would support some regulations to clean up the air. They would support regulations requiring new or rental homes to be well insulated, the use of new technologies and banning wood burning on poor air quality days, but would not support a total ban on all residential wood burning.

-cont.-

MISSOULA CITY-COUNTY HEALTH DEPARTMENT
301 WEST ALDER STREET MISSOULA, MT 59801
TELEPHONE 721-5700

- When asked for their general comments on Missoula's air pollution situation, the four most common responses were:

  1) *Pollution is because of the valley Missoula is in/Inversions from valley cause pollution.*

  2) *More public education is needed/Poeple need to learn how to burn.*

  3) *Industry (Hoerner Waldorf) is a/the problem/ Pulp mill should have been built elsewhere/ Smelly.*

  4) *Cooperation is the key/People have to cooperate and not burn on bad days.*

As a result, the Missoula City-County Health Department does not support any legislation which will weaken standards for hydrogen sulfide (Missoula's "smell") or the standard for particulate which has been shown to cause adverse health effects in Missoula valley citizens (Missoula Air Pollution Study, 1977-1979). We feel the survey is an accurate and representative view of what Missoulians think about their air pollution situation, and hope this information is of use to your committee.

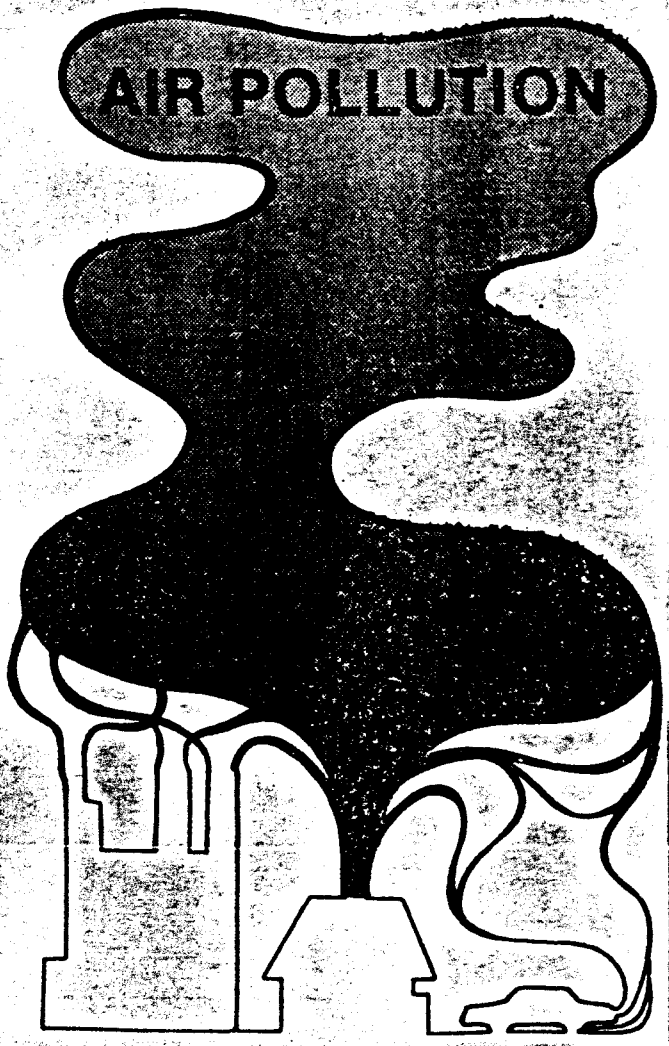
I would be pleased to answer any questions about the results of this survey. (My telephone number is 721-5700, extension 379).

Janice S. Hand

JSH/slp
attached: "1980 Missoula Air Pollution Survey"
Research Unit, December 19, 1980

1980

MISSOULA AIR POLLUTION SURVEY



Research Unit

Missoula City-County Health Department

December 19, 1980

1980 MISSOULA AIR POLLUTION SURVEY

SUMMARY

This telephone survey was conducted to answer the general question, "What do Missoulians think about the community's air quality?" The answers are clear. Eighty-three percent said they felt air pollution is a major problem with living in Missoula. Respondents felt that wood burning has the greatest effect on Missoula's air quality, and that breathing Missoula's air pollution is harmful to health. The study shows that while respondents support public education efforts and limited regulations, they would definitely not support a total ban on all residential wood burning.

The survey was conducted by telephone to a statistically valid sample of 401 Missoula residents. Phone numbers were selected by use of a computer random number generator and respondents' names were not used.

METHODOLOGY

SURVEY DESIGN - The objectives of the study were to learn (1) urban Missoula residents' knowledge of the city's air pollution sources, (2) their perceptions of air pollution's effect on people's health, (3) opinions on possible solutions to Missoula's air pollution problems, (4) effects of current public information efforts, and (5) a focus for future education efforts.

DESIGN - The Research Unit designed a telephone survey of randomly selected urban Missoula residents in order to complete the survey quickly and economically. The Radio Shack TRS-80, Model I computer generated 1037 random four-digit numbers, which were then paired with Missoula urban phone prefixes (251-, 543-, 549-, 721-, and 728-) in proportion to actual phone listings. Ten numbers were written on each of one hundred and four 3" x 5" cards and prefixes were assigned to each card in proportion to actual phone listings. The survey, which covered 54,584 urban residents, did not include Frenchtown, Bonner, Clinton or Lolo, which are outside the urban area. A pretest was conducted on December 2.

For a confidence level of 95% (based on an urban population of 54,584), a sample of 397 is required; 401 questionnaires were completed. A confidence level of 100%, meaning each answer has a 100% chance of being accurate, would

have meant that all 54,584 people would have been interviewed.

All interviewers were trained in phone interviewing techniques. See "Interviewer Instructions," page 12.

To insure a good cross-section of Missoula residents and to minimize possible bias by interviewing only people home during one time of the day, there were six interviewing sessions:

Sunday, December 7	2:00 - 5:00 p.m.
Monday, December 8	1:00 - 4:00 p.m.
	7:00 - 9:00 p.m.
Tuesday, December 9	10:00 -12:00 a.m.
	7:00 - 9:00 p.m.
Wednesday, December 10	7:00 - 9:00 p.m.

These six sessions turned out to be conducted on good air quality days.

TABULATION - On the hypothesis that people who do burn wood will answer air pollution questions differently, 305 of the 401 questionnaires were grouped into two additional tabulations: (1) responses from those who do burn and (2) responses from those who do not burn. Results do show differences. See next section.

Any answers to questions which did not fit into the given categories shown on the questionnaire were placed in an "error" grouping and were not reported in the results. These include interviewer error and ties between two response categories.

Although all possible precautions were taken, the survey does have two possible sources of bias. First, to minimize time and cost of the survey, volunteers rather than professional interviewers were used. A certain amount of error and bias was introduced by somewhat differing interview techniques and recording errors. Second, some questions may reflect some bias because of ambiguity in the questions' wording. (See comments on Questions 10b and 10c.)

RESULTS

These percentages are shown in table form in three sections:

1. Percentage of responses from all 401 respondents.
2. Percentage of responses from those who burn wood (n=191).
3. Percentage of responses from those who do not burn wood (n=210).

1. "Do you believe that air pollution is a major problem with living in Missoula?"

	TOTAL	Burn	Don't Burn
YES	83%	78%	84%

⟹ "What would you say are other major problems with living in Missoula?"

TOTAL ONLY
- 70% air pollution
- 11% jobs/economy
- 4% traffic
- 2% transportation/roads
- (13% miscellaneous)

	TOTAL	Burn	Don't Burn
NO	17%	22%	16%

⟹ "What would you say are the major problems with living in Missoula?"

TOTAL ONLY
- 47% no problems
- 12% traffic
- 11% jobs/economy
- 9% crime
- (21% miscellaneous)

Remarks: When asked if they felt air pollution is a major problem with living in Missoula, respondents overwhelmingly said yes. They backed that up further by reiterating that air pollution is <u>the</u> major problem with living in Missoula. Interestingly, of those who said "no," approximately one half felt there were no problems with living in Missoula.

Please note that analysis of this question should be based on the wording of the questionnaire — is air pollution a major problem? (closed question), <u>not</u> what is the major problem? (open question).

2. "Which source of pollution do you feel has the greatest effect on Missoula's observable winter air quality?"

	TOTAL	Burn	Don't Burn
CAR EXHAUST	20%	20%	18%
ROAD DUST	2%	3%	3%
INDUSTRY	28%	36%	25%
WOOD BURNING	50%	41%	54%

Remarks: The wording of Questions 2 and 3 and the use of the word, "observable," was to differentiate between solid matter (particulate) in the air and gases (CO, H_2S, etc.).

Note that responses to both Questions 2 and 3 show industry was ranked second respectively to wood burning (Question 2) and car exhaust (Question 3).

3. "Which source of pollution do you feel has the second greatest effect on Missoula's observable winter air quality?" (Asked minus response to #2.)

	TOTAL	Burn	Don't Burn
CAR EXHAUST	39%	41%	34%
ROAD DUST	6%	2%	7%
INDUSTRY	28%	26%	35%
WOOD BURNING	27%	30%	24%

4. "Do you strongly-agree, agree, disagree, or strongly-disagree with the following statement? Breathing Missoula's air pollution for more than 10 years would be harmful to a person's health."

	TOTAL	Burn	Don't Burn
AGREE	69%	60%	76%
DISAGREE	31%	40%	24%

Remarks: Respondents appeared to largely ignore the difference between the original question, which had four categories, "strongly agree," "agree," "disagree," and "strongly disagree." These results are presented here in two categories to rule out possible response inaccuracies.

5. "How about young children growing up in Missoula? Do you feel that breathing Missoula's air will be harmful to their health later in their lives?"

	TOTAL	Burn	Don't Burn
YES	64%	57%	69%
NO	24%	33%	20%
DON'T KNOW	12%	10%	11%

6. "Do you believe that breathing Missoula's winter air pollution affects the health of people over 60?"

	TOTAL	Burn	Don't Burn
YES	74%	71%	79%
NO	19%	22%	14%
DON'T KNOW	7%	7%	7%

Remarks: The increase in "yes" responses from Question 5 to Question 6 may come from the "old and sick" stereotype of senior citizens, rather than a true belief that senior citizens are more susceptible to pollution than young children.

7. "Do you believe that industry is responsible for most of Missoula's air pollution problem?"

	TOTAL	Burn	Don't Burn
YES	29%	32%	26%
NO	63%	61%	63%
DON'T KNOW	8%	7%	11%

Remarks: A comparison of Question 7 to both Question 2 and 3 shows internal consistency in the questionnaire. In all three questions, industry is viewed as having roughly one half the impact of other sources of pollution. Although industrial pollution is not considered the major source of pollution, it is of significant concern. (See also #2, #3, #8, and "Comments.")

8. "In Missoula, which do you feel is more dangerous to breathe, pollution from wood smoke or pollution from industry?"

	TOTAL	Burn	Don't Burn
FROM WOOD SMOKE	31%	29%	32%
FROM INDUSTRY	43%	47%	41%
DON'T KNOW	26%	24%	27%

9. "In the long run, say 15 years or more, do you feel that breathing wood smoke is harmful to a person's health?"

	TOTAL	Burn	Don't Burn
YES	60%	54%	64%
NO	24%	28%	22%
DON'T KNOW	16%	18%	14%

Remarks: A comparison of Question 9 to Questions 5 and 6 shows strong correlation among the responses to all of the health questions. Respondents strongly believe that breathing pollution is harmful to people's health.

10. "How do you feel about the following ideas as possible solutions to Missoula's air pollution problems?"

a. "Would you support or oppose public information efforts to inform people about air pollution sources, ways to clean up the air, and health impacts of air pollution?"

	TOTAL	Burn	Don't Burn
SUPPORT	91%	90%	94%
OPPOSE	9%	10%	6%

b. "Would you support or oppose regulations that require new or rental homes to be well insulated?"

	TOTAL	Burn	Don't Burn
SUPPORT	88%	82%	93%
OPPOSE	12%	18%	7%

Remarks: Although the results may be somewhat weakened because some respondents may have only heard "insulation," and not "require new or rental homes to be well insulated," the question still shows strong support.

c. "Would you support or oppose the use of new technologies such as community heating systems like central heating for a neighborhood or community?"

	TOTAL	Burn	Don't Burn
SUPPORT	65%	72%	65%
OPPOSE	35%	28%	35%

Remarks: The wording of this question was unclear. Respondents commonly asked for futher definition of "new technologies" or an idea of the cost to the public. In retrospect, this question should have been more specific and well-defined.

d. "Would you support or oppose regulations requiring a ban on wood burning on poor air quality days?"

	TOTAL	Burn	Don't Burn
SUPPORT	59%	54%	62%
OPPOSE	41%	46%	38%

Remarks: Some respondents opposed a ban for people who burn wood as their only source of heat. The results probably would have been higher (an estimated 10-15% higher) if "except for those who burn wood as their only source of heat" would have been added to the question.

e. "Would you support or oppose requiring the use of less polluting wood burning devices?"

	TOTAL	Burn	Don't Burn
SUPPORT	76%	75%	77%
OPPOSE	24%	25%	23%

Remarks: These results also may have suffered from ambiguous wording, although the results still strongly show strong support for technical improvements (see 10c also).

f. "Would you support or oppose a ban on all residential wood burning?"

	TOTAL	Burn	Don't Burn
SUPPORT	6%	3%	6%
OPPOSE	94%	97%	94%

11. "When was the last time you heard the Health Department issue an air pollution alert or warning?"

	TOTAL	Burn	Don't Burn
COUPLE OF WEEKS AGO, MONTH AGO, LAST MONTH	60%	58%	58%
COULD NOT IDENTIFY TIME PERIOD OR ALERT/WARNING	40%	42%	42%

Remarks: The results are presented in two categories to distinguish between those who did know when the last air pollution alert/warning was called (November 18, 1980) and those who could not or had never heard of an alert or warning.

12. "Have you seen any Health Department spots on TV about air pollution?"

	TOTAL	Burn	Don't Burn
YES	41%	45%	43%

⟹ "There are five spots in all, which did you see?"

TOTALS ONLY
- 14% health effects of air pollution.
- 11% wood stove operation
- 10% wood storage, collection
- 7% fireplace operation/glass doors
- 4% transportation, auto maintenance
- (54% not sure)

	TOTAL	Burn	Don't Burn
NO	59%	55%	57%

Remarks: A total of 13% of the respondents could identify a TV Public Service Announcement or TV spot. This result compares with approximately 25% as a general rule of thumb for awareness and recognition of TV advertisements.*

13. "Do you burn wood in your house or garage?"

Burn	Don't Burn
48%	52%

⟹ (If they burn wood, the following question was asked "What is the main reason you burn wood?"

BURN RESPONDENTS ONLY
- 68% help with utility bills
- 24% enjoy a fire
- 8% only source of heat

Remarks: These percentages are comparable to an earlier study that showed 53% of Missoula residents burn wood ("Winter Emission Inventory," Air Pollution Unit, 1979-1980).

14. "Last, what other comments do you have about Missoula's air pollution situation?" See the Comment section, pages 9-10.

15. Respondents: Because there was not a computer available, analysis of the answers given by male and female respondents could not be compared.
Male = 49%
Female = 51%

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*Missoula Advertising Digest, December 10, 1980

AIR POLLUTION TELEPHONE SURVEY

RESPONDENT COMMENTS

Last, what other comments do you have about Missoula's air pollution situation?

(Comments are from Question #14. Twenty categories were established to show respondents' concerns and remarks in general about air pollution. Respondents' comments may be shown in more than one category.)

36 "Pollution is because of the valley Missoula is in." "Inversions from valley cause pollution."

29 "More public education is needed." "People need to learn how to burn."

26 "Industry/Hoerner Waldorf is a/the problem." "Pulp mill should have been built elsewhere." "Smelly."

26 "Cooperation is the key." "People have to cooperate and not burn on bad days."

23 "Montana Power prices are causing pollution because they are forcing more people to burn." "Woodburning is economically necessary."

23 "Air needs be be cleaned up."

23 "Not as bad as 'they' make out." "Not as bad as some places." "Not a problem here."

12 "New technology needs to be developed to help pollution (esp. from wood stoves and fireplaces)." "Pollution devices needed on chimneys."

10 "People have got to pay attention to alerts." "It would help if people would pay attention to alerts." "Alerts should be enforced."

10 "I'm (or family is) having problems with my health because of the pollution."

10 "Something needs to be done."

8 "Cars are the pollution problem."

8 "I plan to leave Missoula due to the pollution."

7 "Government should stay out of woodburning."

7 "Problem is too many people in valley." "Growth of Missoula."

6 "Need planning." "Need better public transportation." "Urban sprawl is problem."

5 "Don't believe pollution is from wood stoves."

5 "First government wanted us to use less petroleum, so we put in wood stoves and spent lots of money doing it. Now we're having a problem with wood stoves and they want us to quit using those. Now what do we do?"

4 "Strong regulations/enforcement needed."

4 "Need more studies." "Think they should study industry's pollution next." "Don't believe studies."

3 "Need current/frequent updates on air pollution." "Why can't the Health Department forecast inversions so we can quit burning before it gets so bad?"

3 "Slash burning is a bad problem here."

Please note that these comments were given by people — "off the top of their heads." Generally, responses to "open" questions (i.e., where categories for all responses are not set) are made because that is the most important problem/comment on that person's mind. It is then necessary to note that although many people did not say the same general comment, the comments they did say are important.

CONCLUSIONS

This study is not an absolute answer to how Missoulians feel about the community's air quality, but it is a good indicator. The opinions and knowledge of urban Missoulians are clear and the strength of support and opposition to selected possible solutions is also clear-cut. The survey, then, is a useful picture of the urban community's thinking and a direction for future action.

Janice S. Hand
Research Specialist
12/19/80

AIR POLLUTION

TELEPHONE SURVEY

Interviewer Instructions

Objective of Survey: To determine Missoula urban residents' knowledge of air pollution sources, attitudes toward clean-up of the air, and use of wood-burning stoves or fireplaces.

Use of Data: The Air Pollution Unit will use the information from the survey for internal use, like designing public information efforts, and the air pollution committees will have access to the information to help in their work. In short, to deal with a problem, you must first know the extent and seriousness of the issues.

Survey Design and Description: The telephone survey will be administered to a statistically valid sample of Missoula urban residents (n=400). The list of random telephone numbers were selected through use of a random number generator and were assigned to prefixes proportionally. Approximately 1037 phone numbers were generated in order to complete the necessary 400 questionnaires.

INTERVIEWERS, PLEASE FOLLOW THESE TECHNIQUES CAREFULLY

1. Ask each question exactly as it is written. You may re-read a question, but DO NOT rephrase a question to help a respondent. If five interviewers all asked five questions differently, instead of five responses, there could be 25.

2. Successful interviewers never "lead" a respondent by even unconsciously indicating a response as "right." Respondents will very humanly want to please the interviewer by responding as they think the interviewer wants them to. Good encouragers are: "I see," "OK," "uh-huh," "that's interesting."

3. To be sure you record everything a respondent has to offer, use a "probe," which is simply asking, "Anything else?" Use ⓟ to note on the questionnaire that you used a probe.

4. If you have any question at all about which category a response fits into, write the response verbatim and ask about it when you turn the questionnaire in. By the same token, it is flattering for a respondent to be asked to clarify his/her answer – it shows you're really paying attention.

Respondents are motivated to participate because of the desire for self-expression, the desire for interpersonal response, intellectual challenge, insights, feelings of altruism, emotional catharsis, gratification from successful performance of the respondent role and extrinsic rewards. The negative forces –fear, perceived invasion of privacy, hostility toward the interviewer/sponsor and threatening subject matter –are easily dealt with by a comfortable, professional interviewer.

SUZANNA E. RAKER, REG'D FORESTER, BUTTE

TESTIMONY - SENATE HEARINGS - S.B. 65 - AGAINST - Rm. 405-CAPITOL - 30 JAN 81

- IDENTIFY → REG. FORESTER/W.T. - BUTTE

* PERSONAL CONCERN W. AIR QUALITY LED TO INVESTIGATIONS:

  - FOREST SVC./E.P.A.
  - ANACONDA
  - STAUFFER CHEM./RANCHERS/M.E.R.D.I. - FLUORIDE → JAY CORNICHE → ED KUKAY (AIR MONITOR'G)
  - HAL ROBBINS - STATE OF MT. - AIR QUALITY
  - FIRESTONE POST/POLE
  - RESIDENTIAL WOODBURNING
  - LOCAL HOSPITALS

* BUTTE IS VIRTUALLY NEGLECTED AS TO PROTEC. OF CITIZENS - INADEQUATE ANALYSIS OF POLLUTANTS, WARNING CITIZENS, ENFORCING EXISTING REG'S.

* JOBS V.S. AIR QUALITY SCARE TACTICS ARE UNFOUNDED & UNETHICAL...

* THE OLD PEOPLE OF BUTTE... NO WARNING; NO BREAKS

∴ ENFORCEMENT/ANALYSIS ARE THE KEY'S TO UTILIZING MONTANA'S RESOURCES; NOT RELAXING STD'S.

1st of all, I would like to say that I was brought to this meeting under false pretenses. I have here a letter written by Senator Johnson to Jon Reynolds of the Missoulian. In it, she states that SB 65 makes no judgement as to the standards themselves, it makes no judgement as to whether the standards should be raised or lowered. Senator Johnson says that she is concerned only with the process itself. She does not feel that a group of appointed officials should rule upon a matter as important as the air quality standards. Such an important decision should be left to the legislature, a body of elected officials.

I am somewhat surprised that Senator Johnson has changed her tune at this late date. However, the crux of my testimony remains the same. I find it ridiculous that anyone could believe that the legislature, which must consider almost 2,000 bills in 90 days, could make a better, more informed, more intelligent decision than could the Board of Health which spent over 2 years in deciding upon this issue.

Our legislators are well meaning & do represent the people of this state. However, they have neither the time nor the expertise to rule upon the adequacy of air quality standards. As an example, I would like to refer to Senator Johnson's letter. In it, she states that state standards for total suspended particulates are weaker than

the federal standards. Anyone with any knowledge of air quality standards should know that federal law does not allow the States to set standards which are weaker than federal standards.

I therefore oppose SB 65.

Thank you.

Jan Flaherty
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Missoula, Mt.

THE WESTERN MONTANA CLINIC
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REVIEW OF THE LITERATURE ON AIR POLLUTION RELATIVE TO MISSOULA, MONTANA, JANUARY 1981

Kit G. Johnson, M. D., M. P. H.

At higher levels of air pollution, there is general agreement that human health is adversely affected (1,2,3,4). However, a survey of air pollution review literature leads to the conclusion that at the levels of total suspended particulates (TSP) (annual average range 80-100 ug/m^3) found in Missoula the possible effects upon human health are unclear (5,6,7,8,9,10,11). Many studies of pulmonary function or respiratory symptoms have found adverse effects associated with air pollution levels similar to Missoula's (12,13,14,15,16,17,18) while others have not (19,20,21).

Some of the reasons for these discrepancies and confusion are: 1. Probably there is no threshold for some air pollution effects and there is a wide range of individual sensitivities. Thus with a sensitive enough instrument some individuals may be found to react to almost any air pollution level. 2. Imprecision of particulate measurements. The European literature uses smoke concentration. The older American literature uses dust fall or coefficient of haze (COH). TSP is the current U. S. standard particulate pollution measurement. However, TSP simply measures the total weight of particulates contained in a volume of air. None of these measurements quantifies particles as to size, whether they are respirable or not which is a crucial factor in influencing human health (22). Nor do they provide information about the quality of the particulates; are the particles organic or inorganic, chemically inert or active, mutagenistic or carcinogenic, benign or inflammatory? Thus the air pollution particles of two communities with identical levels of TSP could have markedly different effects upon human health. 3. The mixture of particles, vapors and gases in a community's air pollution may act synergistically, antagonistically, catalytically or as vehicles with different effects upon human health. 4. Different health measurement and analytical techniques with different precision and sophistication have been used in various studies.

I have not included carbon monoxide in this review because its health dangers are so widely appreciated; however, any definitive statement about the health effects of air pollution in Missoula must include carbon monoxide.

The most comprehensive in depth review of the effect of air pollution on health was published in the American Thoracic Society News in the spring of 1978 (5). Dr. Ferris's review is also worth reading (7) as is that of Dr. Shy (11). Other reviews are included in the bibliography (6,8,9,10).

As you read the abstracts below, keep in mind that Missoula's annual arithmetic mean TSP is about 100 ug/m^3 and the annual geomteric mean TSP is about 80 ug/m^3.

In a study with TSP levels similar to Missoula's, Chapman found that $FEV_{.75}$ in school children was consistently lower in Birmingham, Alabama (TSP=103 ug/m^3, annual geometric mean) when compared to children from Charlotte, North Carolina (TSP=77 ug/m^3, annual geometric mean). The inter city differences were smallest in the fall. They were greater in the winter and greatest in the spring (this is the same thing we found in the Montana air pollution studies comparing Great Falls with Anaconda, Butte, Billings and Missoula)(12).

Hammer using health diaries kept for one to twelve year old children found that there was an increase of lower respiratory diseases in higher polluted communities of New York City. In their "best judgement" there was increased respiratory morbidity when TSP moved from 85 to 110 ug/m^3, annual geometric mean, SO_2 went from 0.0658 to 0.0939 parts per million or suspended sulfates went from 13 to 14 ug/m^3 (15).

Dr. Ferris in his six cities study with a TSP annual average ranging from 25 to 180 ug/m^3, annual geometric mean and SO_2 ranging from 0.003 to 0.041 found that adults 25 to 74 years old had decreased FEV_1 and increased respiratory symptoms associated with increased levels of air pollution (14).

Bouhuys studying essentially rural areas of Lebanon and Ansonian, Connecticut with TSP levels of 39 and 63 ug/m^3, annual geometric mean respectively could not find a significant difference in pulmonary function tests or symptoms in total population greater than seven years of age (19). These TSP levels are about one half to three quarters those of Missoula.

Stebbings studied elderly people in New York City and found that they had increased symptoms with increased air pollution. The well panel members reacted even more adversely than the elderly panel members with lung disease. He could not find a threshold effect. The range of TSP in the communities were from a low of 35 to 64 to a high of 89 ug/m^3, annual geometric mean. The SO_2 ranges were 0.012, 0.019 and 0.025 parts per million (17). These levels of particulates are even lower than Missoula's levels: however, they had higher levels of SO_2 than we have in Missoula.

Sharratt studied two Canadian communities with particulates measured by coefficient of haze units (COH) which were quite low but which cannot be translated directly into TSP units. He found that children in the community with less air pollution had decreased respiratory symptoms and increased FEV_1 and FEC when compared to the children in the higher polluted community (18).

Stebbings studied the effect of a 1975 air pollution episode in Pittsburg on fourth to sixth grade children and did not find an effect in their pulmonary function tests in the following week. However, Stebbings also studied a subgroup of the children exposed to high levels of air pollution measured by COH units and found that ten to fifteen percent of the children averaged about a twenty percent decrease in FVC. $FEV_{0.75}$ did not have significant changes. Children who had low base line pulmonary function tests, asthma or

acute respiratory symptoms did not seem to be adversely affected by the air pollution episode (16)!

Following COPD (chronic obstructive pulmonary disease) patients over several weeks from 1969 to 1970, Emerson found that FEV_1 was the most sensitive pulmonary function test. Changes were correlated with temperature, wind speed, humidity and pressure. However, they were not correlated with sulfur dioxide or particulate levels which were "too low". European Smoke Units were used which do not translate exactly to TSP levels, however the mean was 45 ug/m^3. The minimum was 5.5 and the maximum was 380 (13).

Using a dairy technique to study "bronchiatic patients" Lawther demonstrated that in London there was increased sensitivity to air pollution at the beginning of winter. Symptoms throughout the winter were closely related to air pollution levels as measured by European smoke units and SO_2 levels. London has controlled its air pollution by prohibiting home burning of coal or wood, producing fifty percent more winter sunshine; therefore they have had difficulty finding days in recent years with air pollution high enough to affect the reported symptom rates (2).

Kerrebijn studied Dutch fourth and fifth grade children's symptoms and pulmonary function tests. His low community had European Smoke Units of 30 and his high community 40 ug/m^3. He found an increased cough in the high polluted area; however, he could not detect significant differences in pulmonary function tests (20).

Lave and Seskin used sophisticated epidemiological techniques to study the effect upon air pollution and human health in the United States. Their data base was the mortality figures from throughout the United States. They concluded that a fifty eight percent decrease of particulates and an eighty-eight percent decrease of SO_2 would lead to a seven percent decrease in total death rate. They also concluded that air pollution does not simply harvest deaths which would occur anyway but reduces life expectancy of the general population exposed. In 1960 to 1961 a fifty percent decrease of SO_2 and particulate would have produced a 0.8 year increase of life expectancy at birth (1).

An excellent review of the importance of particulate size on the relationship of air pollution and respiratory function is contained in Miller's article. He suggests that the cutoff points for fine respirable (which he prefers to call inhalables) should be equal to less than 2.5 microns air dynamic equivalent diameter and the coarse should be less than or equal to 15 microns. He points out that normally fine particles are sulfates, carbon (soot), organic (condensed vapor), lead, ammonia, arsenic, selium and hydrogen ion. Normally coarse particles include iron, calcium, magnesium, potassium, phosphates, silicon, aluminum, organics (pollen, spores, plant particles). Normally bimodal particles include nitrous oxides and chloride. Variable particles include zinc, nickel, copper, manganese and some other heavy metals and isotopes (22).

The ample documentation of the Missoula City County Health Department of the high percentage of wood smoke particulates in Missoula's

air, the report of a high rate of mutagenic elements in Missoula's air by Dr. Gilen Warren, and Cooper's paper all raise the possibility that the most serious potential effect of Missoula's air pollution may be lung cancer. Cooper reports that there are fourteen carcinogenic compounds, which may reach up to one half percent of particulate matter in wood smoke emissions. Wood smoke emissions also contain six cilia toxic and mucus coagulating agents and four cocarcinogens, initiating or cancer promoting agents. Additionally wood smoke emits carbon monoxide, aldehydes, phenols and dioxines (27). (I wonder how many women in the Condon area who sued the Forest Service for spraying the roadsides with dioxines had wood burning stoves?)

Blot studied lung cancer death rates throughout the United States. Using good epidemiological techniques and death certificates, he found that lung cancer rates in urban areas were fifty percent greater than in rural areas. He felt that the highest cancer rates were linked to specific industries in the community especially smelters, chemical, petroleum and paper manufacturing industries. (Paper manufacturing and lung cancer deaths were only linked in the Southern and Eastern States)(28).

Butler studied the British lung cancer death rates. He found that non-smoking males from urban areas had thirty-one lung cancer deaths for one hundred thousand population whereas non-smoking males in rural areas had no deaths from lung cancer for one hundred thousand population. He also reported experiments in which he injected polynuclear compounds extracted from Los Angeles air pollution into mice and found that the mice injected had a two and a half times increased incidence of tumors compared to mice injected with saline only (29).

The best article on the possible association of lung cancer and air pollution is Carl Shy's. He states that there are three possible carcinogens in urban areas. They are polycyclic aromatic hydrocarbons [benzo(a)pyrene], N-hetecyclic hydrocarbons and oxygenated neutral hydrocarbons. When these agents are in their pure states they usually cause cancer only at levels greater than those normally found in air pollution; however, when associated with synergistic particles they can cause cancer at much lower levels. Benzo(a)pyrene (BaP) is the most suspect carcinogen in air pollution. The median winter-spring BaP levels in urban areas are 6.6 micrograms per one thousand cubic meters and the rural areas are 0.4 micrograms per one thousand cubic meters. By comparison one cigarette yeilds three to four micrograms of BaP and a medium sized room with three to four cigarette smokers has BaP levels equal to two to four micrograms per one thousand cubic meters. A one pack per year cigarette smoker inhales fourteen times more BaP than a year of residence in the average polluted American city. Turning to epidemiological evidence Dr. Shy states that studies of immigrants between high and low levels of air pollution suggests that the childhood environmental exposure to air pollution is the most important determinant of lung cancer rates in later adulthood. That is people exposed to high levels of air pollution in childhood and then moving to low pollution areas have lung cancer rates approaching those of people who live their entire lives in high air pollution

areas whereas people who spend their early lives in a lower polluted area but move to a high pollution area have lung cancer rates approaching those of people who spend their entire lives in the low polluted areas. He also points out numerous studies which show that urban residents have higher lung cancer rates than rural residents. Moreover, there seems to be a direct association with urban density (26).

Analyzing two million death certificates with sophisticated analytical techniques, two economists, Mendelsohn and Orcutt, determined that in 1970 air pollution was associated with approximatley one hundred and forty thousand deaths in the United States. This was nine percent of all deaths (4).

BIBLIOGRAPHY

1. Lave, L. B., Seskin, E. P. Air Pollution and Human Health. Baltimore: Johns Hopkins, 1977.

2. Lawther, P. J., Waller, R.E., Henderson, M. Air Pollution and Exacerbations of Bronchitis. Thorax 1970: 25:525-39.

3. Lawther, P. J., MacFarlane, A. J., Waller, R. E., Brooks, A. G. F. Pulmonary Function and Sulphur Dioxide, Some Preliminary Findings. Environ. Res. 1975; 10:355-67.

4. Mendelsohn, R., Orcutt, G. An Empirical Analysis of Air Pollution Dose-Response Curves. J. Environ. Econ. Manag. 1979; 6:85-106.

5. American Thoracic Society Ad Hoc Committee on Health Effects of Air Pollution. Health Effects of Air Pollution. Am. Thoracic Soc. News 1978; 4:22-62.

6. Bates, D. V. The Health Effects of Air Pollution. J. Resp. Dis. 1980: Sep:29-37.

7. Ferris, B. G. Jr. Health Effects of Exposure to Low Levels of Regulated Air Pollutants. J. Air Poll. Cont. Assoc. 1978; 28:482-97.

8. Holland, W. W., Bennett, A. E., Cameron, I. R., et al. Health Effects of Particulate Oluution: Reappraising the Evidence. Am. J. Epid. 1979; 110:533-659.

9. Rall, D. P. Review of the Health Effects of Sulfur Oxides. Environ. Hth. Perspect. 1974; 8:97-121.

10. Mitchell, R. S. Specific Pollutants and Their Known Health Effects. Presented at AMA Course on the Health Effects of Air Pollution. 1979. Sep 27-28, Denver.

11. Shy, C. M. Epidemiological Evidence and the United States Air Quality Standards. Am. J. Epid. 1979; 100:661-71.

12. Chapman, R. S., Hasselbald, V., Hayes, C. G., Williams, J. V. R. Hammer, D. I. Air Pollution and Childhood Ventilatory Function. I. Exposure to Particulate Matter in Two Southeastern Cities, 1971-1972. In:Finkel, A. J., Duel, W. C., ed. Clinical Implications of Air Pollution Research. Acton: Pub. Sci. Grp., 1976.

13. Emerson, P. A. Air Pollution, Atmospheric Conditions and Chronic Airways Obstruction. J. Occupat. Med. 1973; 15:635-38.

14. Ferris, B. G., Jr., Speizer, F. E., Spengler, J. D., et al. Effects of Sulfur Oxides and Respirable Particles on Human Health. Am. Rev. Respir. Dis. 1979; 120:767-79.

15. Hammer, D. I., Miller, F. J., Stead, A. G., Hayes, C. G. Air Pollution and Childhood Lower Respiratory Disease I. Exposure to Sulfur Oxides and Particulate Matter in New York, 1972. In: Finkel, A. J., Duel, W. C., ed. Clinical Implications of Air Pollution Research. Acton: Pub. Sci. Grp., 1976.

16. Stebbings, J. H., Jr., Fogleman, D. G. Identifying a Susceptible Subgroup: Effects of the Pittsburg Air Pollution Episode Upon School Children. Am. J. Epid. 1979; 110:27-40.

17. Stebbings, J. H., Jr., Hayes, C. G. Panel Studies of Acute Effects of Air Pollution I. Cardiopulmonary Symptoms in Adults, New York 1971-1972. Environ. Res. 1976; 11:89-111.

18. Sharratt, M. T., Cerny, F. J. Pulmonary Function and Health Status of Children in Two Cities of Different Air Quality: A Pilot Study. Arch. Environ. Hth. 1979; Mar/Apr:114-19.

19. Bouhays, A., Beck, G. J., Schoenbery, J. B. Do Present Levels of Air Pollution Outdoors Affect Respiratory Health? Nature 1978; 276:466-71.

20. Kerrebijn, K. F., Mourmans, A. R. M., Biersteker, K. Study on the Relationship of Air Pollution to Respiratory Disease in School Children. Environ. Res. 1975; 10:14-28.

21. Stebbings, J. H., Jr., Fogleman, D. G., McClain, K. E., Townsend, M. C. Effect of the Pittsburg Air Pollution Episode Upon Pulmonary Function in School Children. J. Air Poll. Cont. Assoc. 1976; 6:547-53.

22. Miller, F. J., Gardner, D. E., Graham, J. A., et al. Size Considerations for Establishing a Standard for Inhalable Particulates. J. Air. Poll. Cont. Assoc. 1979; 29:610-15.

23. Montana Air Pollution Study Staff. Montana Air Pollution Study: Relationship Between Human Health and Inhalable Particulates. Helena, MT: Air Quality Bureau, Dept. of Health and Environmental Sciences. 1980 Oct.

24. Human Studies Laboratory. Health Consequences of Sulfur Oxides: Report from CHESS, 1970-1971. Research Triangle Park, NC. U. S. E. P. A. Office of Research and Development, National Environmental Research Center, 1974 (EPA-650/1-74-004).

25. Ferris, B. G., Jr. Principal Investigator. Epidemiological Standardization Project. Am. Rev. Respir. Dis. 1978; 118 (6 pt.2): 1-120.

26. Shy, C. M. Lung Cancer and the Urban Environment. A Review. In: Finkel, A. J., Duel, W. C., ed. Clinical Implications of Air Pollution Research. Acton: Pub. Sci. Grp., 1976.

27. Cooper, J. A. Environmental Impact of Residual Wood Combustion Emissions and its Implications. Presented at Wood Energy Institute Wood Heating Seminar VI, 1980 Feb 25-28, Atlanta.

28. Blot, W. J., Fraumeni, J. F. Studies of Respiratory Cancer in High Risk Communities. J. Occup. Med. 1979; 21:276-78.

29. Butler, J. D. Air Pollution, Smoking and Lung Cancer. Chem. Brit. 1975; 11:358-63.

SYNOPSIS OF MAPS PFT STUDIES

Kit G. Johnson, Rudy Gideon, Don Loftsgarrden

January 1981

The Montana State Legislature funded the Montana Air Pollution Study (MAPS) in 1977. Subsequently, the Air Quality Bureau of the State Department of Health and Environmental Sciences developed an extensive program to gather and analyze statewide information about meteorology, air pollution characteristics (quantitative and qualitative), air pollution emissions, and possible health effects of air pollution. The portion of the health effects study reported here was an attempt to determine if air pollution affected the breathing ability of normal school children or of adults with chronic obstructive pulmonary disease (COPD: emphysema, bronchitis, asthma). This study is divided into three parts:

1. Comparison of school children's lung function among communities with different levels of air pollution.
2. Comparison of school children's lung function as air pollution levels change within one community.
3. Comparison of COPD subjects' lung functions and respiratory symptoms as air pollution levels change within one community.

Methods

Third and fourth grade school children were chosen to represent the normal population. They could be tested easily and they had not started smoking cigarettes. Also, adults with COPD were studied. The acute effects of air pollution upon adults with COPD may be dangerous because their lung function is already considerably decreased.

The lung or pulmonary function tests (PFT) used in the MAPS have two principal components (Figure 1). Forced vital capacity (FVC) measures the maximal total amount of air a person can exhale after a maximal inhalation. It reflects total lung volume. Normal levels of air pollution would not be

expected to affect FVC acutely. However high levels of some air pollutants could decrease the growth of lung tissue in children or destroy lung tissue at any age. These changes would be chronic and partially irreversible.

The second component of the PFT is air flow rate. Air flow rate is measured by forced expiratory volume in one second (FEV_1), forced expiratory flow during the mid portion of exhalation ($FEF_{25-75\%}$) and the peak expiratory flow rate (PEFR) (Figure 1). FEV_1 measures the air flow during the first one second of a maximal expiration. It reflects total air way resistance. $FEF_{25-75\%}$ measures the rate of air flow over the mid 50% of a maximal expiration. It is less effort dependent than FEV_1 and it primarily measures small and medium air way resistance. PEFR measures the fastest rate of air flow during a maximal expiration. It is highly effort dependent and reflects large air way resistance.

Air pollution may affect pulmonary air flow rates by causing inflammation, edema, increased viscous mucus secretions, or bronchial smooth muscle constriction. Usually these changes would be acute and reversible; asthma is an example. However, sufficiently toxic substances could cause destruction of normal cells lining the bronchi and produce scarring; emphysema is an example.

Significant air pollutants in the MAPS communities are particulates and sulfur dioxide (SO_2). Nitrogen dioxide (NO_2) is not significant (Table 1). Particulates in ambient air are recorded as Total Suspended Particulates (TSP) and Respirable particulates. TSP is reported as the average weight of all particulates per cubic meter of air trapped by a high volume filter during the 24 hour day. Respirable particulates are divided into coarse respirable, 2.5 to 15 microns aerodynamic diameter and fine respirable particles, equal to or less than 2.5 microns aerodynamic diameter. The fine respirable particulates are more apt to reach the small and medium air ways or the alveoli of the lung. Most coarse respirable particulates will be trapped in the nose except during mouth breathing when many will reach the large and medium air ways. The TSP 24 hour standards are: Federal = 260 $\mu gm/M^3$/24 hour average,

Montana = 200 ugm/M^3/24 hour average. There are no respirable particulate standards; however, the MAPS data may be used to help adopt some.

In the MAPS analysis three day average particulate levels (day before yesterday, yesterday, and today) are used because the children were always tested in the morning, but that days particulate values are collected from midnight to midnight. Moreover, there is some evidence that the effect of air pollution upon lung function might lag behind the insult and also it might be accumulative, that is any effect may be a function of both dose and time.

SO_2 is measured as parts per million (ppm) of air. SO_2 usually is well absorbed by the mucous membranes of the nose or upper air ways. The SO_2 standards are: Federal = 0.14 ppm 24 hour average, Montana = 0.10 ppm 24 hour average.

Throughout this report the tables may contain references either to probability or significance level. These are interchangeable statistical terms referring to the statistical probability that an analysis might have occurred by chance. Covariant Analysis or Regression Analysis are used to test the statistical significance of the MAPS analysis. These tests the influence on one variable (PFT) as the other variables (air pollution, etc.) change. Additionally, it is possible by means of a Sign test to test for the statistical significance of a group of nonsimilar tests. Thus if 19 out of 20 different tests all fit a hypothesis (have a positive sign), as a group they are statistically significant even though each or any individual test may not have reached the level of statistical significance. The MAPS analyses were subjected to the Sign test as well. Many researchers accept any probability value or significance level equal to or less than 0.05 as statistically significant; however, due to the large number of statistical analyses done in the MAPS it is more prudent to consider only those probability values or significant levels equal to or less than 0.01 as statistically significant.

Childrens Pulmonary Function Test Comparison Among Communities

1978 Studies

In January of 1978, 468 school children in urban Missoula had their PFT compared to the PFT tests of 88 school children in Target Range. Target Range is a rural suburban area adjacent to Missoula. The TSP levels in Target Range usually are about one third to two thirds the levels of urban Missoula.

In February of 1978, 478 Missoula school children had their pulmonary function test compared to pulmonary function tests of 45 Clinton school children. Clinton is a rural sylvan widely dispersed community about 20 miles from Missoula. Clinton does not have any known air pollutants.

In May of 1978, 548 school children in Missoula had their pulmonary function tests compared with the pulmonary function tests of 328 school children in Great Falls. TSP is the only significant air pollutant in either Great Falls or Missoula. In 1978 the annual average TSP level in Great Falls was 42 ugm/M^3 and in Missoula it was 81 ugm/M^3.

Table 2 discloses the results of these studies. The numbers in the body of Table 2 indicate the percent differences of the pulmonary function tests of the other communities with Missoula's. In all cases except FEV_1 in Target Range males the children from the communities of cleaner air have better pulmonary function tests than the children of Missoula. The Sign test indicates there is less than 0.000 probability this is a chance association. The differences are greatest for $FEF_{25-75\%}$, which reflects medium and small air way resistance. These air ways would be expected to be most sensitive to air pollution effects.

1978-1979 Studies

During the school year 1978-1979 third and fourth grade children of Anaconda (252), Billings (310), Butte (411), Great Falls (314), and Missoula (303) had their pulmonary function tested in the fall, winter, and spring.

Table 1 shows the comparative air pollution characteristics of these communities. Great Falls has the cleanest air; Missoula has the highest par-

ticulate levels, and Anaconda is the only community with high SO_2 levels. Billings has intermediate levels of both particulates and SO_2. Butte has moderate levels of particulates.

Table 3 compares the PFT of Great Falls children with the pulmonary function tests of children in the other communities. The numbers in the body of Table 3 show the percent differences between the pulmonary function tests of each of the other communities with Great Falls. There are a total of 72 separate comparisons in this table; 59 of these comparisons have a negative (-) sign indicating the children in the communities with dirtier air have decreased pulmonary function tests compared to children of Great Falls. There is less than 0.000 probability this is due to chance. Again the greatest differences are $FEF_{25-75\%}$ which is compatable with an association of air pollution and increased small and medium air way resistance.

The data from the above studies also were analyzed for an interaction between the children's pulmonary function tests and the ambient air particulate levels at the time of their test. In Table 4, the negative signs indicate that as the particulate levels increase the pulmonary function tests decrease in all cases except for TSP with females' FVC and FEV_1. The statistical probability for individual tests are in the body of Table 4. None of them are very impressive; however, again using the Sign test the probability of a chance occurrence as a group of tests is less than 0.000 which indicates increased TSP is associated with decreased PFT.

Children's Plumonary Function Tests and Acute Air Pollution Changes

During the school year 1978-1979, 366 Missoula third and fourth grade school children had pulmonary function tests on a predetermined monthly schedule for eight tests per child. The results were analyzed for an interaction between the three day average level and the children's PFT. Also, in the school year 1979-1980, 120 Missoula children had pulmonary function tests, but during this study it was attempted to test on some days with low air pollution and some days with high air pollution. Unfortunately, there were no days during this testing period when the three day average particulate level was low. The

children were tested five times when the three day average TSP range was 98 to 154 ugm/M^3 per 24 hours, and once when the three day average TSP was 440 ugm/M^3 per 24 hours. Table 5 presents the results of the tests for both years. The direction and percent of pulmonary function test changes with different levels of air pollution are indicated in the body of Table 5. In both years as TSP increases all PFT decrease. As fine respirables increase all PFT decrease, except males' $FEF_{25-75\%}$. Coarse respirable changes are not consistently associated with PFT changes. Note that for 35 of the 42 analyses the children have decreased pulmonary function tests as air pollution increases. The Sign tests indicates the probability of this is less than 0.000. These results indicate an association of high particulate air pollution levels with low children's pulmonary function tests.

COPD Test

Eighty-four adults with COPD were studied during 18 months of 1978-1979. They had FEV_1 and PEFR testing on a predetermined once a month schedule. Additionally they filled out a questionnaire on each of the seven days preceding their PFT day to record their daily symptoms and activity levels. The results were correlated with the three day average TSP by regression analysis. Table 6 shows that FEV_1, PEFR and activity level all decrease as TSP increases. The rates of four of the five symptoms increase as air pollution increases. Again by Sign test the probability that all of these results could occur by chance is 0.035. This analysis suggests an association between increased TSP ambient air levels and decreased health in adults with COPD.

Summary

Table 7 summarizes the MAPS analysis of air pollution and pulmonary function tests. 132 of the 155 analyses showed an association of increased air pollution and decreased health indicators. There is less than 0.000 probability by the Sign test that results were due to chance.

In Table 8, $FEF_{25-75\%}$ had the most consistent and the greatest decreases as air pollution increased. 45 of 49 analyses showed $FEF_{25-75\%}$ decreased as air pollution increased. In 23 of 43 analyses with percent differences $FEF_{25-75\%}$ was decreased by 4% or more and in five analyses by 10% or more. FEV_1 varied more than FVC. 42 of 49 FEV_1 analyses showed an association with air pollution while 35 of 49 FVC analyses showed such an association. The probability by Sign test for $FEF_{25-75\%}$ and FEV_1 is less than 0.000 and for FVC it is 0.004.

These results suggest air pollution most likely triggers reactive air way responses in small or medium bronchi: edema, increased mucus secretion, more viscous mucus, inflammation, or smooth muscle bronchial constriction. Possibly these changes are reversible and short term and may not lead to significant permanent lung damage in the majority of individuals. However, the long-term effects are not known and the effects upon the growing lungs of children less than five or six years old are unexplored.

KGJ/mef

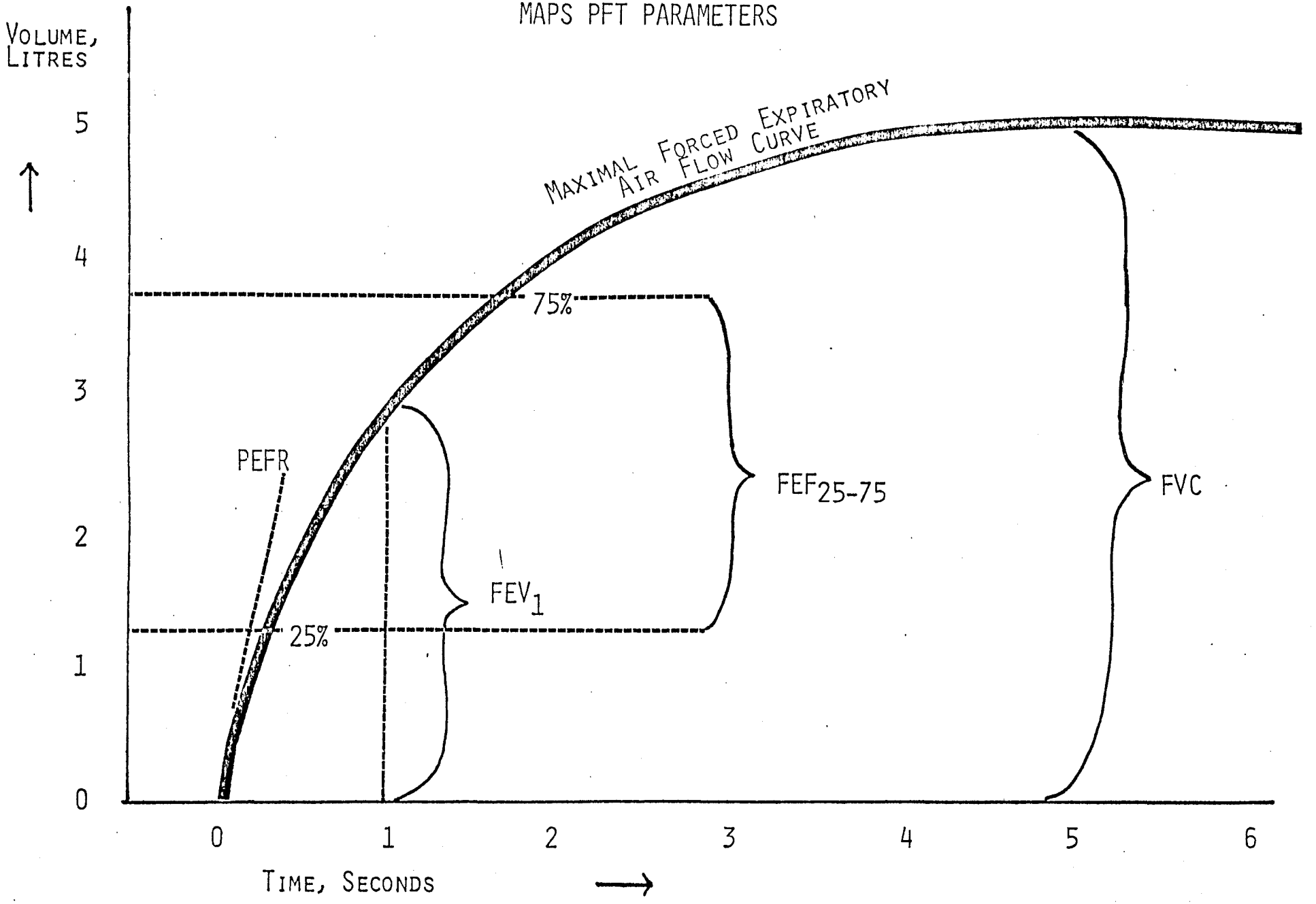
MAPS PFT PARAMETERS
VOLUME, LITRES
5
4
3
2
1
0
MAXIMAL FORCED EXPIRATORY AIR FLOW CURVE
75%
25%
PEFR
FEV1
FEF25-75
FVC
0
1
2
3
4
5
6
TIME, SECONDS

Figure 1

TABLE 1

AIR QUALITY CHARACTERISTICS OF
MAPS COMMUNITIES

1978-1979 18 Months Data	Anaconda Lincoln School	Billings Central Park	Butte Hebgen Park	Missoula Lions' Park	Great Falls Kiwanis Park
TSP ug/m^3					
- Average arithmetic	57	88	76	101	43
- No. days $\geq$ 200	3	9	1	37*	0
Respirable Particulates ug/m^3					
- Total $\leq$ 15u					
- Avg.	33.4	36.4	56.6	58.4	33.8
- Max.	74.0	117.0	95.3	181.5	60.7
- Coarse 2.5-15 u					
- Avg.	19.9	18.7	37.0	34.9	22.9
- Max.	40.3	74.4	75.7	140.3	43.5
- Fine $\leq$ 2.5 u					
- Avg.	14.5	17.7	19.6	23.5	10.9
- Max.	41.9	55.4	65.9	83.2	28.9
SO_2 ppm:					
- Average	.033	.011	.008	.000	.000
- No. days $\geq$ 0.14	16	0	0	0	0
NO_2 ppm:					
- Average	.0063	.0155	.0240	.0172	.0089

* In March of 1978 and 1979, twelve days TSP data were excluded because of excessive windy days and street dust.

TABLE 2

PERCENT DIFFERENCE[1] OF CHILDREN'S PFT

BETWEEN MISSOULA AND THREE COMMUNITIES, 1978 SPRING

COMMUNITIES	FVC		FEV_1		FEF_{25-75}	
	Male	Female	Male	Female	Male	Female
MISSOULA : GREAT FALLS	2.7%**		4.7%**		10.2%**	
MISSOULA : T. RANGE	.9%	2.5%	-1.0%	4.5%*	3.8%	11.0%*
MISSOULA : CLINTON	3.2%	3.0%	3.2%	4.8%	4.8%	14.9%*

Significance level: * -0.01, ** 0.000

[1]- Percent Difference = $\left((\text{Other Community} - \text{Missoula}) \div \text{Missoula}\right) \times 100\%$

TABLE 3

PERCENT DIFFERENCE[1] OF CHILDREN'S PFT

BETWEEN FOUR COMMUNITIES AND GREAT FALLS, 1978-79

	FVC		FEV_1		FEF_{25-75}	
	Male	Female	Male	Female	Male	Female
GREAT FALLS : ANACONDA						
- Fall	-0.2%	-4.1%	-1.4%	-5.1%	-6.5%	-7.6%
- Winter	0.6%	-2.0%	-1.1%	-3.4%	-6.1%	-7.6%
- Spring	0.5%	-3.0%	-1.3%	-4.2%	-7.7%	-10.4%
GREAT FALLS : BILLINGS						
- Fall	7.4%	0.6%	1.8%	0.1%	2.6%	0.7%
- Winter	-2.4%	-2.0%	-3.0%	-2.8%	-4.6%	-4.2%
- Spring	-2.5%	-1.5%	-3.5%	-2.4%	-3.7%	-4.0%
GREAT FALLS : BUTTE						
- Fall	-2.0%	-0.8%	-1.7%	-0.8%	-5.0%	-1.1%
- Winter	-0.4%	-0.8%	-2.0%	-1.6%	-7.6%	-5.2%
- Spring	-0.4%	0.7%	-2.0%	0.1%	-6.3%	-3.3%
GREAT FALLS : MISSOULA						
- Fall	-1.0%	2.1%	-0.8%	2.0%	-4.7%	1.1%
- Winter	-0.2%	-1.3%	-0.9%	-1.5%	-2.6%	-1.1%
- Spring	-2.8%	-1.5%	-4.3%	-2.2%	-9.3%	-4.3%
Significance level among communities	.361	.106	.507	.031	.036	.001

[1] - Percent Difference = $\left[(\text{Other Community} - \text{Great Falls}) \div \text{Great Falls}\right] \times 100\%$

TABLE 4

REGRESSION OF CHILDREN'S PFT ON AIR POLLUTION PARTICULATES AMONG FIVE COMMUNITIES FOR THREE SEASONS, 1978-79

AIR POLLUTANT	DIRECTION AND PROBABILITY OF REGRESSION					
	FVC		FEV_1		FEF_{25-75}	
	Male	Female	Male	Female	Male	Female
TSP	-.80	.67	-.33	.82	-.49	-.03
RESPIRABLE PARTICLES:						
- Fine	-.25	-.68	-.19	-.72	-.92	-.31
- Total	-.76	-.77	-.37	-.76	-.67	-.12

TABLE 5

PERCENT CHANGE OF MISSOULA CHILDREN'S PFT

WITH DIFFERENT LEVELS OF AIR POLLUTANT PARTICULATES

AIR POLLUTANT	FVC		FEV_1		FEF_{25-75}	
ugm/M^3	Male	Female	Male	Female	Male	Female
TSP, 1978-79:						
0-100	0	0	0	0	0	0
101-150	-.42%	-.23%	-.73%	-.56%	-1.39%	-.68%
151-200	-.65%	-.73%	-.96%	-1.12%	-1.46%	-2.19%
(Probability)	(.15)	(.14)	(.07)	(.07)	(.16)	(.16)
FINE RESPIRABLE, 1978-79:						
0-30	0	0	0	0	0	0
31-60	-.35%	-.44%	-.28%	-.10%	-.36%	.37%
61+	-.65%	-.75%	-.51%	-.47%	.08%	-.61%
(Probability)	(.08)	(.04)	(.45)	(.51)	(.85)	(.60)
COARSE RESPIRABLE, 1978-79						
0-30	0	0	0	0	0	0
31-60	.22%	.24%	.10%	.04%	-1.03%	-.01%
61-90	.22%	.31%	-.49%	-.37%	-1.68%	-.66%
(Probability)	(.65)	(.58)	(.52)	(.67)	(.17)	(.81)
TSP, 1979-80						
Average 119	0	0	0	0	0	0
440	-.65%	-.82%	-1.58%	-1.66%	-1.83%	-10.00%
(Probability)	(.18)	(.06)	(.02)	(.01)	(.20)	(.01)

TABLE 6

COPD PATIENTS REGRESSIONS ON TSP, 1977-79

	DIRECTION	PROBABILITY
FEV_1	-	.005
PEFR	-	.374
Activity level	-	.198
Shortness of breath	+	.065
Cough	+	.139
Wheezing	+	.203
Phlegm	-	.500
Self treatment	+	.339

TABLE 7

SUMMARY OF MAPS ANALYSES

WITH NUMBER ASSOCIATING AIR POLLUTION AND DECREASED PULMONARY FUNCTION

	Number Analyses	Number Associated	Probability*
PFT Missoula vs. 3 Communities	15	14	< .000
PFT Great Falls vs. 4 Communities	72	59	< .000
5 Communities: AP vs. PFT	18	16	< .000
Missoula: AP vs. PFT	42	35	< .000
COPD: AP vs. PFT and Symptoms	8	7	.035
TOTAL	155	132	< .000

* Probability by Sign test

TABLE 8

SUMMARY OF MAPS PFT VERSUS AIR POLLUTION ANALYSES

	FVC	FEV_1	FEF_{25-75}
Number of Analysis	49	49	49
Number of Analysis with Air Pollution Associated with PFT	35	42	45
Probability by Sign Test	.004	$<.000$	$<.000$

THE WESTERN MONTANA CLINIC
501 WEST BROADWAY
MISSOULA, MONTANA
59801
TELEPHONE 721-5600

TESTIMONY FOR SELECT COMMITTEE ON ECONOMIC PROBLEMS RELATIVE TO AMBIENT AIR POLLUTION STANDARDS JANUARY 21, 1981

KIT G. JOHNSON, M. D., M. P. H.

THANK YOU FOR ALLOWING ME TO TESTIFY FOR THIS COMMITTEE. MY TESTIMONY WILL BRIEFLY ADDRESS TWO ISSUES: FIRST THE EFFECTS OF AIR POLLUTION UPON THE HEALTH OF MONTANANS AND THEN THE APPROPRIATENESS OF THE LEGISLATURE OVERRULING THE DECISIONS OF THE STATE BOARD OF HEALTH.

HEALTH EFFECTS OF AIR POLLUTION

MONTANA HAS URBAN AIR POLLUTION PROBLEMS. POPULATION CENTERS ARE USUALLY LOCATED EITHER IN MOUNTAIN VALLEYS OR IN PLAINS RIVER CANYONS, WHERE PROLONGED PERIODS OF AIR STAGNATION ARE COMMON DURING THE LONG WINTER SEASON. SOURCES OF AIR POLLUTION EMISSIONS ARE AUTOMOBILES, WOOD HOME HEATING, SMELTERS, OIL REFINERIES, VENEER DRIERS, PULP PAPER PLANTS AND COAL FIRED GENERATORS. ALSO EACH OF THE MAJOR POPULATION CENTERS HAS ITS OWN UNIQUE METEOROLOGICAL AND GEOGRAPHIC AIR MIXING CHARACTERISTICS AND MAJOR SOURCES OF AIR POLLUTION.

AT HIGHER LEVELS OF AIR POLLUTION THERE IS GENERAL AGREEMENT THAT HUMAN HEALTH IS ADVERSELY EFFECTED. HOWEVER, A SURVEY OF AIR POLLUTION REVIEW LITERATURE LEADS TO THE CONCLUSION THAT AT THE LEVELS OF TOTAL SUSPENDED PARTICULATES (TSP) (ANNUAL AVERAGE RANGE FORTY-

THREE TO ONE HUNDRED AND ONE MICROGRAMS PER CUBIC METER) AND SULFUR DIOXIDE (SO_2) (ANNUAL AVERAGE RANGE 0.000 TO 0.033 PARTS PER MILLION) FOUND IN MONTANA'S LARGEST COMMUNITIES THE POSSIBLE EFFECTS ON HUMAN HEALTH ARE UNCLEAR. MOST STUDIES ON PULMONARY FUNCTION OR RESPIRATORY SYMPTOMS HAVE FOUND ADVERSE EFFECTS AT AIR POLLUTION LEVELS SIMILAR TO MONTANA'S; HOWEVER, OTHERS HAVE NOT.

SOME OF THE REASONS FOR THESE DISCREPANCIES AND CONFUSION ARE: 1. PROBABLY THERE IS NO THRESHOLD FOR SOME AIR POLLUTION EFFECTS AND THERE IS A WIDE RANGE OF INDIVIDUAL SENSITIVITY.- THUS WITH A SENSITIVE ENOUGH INSTRUMENT SOME INDIVIDUALS MAY BE FOUND TO REACT TO ALMOST ANY AIR POLLUTION LEVEL. 2. IMPRECISION OF PARTICULATE MEASUREMENTS. THE EUROPEAN LITERATURE USES SMOKE CONCENTRATION. THE OLDER AMERICAN LITERATURE USED DUST FALL OR COEFFICIENT OF HAZE (COH). TSP IS THE CURRENT UNITED STATES PARTICULATE POLLUTION MEASUREMENT. HOWEVER, TSP SIMPLY MEASURES THE TOTAL WEIGHT OF PARTICULATE CONTAINED IN A VOLUME OF AIR. NONE OF THESE MEASUREMENTS QUANTIFIES PARTICULATES AS TO SIZE, WHETHER THEY ARE RESPIRABLE OR NOT WHICH IS A CRUCIAL FACTOR IN INFLUENCING HUMAN HEALTH. NEITHER DO THEY PROVIDE INFORMATION ABOUT THE QUALITY OF THE PARTICULATES: ARE THE PARTICULATES ORGANIC OR INORGANIC, CHEMICALLY INERT OR ACTIVE, MUTAGENIC OR CARCINOGENIC, BENIGN OR INFLAMMATORY? THUS THE AIR POLLUTION PARTICULATES OF TWO COMMUNITIES WITH IDENTICAL LEVELS OF TSP COULD HAVE MARKEDLY DIFFERENT EFFECTS ON HUMAN HEALTH. 3. MOREOVER THE MIXTURE OF PARTICULATES, VAPORS AND GASES IN A COMMUNITY'S AIR POLLUTION MAY ACT SYNERGISTICALLY, ANTAGONISTICALLY,

CATALYTICALLY OR AS VEHICLES WITH DIFFERENT EFFECTS ON HUMAN HEALTH. 4. ENTIRELY DIFFERENT HEALTH MEASUREMENT AND ANALYTICAL TECHNIQUES WITH DIFFERENT PRECISION AND SOPHISTICATION HAVE BEEN USED IN THE VARIOUS STUDIES.

FOR THESE REASONS THE 1977 MONTANA STATE LEGISLATURE FUNDED A HEALTH STUDY AS PART OF THE MONTANA AIR POLLUTION STUDY (MAPS). A SYNOPSIS OF THIS STUDY IS ATTACHED. HOWEVER, THE FINDINGS CAN BE BRIEFLY SUMMARIZED: 1. MISSOULA'S CHILDREN HAVE DECREASED LUNG FUNCTION ASSOCIATED WITH HIGH AIR POLLUTION EPISODES. 2. ADULTS IN MISSOULA WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE HAVE INCREASED SYMPTOMS AND DECREASED ACTIVITY AND LUNG FUNCTION ASSOCIATED WITH HIGH AIR POLLUTION EPISODES. 3. WHEN LUNG FUNCTIONS OF CHILDREN FROM GREAT FALLS, EXPOSED TO MINIMAL AIR POLLUTION, ARE COMPARED TO THE LUNG FUNCTIONS OF OTHER MONTANA COMMUNITIES: A. MISSOULA'S CHILDREN HAVE THE WORST LUNG FUNCTION, THEY ARE EXPOSED TO THE HIGHEST LEVEL OF PARTICULATES. B. ANACONDA'S CHILDREN HAVE THE NEXT WORST LUNG FUNCTION, THEY ARE EXPOSED TO THE HIGHEST LEVELS OF SULFUR DIOXIDE. C. BILLINGS AND BUTTE'S CHILDREN HAVE INTERMEDIATE LEVELS OF LUNG FUNCTION, THEY ARE ALSO EXPOSED TO INTERMEDIATE LEVELS OF PARTICULATES AND SULFUR DIOXIDE. 4. ALL OF THE EFFECTS FOUND ARE RELATIVELY SMALL: HOWEVER, THE LONG RANGE IMPACT ON THE LIVES OF CHILDREN AND ADULTS IN THESE COMMUNITIES IS UNKNOWN.

ALSO, FOR YOUR INFORMATION I HAVE ATTACHED A BRIEF REVIEW OF SOME AIR POLLUTION AND HEALTH LITERATURE WHICH I RECENTLY COMPLETED FOR THE MISSOULA CITY COUNTY BOARD OF HEALTH.

ACCUMULATED LOCAL EVIDENCE AND THE MEDICAL LITERATURE INDICATES THAT THE HEALTH OF MONTANANS IS ADVERSELY EFFECTED BY THE PRESENT LEVELS OF AIR POLLUTION.

APPROPRIATENESS OF OVERRULING THE STATE BOARD OF HEALTH

THERE IS NO DOUBT THAT THE STATE LEGISLATURE HAS A DUTY TO ACT IN THE BEST INTEREST OF MONTANA; HOWEVER, IN THIS INSTANCE IS THE STATE LEGISLATURE IN A POSITION TO ACCURATELY DETERMINE WHAT IS THE BEST INTEREST OF MONTANA? BEFORE YOU ACT TO OVERTURN THE ACTIONS OF THE STATE BOARD OF HEALTH PLEASE CONSIDER THE FOLLOWING.

FIRST THE ISSUES ARE VERY COMPLEX. MY TESTIMONY AND I BELIEVE THE TESTIMONY OF EVERY OTHER WITNESS IS AN OVER SIMPLIFICATION OF THE ISSUES AND PERHAPS SOME MAY EVEN OVERSTATE THEIR POSITION. IN THIS CONTROVERSY THERE ARE NO GOOD GUYS OR BAD GUYS, BUT MOST WITNESSES ARE WELL MEANING PEOPLE EACH OF WHOM IS TRYING TO PROTECT HIS INTEREST IN A SMALL PIECE OF THE PROVERBIAL ELEPHANT, FOR SOME IT IS PROFIT, FOR OTHERS IT IS HEALTH.

IN MY OPINION, TO ABSOLUTELY PROTECT HUMAN HEALTH FROM ALL THE EFFECTS OF AIR POLLUTION WE WOULD HAVE TO DO AWAY WITH ALL AIR POLLUTION. THIS IS IMPOSSIBLE IN MODERN SOCIETY; THEREFORE, OUR DUTY IT TO TRY TO DEFINE THE MOST COST EFFECTIVE LEVELS OF AIR POLLUTION CONTROL. UNFORTUNATELY, DEFINING EXACTLY THE MOST COST EFFECTIVE LEVELS OF AIR POLLUTION CONTROL IS BEYOND OUR PRESENT ABILITIES. WE CAN ESTIMATE THE COST OF AIR POLLUTION CONTROL MEASURES BUT WE CANNOT ACCURATELY

EVALUATE THE COST OF ADDITIONAL MEDICAL CARE, THE LOSS OF PRODUCTIVITY, THE COST OF ILL HEALTH AND SHORTENED LIFE EXPECTANCY DUE TO AIR POLLUTION. JUST CONSIDER THAT IT IS STANDARD HEALTH CARE PRACTICE IN MONTANA TODAY FOR PEOPLE WITH CORONARY ARTERY DISEASE TO PAY UP TO FOURTEEN TO FIFTEEN THOUSAND DOLLARS FOR CORONARY BIPASS SURGERY WHICH HAS NOT BEEN DEFINITELY PROVEN TO LENGTHEN LIFE EXPECTANCY BUT ONLY REDUCES PAIN. CONSIDER ALSO THAT EXPOSURE TO MODERATE LEVELS OF CARBON MONOXIDE INCREASES PAIN IN PEOPLE WITH CORONARY ARTERY DISEASE. WHAT PRICE ARE CITIZENS WILLING TO PAY FOR GOOD HEALTH? WHAT ARE THE MOST COST EFFECTIVE LEVELS OF AIR POLLUTION CONTROL?

SECOND CONSIDER THE IMPACT OVERRULING THE STATE BOARD OF HEALTH'S DECISIONS WILL HAVE UPON FUTURE ACTIONS OF THE STATE BOARD OF HEALTH AND SIMILAR PUBLIC POLICY BODIES. FUTURE DECISIONS WOULD NOT BE WEIGHED OBJECTIVELY ACCORDING TO THE EVIDENCE AND THE MERITS OF THE ARGUMENTS, RATHER EVERY IMPORTANT DECISION WOULD BE MADE WITH AN EYE AS TO WHO MAY HAVE THE MOST POLITICAL POWER IN THE NEXT LEGISLATURE AND PLEASE DO NOT FORGET THAT THE POLITICAL PENDULUM SWINGS BOTH WAYS. THE STATE LEGISLATURE IS A POLITICAL BODY AND SHOULD REACT TO POLITICAL PRESSURE; HOWEVER THE STATE BOARD OF HEALTH MUST BE A STEP REMOVED FROM THE EXCESSES OF POLITICS IN <u>ANY</u> DIRECTION. STATE BOARD OF HEALTH POLICIES MUST BE DELIBERATE, RELATIVELY CONSERVATIVE IN PROTECTING HUMAN HEALTH AND BASED UPON THOUGHTFUL CONSIDERATIONS OF THE BEST AVAILABLE EVIDENCE AND ADVICE. PLEASE RESPECT THAT ROLL.

LASTLY, THE STATE BOARD OF HEALTH HAS CONSIDERED THE TOTAL EFFECT OF AIR POLLUTION AND AIR POLLUTION CONTROL UPON MONTANANS FOR YEARS,

INCLUDING NUMEROUS HEARINGS INVOLVING THE HEALTH AND ECONOMIC IMPACTS OF SPECIFIC EMISSION CONTROL MEASURES UPON SPECIFIC INDUSTRIES. IN GENERAL THEIR RECOPD OF REASONABLY RESOLVING THE PROBLEMS HAS BEEN EXCELLENT; CITIZENS HAVE BEEN PROTECTED AND MONTANA'S INDUSTRIES HAVE NOT SUFFERED. MORE SPECIFICALLY, THE STATE BOARD OF HEALTH SPENT OVER A YEAR STUDYING THE ISSUES BEFORE ADOPTING THE PRESENT AMBIENT AIR STANDARDS. THE EVIDENCE THEY CONSIDERED MUST BE MEASURED IN POUNDS NOT PAGES. BY COMPARISON, I WAS GIVEN TEN MINUTES TO PRESENT EVIDENCE WHICH WE COULD REASONABLY SPEND THREE HOURS ON. SOME WITNESSES WILL NOT EVEN GET TO TESTIFY. MOREOVER, DURING THIS NINETY DAY SESSION THIS LEGISLATURE MUST CONSIDER OVER TWELVE HUNDRED SEPARATE BILLS COVERING A MYRIAD OF SUBJECTS. IT IS DIFFICULT TO BELIEVE THAT EACH LEGISLATOR WILL BE ABLE TO BECOME SUFFICIENTLY ACQUAINTED WITH THE ISSUES TO OVERRULE THE STATE BOARD OF HEALTH.

THEREFORE, ALTHOUGH I PERSONALLY MAY NOT AGREE WITH ALL OF THE ADOPTED AMBIENT AIR STANDARDS I RESPECTFULLY REQUEST YOU TO LET THE DECISIONS OF THE STATE BOARD OF HEALTH STAND AS THE MOST PRACTICAL CURRENT SOLUTION TO VERY DIFFICULT PUBLIC POLICY ISSUES.

THANK YOU,

KIT G. JOHNSON, M. D., M. P. H.

KGJ/KDK

County of Yellowstone

COMMISSIONERS

BILLINGS, MONTANA
59101

January 29, 1981

Senator Harold Dover
Chairman
Senate Natural Resources Committee
Capitol Station
Helena, Montana 59601

Re: Senate Bill 65

Dear Senator Dover and Committe Members:

Although I will not be able to attend your Committee's hearing on January 30, 1981, I want you to know that I oppose Senate Bill 65.

The function of establishing ambient air standards has been and should be an administrative one handled by the State Board of Health. I am satisfied that the Board of Health has the necessary background and expertise to handle these matters and that the Legislature should not add such duties to its immense workload. I am also satisfied that no other Board or agency in State government is qualified to establish and monitor ambient air standards.

As a life-long resident of Montana who intends to stay here, I hope that we will never lose the opportunity to determine the quality of our own lives, including that of the air we breathe; and I hope that we never give up that right to the Federal Government. Please recommend a "do not pass" for this bill.

Very truly yours,

Dave Gorton, County Commissioner
YELLOWSTONE COUNTY, MONTANA

DG:hk

TESTIMONY ON SENATE BILL 65

January 30, 1981

Hal Robbins, Chief

Air Quality Bureau

Members of the Committee: My name is Hal Robbins, and I am Chief of the Air Quality Bureau. My testimony is presented on behalf of the Department of Health and Environmental Sciences. I would like to thank you for the opportunity to speak before you today. The Department would like to go on record as opposing this legislation.

I would like to make five brief points.

I. In the first place, this legislation requiring affirmative legislative action apparently springs from a feeling that the Board of Health has acted irresponsibly in adopting the air quality standards--perhaps that the Board hasn't adequately considered the economic aspects of the standards particularly those on industries in the state.

If indeed the process followed by the Board had been inadequate or if the Board had ignored important economic information before it, then there might be some cause for concern.

However, as someone who participated extensively in the rulemaking process before the Board, and as someone who works with the state's industries on a daily basis, I can assure you that there is no grounds to say that the Board ignored economics or the industries in the state.

In fact, the Board gave careful consideration to economics. One example is the case of ASARCO, which recently completed a major renovation of its plant, including major pollution controls.

Several health studies showed the need for a one-hour rather than a three-hour sulfur dioxide standard. The Board used ASARCO's own data in allowing 18 excursions over the standard per year--thereby actually tailoring the standard to the needs of a major employer and producer.

Another example is the standard for hydrogen sulfide, which has been a nuisance problem in Missoula associated with Hoerner-Waldorf. While many people in Missoula wanted a standard more stringent than the one recommended, Champion International supported the Department's recommendation throughout the proceedings. The Board struck a proper balance by taking into account arguments on both sides and it adopted the Department's recommended standard.

By any standard the Board has not only taken a hard look at the economics, but also applied it. This is not irresponsible action but is clearly the type of balancing that we need in Montana.

II. My second point is that this legislation is likely to promote the very thing it is trying to prevent. This bill is apparently designed to create a stable regulatory climate in the state by making sure that air standards don't disrupt business. In fact, this bill will make the situation worse, not better. Perhaps this could best be illustrated through an example. Would it be fair to ask a company not only to be subjected to review by the Department in adopting an appropriate standard, if necessary, but also to subject the same companny to legislative oversite regarding that standard? How can this be efficient government regulation when two approvals are needed for the same thing? Why would this hypothetical company locate in Montana when the appropriate rules are already established in another state?

III. My third point concerns the role of the standards in affecting the future growth of industry in the state. A distinction has to be made between new

industry and existing indusry. It would be too lengthy for me to discuss the effects on existing industry. I would instead refer you to testimony that the Department submitted to the "select committee on economic problems" and to testimony presented on House Bill 334. The issue of each industry is addressed in that testimony. It is easier, however, to discuss the effect of ambient standards on new industry considering the establishment of operations in Montana. It's completely fair to say that the effect of the new Ambient Air Standards on new industry is next to nothing. When a major industry desires to build its project in this state, or any other state for that matter, several special rules apply. One is the requirement to install the best available control technology and the other is to meet prevention of significant deterioration rules. Simply stated, new plants are obliged to design in pollution control devices currently available on the market. Almost without exception, these rules are considerably more stringent than the Ambient Air Quality Standards. Colstrip 1 through 4 might be a good example. The Colstrip units were required to comply with these standards. Yet I can assure you that the four units, with a combined output of over 2,000 megawatts, will not cause any violations of the ambient standards. These two programs I have described are federal programs and are applicable to all states.

IV. My fourth point is the legislative review process itself. It is not at all clear on what basis the legislature should or should not reject or accept standards. Are the standards to be viewed on a scientific basis? Will the legislature review the scientific and technical documents, which could easily amount to several hundred pages, and make a determination on that basis? If that is the case, then I do not see what advantage exists for both the Board of Health and the Legislature to review the testimony.

Will the Legislature subpoena witnesses and review the record of the Board, or will the Legislature conduct its own public hearing? If the Legislature intends to make a comprehensive look at the proposed standards, I can't help but wonder how the new Board of Health will react during its rule-making procedures. Would it not be difficult for members of the unpaid Board of Health to spend many hours listening to testimony and researching the matter when in fact they know that their efforts may be both reviewed by the courts and second-guessed by the Legislature? Whatever their decision, they know it doesn't really count until the Legislature conducts its own investigation.

If the Legislature does not intend to review the decisions of the Board on a scientific basis, then I assume that a political decision is in order. A political decision that affects the direct health of Montanans and their children, as well as the state's agriculture, does not seem to be an acceptable alternative.

V. My final point concerns the six-month provision of the Administrative Procedure Act (section 2-4-306) which states that rules are not valid unless adopted within six months of the publishing of the notice for the rule. Under Senate Bill 65, unless a rule was proposed, adopted and reviewed by the Legislature, all within six months, the whole rulemaking process would have to resume again and again. The process of adopting or amending air quality rules would be extremely complicated.

In summary, let me point out that SB65 in fact would not facilitiate the process for helping companies locate in Montana, it only increases the required regulations. Finally, it is very unclear how the Legislature intends to review or amend Board decisions, or what criteria are to be used in approving the standards. Thank you.

Testimony of Michael Dahlem in Opposition to HB 334 and SB 65

Speaking on behalf of the Associated Students of the University of Montana, I wish to state our categorical opposition to any attempt to subject Montana's ambient air quality standards to legislative approval. We cite three reasons for our position.

One, the standards recently adopted by the Board of Health represent the work of more than two years of public debate, expert testimony and careful examination by the Board before reaching its decision. The net effect of HB 334 and SB 65 is to wipe the slate clean, thereby eliminating all but the minimal standards imposed by the federal government.

We believe that before any body, whether it be administrative, judicial or legislative, takes such a drastic step, it must have strong evidence that the original decision it is rescinding was incorrect. There has been no such determination by this legislature, nor do the proponents of these bills offer any compelling evidence that the Board of Health erred in reaching its findings. Furthermore, no evidence of economic dislocation has been presented as a result of state ambient air quality standards. In fact, not one plant has been closed, nor has one job been lost because of these standards. The proponents have shown no need for legislative intervention.

Secondly, it is the right of the people of Montana to determine what levels of air quality are adequate to protect human health and welfare. We find it ironic that many of the same people who advocate the so-called "Sagebrush Rebellion" also support these bills. The federal government has specifically delegated to the states the power to adopt air standards stricter than the federal requirement. Montanans have enthusiastically embraced this opportunity to exert more control over their physical environment. In our estimation, the adoption of federal ambient air standards would mark a giant step backwards in the struggle for state control of our resources.

Finally, we believe that the legislature is not the proper forum for making complex, technical decisions about air quality. The written testimony submitted over the past two years amounted to more than three feet of documents. The time and the expertise to digest this information is lacking in the legislature.

The argument that the legislature is somehow "closer to the people" and ought to serve as a court of last resort is confused. One, the Board of Health is not "a bunch of bureacrats" as was suggested by some industry representatives. It is a citizen board, working without pay and blessed with the technical expertise to make informed decisions. The legislature, on the other hand, is ill-equiped for such a task. The judicial review role suggested by these bills also raises some serious separation of powers questions.

In conclusion, the students at the University of Montana oppose HB 334 and SB 65 because no need has been demonstrated to overturn two years of public participation in the rule-making process; because the state of Montana has a responsibility to determine standards to guard the health and well-being of its citizens; and because the legislature is not the proper body to engage in administrative rule-making.

Michael Dahlem

Michael Dahlem

Associated Students of the
University of Montana

The Big Sky Country

MONTANA STATE SENATE

Senator Mike Halligan
Senate District 48
435 University Avenue
Missoula, Montana 59801
Phone: 725-3004

HELENA ADDRESS:
2212 Choteau
Helena, MT 59601
Phone: 442-0585
Phone: 449-3064

January 30, 1981

Committees:
Judiciary,
Public Health,
Bills and Journals

TO: Harold Dover, Chairman
Senate Natural Resources Committee

FROM: Mike Halligan
Senate District #48

RE: SB 65

If my understanding of this bill is correct, the original reason for the submission of SB 65 was concern that the air quality regulations as proposed would severely hinder the state's job creating potential by limiting it's ability to attract outside industry; and there was also concern that jobs would be lost because certain, existing industries could not comply, and therefore would be forced to shut down. The center of the controversy, then, revolves around jobs.

No one can deny that a bill whose purpose is to potentially save and/or create jobs has merit, and Senator Johnson's concern is noteworthy, and I'm sure all of us would stand by her in that regard. But the question still remains, would the bill have a measurable impact in this area if it were to pass? And, the answer is no.

We happen to live in a state that has never had, and does not have now a coordinated, aggressive economic planning and development

program. In fact, in our 92 year history, we have only made token efforts to attract outside industry and we have virtually ignored the needs of existing industries; we do not have a highly skilled, diverse labor pool available for work and the deficiencies in our transportation industry and the sheer geographic location of our state are well-known detriments to economic growth. Perhaps the greatest atrocity is that we have continued to openly pursue investment policies both in government and the private sector, that have sent our capital out of state at the expense of local development projects and local jobs.

My point, and I hope is't obvious, is that when you look at the problems we have experienced in the area of employment stability and job creation, we have been our own worst enemy, and the air quality regulations are an insignificant part of the picture. So if your concern is jobs, then it doesn't make sense to address the problem in a negative way, from the back door. Instead we should actively support legislative measures that address the real reasons behind job creation, and there have been several bills submitted by legislators on both sides of the aisle in this session to do just that.

My recommendation is simple. If you have difficulty with a particular standard as it is proposed, such as in the case of fluoride emissions, then deal specifically with this standard. Just as it does not make sense to scrap the tractor you use to run the family farm because it has a flat tire, neither does it make sense to scrap an entire set of regulations because one standard appears unworkable. I find it ironic that over 99% of the business

and industries presently operating in Montana are in compliance with the proposed standards, yet we seem to be bent on tossing out the entire set of standards for less than 1% of the industries.

In closing, one of the more important bits of wisdom I have learned from other senators since coming to Helena, is that when making a decision to support or not support a particular piece of legislation, you apply a very simple test.

If it cannot be shown that a bill will accomplish what it's sponsor intends it to do, (and in this case there must be a direct correlation between air quality and jobs) then the bill in question should not become law.

If your concern is jobs Senator Johnson, and I'm certain we all share that concern, then we should deal directly and aggressively with the economic development problems that are the causes of the instability, rather than tamper with air quality regulations that are only peripherally related.

Mr. Chairman and members of the Natural Resources Committee, while I strongly urge you to support Senator Johnson's concern for jobs, I must also ask for your total opposition to the method in which she proposes to address that concern. This bill should be given a DO NOT PASS and sent on its way to the legislative morgue.

Testimony on SB65 January 30, 1981

Mr. Chairman and members of the Natural Resources Committee. My name is Noel Rosetta. I speak on behalf of the Montana Audubon Council which represents over 1800 Audubon members in Montana.

We have taken part in the lengthy and technical process by which the Board of Health has set ambient air quality standards for Montana. Though we have some criticism of the standard setting process, we still support it.

We are opposed to this bill (SB65) because it transfers responsibilityes from the Board of Health and the courts to legislative committees. In session, with over 1,000 bills to look after, a legislative committee could not operate effectively. Out of session, an administrative code committee would present other problems. We wonder if the same strict Board of Health rules for technical accuracy under oath, public hearings, publication of findings, and so on would apply. We believe not. It appears that the administrative code committee decision would not be as reliable, as public, or as objective as the Board of Health's.

Actually, it seems that SB65 is intended to circumvent the Board of Health's decision. That decision allowed standards favorable to the health and welfare of the public and it was supported overwhelmingly by the public.

Hopefully this committee will not approve SB65.

My name is Ellen Sallee. I am a registered nurse from Missoula. By profession I have a concern and regard for the health of individuals.

The people of Missoula are expressing great interest and concern in the area of air quality because we contend with poor air quality on a daily basis in the winter months. Parents are phoning the county health department seeking answers to questions such as--"should we allow our children to play outside today, or not?". Citizen compliance with recommended wood-burning restrictions has been significant enough to lessen the intensity and duration of air quality crisis periods. Also a citizen's committee has been formed of 75 volunteers who plan to study extensively the specific pollution problem in Missoula and to make citizen-based recommendations for improving the air quality there.

I point this out to demonstrate how much of an effect poor air quality can have on a community, regardless of the source of pollution. I have delineated only the energy expended by Missoulians toward the problem of air pollution and suggest that the motivating factor for this is a concern for the known and potential, but yet unknown, health effects of air pollution.

Any Board of Health is established to protect the health and welfare of the public. Health can be defined in many ways but generally good health lends toward <u>quality</u> living. Quality living encompasses phyisical or bodily integrity, economic well-being and mental stability.

The State Board of Health is committed to this whole picture of public health and has studied long and hard to <u>balance</u> all health and welfare considerations into a sound decision in regard to air quality

standards. Their decision was based on the quality of life that exists in Montana, generally speaking, and the standards seek to preserve something that we ought to value. (Ask any Missoulian if clean air is important. They will wistfully affirm it's significant role in our lives.)

Health, or quality living, for Montanans should not be subject to the political arena where decisions are apt to be made from under political pressures. It is my opinion that the authority for state standards should remain within the Board of Health where the committment to public health and welfare is the sole purpose and perspective. Therefore I oppose SB 65 and HB 334

Ellen Sallee

Ellen Sallee
714 City Drive
Missoula, MT 59801

Also I have with me a testimony from Dr. Kit Johnson, of Missoula, who was unable to attend this hearing today.

The Montana Environmental Information Center

• P.O. Box 1184, Helena, Montana 59601 (406) 443-2520
• P.O. Box 8166, Missoula, Montana 59801 (406) 728-2644

Submitted to Senate Natural Resources Committee on SB-65. 12/30/81 D Snow

January ~~6th~~ 30th, 1981

Testimony Before The Select Committee
on Economic Problems Concerning
The Economic Effects of Montana's
Ambient Air Quality Standards

My name is Don Snow. I am Staff Coordinator of the Montana Environmental Information Center. I am speaking today on behalf of The Center, its membership, and its 18-member Board of Directors.

Through the 2-year-long process of promulgating enforceable ambient air quality standards for Montana, EIC participated at every available opportunity. We submitted technical testimony to the Board of Health and Environmental Sciences. Many of our members testified orally and in writing during the public hearings last spring. Our position today remains essentially unchanged. We support Montana's right to establish our own ambient air quality standards. We generally support standards that are more stringent than those adopted by the federal government. We generally support the standards adopted by The State Board of Health because we feel that the hearings and review process was fair, objective, and democratic. We are willing to live with the findings of The Board even though there is some doubt that each individual standard is adequate to protect human health and the welfare of other affected industries.

I do not envy the Committee's task of trying to evaluate the potential economic effects of our new ambient air quality standards. In a sense, the Committee is trying to accomplish in a few hearings what the Department and Board accomplished

in over two years of review. The Committee is now apparently engaged with the thorny question of margins of error in regard to an issue that remains somewhat nebulous and excruciatingly technical in nature.

For the benefit of the Committee, then, I would like to review briefly a few facts about federal and state air quality standards and the need for local regulations to ensure the welfare of industries affected by pollution damage.

Beginning as far back as the 1966 and '67 amendments to the federal Clean Air Act, Congress began writing provisions for state control into the Act. In 1970, the Act was further strengthened with the addition of standards and compliance plans for five "criteria" pollutants: sulfur dioxide, particulates, carbon monoxide, hydrocarbons, and photochemical oxidants. Notice that even in 1970, numberous pollutant were not regulated by federal standards. The reasons were several. An insufficient data base on which to set standards existed for several dangerous substances. In the past ten years, much has been added to that base. A second important reason was that some pollutants were of chiefly local significance. SO_2 occurs everywhere that coal is burned or oil is refined, but hydrogen sulfide in large quantities is mostly a phenomenon of pulp and paper mills. In setting standards for pollutants that affect livestock and other economic entities - fluorides in forage for instance - the federal government has simply lagged behind.

Thus, there are ambient air quality standards that apply to only six pollutants. Montana has standards for eleven pollutants. We don't have more standards because we favor over-regulation. We have them because the people of the state want certain dangerous and unpleasant pollutants regulated.

Industries have told the Committee that federal standards are fine because they are strong enough and they will allow for more standardized regulation. Neither contention is conclusively true. Standardized regulation cannot occur because many states have independent air quality standards. That's because the feds wanted it so. It also cannot occur because numerous pollutants are not regulated by EPA.

As to the adequacy of federal standards, the thing to keep in mind is that they are the minimum standards available for our use. And they might not be sufficient

even to protect human health, let alone economic welfare. Witness this quotation from the U.S. Codes Congressional & Administrative News for the 95th Congressional Session (1977):

"Since 1971 when the national ambient air quality standards were set, new and disturbing information has come to light showing that the public's health is being harmed to some extent, perhaps seriously, even at levels below federal standards. The margins of safety, supposedly insured by the standards, seem to have vanished in the face of new data."

The report summarized six short comings of the standards: 1) Margins of safety are inadequate. 2) The No-effects threshold on which standards were based does not exist. 3) Standards don't protect against birth defects or cancer. 4) Standards don't protect against long term chronic exposures or short-term peak concentrations. 5) Standards don't protect against accumulative effects of multiple pollutants. 6) Standards don't protect against derivative pollutants that form in the atmosphere.

The Department of Health and Environmental Sciences recognized the inadequacy of federal standards. The draft and final EIS on ambient air quality both speak to that inadequacy. We urge the Committee to read pp. 145-169 of the Final EIS for the Department's justification for proposing alternative standards.

EIC wishes to remind the Committee that our Constitution gives Montanans the right to a clean and healthful environment. If serious questions arise about the health effects of pollutants, the legislature should follow the path of the Board of Health and err on the side of protection.

A second inadequacy in federal standards is that they do not regulate numerous important pollutants. Three of them are of special concern to Montana: fluorides in forage, hydrogen sulfide, and residential settled particulates, which is of major concern in Missoula. If we adopt federal standards because we think such action will promote development, we must still treat the issue of pollutants not regulated by EPA. Further, if the legislature takes the reins to review every standard adopted by the Board, then the legislature must be prepared to study all of the issues related to air standards. The U.S. Congress recognizes the lack of exactitude in knowledge about

health and economic effects. Congress, however, does not pretend to know enough to set standards. If the 1981 legislature wants to go federal across the board, it must override the careful work of the Health Board in order to do so. Yet the Board and Department of Health are the best advisers in government in air quality standards setting. Opting for federal standards will put the legislature, then, in the odd position of overriding the Board on some pollutants levels (i.e. the ones with federal standards) and accepting the Board's decision on others not federally regulated. EIC is not certain that the legislature has that kind of expertise.

I'd like to address now the question of economic impacts and dislocations caused by our new ambient air quality standards. Montana is not the only state that recognized the short comings of federal standards and set its own. The following neighbors and others have adopted independent ambient air standards: North Dakota, Wyoming, California, Florida, Alaska. ~~Eight~~ Eleven states have SO_2 standards that are tougher than Federal in all three levels of measurement ; 24 states have SO_2 standards that are tougher in two levels of measurement.

One of our neighbors makes a good basis for comparison, since its economy is not sluggish and its air quality standards are at least as strict as Montana's. That state is Wyoming. Let's look for a moment at whether Wyoming's ambient air quality standards, or any other laws, have stifled development. Since 1970, Wyoming has had a 41% rise in population. There has been an 800% growth in the coal industry, from less than 10 million tons produced in 1970 to about 80 million in 1980. Seven new coal fired power units have come on-line in the 1970's, and three more are now under construction. All but three of those must comply with federal New Source Performance (emission) Standards. Two new trona plants with attendant mines have come on-line in the past ten years. The Texas Gulf plant employs 508 and is now expanding. The Tenneco plant, now under construction, will employ 450 permanently. These plants take their places alongside the larger Allied Chemical, FMC, and stauffer trona operations, all of which operate in an area of chronic particulate problems. In total, the Wyoming trona output doubled between 1972 and 1977. In addition, there has been significant growth and employment in the uranium industry. In 1977, 2,969 workers were directly employed at uranium mines

and mills. The Wyoming Dept. of Economic Planning and Development predicts that 7,394 workers will be in the force by 1983. Thirty new uranium mines have opened there since 1970.

All of this, gentlemen, with air quality standards that are at least as tough and in some cases tougher than ours. And all of this with little significant air quality degradation in part due to good standards. I again refer the Committee to an article from the Great Falls Tribune, dated October 6, 1980, in which a William Tabor of the EPA reports that only one Rocky Mountain state has cleaner air than Wyoming. That's North Dakota, which has also experienced rapid industrial growth. It is possible to have development and a clean environment.

In closing, I'd like to emphasize one final point about federal standards. 1981 is the year for federal Clean Air Act review. Congress will very likely review and recommend some changes in federal standards, perhaps ambient air, or emission, or PSD standards. Thus, we do not know exactly what federal standards will look like at the end of 1981. Going federal now makes us live with uncertainty. By maintaining our own standards, we reserve a right to clean air that the feds might partially abandon.

EIC is grateful to the Committee for accepting our testimony today. Thank you for your attention.

SB. 65 - Oppose -

Resolution of the City-County Board of Health's Citizen Committee on Residential Wood-Burning

As a group of concerned Missoulians who have come together to address the problem of residential wood burning in our valley, we, the Missoula City-County Health Board's Committee on Residential Wood Burning oppose any legislative enactment which will remove the City-County Health Board's authority to address the chronic air quality problem of the Missoula valley.

submitted by

Richard Stegner -
member of the committee

SB 65 — Oppose

Richard Stoffel
758 Eddy Ave
Missoula, MT.

— two separate issues:

I. The state vs fed. air stds —

if that is indeed the issue, then this is a underhanded way to approach the issue. → the process was open & accessible to all those who wanted to take part —

II The administrative process itself — now Sen. Johnson is saying it is the process itself that she would like to change - this seems a strange way to go about it - why was this single issue targeted —

— at any rate, i oppose the attempt to change the process for several reasons:

1) the admin. process is more accessible to the public — it goes on year round and carries out its business all over the state
2) the procedure includes the use of a technical staff - which is not available to the legislature
3) the proposed change would further inundate the legislative body with technical scientific information - that they would have to review to be able to judge the adequacy of the Board's decision → in this instance that would mean the consideration of of 8 different pollutants and 10 diff. stds. — that entails literally thousand of pages of testimony + exhibits
↳ in talking to Sen. Johnson yesterday she said that she didn't think that review of the entire record would be necessary - that they legis. could just deal with summaries — i disagree with that sentiment b/c i feel such an abbreviated review would be bound to slight some of the evidence -- and i think the slight could very possibly be in the consideration of the sentiment of the public — that would decrease the effectiveness of it, participation —
→ this possibility is an excellent example of the
4) the bill would remove the possibility of judicial review

DATE January 30, 1981

COMMITTEE ON Senate Natural Resources BILL NO. SB 65

VISITOR'S REGISTER

NAME	REPRESENTING	Check One: Support	Check One: Oppose
Hal Robbins	Air Quality Bureau		
James O. Mockler	Mont Coal Council	✓	
Robert E. Eagle	citizen		✓
[illegible]	citizen		
[illegible]	Lee County Democrats		✓
[illegible]	citizen		
[illegible]	[illegible]		
[illegible]	DSWA [illegible]	✓	
[illegible]			
[illegible]	[illegible]	✓	
[illegible]	[illegible]	✓	
Bill Hanson	UPC		
[illegible] McMillan	citizen		
[illegible]	citizen		
[illegible] Hanson	Montana Power	✓	
[illegible]			✓
[illegible]			✓
Philip W. Davis			✓
[illegible]	Northwest Mining Association	✓	
David F. Johnston	Operating Engineers & W.E.T.A.	✓	
K Wigal	Citizen & Bozeman Envir. Info. Center		✓
Jim Jensen	LISCA		X
[illegible] Howard Jr	citizen & EEC		X
[illegible]	EEC		X
[illegible]	[illegible]		✓

(Please leave prepared statement with Secretary)

DATE January 30, 1981

COMMITTEE ON Senate Natural Resources BILL NO. SB 65

VISITOR'S REGISTER

NAME	REPRESENTING	Check One: Support	Check One: Oppose
[illegible]	Mont Rec. and Parks Assoc. staff		X
[illegible]	myself		X
Marty Onsrud	LWV of Montana		X
[illegible]			X
[illegible]			X
[illegible]	LWV of Montana		X
[illegible]	myself Alberton		X
[illegible]	[illegible]		X
[illegible]	[illegible]		X
[illegible]			
[illegible]	[illegible]	—	—
[illegible]	EPA		
[illegible]	[illegible]		
[illegible]	[illegible]	—	—
[illegible]	Intern		X
[illegible]	[illegible]		—
[illegible]	[illegible]		
[illegible]	[illegible]		X
[illegible]	self		X
Robert Melcarand	[illegible]	—	—
[illegible]	[illegible]	X	
[illegible]	[illegible]	X	
[illegible]	[illegible]		
[illegible]			
[illegible]	[illegible]		X
[illegible]	[illegible]		X
[illegible]	[illegible]		X

(Please leave prepared statement with Secretary)

DATE January 30, 1981

COMMITTEE ON Senate Natural Resources BILL NO. 65

VISITOR'S REGISTER

NAME	REPRESENTING	Check One: Support	Check One: Oppose
[illegible]	USCH		✓
Gail Paterson	self - Deer Lodge		✓
Helen Waller	Circle NPRC		✓
[illegible]	Dawson, Mont.		✓
[illegible]			
[illegible]	F.T.C. Helena		✓
[illegible]	Mont. Audubon Council		✓
			✓
[illegible]	[illegible]	✓	
[illegible]	Mont Coop Wildlife Res.		✓
[illegible]	self		✓
[illegible]	self		✓
[illegible]	self - W Glendive		✓
Bernie A. Swift	Self - Hamilton Mt.	✓	[redacted]
Mike Halligan	Missoula Dist Dist. 48		✓
[illegible]	Montana Lung ASSN		✓
[illegible]	Conservation Council	✓	
[illegible]	[illegible]	✓	
[illegible]	BSB	✓	
[illegible]	Butte Silver Bow	✓	
[illegible]	[illegible]		✓
[illegible]	[illegible]		✓
[illegible]	[illegible]		✓
[illegible]	ASUM		✓

(Please leave prepared statement with Secretary)

DATE

COMMITTEE ON BILL NO.

VISITOR'S REGISTER

NAME	REPRESENTING	Check One	
		Support	Oppose
Vicki Reis	Bozeman Environmental Office		X
E Keith Anderson	Montana Taxpayers Assoc	X	
Jamille Fallan	Montana Chamber	X	

(Please leave prepared statement with Secretary)

NAME: Ron Erickson DATE: 1-30-81

ADDRESS: 3250 Pattee Canyon, Missoula Mt

PHONE: 549-4671

REPRESENTING WHOM? self

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Dave Dial DATE: 1-27-81

ADDRESS: Box 412

PHONE: 227-6740

REPRESENTING WHOM? United Steel Workers of America Local 72

APPEARING ON WHICH PROPOSAL: Bill 55

DO YOU: SUPPORT? X AMEND? _____ OPPOSE? _____

COMMENTS: It will be in ...

more people from east ... Lands

for people and coal.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Hal Ribbins DATE: 1-30-81

ADDRESS: 1119 Hauser Blvd

PHONE: 443-6088 469-3454

REPRESENTING WHOM? A. Q. H. Bum

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: A Hall

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Marty Onishak DATE: 1/30/81

ADDRESS: 5855 Pinewood Missoula, MT

PHONE: 251-2754

REPRESENTING WHOM? League of Women Voters

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: Procedures already exist 2-4-702 to 2-4-712 for the Legislature to review the rules of any state agency or Board. Do not need this bill. If adopted, Rules at least should stand unless voted down, not be ineffective unless affirmatively approved by Legislature.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Ellen Knight DATE: 1-30-91

ADDRESS: 5800 Rattlesnake Missoula

PHONE: 549-5952

REPRESENTING WHOM? Missoula league ? Women Voters

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS:

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: BETH LOEHNEN DATE: 1-30-81

ADDRESS: 12400 BENCH RD MISSOULA, MT

PHONE: 728 7459

REPRESENTING WHOM? C. PAUL LOEHNEN, M.D. PULMONARY SPECIALIST

APPEARING ON WHICH PROPOSAL: SB. 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: WOULD LIKE TO READ A PREPARED TESTIMONY WRITTEN BY MY HUSBAND.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Peter Price DATE: 30 Jan 81

ADDRESS: 340 S. 2nd W.

PHONE: 549-9998

REPRESENTING WHOM? Myself

APPEARING ON WHICH PROPOSAL: Senate Bill 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS: Would like to testify. Written statements attached.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: _____ DATE: _____

ADDRESS: _____

PHONE: _____

REPRESENTING WHOM? _____

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? _____

COMMENTS: Air quality should be the most important consideration in the Board of Health's decision to adopt rules for the control of particulate matter. This is the only thing that can be taken into practical consideration for immediate success of the health & viability of Montana's environment in the future. Remember: Montana has unique industries ie. agriculture & tourism which in turn have unique demands on the environment. Further, for the existence of industry & special interest representation to have pressure that they can consider of more importance than the land and people to be valid conclusions as that very board is ludicrous. I urge you to oppose SB. 65. Thankyou

Lisa

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

page 2

NAME: _____ DATE: _____

ADDRESS: _____

PHONE: _____

REPRESENTING WHOM? _____

APPEARING ON WHICH PROPOSAL: _____

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? _____

COMMENTS: _____

Students in air quality should not be limited to a critical year - it is a value of the school to educate students in science with reference to experts with information evidence & scientific & technical nature.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: _____ DATE: _____

ADDRESS: _____

PHONE: _____

REPRESENTING WHOM? _____

APPEARING ON WHICH PROPOSAL: _____

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? _____

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Vickie Rea DATE: Jan. 30 1981

ADDRESS: P.O. Box 1532 Bozeman, MT. 59715

PHONE: 587-4370

REPRESENTING WHOM? Bozeman Environmental Information Center

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: Establishment of Air quality Standards has an impact on all sectors of the society. The Board of health carried out an extensive examination of standards accepting much testimoney from all these sectors. They are better able to examine the individual characteristics of Montana that may not be accounted for by EPA; Namely those industries. Forestry (lumbering not to mention the health of all citizens) Agriculture, Tourism dependent on clean air. through intensive public participation and acute analysis, the Bd. of health is in a better position to set standards than the legislature would perform through a few hearings and expensive lobbying by certain industrial groups. Thank-you

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Marlin D. Gilman DATE: 1/30/81

ADDRESS: Bx 56 Garrison, Mont.

PHONE: 846-1514

REPRESENTING WHOM? Tri County Anti Pollution Association

APPEARING ON WHICH PROPOSAL: Bill # 65 + # 337

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS: No Federal Standards on Fluoride emmissions. We like the Standards of the Division amended by Stub Ford & Dave T. in Florida

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Norma Gilman DATE: 1/30/81

ADDRESS: Box 56 - Garrison, Montana

PHONE: 846-1514

REPRESENTING WHOM? Garrison Area

APPEARING ON WHICH PROPOSAL: Bill #65 & #334

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS: There are no Federal Air Standards for Florida emissions. [illegible]

It's like the [illegible] Standard a. There are [illegible]

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Ellen Sallee DATE: 1-30-91

ADDRESS: 714 City Drive Missoula MT

PHONE: 728-3324

REPRESENTING WHOM? Self

APPEARING ON WHICH PROPOSAL: S.B. 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: See written comments

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Thomas Greason DATE: JAN 30 1981

ADDRESS: 533 Hillsdale ST Helena MT

PHONE: 442-1460

REPRESENTING WHOM? myself

APPEARING ON WHICH PROPOSAL: [illegible]

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS: feel the Bd of Health and the DHES should be responsible for setting our air quality standards and that review & approval of such standards does not belong in the legislative branch of our State government

NAME: SUE RALEY DATE: 3/5/91

ADDRESS: #1 N. BUTCHERTOWN, BUTTE

PHONE: 782-2173

REPRESENTING WHOM? PRIVATE CITIZEN (TAXPAYER)

APPEARING ON WHICH PROPOSAL: S.B. 35

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS:

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Richard Steffel DATE: 1/30/81

ADDRESS: 758 Eddy Ave Msla, MT

PHONE: 243-6273

REPRESENTING WHOM? Msla City County Board of Health, Residential Wood Burning Committee + self

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: The committee thinks that the bill may endanger the power of local health authorities to take such steps necessary to protect public health & welfare. The issue must be maintained so that local authorities can effectively deal with local problems.

- This bill would undermine the well founded principles of balanced decision making through administrative procedures with the right to judicial review. - It would also remove from the public the right to effectively participate in the final decision-making process, by putting one more layer of complex political shenanigans between the people & the ultimate decisions to protect their health.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Jan Flaherty DATE: 1-30-81

ADDRESS: 408½ S Ave. W. Missoula

PHONE: 728-4439

REPRESENTING WHOM? Myself

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: I legislature has neither the time nor the expertise to decide upon a matter which took the Board of Health over 2 yrs to decide.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: J. P. SIEVERSON DATE: 1/30/91

ADDRESS: P.O. BOX G EAST HELENA MT

PHONE: 227-5311 OFFICE

REPRESENTING WHOM? ASARCO - EAST HELENA SMELTER

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? ✓ AMEND? _____ OPPOSE? _____

COMMENTS: IF MONTANANS [illegible] PARLIAMENT FOR STANDARDS MORE STRINGENT THAN FEDERAL E.P.A. REQUIREMENTS, THE LEGISLATURE IS BETTER POSITIONED TO REPRESENT THE PEOPLE OF MONTANA.

U.S. HAS 6 PRIMARY LEAD SMELTERS. ALL BUT MONTANA'S ARE ONLY REQUIRED TO COMPLY WITH FEDERAL STANDARDS.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: James D. Mockler DATE: 1/30/81

ADDRESS: 2301 Colonial Dr.

PHONE: 442-6223

REPRESENTING WHOM? Mont. Coal Council

APPEARING ON WHICH PROPOSAL: S.B. 65

DO YOU: SUPPORT? ✓ AMEND? _____ OPPOSE? _____

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Bill Hand DATE: Jan 30 81

ADDRESS: 1808 11th Ave - HELENA - MT. 59601

PHONE: 443-7297

REPRESENTING WHOM? Mt. Mining Assn.

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? ~~✓~~ AMEND? _____ OPPOSE? _____

COMMENTS: _____

The Mining industry has been a victim of the current Air Std's - Legislation affecting would be a reflection of will of the people

Bill Hand
Exec. Sec
Mt. Min. Assn.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Bill Sternhagen DATE: 1-30-81

ADDRESS: Power Block, Helena MT 59601

PHONE: 442-0230

REPRESENTING WHOM? Northwest Mining Association

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? ✓ AMEND? _____ OPPOSE? _____

COMMENTS:

Montana's air standards should not be more stringent than the Federal Standards. Please give this bill your favorable consideration.

Thank You

B Sternhagen

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: RITA SHEEHY DATE: 1-30-81

ADDRESS: 825 N Rodney

PHONE: 443-1398

REPRESENTING WHOM? Self

APPEARING ON WHICH PROPOSAL: SB 17

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS:

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Nancy N. Erickson DATE: Jan 30, 1997

ADDRESS: 3250 Pattee Canyon RD., Missoula, Mt. 59801

PHONE: (406) 549-4671

REPRESENTING WHOM? ~~[illegible]~~ self + Dr. Jerry Brenneborg

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Don Poppler DATE: _____

ADDRESS: 3410 S.A. Ave

PHONE: 752-7410

REPRESENTING WHOM? Butte Silv. Bow

APPEARING ON WHICH PROPOSAL: SB-65

DO YOU: SUPPORT? ✓ AMEND? _____ OPPOSE? _____

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Bernie A. Swift DATE: 1/30/81

ADDRESS: SE 206 Rose Lane, Hamilton, MT 59840

PHONE: 363-2172

REPRESENTING WHOM? Self.

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? ✓ AMEND? _____ OPPOSE? _____

COMMENTS: I Firmly believe there must be provisions for the Legislature to control Boards & Committees which this Bill is designed to accomplish. The Bill prevents undue penalties and pressures being fostered upon Business and Industry in the State of Montana by bureaucrats. The recent impact and closure of the Anaconda Copper Smelter in Anaconda is a case in Point.

Thank you

Bernie A. Swift

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: David F. Johnston DATE: 1-30-81

ADDRESS: 1216 Williams Helena, MT

PHONE: 443-3023

REPRESENTING WHOM? Operating Engineers and WETA

APPEARING ON WHICH PROPOSAL: SB #65

DO YOU: SUPPORT? X AMEND? _____ OPPOSE? _____

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: [illegible] DATE: 1/30/91

ADDRESS: 681 Sapphire Ave. Billings, Mt.

PHONE: 248-2526

REPRESENTING WHOM? self

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? ✓

COMMENTS:

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Susan B. Mate DATE: 12-30-97

ADDRESS: 100 S. Ravenna

PHONE: 443-5377

REPRESENTING WHOM? Myself

APPEARING ON WHICH PROPOSAL: O.C.

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? +

COMMENTS: Just me.

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: DARRYL A. LEE DATE: 1/30/81

ADDRESS: 25 ROCKY MTN LANE

PHONE: 494-2394

REPRESENTING WHOM? Butte Local Dev. Corp & Butte Chamber

APPEARING ON WHICH PROPOSAL: SB 65

DO YOU: SUPPORT? X AMEND? _____ OPPOSE? _____

COMMENTS: _____

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

NAME: Neal Rosetta DATE: 1/26/21

ADDRESS: 1100 Wisconsin Helena, Mont.

PHONE: 442-9695

REPRESENTING WHOM? Mt Natural Gas Utility Council

APPEARING ON WHICH PROPOSAL: SB 3

DO YOU: SUPPORT? _____ AMEND? _____ OPPOSE? X

COMMENTS: See Testimony

PLEASE LEAVE ANY PREPARED STATEMENTS WITH THE COMMITTEE SECRETARY

AMBIENT AIR QUALITY STANDARDS

	FEDERAL	MONTANA	STRICTEST	
CARBON MONOXIDE				
8 hour	9 ppm	9 ppm	6 ppm	(C
Hourly	35 ppm	23 ppm	23 ppm	
FLUORIDE				
Daily	---	1 ppb*	1 ppb	(W
Monthly	---	.3 ppb*		
Growing Season	---	---		
In Forage	---	20 ppm	20 ppm	
HYDROGEN SULFIDE				
Hourly	---	.05 ppm	.03 ppm	(C W
LEAD				
Quarterly	1.5 ug/m^3	1.5 ug/m^3	1.5 ug/m^3	
NITROGEN DIOXIDE				
Annual	.05 ppm	.05 ppm	.05 ppm	
Hourly	---	.30 ppm	.25 ppm	(C
OZONE (PHOTOCHEMICAL OXIDANTS)				
Hourly	.12 ppm	.10 ppm	.08 ppm	(F
SETTLED PARTICULATE				
Monthly	---	10 gpm^2	5 gpm^2	(W
SULFUR DIOXIDE				
Annual	.03 ppm	.02 ppm	.008 ppm	(E
Daily	.14 ppm	.10 ppm	.02 ppm	(N W
3 Hour	.50 ppm	---	.153 ppm	(E
Hourly	---	.50 ppm	.28 ppm	(N
SUSPENDED PARTICULATES				
Annual (Primary)	75 ug/m^3	75 ug/m^3	55 ug/m^3	(E
Daily (Primary)	260 ug/m^3	200 ug/m^3	100 ug/m^3	(C E
Annual (Secondary)	60 ug/m^3			
Daily	150 ug/m^3			

* Proposed

TESTIMONY SB65 BEFORE

SENATE NATURAL RESOURCES COMMITTEE

Mr Chairman, Members of the Committee:

I am Dr Carlton D Grimm, my employer is The Montana Power Company for whom I am the Manager of Generation System Development. I live in Butte, Montana. I wish to comment on Senate Bill No. 65, introduced by Senator Johnson and which states that legislative approval is required of certain ambient air quality standards.

I feel there are at least two important points to make in favor of this bill:

1. Standards adopted by the State of Montana should be no different than the Federal standards. The Federal ambient air quality standards have been set to protect human health and welfare; the process used to set those standards was exhaustive and the review process extensive. The final Federal standards were set at levels that have adequate margins of safety. There is no demonstrated need for Montana to have any different standards. One of the persons involved in the program for the Federal standards for SO_2 and particulate, Mr Ferris, stated at a recent technical meeting that the present Federal rules are adequate and in some instants may still be too conservative. Setting new ambient air quality standards is a formidable task requiring considerable effort and cost.

2. Conflicting and different Federal and State standards add to the complexity of permit review and enforcement of those standards. Individual interpretation can create extensive delays to projects.

One example of a "different" and "conflicting" standard I wish to use is the visibility standard. EPA has recognized that visibility impairment caused by regional haze or urban plume is a highly complex problem and that both scientific understanding of these phenomena and ability to predict and control these types of visibility impairments are extremely limited. Accordingly, the final regulations represent a phased approach to visibility protection. Phase I of the

program will "require control of visibility impairment that can be traced to a single existing stationary facility or small group of existing stationary facilities". Future phases of the regulatory program will address the regional haze and urban plume problems when scientific knowledge and techniques have progressed sufficiently to warrant their application.

The State has adopted a numerical value representing visibility which in essence is for the process of regional haze, the area for which EPA at this time has no solution. We question how the State can model and enforce their standard.

In summary, I believe any standard made should come from a solid supportable scientific base. These standards should be subject to extensive review.

GIVEN BEFORE
AIR POLLUTION CONTROL ASSOCIATION
MEETING - ATLANTA - SEPTEMBER 1980

REVIEW OF SO_x AND PARTICULATE STANDARD: THE EPIDEMIOLOGIC EVIDENCE

B. G. Ferris, Jr.

James H. Ware, F. E. Speizer

FEDERAL STANDARDS

Criteria for acceptance of a study to be adequate are presented. These are then used to select those studies that seem to meet most of the criteria. Relatively few studies are available to assess the adequacy of the 24-hour standard, but those that are acceptable indicate that a small increase could be permitted. For long-term or annual average there are more studies and it appears from them that the annual average could probably be increased. There is a need for data on the respirable or fine fraction with some chemical characterization of them.

REVIEW OF SO_X AND PARTICULATE STANDARD: THE EPIDEMIOLOGIC EVIDENCE

There are a limited number of properly designed and executed epidemiologic studies that can be used to test the adequacy of the present National Ambient Air Quality Standards or to use as a basis for developing new standards. This presentation will examine those studies to evaluate whether the present standards should, on the basis of the evidence, be changed. We shall be concerned primarily with studies in which the concentrations of SO_2 or particulates were measured in the ambient environment and were close to or no more than 3-4 times higher than the present standards.

To develop specific criteria to identify those studies that are acceptable seems appropriate. Severely flawed or biased studies, even though they may be somewhat confirmatory, do not provide useful information.

Guidelines for Selection Criteria of an Acceptable Study (1).

1. For a study to be acceptable it must have been reported in the open or peer-reviewed literature. It must be emphasized, however, that this cannot be the only criterion of acceptability as a number of studies that have appeared in the literature do not meet some or all of the remaining criteria.
2. Concentrations of both SO_2 and particulates must be reported in the presentation and appear to reasonably estimate exposure.
3. Major confounding or collinear factors must be controlled for, particularly temperature and season in studies of acute exposures, and smoking, race and socio-economic status in studies of chronic exposure.
4. Concentrations of the pollutants must be in the ranges that are relevant to the standard setting procedure, that is, no more than 3-4 times the present standards.
5. The data collection, analysis and interpretation must be free of error or potential bias which could be reasonably expected to affect the results substantially.

Since a variety of effects may be identified, it is important to define which of these should be considered as adverse health effects. To accept any measurable change which might even be statistically significant as medically significant and thus an adverse health effect does not seem appropriate. In general, those effects that result in permanent change are considered adverse. Temporary decrease in pulmonary function may not be considered adverse nor would eye irritation or mild increase in rates of phlegm production as long as these effects are not associated with any permanent sequelae. The question can be raised as to how many temporary decreases in pulmonary function can be sustained before a permanent effect is manifest. The answer to this question is not clear, but it does appear that a considerable number of repeated insults may be required (2).

Short-term Effects

The earliest reported effects of acute or short-term exposure were related to dramatic episodes associated with high concentrations (above 1000 $\mu g/m^3$) of exposure to SO_2 and/or smoke in the Meuse Valley, 1931 episode (3), London, 1952, (4) and Donora, PA, 1948 (5). There has been general agreement that these higher levels of smoke and SO_2 carried a high risk for persons with cardio-respiratory disease. It was not possible to identify which component, SO_2 or smoke, was the more important culprit. As a result of these episodes controls were instituted and in London smoke levels fell dramatically. Sulfur dioxide levels fell more slowly. Later studies of morbidity (6) showed that the smoke concentration was more important than

the SO_2 concentration since episodes with SO_2 concentrations above 750 $\mu g/m^3$ without much elevation of smoke did not produce exacerbations in chronic bronchitic patients as had occurred before. Earlier studies of mortality at levels above the present standards alleged to show a small effect (7,8,9,10). These earlier studies are flawed because the various confounding and co-linear factors have not adequately been taken into account. These included such factors as cigarette smoking, socio-economic status, season, temperature and day of week. Furthermore, as these studies are considered together it becomes apparent that association between air pollution and mortality is highly model specific and the association can be shown to vary several fold, depending upon how the model is selected (11,12). More recent studies of time-series analyses (11,12,13) have demonstrated that as additional factors are taken into consideration the effect of air pollution and SO_2 in particular, drops out. A small but weak effect is noted for particulates which seem to be more important than SO_2. It is probably safe to conclude that mortality studies at concentrations slightly above present standards will not reveal useful data as there is too much background noise and, in fact, if there is any effect it will be undetectable. For a more complete discussion see Ware et al. (1).

If we use the aforementioned criteria of acceptability of studies as a guide we can now consider those studies that could be used to test the adequacy of the present standards. British or European studies that have reported Black Smoke (BS) have been converted to Total Suspended Particulates (TSP) equivalents by the relationship reported by Commins and Waller (14). We recognize the problems associated with this conversion. However, most of the British studies used were conducted at about the same time, although at different sites, and relate to a time when coal was the major fuel and the time at which Commins and Waller did their comparisons of TSP and BS levels. Thus, the difficulties are not as major as they would be if such a conversion were used at the present time.

Short-term 24-hour Concentrations.

There are very few studies that can be used to test the adequacy of the present 24-hour standards for SO_2 (365 $\mu g/m^3$) and TSP (260 $\mu g/m^3$). Earlier studies by Martin (9) and by Lawther et al. (6) can be used. Martin noted increased hospitalization as an index of morbidity at concentrations of SO_2 at 400 $\mu g/m^3$ and Black Smoke at 565 $\mu g/m^3$. Lawther et al. (6) using a diary technique noted increased respiratory symptoms in bronchitics when SO_2 was 500 $\mu g/m^3$ or more and Black Smoke was 250 $\mu g/m^3$ or more.

A couple of recent studies that have not been published but have appeared as an abstract or are in press could be used. One is related to pulmonary function of primary school children during an air pollution "alert" (15), the other looked at emergency room visits in relation to daily pollution levels (16). In the former, a group of children were studied before, during and after an episode of air stagnation which lasted at least 48 hours and was called by the local authorities an "alert" (Figure 1). Pulmonary function was depressed at the time of the "alert" and remained depressed for about 3 weeks after the episode. Concentrations at the time of the "alert" were 211 $\mu g/m^3$ for SO_2 and 422 $\mu g/m^3$ for TSP. A repeat study of a similar group of children occurred a year later with similar results. During this second study concentrations of SO_2 were 439 $\mu g/m^3$ and for TSP were 280 $\mu g/m^3$. A "false alert" called just prior to the real "alert" afforded the opportunity to test the method of study and it produced levels of pulmonary function which were not significantly different from the original

base-line (Figure 2). The significance of these changes is uncertain. Based on cross-sectional comparisons the children from this community have as good or better pulmonary function than children in other communities similarly studied. Longitudinal data obtained on these groups of children, keeping track of both the number of "alert" exposures and the rate of development of pulmonary function, will be required before we can confirm the importance of these observations.

The emergency room study found a very weak effect, such that the contribution of pollutants to the R^2 was 0.01. That study involved the months of March, April, October and November, 1974-1977. Data were analyzed lagged 24 hours and unlagged. TSP concentrations exceed the 24-hour primary standard of 260 $\mu g/m^3$ on 76 days out of a possible 466 days and had a maximum of 696 $\mu g/m^3$. SO_2 exceeded the standard on only two days with a maximum of 360 $\mu g/m^3$. The effects of temperature, season and day of week were controlled for and the other regulated pollutants were also examined. Although this appears to be a negative study it may reflect the crudeness of this approach or the need for a larger population base on which to carry out this kind of investigation. In contrast, the Martin study (9) which used hospital admission on a national basis did appear to show a positive association between admission rates and concentrations of pollution in this range.

Two other studies need to be mentioned. One is by Van der Lende et al.(17). They noted what appeared to be a difference in pulmonary function in a two community study in which, on a subsequent visit, the community with the former higher pollution levels and lower pulmonary function levels no longer was polluted and had pulmonary function levels which have returned to normal levels. They tried to identify bias but were not able to do so. It could have been a chance occurrence but the fact that effect appeared to be temporary makes it a non-adverse effect and thus should not be used to identify a level of significant health effect. The other study by Cohen et al. (18) investigated a small group of asthmatics living near a coal-fired power plant. Temperature had a very significant effect on asthmatic attacks and air pollution a weak one. Any of the pollutants measured seemed to act equally well. There are a number of problems associated with this study: little comment is made with regard to drop-outs; other confounding factors such as emotional or allergic precipitants of "attacks" were not considered; the criteria for acceptance of subjects into the study was not well described nor was the pattern of attacks or type prior to the study. Because of the weak association and particularly the problem associated with the design of the study it is difficult to assign a great deal of weight to the observations.

Another group of acute studies (19-21) need to be assessed. The two earlier studies by Dohan and Taylor (19) and Dohan (20) appeared to show an association between concentrations of sulfates and the occurrence of respiratory illnesses. These investigators did not control for season and other confounding factors. When this was carried out by Ipsen et al. (21) using similar data they were not able to show any effect of sulfates per se, even at concentrations of sulfate up to 30 $\mu g/m^3$.

These few acceptable studies have been summarized in Figure 3. The present 24-hour standard seems to be adequate to protect even the most sensitive subjects and might be extended slightly. It may well be that we shall have to turn to clinical or chamber studies to establish a more definitive short-term standard. Most of the chamber studies to date, however, are for much shorter periods (2-4 hours) and thus deal with issues related to peak exposures

that might occur in a 24-hour period without exceeding the standard for a 24-hour period. This short-term peak exposure is beyond the scope of this discussion.

Long-term Chronic Exposure - 24-hour Annual Average

There are a number of studies that have purported to assess the chronic effects of sulfur oxides and particulates on health. Most of these do not meet the criteria developed above. We have not included the CHESS studies as it has been recommended by a governmental committee that they suffer from a number of biases and flaws (22) which make their use beyond the development of hypotheses useless.

The studies carried out in the 1960's by Lunn and co-workers (23-24) of Sheffield school children showed correlations between levels of smoke and SO_2 and the occurrence of respiratory illnesses and levels of pulmonary function. Effects appeared to occur at concentrations of 350 $\mu g/m^3$ for TSP (corrected) and 225 $\mu g/m^3$ for SO_2. Douglas and Waller (25) used coal consumption as an index of air pollution but verified their categories of pollution at a later date in a study of respiratory illness in a cohort of children studied from birth to age 10. Their concentrations, therefore, represent a lower level than that which was probably active -these were 230 $\mu g/m^3$ for TSP (corrected) and 135 $\mu g/m^3$ for SO_2. Lambert and Reid (26) studied a large group of British civil servants but only 30% of the population had associated air monitoring concentrations. Using their data on only this 30% their effect concentrations were at 200 $\mu g/m^3$ for TSP (corrected) and 100 $\mu g/m^3$ for SO_2. They showed correlations of respiratory illness with pollution concentrations. Two Polish studies by Sawicki (27) and Rudnik (28) found correlation between respiratory illnesses and pollution levels, although there may be some confounding with occupational exposures in the Sawicki study. Sawicki's concentrations where effects appeared were 265 $\mu g/m^3$ for TSP (corrected) and 125 $\mu g/m^3$ for SO_2, and Rudnik's were 285 $\mu g/m^3$ for TSP (corrected) and 125 $\mu g/m^3$ for SO_2.

A series of prospective studies have been conducted in Berlin, N.H., 1961-1973 (29,30). It appeared that levels of TSP of 180 $\mu g/m^3$ were associated with slightly increased respiratory symptoms and slightly decreased pulmonary function. This study used sulfation rate as the indicator of SO_2 and assumed that the total sulfur measured was all due to SO_2. Actual measurements of SO_2 by the hydrogen peroxide method showed that SO_2 made up about 10% of the total sulfur. Also this community was a pulp and paper mill town which might not be characteristic of other communities. A comparison was made between Berlin, N.H., and the results from the general practitioner's study in England (31). Berlin, N.H., residents had lower prevalence of complex chronic bronchitis syndrome than British residents. Similarly, a comparison with a cleaner community (Chilliwack, B.C.) showed that Berlin, N.H., had poorer pulmonary function (32). These comparative studies should give more credence to the Berlin results and demonstrate their broad applicablity.

Two studies by Hammer (33,34) are spin-offs from the CHESS studies and are, therefore, subject to the same criticisms as have been made of CHESS. It is probably advisable at this time not to use the data. The suggested levels at which effects were alleged were TSP 85 $\mu g/m^3$ with SO_2 175 $\mu g/m^3$ in one and 135 $\mu g/m^3$ TSP with SO_2 about 25 $\mu g/m^3$ in the other.

The acceptable studies for chronic effects related to annual averages of SO_2 amd TSP are summarized in Figure 4. Based on these studies it would

appear that the allowable concentrations for annual averages for chronic exposures could be relaxed - probably to about 150 $\mu g/m^3$ for each pollutant. We realize that this number is not absolute. It does represent our best judgment and we anticipate a variation about this number of about 25 $\mu g/m^3$ It should be emphasized that there is a need for a standard for fine particles and also some chemical characterization of these particles.

REFERENCES

1. J. H. Ware, L. A. Thibodeau, F.E. Speizer, S. Colome and B. G. Ferris, Jr. "Assessment of the health effects of atmospheric sulfur oxides and particulate matter: evidence from observational studies," Submitted for publication July, 1980.

2. C. Fletcher, R. Peto, C. Tinker and F. E. Speizer, "The natural history of chronic bronchitis and emphysema," Oxford University Press, Oxford, 1976: 272 p.

3. J. Firket, "Sur les causes des accidents survenus dans la Vallée la Meuse lors des brouillards de decembre, 1930," Bull. Acad. Roy. Med. Belg., 11: 683 (1931).

4. Ministry of Health. "Mortality and morbidity during the London fog, December, 1952," London, Her Majesty's Stationery Office, (1949).

5. H. H. Shrenk, F. Heimann, G. D. Clayton, W. Gafafar and H. Wexler, "Air pollution in Donora, Pennsylvania. Epidemiology of the smog episode of October, 1948," Pub. Health. Bull. 306, U. S. Government Printing Office: p 173 (1949).

6. P. J. Lawther, R. E. Waller and M. Henderson, "Air pollution and exacerbations of bronchitis," Thorax, 25: 525 (1970).

7. L. B. Lave and E. P. Seskin, Air Pollution and Human Health, Johns Hopkins University Press, Baltimore, MD: p 368 (1977).

8. A. E. Martin and W. H. Bradley, "Mortality, fog and atmospheric pollution - an investigation during the winter of 1958-59," Mon. Bull. Minist. Health, Health Service Laboratory, London, England, 19: 56 (1960).

9. A. E. Martin, "Mortality and morbidity statistics and air pollution," Proc. Roy. Soc. Med. 57: 969 (1964).

10. M. Glasser and L. Greenburg, "A study of the relationship of pollution to mortality, New York, 1963-1968," J. Air Pollut. Control Assoc. 22: 607 (1972).

11. L. A. Thibodeau, R. B. Reed, Y. M. M. Bishop and L. A. Kammerman, "Air pollution and human health: a review and reanalysis," Environ. Health Perspect. 34: 165 (1980).

12. T. D. Crocker, W. Schulze, S. Ben David and A. V. Kneese, "Methods development for assessing air pollution control benefits, Volume I: experiments in the economics of air pollution epidemiology," EPA 600/5 - 79 - 001 a, Environmental Protection Agency, Research Triangle Park, N.C. (1979).

13. H. Schimmel, "Evidence for possible acute health effects of ambient air pollution from time series analysis: methodological questions and some new results based on New York City daily mortality 1963-1966," Bull. N.Y. Acad. Med. 54: 1052 (1978).

14. B. T. Commins and R. E. Waller, "Observations from a ten-year study of pollution at a site in the city of London," Atmos. Environ. 1: 49 (1967).

15. S. Herman, F. E. Speizer, B. G. Ferris, Jr., J. Ware, D. W. Dockery and J. D. Spengler, "Acute change in pulmonary function in children naturally exposed to an air pollution 'alert'," Am. Rev. Resp. Dis. 121 part 2: 239 (1980).

16. J. M. Samet, F. E. Speizer, Y. Bishop, J. D. Spengler and B. G. Ferris, Jr., "The relationship between air pollution and emergency room visits in an industrial community," Submitted for publication.

17. R. Van der Lende, C. Huggen, E. J. Jansen-Koster, S. Knijpstra, R. Peset, B. F. Visser, E. N. E. Wolfs and N. G. M. Orie, "A temporary decrease in ventilatory function of an urban population during an acute increase in air pollution," Bull. Physiopathol. Resp. 11: 31-43 (1975).

18. A. A. Cohen, S. Bromberg, R. W. Buechley, L. T. Heiderscheit and C. M. Shy, "Asthma and air pollution and respiratory disease, a preliminary report," Am. J. Pub. Health 62: 1181 (1972).

19. F. C. Dohan and E. W. Taylor, "Air pollution and respiratory disease, a preliminary report," Am. J. Med. Sci. 240: 337 (1960).

20. F. C. Dohan, "Air pollutants and incidence of respiratory disease," Arch. Environ. Health 3: 387 (1961).

21. J. Ipsen, M. Deane and F. E. Ingenito, "Relationships of acute respiratory disease to atmospheric pollution and meteorological conditions," Arch. Environ. Health 18: 462 (1969).

22. U.S. Government, "The Environmental Protection Agency's Research Program with primary emphasis on the Community Health and Environmental Surveillance System (CHESS): an investigative report," U.S. House of Representatives, 19 November, U.S. Government Printing Office, Washington, D.C. (1976).

23. J. E. Lunn, J. Knowelden and A. J. Handyside, "Patterns of respiratory illness in Sheffield infant school-children," Brit. J. Prev. Soc. Med. 21: 7 (1967).

24. J. E. Lunn, J. Knowelden and J. W. Roe, "Patterns of respiratory illness in Sheffield junior school-children: a follow-up study," Brit. J. Prev. Soc. Med. 24: 223 (1970).

25. J. W. B. Douglas and R. E. Waller, "Air pollution and respiratory infection in children," Brit. J. Prev. Soc. Med. 20: 1 (1966).

26. P. M. Lambert and D. D. Reid, "Smoking, air pollution and bronchitis in Britain," Lancet 1: 853 (1970).

27. R. Sawicki, "Chronic non-specific respiratory disease in Cracow," Epidemiological Rev. 62: 229 (1972).

28. J. Rudnik, "Epidemiologic study on long-term effects on health of air pollution," Probl. Med. Wieku Rozwojowego, 7a suppl: 1-159 (1977).

29. B. G. Ferris, Jr., I. T. T. Higgins, M. W. Higgins and J. M. Peters, "Chronic non-specific respiratory disease in Berlin, New Hampshire, 1961-1967: a follow-up study," Am. Rev. Resp. Dis. 107: 110 (1973).

30. B. G. Ferris, Jr., H. Chen, S. Puleo and R. L. Murphy, Jr., "Chronic non-specific respiratory disease in Berlin, New Hampshire, 1967-1973: a further follow-up study," Am. Rev. Resp. Dis. 113: 475 (1976).

31. D. D. Reid, D. O. Anderson, B. G. Ferris, Jr. and C. M. Fletcher, "An Anglo-American comparison of the prevalence of bronchitis," Brit. Med. J. 2: 1487 (1964).

32. B. G. Ferris, Jr. and D. O. Anderson, "Epidemiological studies related to air pollution: a comparison of Berlin, New Hampshire and Chilliwack, British Columbia," Proc. Roy. Soc. Med. 57, part 2: 979 (1964).

33. D. I. Hammer, F. J. Miller, A. G. Stead and C. G. Hayes, "Air pollution and childhood lower respiratory disease. I. Exposure to sulfur oxides and particulate matter in New York, 1972," In: Clinical Implications of Air Pollution Research, Eds. A. J. Finkel and W. C. Duel, Acton, MA Publishing Sciences Group: p. 321-337 (1967).

34. D. I. Hammer, "Frequency of lower respiratory disease in two south-eastern communities, 1968-1971," Sc. D. Dissertation, Harvard University, Cambridge, MA (1976).

Key Words:

Air Pollution, Epidemiology, Health Effects, Particulates, Standards, Sulfur Oxides

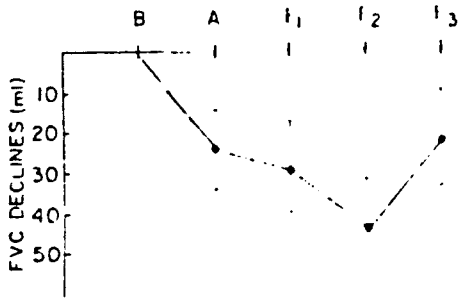

Figure 1. FVC declines 1978 during and after "Alert."
B = baseline, A = "Alert," F1,2,3, = follow-up 1,2,3,
at weekly intervals. Only children seen at each visit.

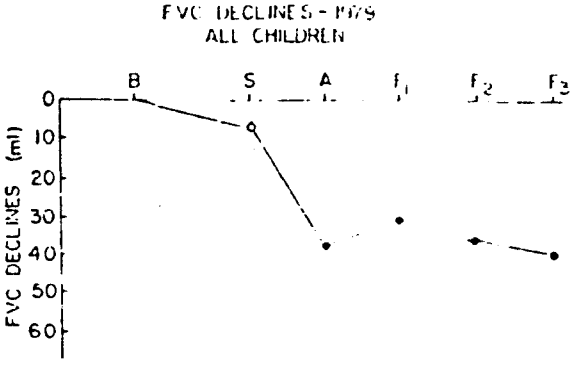

Figure 2. FVC declines 1979 during and after "Alert."
See Figure 1 for meaning of letters.
S = "Sham Alert."

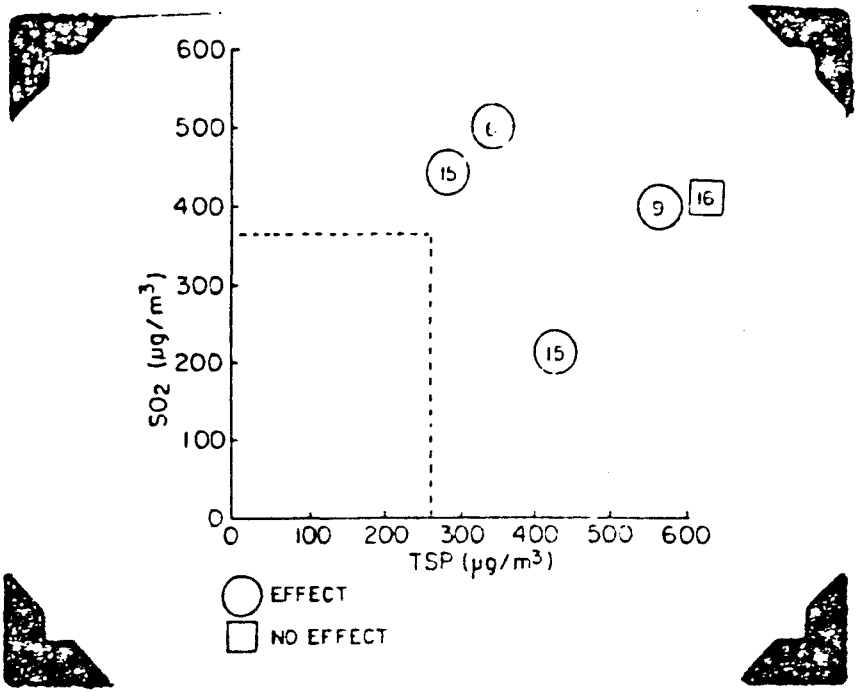

Figure 3. Selected studies evaluating short-term 24-hour concentrations and effects on health. Numbers refer to bibliography. Dotted line outlines present 24-hour standards for SO_2 and TSP.

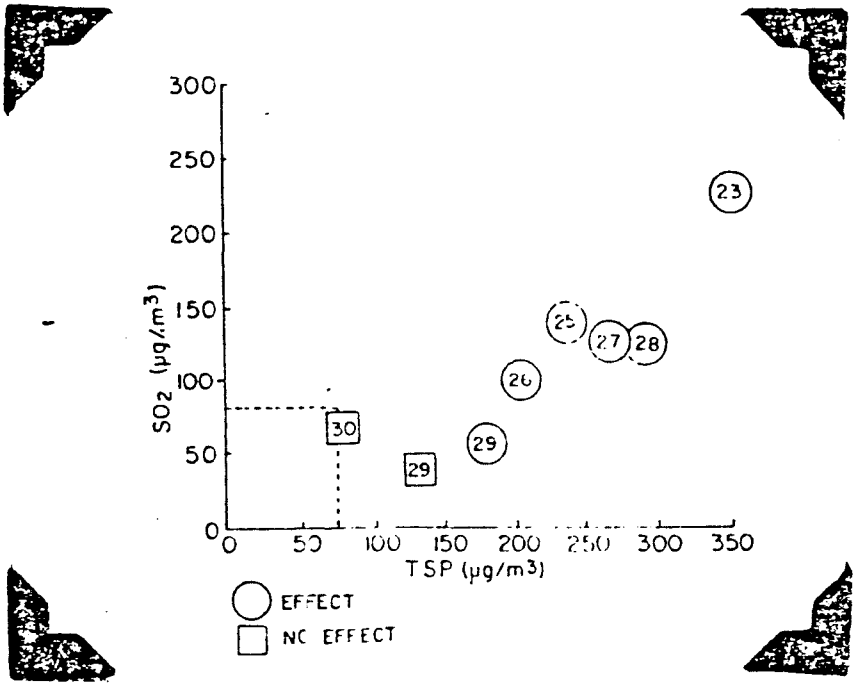

Figure 4. Selected studies evaluating long-term 24-hour annual averages and effects on health. Numbers refer to bibliography. Dotted line outlines present annual standards for SO_2 and TSP.

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Ms. Agnes Hamilton
Senate Natural Resources Committee
Capitol Station
Helena, MT 59620

Dear Ms. Hamilton:

I have enclosed a written copy of my testimony before the Committee last Friday, January 30, 1981. My comments before the Committee were taken from some rough notes from which I prepared the comments enclosed. Therefore, there may be some minor deviations between my verbal statement and my written statement.

Sincerely,

J. P. Sieverson

J. P. SIEVERSON
Senior Environmental Scientist

STATEMENT OF

J. P. SIEVERSON

for

ASARCO Incorporated

Before the Senate Natural Resources Committee
Senate Bill 65
MONTANA STATE LEGISLATURE

January 30, 1981

Helena, Montana

Mr. Chairman, Members of the Committee, Ladies & Gentlemen:

My name is James Sieverson. I am employed by ASARCO Incorporated as the senior environmental scientist and I am here today representing the only remaining smelter in Montana. ASARCO's East Helena Smelter is a primary lead smelter. The East Helena Smelter employs 360 Montanans at an annual payroll of $7 million and we spend $3 million per year on local goods and services. The East Helena Smelter is one of only six lead smelters in the United States. There are three lead smelters in Missouri, one in Idaho, one in Texas, and, of course, one in Montana at East Helena.

I recently called all six lead smelters in the United States and asked what ambient air standards they are required to meet. The three lead smelters in Missouri and the one in Idaho are all required to meet federal ambient air quality standards, and there are no state standards. Texas has an SO2 standard which is more stringent than the federal standard; however, the smelter in Texas has had a continual variance from that ambient air standard and in effect has been required to comply only with the federal standards. Thus you can see that East Helena is the only U. S. lead smelter which has to comply with standards that are more strict than the federal standards.

I note that you have all been handed a list showing the federal ambient air standards, Montana ambient air standards, and the strictest ambient air quality standards and the name of the state that has that strictest standard. I would call your attention to the fact that the

strictest ambient air standards are in Hawaii, North Dakota, and California. To my knowledge, Hawaii and North Dakota don't have any major industrial sources to worry about. The California air quality standards have been thrown out by a court of law and I might note that Asarco did shut down a lead smelter in the state of California.

To help your understanding, I would like to give you a short historical perspective. In 1974, the State of Montana, EPA, and Asarco entered into a stipulated agreement which provided for a control program for sulfur dioxide at the East Helena smelter. This program required Asarco to construct and operate a sulfuric acid plant at the smelter. This plant would capture not less than 75% of the sulfur dioxide gases emitted from the sinter machine operation. This control program was designed and approved on the premise that the sulfur dioxide emissions would be reduced to the extent necessary to attain and maintain the federal ambient air quality standard for sulfur dioxide. The acid plant was completed in 1978 at a cost of roughly $40 million. Although the operation of the acid plant met or exceeded all of its design capabilities, we discovered that the federal ambient air quality standards for sulfur dioxide continued to be exceeded during certain infrequent weather conditions at one location. In 1979 there were four violations of the federal standards and in 1980 there were two violations. Further studies revealed this problem was caused by low level sulfur dioxide emissions from the blast furnace baghouse. In order to correct this problem, the State of Montana and Asarco

agreed to a further control program which required the construction of a new 375 foot stack for the emissions from the blast furnace baghouse. This stack, as a precautionary measure, was increased in height to 425 feet and is now nearing completion at a cost of over $2.9 million.

Besides the construction costs of $40 million, the acid plant also has a net operating loss which amounted to $4.2 million in 1979. To put these costs in some perspective, the $40 million capital cost of the acid plant is over $100,000 per employee at the East Helena Plant while the annual operating loss for 1979 is about $12,000 per employee. Also, electrical power consumption of the acid plant is about twice the power consumption for the entire smelter.

I hope that you understand that when the State of Montana recently proposed new ambient air quality standards for sulfur dioxide which were more stringent and more difficult to attain than the federal standards, Asarco was extremely concerned. Asarco believed that it had fully performed its agreement to construct and operate the pollution control facilities to meet the federal sulfur dioxide standards. Furthermore, Asarco was, and remains, fearful that its costly new pollution control equipment will be inadequate to meet these new state standards. Therefore, we employed a world-recognized expert on the impacts of sulfur dioxide on human health. This expert was Dr. Donald F. Proctor of the Johns Hopkins Medical School. Dr. Proctor summarized his conclusion in the following words:

"It remains my carefully considered opinion that current federal standards for SO_2 are more than adequate to protect human health in the broadest sense. Indeed, it is my belief that the current standards could be somewhat relaxed. The proposal to make these standards more stringent in the State of Montana is without justification."

Mr. Chairman, members of the committee, I urge your approval of Senate Bill 65 and I thank you for your attention.