GHQ
December 3, 1971

TO: JOHNS-MANVILLE ENVIRONMENTAL HEALTH TASK FORCE
AIA/NA MEMBER COMPANIES
AIA/NA ADMINISTRATIVE SUB-COMMITTEE

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ILLINOIS POLLUTION CONTROL BOARD REGULATIONS ON ASBESTOS

Attached is the "Proposed Final Draft" of the State of Illinois Pollution Control Board regulations on asbestos. Substantial changes of a positive nature have been made in nearly every section of the regulations as compared with the draft published last summer.

Among the most important changes are the following:

1. The section banning the use of asbestos-containing brake linings after 1975 has been eliminated. While it might appear from the comments in the "Explanation" section of the regulations on page 10-11 that this question is not completely settled, it is our belief that the Board will take no further action against brake linings unless the Federal Government does first, in which case any action taken by the state would be rather academic.

2. The plant emission standard has been raised from a level of .5 fibers per cc to a more acceptable level of 2 fibers per cc. In addition, the standard of .05 fibers per cc at the boundary line of a plant has been eliminated completely.

3. A "no visible emissions" standard has been included in various sections of the regulations where enforcement of a stricter standard would have been a problem, if not impossible.

4. The segment of the regulations requiring "total enclosure" of a structure under demolition before toppling of walls could begin has been altered to a more-or-less "do the best you can" standard.

5. The section requiring the use of a sealant on all "fibrous" materials used inside ducts or plenums has been changed to "asbestos-containing" materials only.

6. The section prohibiting the discharge of asbestos-containing process waste water into the rivers, streams and sewers of the state has been changed to permit such discharge if the waste water "is given the best available treatment consistent with technological feasibility and economic reasonableness."

7. Under the Proposed Final Draft, only manufacturing plants will be required to obtain a permit from the state. The first draft required permits for any operation or activity involving asbestos.

The vast majority of the above and other positive changes in the regulations reflect specific recommendations and corroborative evidence presented to the Board by Dr. F. L. Pundsack of Johns-Manville and Dr. Joseph L. Goodman of Raybestos-Manhattan on behalf of the AIA/NA at the public hearing on the regulations held October 15 in Chicago, and by Dr. George W. Wright and an industry team at a meeting held with Board staff representatives in September. Also participating in the overall cooperative industry effort were NIMA and the Friction Materials Standards Institute.

Attached is a copy of the specific changes submitted by the AIA/NA at Board request following the Chicago hearing. Because of the many changes in the final draft, the section and sub-section numbers on the AIA/NA recommendations do not correspond to those in the final draft. However, as you can see, the basic changes recommended by the AIA/NA have been adopted by the Board.

It is indeed an encouraging sign to find that, in this era of national environmental panic, a well-documented and well-presented industry case can produce results as fair and reasonable as those obtained in the state of Illinois. Much credit must go to the responsible yet fair attitude of the Illinois Pollution Control Board, and to all those in the industry who worked long and hard on this project.

W. P. Raines

Asbestos dust called killer

10/20/71

By STEVE ROTHMAN
Staff Writer

"There is no doubt about it . . .asbestos dust is a killer if it gets into your lungs."

The man who was speaking was James Middleton, business representative for the International Chemical Workers Union, Local 60, in Waukegan.

Some 25 environmental experts, concerned citizens and representatives of the Johns-Manville Company plant in Waukegan sat and listened.

Samuel T. Lawton Jr., Illinois Pollution Control Board member, eyed the wiry union executive with interest.

"There is a long hard road ahead to improving conditions (in the Waukegan plant)," added Middleton, "but we are looking toward the day when we can pull off our respirators and work without them."

Middleton's testimony came at the end of three days of hearings before the IPCB, which is creating regulations to protect the public and workers from asbestos-related ailments.

Hearings also were held in Granite City and the Field Museum in Chicago.

"We read a great deal about emission control standards," said Middleton, "but we seldom come in contact with the people working with the products."

Middleton brought employe problems to the attention of News-Sun reporter Steve Rothman last June.

He provided death certificates on two workers, who died of ailments caused by long exposure to asbestos dust in the plant.

A series of News-Sun articles led to a promise by J-M officials to clean up the four plants it operates in Waukegan and to create a union-management environmental team to work out methods of dust control. It also led to a special asbestos dust hearing in Waukegan.

J-M officials termed the series the work of a "local busybody troublemaker trying to muddy up J-M's good name," according to an IPCB investigator.

But the investigator added the investigation indicated J-M had a great deal more to do even though it was a leader in the field of environmental protection for asbestos workers.

Middleton said workers were exposed to dust when unloading railroad cars of asbestos material and making pipe in the transite pipe division, as well as in its block-making process.

"The company has showed us where it is making improvements in the plant," he said, "but the problem has not been solved.

"Asbestos dust will get into the lungs *some way, if it is* not controlled," he added, "and we feel the respirator (used by employes) is not good."

Middleton said the union has adopted a wait-and-see attitude to see how far the committee can go in cleaning up the plant."

The danger not only is in the handling of asbestos, said Middleton.

"Workers leave the plant with dust on their clothes," he said. "They carry it into their cars, into the stores where other people buy products and home.

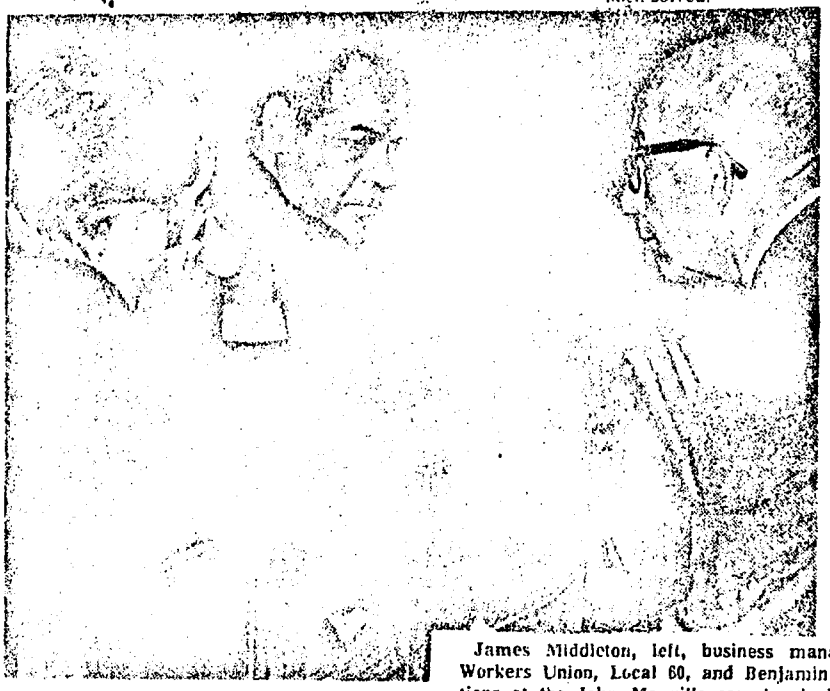
"Their children come in contact with the dust and get it in their lungs, when they play on the couch where their fathers' sit to rest," he added.

Middleton said he felt workers should be provided clothes which would be left in the plant at the end of the day, or some means of cleaning the dust from their clothing before they went home.

Gaddam N. Reddy, an Illinois Environmental Protection Agency environmental engineer, said he felt regulations should stop all commercial activity where asbestos was used

(Continued on Page 4A, Col. 6)

WAUKEGAN, ILL., WEDNESDAY, OCTOBER 20, 1971



James Middleton, left, business manager for the International Chemical Workers Union, Local 60, and Benjamin Fout, union president, discuss conditions at the Johns-Manville complex in Waukegan with Charles Wikel, one of the company's plant managers. (Staff photo)

Plant problems

Asbestos dust called killer at hearing

(Continued from Page 1)

unless the person in charge complies with regulations.

"We want to stop dust from getting into the atmosphere not just those who violate the regulations," he said.

Reddy said the agency was recommending that mechanical exhaust of dust into the atmosphere be prohibited.

"Any factory, plant or enterprise should have to enclose its asbestos facilities so all exhaust air is filtered," he said.

Reddy said he felt the spraying of asbestos fibers should be regulated so that the fibers are confined to the area being treated.

But he did not feel that all spraying of asbestos fibers should be prevented.

IPCB is proposing that all asbestos spraying be halted.

But Benjamin Fout, president of Local 60, urged the board not to halt use of asbestos spraying.

"Handled properly, asbestos is a good fire protection material," he said, pointing to the disastrous McCormick Place fire of several years ago.

McCormick Place had not been protected from fire by flame resistant materials and all steel girders melted under the intense heat.

Howard Ayer, National Institute for Occupational Safety and Health of the U.S. Public Service, said that in-plant testing for dust concentrations can be set up for about $1,100.

He said filters which employes could wear cost about 60-cents a piece.

He said it takes one day to train a man who knows how to use a microscope in testing techniques.

A man of average intelligence can learn the process in one week where he first must learn to handle a microscope.

"Our primary concern is with the workers," he said. "Asbestos is related to lung cancer and we aim to see these people protected because of the danger from long exposure."

Ayer said that protection must come at the "source" of exposure.

Ayers said the concern is not with the dust which you see, "but the dust which you cannot see because it is too small but can make it into your lungs."

Fred Engelking, a Catapillar Tractor Co. research expert, said that the company had made its own test of brake linings and felt the evidence inconclusive to pass regulations covering them.

"Caterpillar. . .questions whether the intent of the . . . requlations is actually accomplished by the proposed ban of asbestos brake linings," he said referring to the 1975 cutoff date for use of aasbestos in brake linings.

He said if testing indicates a danger exists, the regulations should be qualified to allow asbestos use in a totally enclosed brake compartment system. This would prevent asbestos particles from getting into the air.

If testing indicates that asbestos brakes are harmful then a reasonable threshhold limit of the danger should be established, he added.

"Place the burden on the manufacturer to design his product to meet reasonable, attainable standards," he said. "Don't just prohibit the use of asbestos in brakes."

But Colin F. Harwood, an Illinois Institute of Technology Institute research chemist, said brake linings have asbestos dust in them and that many people have asbestos deposits in their lungs although they don't work with the product.

Harwood, who testified at earlier hearings, told The News-Sun "asbestos spraying" should be stopped.

"Building sites are essentially messy places and are hard to clean up," he said. "Spraying increases the number of airborne particles."

While J-M took no active part ni the Waukegan hearings, officials later backed the position of Dr. Fred L. Pundsack, a company vice president who represented the Asbestos Information Association of North America in Chicago.

Pundsack said while the danger to the general public had not been defined. . .

"We believe it is prudent and feasible to establish reasonable emission controls that will protect the public and ensure that hazardous levels of asbestos will not develop in the community air in the future."

Dust dangers

Samuel T. Lawton Jr., IPCB board member, reads over submitted testimony dealing with the dangers of asbestos dust. (Staff photo)

October 20, 1971

ILLINOIS POLLUTION CONTROL BOARD HEARING ON ASBESTOS
WAUKEGAN, ILLINOIS - OCTOBER 19, 1971

This hearing was presided over by Board Member Samuel Lawton and was also attended by his Assistant, Timothy Harker. Others in attendance included representatives of the Johns-Manville Local 600 of the International Chemical Workers Union, Dr. Colin Harwood, of Illinois Institute of Technology Research Institute, Reporter Steve Rothman of the Waukegan "News-Sun", the newspaper that blasted J-M on the asbestos and health issue last summer, and a representative of the Illinois Department of Labor.

Johns-Manville was represented by Plant Manager Chuck Wikel, Dr. Tom Davison, Cliff Sheckler, Roy Winkworth (employee relations) Frank Angelos, (Environmental Control) J. Robbin (P&FM District Sales Office, Chicago) and Bill Raines. Dr. Eugene Stefl of Raybestos and Attorney Carol Halfpenny, representing Raybestos, also were present.

The first witness was Mr. Gaddam Reddy, Environmental Control Engineer, Illinois Environmental Protection Agency. Mr. Reddy, a native of India, spoke with such a decided accent that it was difficult to understand what he was saying. The gist of it appeared to be that the EPA (enforcement arm of the Illinois Pollution Control Setup) did not have the personnel nor the

equipment to do the kind of sampling of ambient air that the regulations called for.

The second witness was Cliff Sheckler, speaking for the National Insulation Manufacturers Association. He gave a statement on the health aspects of Fiber Glass. This was intended to counter the allegations made by Mr. Golinken at Chicago, although no reference to those allegations was made by Sheckler. There were no questions from the Board.

The third witness was Fred Engelking of Caterpillar Tractor. He is a Chemist who is in charge of Research and Development on Friction Materials in the Research Department of Caterpillar. He gave an excellent slide presentation covering the types of equipment that Caterpillar makes that use brakes, the five different types of braking systems and some of the research Caterpillar has done. He states that no safe substitute has ever been developed for asbestos in brake linings. He showed very impressive graphs demonstrating the difference in "slip time" of asbestos containing brake linings versus sintered metal. The latter are very noisy and, worse, tend to lock, throwing the driver into the windshield.

Caterpillar has done research somewhat to that of Lynch. They see no fibers ~~smaller~~ larger than 5 microns; their results generally parallel those of Lynch.

Caterpillar wants the brake lining ban modified so that:

1. Asbestos brake linings would be permitted if in totally enclosed brake compartments.
2. Asbestos containing brake linings would be permitted in any event until conclusive medical evidence has been shown to prove the need for a ban on them. Even then, a threshold limit value should be assigned rather than a complete ban. (An interesting contrast to Nicholson's "Make Industry Prove It's Safe" Testimony in Chicago.)

The fourth witness was Dr. Howard Ayer of the National Institute of Occupational Safety and Health, H.E.W. He talked about sampling and calculating methods and the great variations in sampling. He talked about reliability, reproducibility and cost of sampling techniques, particularly those that would have to be used for the ambient air. It appeared that his testimony was aimed at supporting a "visible emission" versus "numerical" standard, although Ayer expressed some doubts about the idea of a visible emission standard. It was never entirely clear who invited him to testify, although he stated that he had been "invited" the previous day.

The final witness was Mr. Middleton of Chemical Workers. He said he wanted to talk about in-plant conditions and gave a bit of background as to his interest in the subject, including the fact that he had attended Dr. Selikoff's seminar in March. He implied strongly that the Union had "discovered" the asbestos health problem and had "brought it to the attention of the company and got the company to do something about it" but when one ignores those jabs, his testimony was helpful in that he said that the company and the Union had setup a joint Environmental Control Committee and that conditions were "improved". He said that J-M was making "progress" on dust control although the Union would take a "wait-and-see" attitude. He pushed for some provision for change of clothing so that workers do not take asbestos-laden clothes home from work. He also said that he wants TLV under the Occupational Safety and Health Act lowered, although he did not cite a figure. He did say that the Union and the company are now cooperating. When he completed his testimony, Cliff Sheckler rose and, speaking for Johns-Manville, thanked him for his comments.

Before adjoining the hearings, Lawton mentioned that there would be additional hearings only if the full Board chooses to make "substantial" changes in the proposed regulations. He implied that he did not think this would happen!

W. P. Raines

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10/18/71

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10/18/71

Dr Dawson's
This confirms my belief that there is a
synergism between cigarets and asbestos
as expressed in my letter to the News-Sun 7/21
It seems to me that any survey of
asbestos induced lung cancer, without
giving consideration to cigaret smoke
would be misleading and useless
Axel Shuster

CHICAGO SUN-TIMES
30 Mon., Oct. 18, 1971

Illinois urged to put curbs on asbestos use

By Bruce Ingersoll

If smoking two packs a day doesn't give you lung cancer, there is a good chance that working with asbestos will, a New York environmental scientist has warned.

Lung cancer has been solidly linked with smoking and with inhaling asbestos fibers, William J. Nicholson testified, but new medical evidence reveals that cigarets and asbestos make for a far deadlier mix.

"Asbestos workers who smoke run more than 50 times the risk of dying of lung cancer than men who neither smoke cigarets nor work with asbestos," he asserted.

Nicholson, assistant professor of community medicine at Mount Sinai School of Medicine in New York City, appeared Friday at a hearing on proposed state regulations on the use and manufacture of asbestos products.

He and Harold Romer, New York City's assistant commissioner of air resources, urged the Illinois Pollution Control Board to adopt a proposed ban on spraying asbestos insulating and fireproofing materials.

Romer pointed out at the hearing at the Field Museum of Natural History that his city, Boston, Philadelphia and Chicago already have outlawed asbestos spraying.

Nicholson told of research tying the rise in asbestos use to greater incidence of asbestosis, a disease characterized by asbestos-fiber scars on the lungs.

Asbestos is used in more than 3,200 products, ranging from clutch linings to women's coats to vehicle snow sprayed on Christmas trees.

Nicholson said Dutch and Scottish studies show a "strong" link between occupational exposure to asbestos in shipyards and mesothelioma, a rare form of cancer.

Fred L. Pundsack, vice president of research and development for Johns-Manville Corp., which has a large asbestos-manufacturing complex in Waukegan, said asbestos levels in urban air are low and pose no health threat.

He cited a recent report to the National Academy of Sciences stating, "There is no evidence that the small numbers of (asbestos) fibers in most members of the general population affect health or longevity."

In addition to the spraying ban, the proposed Illinois regulations would require safeguards to keep asbestos from escaping construction and building-demolition sites, set stringent limits on emissions from asbestos plants, and outlaw asbestos in brake linings by 1975.

"Virtually every vehicle on the road carries several pounds of asbestos in its brakes," said Colin F. Harwood, an IIT Research Institute chemist who explored the asbestos problem for the state.

Guard unit cites Sun-Times

Ken Towers, assistant managing editor of The Sun-Times, accepts award for this newspaper from the 178th Infantry, Illinois National Guard, a community action plaque. Presenting the award are Mrs. LaJune Horton, co-chairman of the unit's community relations committee, and Lt. Col. Frank A. Marchant Jr., 178th commander. (Sun-Times Photo by Bob Black)

October 20, 1971

DESK MEMORANDUM

RE: ILLINOIS POLLUTION CONTROL BOARD HEARING ON ASBESTOS

CHICAGO ----- OCTOBER 15, 1971

On October 15, 1971, Dr. F. L. Pundsack, Vice President, Research and Development, Johns-Manville Corporation, presented testimony on behalf of the AIA/NA at the second of three hearings being held by the Illinois Pollution Control Board on proposed regulations affecting asbestos. The hearing was held in Chicago's Field Museum, and was attended by approximately 70 people. Appearing with Dr. Pundsack to help answer questions posed by the Board were Dr. Joseph L. Goodman, Medical Director, Raybestos-Manhattan; George L. Swallow, Manager, Occupational Environmental Control, Johns-Manville; and I. H. Weaver, Corporate Director, Environmental Control, Raybestos-Manhattan. The hearing was chaired by Samuel Lawton, a member of the Board. Also present were Board member Jacob Dumelle and Lawton's Administrativ Assistant, Timothy Harker. All three asked questions during the hearing.

The first person to testify was Dr. Colin Harwood of the Illinois Institute of Technology Research Institute (IITRI). Dr. Harwood served as advisor to the Board on the proposed regulations, and was present at the meeting held on September 17 between a team from the industry and representatives of the Board (a report on this meeting by W. P. Raines was distributed on September 22).

Basically, Dr. Harwood supported the regulations as written. He said that while there is no cause for panic about the amount of asbestos in the ambient air, controls should be instituted. He said that the requirements of the proposed regulations are within the capabilities of existing technology, and that an efficiency standard or a "no visible emissions" standard would not be sufficient to control emissions. He also stated that brake lining wear contributes to the background level in the ambient air, and that he has faith in the industry's ability to develop a non-asbestos containing lining by 1975. Dr. Harwood promised to send me a copy of his final report to the Board in the near future.

The second person to testify was Bill Nicholson of Mount Sinai Hospital (a copy of his prepared remarks is attached). Nicholson, after giving the standard Mount Sinai pitch on the insulation workers studied by Dr. Selikoff, congratulated the

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Board on its proposed ban of sprayed fireproofing. He said that permitting the spraying of buildings with asbestos-containing compounds would be "playing Russian roulette" with the lives of the general public. He also said that the regulations with regard to demolition should be made stronger. He opposed the use of a numerical standard for emissions from manufacturing facilities because of the difficulty of accurate measuring of very low ambient air concentrations. Instead, Nicholson recommended that the Board adopt an equipment efficiency standard and a "no visible emissions" standard, based on the Federal EPA model. While this position was in general agreement with the AIA/NA position, under questioning Nicholson said that he would not be opposed to ambient air testing as a sort of check-up on the efficiency standard. With regard to brake linings, Nicholson quoted some figures showing that ambient air levels at toll booths on the Long Island Thruway were 3-4 times higher than samples taken a few blocks away (all levels were in the nanogram per cubic meter range). Nevertheless, he did not indicate full support for the ban, but suggested that the regulation be rewritten to include a clause saying that if the industry could demonstrate no hazard from brake linings, the ban would not go into effect (once again we see the position being taken that asbestos should be considered guilty until proven safe).

The next speaker was a man named Golinken (?), who identified himself as an insulation contractor in the Chicago area. Golinken started off by saying that he had no comments to make with regard to the "asbestos" regulations, but that he was really concerned about the hazards of fiber glass inside ducts. He then proceeded to give the standard asbestos workers union pitch against fiber glass. The Board appeared to be somewhat confused as to the raison d'etre for Golinken's presentation and had no questions.

Following a 45 minute break for lunch, Harold Romer of the New York City Environmental Protection Administration launched into the most vitriolic attack on asbestos of the entire day. By comparison, Nicholson was a tower of objectivity. Quite naturally, Romer spent considerable time on the New York City experience with spraying. He called the asbestos that is being found in the lungs of city dwellers a "time bomb" for the future, and expressed great concern over the demolition of buildings containing asbestos products of any type. He also took broad swipes at numerous other uses of asbestos, including in talcum powder, in women's coats, as Christmas tree "snow" and others. He supported the ban on brake linings and called for close controls on every conceivable use of asbestos. Romer made numerous factual errors in his presentation. For example, he stated quite unequivocally that

-more-

EM size asbestos fibers were extremely hazardous to human health. Dr. Pundsack took Romer to task on this particular error, but there were so many others that refuting them all would have taken up half the afternoon.

Dr. Pundsack was next to testify. A copy of his presentation is attached. Dr. Pundsack replied to Nicholson's comments about asbestos levels on the Long Island Thruway by saying that if asbestos concentrations from brake lining wear were going to be high anyplace, they would be high at the spot sampled, yet the levels found were insignificant when compared with safe occupational levels. He also commented that at the low levels found, the margin of error was so high as to make the findings useless. Following his prepared comments, Dr. Pundsack introduced Dr. Goodman, who reported on a study by Dr. Paul Gross in which he injected brake lining dust into the lungs of test animals and produced no disease. Dr. Goodman also commented on another study by Dr. Gross in which human lungs were digested and the amount of fiber calculated. These tests showed no relationship between disease and the inhalation by people in the general public of even large amounts of EM sized asbestos fibers.

Numerous questions were asked of Dr. Pundsack following his prepared testimony. They dealt with such subjects as: loosely-bound vs locked-in products, how a visible emissions standard would work (the AIA/NA was asked to submit in writing its specific recommendations in this area), the possibility of asbestos fiber accumulating in the community air, asbestos in water, whether chrysotile is less hazardous than crocidolite, the Selikoff study of insulation workers, talc and GI cancer, etc. All questions were handled skillfully by Dr. Pundsack. The total AIA/NA presentation, including the question and answer period, lasted approximately one hour. The AIA/NA was asked to submit numerous documents, medical papers, specific recommendations and other supporting data to the Board.

Following the AIA/NA presentation, Ivan Sabourin gave a short presentation on the Canadian-American asbestos industry.

Matthew M. Swetonic

10/15/71

Dr. F. L. Pundsack
Presentation to Illinois Pollution Control Board
October 15, 1971

My name is Dr. Fred L. Pundsack, and I am Vice President of Research and Development for the Johns-Manville Corporation. I am an inorganic chemist with a Ph.D. degree from the University of Illinois, and I have been involved in asbestos research since 1952. I am here today representing the Asbestos Information Association, an organization sponsored by nine leading manufacturers of asbestos products to provide information on asbestos and its health implications. The members of this Association are listed in a fact sheet which I have provided.

In the event that my presentation prompts questions relating to environmental control technology or the medical aspects of the asbestos situation, I have asked three experts in these fields to accompany me here today to assist in answering questions of a highly technical or medical nature. They are Dr. Joseph L. Goodman, Associate Professor, Department of Preventive Medicine, Medical University of South Carolina, and Medical Director, Raybestos-Manhattan Corporation; Mr. Isaac H. Weaver, Corporate director for Environmental Control for the Raybestos-Manhattan Corporation; and Mr. George L. Swallow, Manager of Occupational Environmental Control, Johns-Manville Corporation.

Before proceeding, I would like to express the appreciation of the Asbestos Information Association for the opportunity to testify on the proposed asbestos regulations.

Asbestos has numerous important applications in our modern industrial society. Among these, it provides built-in protection against fire and deterioration in scores of common products in daily use. Through the years it has saved countless lives and billions of dollars in property damage by preventing or checking the spread of fires. Asbestos-containing acoustical products make a valuable contribution to noise abatement. Products containing asbestos are used, among other applications, in the construction of schools, houses, theaters, factories, office and other public buildings, and in the insulation of furnaces, boilers and electrical equipment.

The asbestos industry within the state of Illinois plays an important role in the economic life of the state and its people. The member companies of the Asbestos Information Association own and operate a total of eight plants within the boundaries of the state. Some of the product lines produced at these eight plants include: asbestos-cement pipe, packings, gaskets, friction materials--including both conventional and disc brake linings--asbestos-cement sheet products, asbestos roofing and siding shingles, insulations, and many others. A total of 3,118

Illinois residents are employed at these manufacturing facilities. Last year, these employees received a total of $ 24.4 million in wages, salaries and fringe benefits. Services and goods purchased within the state, such as water, electricity, telephone service, raw materials and freight amounted to more than $ 17 million in 1970. In addition, state, county and local taxes, amounting to nearly a million dollars last year, helped to pay for new schools, roads and other benefits to the state and its citizens. The value of goods produced at these manufacturing locations last year totalled $ 70.1 million, with approximately $14.5 million worth of these asbestos-containing products being sold within the state.

As you can see, the economic contribution of the asbestos industry in the State of Illinois is by no means small. And the figures I have just given you represent only those companies that are members of the Asbestos Information Association. There are also within the state many other concerns -- both large and small--whose livelihood depends in some measure on the use of asbestos or asbestos-containing products. Such concerns would include many segments of the construction industry, companies engaged in the manufacture of asbestos-containing products, companies which use finished asbestos-containing products in the manufacture of other products, and many others. The economic value to the State derived by the use of asbestos by these other

concerns is difficult to gauge, however it would certainly double or triple the figures I gave you earlier with regard to the contribution of the member companies of the Asbestos Information Association.

The asbestos industry has recognized for many years that there are occupational health hazards associated with the excessive inhalation of asbestos dust over long periods of time. As a result, the industry, beginning in the late 1920s, has sponsored and cooperated in a wide variety of scientific research projects designed to identify these hazards and to eliminate them wherever they may exist, not only in asbestos mines, mills and manufacturing plants, but also among fabricators and applicators of finished asbestos products. Today, the asbestos industry, either as individual companies or through the Quebec Asbestos Mining Association's sponsorship of the Institute of Occupational and Environmental Health in Montreal, is supporting medical research at such highly regarded institutions as McGill University in Montreal, Tulane University in Louisiana, St. Luke's Hospital in Cleveland, the Environmental Sciences Laboratory at Mount Sinai Hospital in New York, the Industrial Health Foundation in Pittsburgh, the University of California at Berkley, Farleigh-Dickinson University in New Jersey, the University of Pittsburgh, the Medical College of South Carolina, and a number of others, both here and overseas. In addition, the industry has cooperated extensively

in various investigations into asbestos-health conducted by agencies of the Federal Government, including the U.S. Public Health Service, the Federal Environmental Protection Agency, the National Institute of Occupational Safety and Health, and others. In the industry's own research laboratories, scientists and engineers are also engaging in work related to health, developing safer packaging and handling techniques for loosely bound asbestos products and also developing and improving techniques for the measurement and control of asbestos emissions both in the work-place and in the ambient air.

As a result of these activites, over the years the industry has amassed a substantial amount of medical knowledge and technological know-how in the asbestos-health area.

Basically, the known facts about asbestos-related disease can be summed up as follows:

First, asbestos-related health risks are basically confined to the occupational and para-occupational setting.

Second, the effects of excessive inhalation of asbestos are both time and dose related. This means that asbestos-related diseases may develop, generally, only after the inhalation of substantial amounts of asbestos dust over a substantial period of time.

And third, there is presently no evidence of hazard to the general public from exposure to the minute amounts of asbestos that may be present in community air.

Because the general purpose of the regulations under discussion here today is to prevent the emission of hazardous quantities of asbestos fibers into the air that the general public breathes, I will restrict my further comments on health to this area. It is very important to realize in any discussion of a possible public health hazard from asbestos exposure that the only scientific studies we have to go on are those of groups of people in occupational and para-occupational environments. There is no basis for assuming that data on occupational health risks associated with heavy, long term asbestos exposure can be applied to the general public without taking into consideration the vast differences in exposure between the two.

Despite the fact that the only studies in existence are of occupational and para-occupational populations, a careful analysis of the data available can give us some general information about the question of a possible public hazard from asbestos. The substance of this information is that diseases associated with occupational exposure to asbestos are dose related and that the doses below which no measurable increase in disease occurs are far higher than any dose to which the general public is exposed.

This evidence is based on a number of epidemiological studies---three of the most prominent being one by Dr. J. Corbett McDonald of 10,421 past and present asbestos mining and milling workers in Quebec, a second by Dr. M. L. Newhouse of 4,500 men who were employed in a British asbestos factory between 1933 and 1964 and the Third a study by Drs. Knox, Doll and associates of 878 workers in an asbestos textile factory, also in Great Britain.

Dr. McDonald, in his study, divided his subjects into eight categories, based on length of employment and severity of dust exposure. He noted that only in the highest time-exposure category, comprising five per cent of the total, was there any increase in deaths from respiratory and cardiac diseases, including lung cancer. Taken as a group, the Quebec asbestos workers had a mortality rate from all causes lower than the level expected in the general population.

Dr. Newhouse in her study in Great Britain found that workers who had low and moderate occupational exposure to asbestos dust showed a rate of deaths from diseases of the lung, including cancer of the lung and pleura, that were comparable with that of the general public. On the other hand, another study by Dr. Newhouse of mesothelioma (a relatively rare cancer of the lining around the lungs) in the London area showed a small number of cases among people who lived in close proximity to an asbestos textile plant and also among people living in the household of an asbestos worker, who presumably brought home quantities of the material on his clothes from work. The intensity of exposure experienced by these

so-called para-occupational populations in London is difficult to gauge, but there is every reason to believe that they were in fact higher than the low and moderate occupational levels in factories that have been shown to produce no excess of mesothelioma. These studies do, however, point up the need for proper control of emissions of asbestos from factories so that neighboring areas will not suffer para-occupational exposures to asbestos.

The Knox-Doll study, like the Newhouse and McDonald studies, confirmed the fact that low to moderate levels of asbestos exposure will not produce an excess of disease. It should always be remembered that these low to moderate levels in occupational settings inside factories were certainly higher than any to which the general public in this country is exposed.

In addition to these studies, there are several studies of the effect of various doses of asbestos on laboratory animals which also indicate that there are dose levels below which no measurable disease effect is observed. Dr. William Smith of Fairleigh-Dickinson University studied mesothelioma cancers in hamsters, and his data show that below certain specific doses of asbestos, no cancers were observed to develop over the entire natural life span of the animals. Dr. Merl Stanton of the National Institute of Health, Bethesda, Maryland, conducted a somewhat similar study with rats and observed the same type of dose-related response.

The most well-known of the American epidemiological studies related to asbestos exposure is that made by Dr. I. J. Selikoff of 632 members of the Heat Frost and Asbestos Insulation Workers Union in the New York/New Jersey area. These men, for the most part, are journeymen-craftsmen who work on construction sites and apply insulation to boilers, steam and hot water pipes, heating ducts, etc., during the construction of a building or a power plant. They may also be involved in tearing off old insulation. When one construction job is completed, they move to another construction job.

The occupational environment to which they may be exposed involves not only asbestos but also silica and particulate materials. In addition they are exposed to a variety of fumes from organic solvents and adhesives with which they work. In short, they have a widely varied and, in the past at least, a relatively uncontrolled occupational dust and fume exposure.

Dr. Selikoff found that the death rate from lung cancer was extremely high in this group of 632 workers, but that this very high mortality rate occurred almost exclusively among those workers who were cigarette smokers.

On the other hand, those workers who had no history of cigarette smoking had essentially no greater incidence of lung cancer than the general population of non-smokers.

In general, the mortality rate of insulation workers reported by Selikoff is much higher than the rates found in studies of larger groups of people who work in factories producing asbestos-containing products, and in mines and mills processing asbestos. Why the incidence of certain diseases among insulation workers is so much higher than the other groups studied is a question as yet unanswered.

Unfortunately, as is so often the case with diseases that take from 10 to 40 years to develop, reliable data as to the past occupational exposure of these men to asbestos and other potentially hazardous dust and fumes in their work are not available.

As a result, at the present time we have little information as to what other factors may have influenced their high rate of disease except that those insulation workers who smoked cigarettes developed lung cancer at a rate far higher than the general population who smoked.

In 1970, with a grant from the National Air Pollution Control Administration, The National Academy of Sciences called together a blue-ribbon panel of asbestos-health experts to draft a document on the problem that would serve as the

medical basis for the Federal asbestos emission standards. Among those asked to serve on the panel were Dr. Clark Cooper of the University of California, Dr. Lewis Cralley of the Public Health Service, Dr. George Wright, Dr. Irving Selikoff and others.

The result of their study was a fifty-three page document on asbestos/health. As a conclusion to this part of my presentation, I would like to read a few pertinent excerpts from the report, which constitutes the most up-to-date evaluation of the asbestos-health problem that is available.

On page 20, the report states (quote) We cannot extrapolate from the mortality experience of those who are directly and indirectly exposed in their employment to the general public who have had moderate or slight exposure from ambient air. There is evidence to suggest a gradient of effect from direct occupational, to indirect occupational, to family and neighborhood situations, in all of which dust concentrations are probably high by comparison with most community air. This suggests that there are levels of asbestos exposure that will not be associated with any

detectable risk. What those levels are is not known, but there is no evidence that persons in the general population--without occupational, household or neighborhood exposures--have any increased risk of neoplasm, even though there may be ferruginous bodies or fibers in their lungs (end quote).

In the conclusion and recommendation section of the report for the National Academy of Sciences, the following statements are made:

(quote) At present, there is no evidence that the small numbers of fibers found in most members of the general population affect health or longevity. Asbestos is too important in our technology and economy for its essential use to be stopped. But, because of the known serious effects of uncontrolled inhalation of asbestos minerals in industry. . . it would be highly imprudent to permit unrestricted additional contamination of the public environment with asbestos (end quote).

I believe that these statements from the report adequately express the position of the asbestos industry with regard to the health hazards of asbestos. We do not believe that at present the general public is in danger from the minute amounts of asbestos that exist in the ambient air. However we also believe that it is prudent and feasible to establish reasonable emission controls that will protect the public and ensure that hazardous levels of asbestos will not develop in the community air in the future.

With this position in mind, I would now like to discuss the asbestos regulations proposed for the State of Illinois. To begin with, I would like to commend the Illinois Pollution Control Board for its efforts to ensure a safe environment for the State and all its citizens. Your credentials as a progressive yet fair control board are well known and respected in environmental circles throughout the nation.

While the asbestos industry as represented by the Asbestos Information Association is of the position that there is presently no hazard to the general public from the minute amounts of asbostos existing in the community air, we nevertheless are in favor of regulations designed to accomplish one or more of the following three objectives:

One, to ensure the health and safety of those occupationally exposed to asbestos fiber.

Two, to prevent possibly hazardous amounts of asbestos fiber from escaping into the ambient air, and

Three, to eliminate, where possible, the nuisance of even small amounts of asbestos fiber from escaping into the ambient air. While this third point is not directly related to health because of the small amounts of fiber involved, we wholeheartedly support the position that the environment should be as clean as possible.

For these reasons, we support most of the items in the proposed regulations. However, we do have several specific comments and

suggestions to make regarding the regulations that we hope will be of help to the Board in arriving at a final document that will not only be effective but also practical and reasonable. I will discuss the sections upon which we wish to comment in the order in which they appear in the regulations.

Our first suggestion is with regard to Part II: General Requirements, Section 201. This section calls for the obtaining of a permit to engage in any activity which could discharge asbestos fiber into the environment. We feel that this section is not specific enough with regard to which activities would be covered. As you are probably aware, in the vast majority of asbestos-containing products used in the country, the asbestos is locked in place with cement, plastics or other binding materials, and does not constitute a source of emissions to the atmosphere. Asbestos-cement pipe and vinyl-asbestos floor tile are examples of such products. Other products and activities do constitute possible emission sources, and under the regulation would require a permit. If it would be of help to the Board, the Association I represent would be most willing to prepare a list of those products in common use where the asbestos is in a non-locked-in or loosely-bound state and thus constitute a possible emission source which would require a permit.

As to Section 201, Sub-section B, requiring a satisfactory course of health instruction for employees in those industries involving the handling of loose or loosely-bound asbestos products, I would like to point out that

the various trade associations in the asbestos industry have over the years produced a number of safety practices manuals and booklets dealing with various sections of the industry. The Asbestos Information Association would therefore recommend for your consideration as instructional material for use under Section 201, Sub-section B, the safety practices booklets which I have submitted to the Board with my presentation. The four booklets are:

1. Recommended Safety Practices for Handling Asbestos Fiber
2. Recommended Health Safety Practices for Handling and Fabricating Asbestos Textile Products.
3. Recommended Practices for Fabricating, Handling and Applying Asbestos-Cement Products in the Building and Construction Industries...and
4. Recommended Health Safety Practices for Handling and Applying Thermal Insulation Products Containing Asbestos.

Under Part V, Section 501, it is our opinion that Subsection B, which requires the enclosure of walls before toppling during demolition, is both impractical and unnecessary. We know of no suitable method for enclosing the walls of a structure during demolition. Even more important is the fact that there is, in reality, very little asbestos used in the construction of a modern medium-sized or high-rise structure. In addition, dust counts taken during the demolition of a building in

Easton, Pennsylvania, which did contain significant quantities of asbestos products, showed very little dispersion of fiber into the surrounding air, both upwind and downwind of the demolition site. This is due to the fact that most asbestos-containing products in which the fiber is locked-in with cement, plastic or other binding materials do not readily release fiber in the atmosphere, even during demolition. Subsection A of Section 501 requires the prior removal before toppling of boiler and pipe insulations....two asbestos-containing products that might release dust from improper demolition. Since this will remove any loosely-bound asbestos products from the structure, we believe enclosure of the walls to be unnecessary, and recommend that simple wetting of the walls to be toppled would be sufficient to control the dispersion of dust from whatever small amount of asbestos-containing products the walls might contain.

With regard to Part VI, Section 601 of the regulations, we would like to recommend for your consideration a completely new approach to the control of asbestos emissions from manufacturing

operations. As presently written, the regulations call for the establishment of a numerical emission standard of .5 fibers per cubic centimeter of air from any manufacturing operation, and .05 fibers per cc of air at the boundary line of the plant or factory.

We would recommend that Section 601 of the regulations be re-written so as to substitute a control practice standard for the present numerical emission standard. The reasons for this recommended approach are varied, but are primarily based on the lack of specific data with regard to safe non-occupational levels and the difficulty of accurate and meaningful emission sampling techniques at very low fiber concentrations.

The Federal Environmental Protection Agency studied this problem very carefully in preparing its national emission standards on asbestos, and arrived at the conclusion that a numerical standard was impractical at this time. In this regard, I would like to read a few excerpts from a document prepared by the EPA as justification for this viewpoint.

The document states that ideally, national emission standards for asbestos would be established on a concentration basis related to health effects and would provide an ample margin of protection to the public health regardless of the number of sources in a given geographical area. There are many practical considerations, the report goes on, which prohibit the establishment of a numerical standard at this time.

Foremost of these problems is the lack of a data base. This base is lacking from both the health-effects standpoint for non-occupational exposure and the emissions standpoint. The majority of data available on asbestos health effects is related to occupational exposure and cannot be readily extrapolated to non-occupational levels.

A little later on, the report states that (quote) a control practice approach to reducing asbestos exposure levels offers a practical alternative to numerical emission limits. A major advantage of a control practice standard would be realized in enforcement. Inspectors could be easily trained to certify compliance with control practice regulations (end quote).

The report goes on to describe some of the many difficulties involve in asbestos sampling and analysis, especially with regard to emissions into the ambient air, and concludes that present techniques are not only time consuming and expensive, but that they

also tend to distort the concentration of asbestos in the sample being analyzed and are hence not meaningful in establishing the actual amount of asbestos being emitted into the atmosphere.

The National Academy of Sciences Committee report on asbestos health, which I quoted from earlier, agrees with the EPA position on numerical standards. It states (quote) because of methodologic and other uncertainties, it is not yet feasible to base control on numerical ambient air quality standards (end quote).

I will not go into detail on the specifics of a control practice standard since they would be primarily of an engineering nature, however, I will submit for your consideration, as soon as they are published, the asbestos emission standards proposed by the Environmental Protection Agency. These standards will contain sufficient information to set up a similar program for the State of Ill

Section 602 of Part IV of the regulations deals with the discharge of asbestos-containing waste into the sewage systems or waters of the state. We believe that this section is unnecessary. In the first place, the water pollution control systems in use in most asbestos manufacturing plants across the state effectively remove the majority of asbestos wastes from the effluent before discharge into state waters.

Secondly, sewage plants also remove asbestos fibers from waste water during purification. In reality, the high dillution of small quantities of asbestos fibers in water is as effective and safe a method for the disposal of asbestos wastes as could be devised. There is no evidence that the swallowing of small amounts of asbestos constitutes any health hazard whatever.

In addition, studies conducted by Johns-Manville have found small amounts of asbestos fiber in samples of water tested from sources all over the United States, including well and spring water. The reason for this is quite simple. Asbestos-bearing serpentine rock is to be found in a majority of the states of the union, including Illinois, and the simple process of water flowing over and through these rocks errodes a certain amount of asbestos fiber.

Thus, we have all been drinking tiny amounts of asbestos in our water since birth, without any discernable adverse effects.

In Part VII, Section 701 of the regulations, we would recommend the addition of the word "visible" in the next to the last line, so that the amended section would read: "No product which may emit

asbestos-fiber during its transportation shall be transported unless such product is enclosed in such a manner as to preclude the "visible" emission of asbestos fiber into the ambient air." The problem here is once again with analysis techniques and enforcement. The EPA has gone to a (quote) no visible emissions (end quote) standard in circumstances similar to this one, and we would recommend to the Board that this also be applied in Illinois. This would also be useful in other sections of the proposed regulations where measurement and enforcement would tend to be extremely difficult if not impossible.

Our final comment is with regard to Part VII, Section 702, which would prohibit the use of asbestos in the brake lining of vehicles manufactured after January 1, 1975, and sold for use within the State of Illinois. We believe that on the basis of the existing scientific evidence such a prohibition is completely unnecessary. In 1968, this question was investigated thoroughly by the United States Public Health Service, and a report on these investigations by Jeremiah R. Lynch, entitled "Brake Lining Decomposition Products" was published in the Journal of the Air Pollution Control Association. The report stated that (quote) except in all but the most extreme driving conditions, only a very small fraction of the 30 to 50 per cent asbestos present in a brake lining escapes into the atmosphere as free fiber (end quote). Lynch found that the average amount of free fiber released was less than one per cent of the fiber present in the brake lining composition. The percentage was higher only under conditions that would have resulted in brake failure. Lynch further

reported that the majority of the fiber in linings was converted into an inert non-fibrous material by the heat of friction, and concluded that the use of asbestos-containing brake linings was "an inconsequential health factor in urban air pollution." His conclusion is reasonable in light of the fact that hundreds of millions of cars using asbestos-containing brake linings have been stopping and starting in this country for more than half a century, and yet there has been no epidemic of asbestos-related disease among the general public nor have significant quantities of asbestos been demonstrated to exist in the community air. While we consider this evidence to be conclusive, if the Board is still concerned about asbestos emissions from brake linings, you will be interested to know that the Federal Environmental Protection Agency has contracted with the Bendix Corporation to do additional tests in this area. This study is due for completion in June of 1972, and we would recommend that the Board, at the very least, await the outcome of the EPA study before making a final decision on asbestos-containing brake linings. It is our belief that the Bendix study will confirm the conclusion reached by Lynch as to the safety of asbestos-containing brake linings.

This concludes my presentation on the proposed regulations. I have submitted for your consideration copies of all the medical papers, reports, booklets and documents that I referred to in my presentation. I would once again like to express the appreciation of the Asbestos Information Association for the opportunity to appear here this morning. Thank you.