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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, offi 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 taxe 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 Sina Hospital in New York, the Industrial Health Foundation in Pittsburgh, the University of California at Berkley, Farleigh-Dickinso University in New Jersey, the University of Pittsburgh, the Medic 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 environment 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 categor 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 worke 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 mesotheliom 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 measurabl 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 materia 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 manufactur

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 dat 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 apprach 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 invc 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 sampl 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 positi on numerical standards. It states (quote) because of methodolo 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 a 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

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 emi

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 million of cars using asbestos-containing brake linings have been stopping and starting in this country for more than half a century, and yet th 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 emission 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 paper 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.